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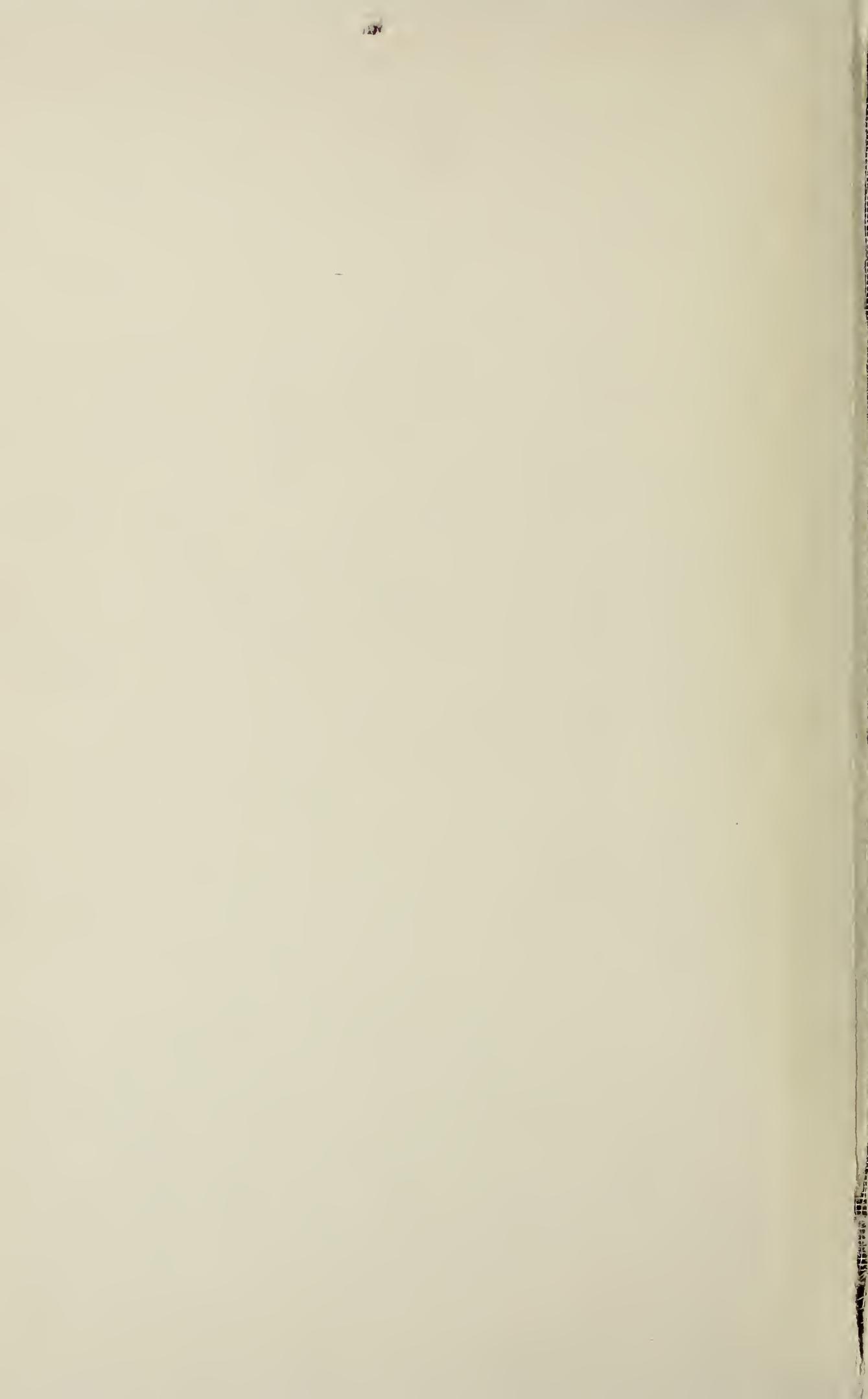
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QC100 .U556 V53;1962 C.1 NBS-PUB-C 1959

NBS MONOGRAPH 53

Experimental
Transition Probabilities
for Spectral Lines of
Seventy Elements



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UNITED STATES DEPARTMENT OF COMMERCE • Luther H. Hodges, *Secretary*
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Experimental Transition Probabilities for Spectral Lines of Seventy Elements

Derived From the
NBS Tables of Spectral-Line Intensities

The wavelength, energy levels,
transition probability, and oscillator strength
of 25,000 lines between 2000 and 9000 Å
for 112 spectra of 70 elements.

Charles H. Corliss and William R. Bozman



National Bureau of Standards Monograph 53

Issued July 20, 1962

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Be II	13	Mg I	185	Sn I	386
Bi I	14	Mg II	186	Sr I	388
C I	15	Mn I	187	Sr II	390
Ca I	16	Mn II	193	Ta I	391
Ca II	18	Mo I	195	Ta II	407
Cd I	19	Mo II	220	Tb I	413
Cd II	20	Na I	225	Te I	414
Ce II	21	Nb I	226	Th I	415
Co I	48	Nb II	247	Th II	422
Co II	60	Nd I	254	Ti I	438
Cr I	62	Nd II	256	Ti II	452
Cr II	75	Ni I	262	Tl I	456
Cs I	79	Ni II	267	Tm I	457
Cu I	80	Os I	268	Tm II	459
Cu II	81	Os II	287	U I	463
Dy II	82	P I	288	U II	470
Er II	84	Pb I	289	V I	477
Eu I	86	Pb II	290	V II	493
Eu II	92	Pd I	291	W I	498
Fe I	95	Pd II	293	W II	519
Fe II	109	Pr I	294	Y I	522
Ga I	111	Pt I	299	Y II	528
Gd I	112	Pt II	303	Yb I	531
Gd II	123	Rb I	304	Yb II	533
Ge I	135	Re I	305	Zn I	539
Hf I	136	Re II	322	Zn II	540
Hf II	145	Rh I	323	Zr I	541
Hg I	152	Rh II	332	Zr II	555
Ho I	153				

Experimental Transition Probabilities for Spectral Lines of Seventy Elements

Derived From the NBS Tables of Spectral-Line Intensities

Charles H. Corliss and William R. Bozman

Relative intensities of 39,000 spectral lines with wavelengths between 2000 and 9000 angstroms have been determined on a uniform energy scale for seventy elements. The light source was an arc between copper electrodes to which a single element was added in the ratio of one atom of element to 1000 atoms of copper. The temperature of the arc was determined, by comparison of the observed intensities with published relative *gf*-values, to be 5100 ± 110 °K. The degree of ionization of eleven elements in the arc was determined by comparison of intensities in spectra of neutral and ionized atoms with known absolute *gf*-values. With the aid of Saha's ionization equation, the electron density in the arc was found to be $2.4 \times 10^{14} \text{ cm}^{-3}$. The ionization of seventy elements separately added to the arc was then calculated with Saha's equation. A correction was made for diffusion of atoms from the arc stream. With this information, relative values of *gf* on a uniform scale can be computed for the 25,000 lines which have been classified. By calibration with known absolute *gf*-values, the scale is put on an absolute basis. Absolute transition probabilities for 25,000 lines of 112 spectra have been calculated in this way and the results are tabulated by spectrum. The wavelength in angstroms, energy levels to the nearest kaiser, *gA* in 10^8 per second, *gf*, and $\log gf$ are given for each line.

1. Introduction

The primary attributes of a spectrum line as observed in the laboratory are its wavelength and its intensity. The wavelength is ordinarily measured to six significant figures and, occasionally, to eight or nine. The intensity, on the other hand, is seldom measured accurately to one figure and never to more than two.

About thirty years ago, W. F. Meggers decided to correct this situation and initiated an extensive program of intensity measurements. The work is now completed and the results have just been published by Meggers, Corliss, and Scribner [1961]. The goal of the work was to provide lists of the principal lines of the elements generally observed under ordinary conditions in arc spectra, together with their relative intensities on a true scale of relative energy. In addition, the numerical values of the energy levels between which the transition occurs are given if the line has been classified. An inventory of these data is given in table 1. The element symbols are listed in alphabetical order in column 1, the total number of lines for each element in column 2, and the number of lines classified in the first and second spectra in columns 3 and 4. The difference between column 2 and the sum of columns 3 and 4 reflects the fact that more than one-third of the lines in the tables have not yet been classified. This provides an interesting quantitative view of the state of analysis in atomic spectra.

TABLE 1. Inventory of lines in tables of spectral-line intensities

Element symbol	Total	Number of lines I	Number of lines II	Element symbol	Total	Number of lines I	Number of lines II
Ag	15	11	4	Na	12	12	—
Al	16	16	—	Nb	1,442	1,062	314
As	25	25	—	Nd	1,465	80	275
Au	27	26	—	Ni	248	242	4
B	4	4	—	Os	1,036	912	35
Ba	96	79	16	P	9	9	—
Be	20	17	2	Pb	39	38	1
Bi	34	32	—	Pd	80	76	4
C	1	1	—	Pr	1,460	—	232
Ca	79	69	10	Pt	173	161	1
Cd	24	20	4	Rb	13	13	—
Ce	2,521	—	1,349	Re	962	824	48
Co	675	602	57	Rh	512	434	25
Cr	801	615	177	Ru	999	915	52
Cs	19	19	—	Sb	53	53	—
Cu	56	46	10	Sc	397	230	81
Dy	1,368	—	86	Se	5	5	—
Er	1,199	—	78	Si	15	15	—
Eu	524	298	149	Sm	1,563	221	780
Fe	762	671	80	Sn	59	59	—
Ga	15	15	—	Sr	76	67	9
Gd	1,426	520	581	Ta	1,302	789	288
Ge	43	43	—	Tb	1,656	3	—
Hf	770	433	309	Te	12	12	—
Hg	19	19	—	Th	2,221	342	789
Ho	966	3	—	Ti	951	707	178
In	22	21	1	Tl	18	18	—
Ir	534	511	—	Tm	875	62	157
K	8	8	—	U	1,951	326	316
La	641	270	272	V	1,060	795	219
Li	7	7	—	W	1,301	1,045	108
Lu	224	82	81	Y	453	260	110
Mg	25	19	6	Yb	432	53	281
Mn	353	290	54	Zn	20	18	2
Mo	1,577	1,258	208	Zr	1,060	700	322

Total number of lines _____ 38,826 16,602 8,165
Total number of elements _____ 70 66 46

2. Intensity Measurements

The light source chosen for this work was a 10-amp, 220-v d-c arc between copper electrodes mounted in water-cooled clamps. The electrodes were 1.5-g copper pellets $\frac{1}{4}$ in. in diameter, formed in a hydraulic press from copper powder to which one atom of the element under investigation was added for every 1000 atoms of copper. A 3-mm gap was maintained between the electrodes during the exposures, which varied in duration from 1 sec to 5 min depending on the spectral region under observation.

An image of the arc was formed within the aperture of the grating by a quartz lens at the slit which was uniformly illuminated by light from all parts of the arc. A rotating step sector at the slit reduced the exposure in four steps, with ratio 5 to 1 between steps, along the length of the slit. All observations were made in the first-order spectrum of a 6-in. grating with 15,000 lines per inch, and 22-ft. radius of curvature, mounted in parallel light to form stigmatic images on the plates. At a reciprocal dispersion of 5A/mm and a slit width of $30\ \mu$, a uniformly flat-topped image of the slit was formed for all but the broadest lines.

To cover the spectral range from 2000 to 9000 Å, each spectrum was photographed in five different settings of the spectrograph, by using Eastman Kodak spectroscopic plates 103-O U-V from 2000 to 3000 Å, "33" from 2600 to 4900 Å, II-F from 4600 to 6900 Å, and I-N from 6600 to 9000 Å. Each plate was developed 4 min in a rocking tray containing D-19 developer at 70 °F. Beside each spectrum of copper containing 0.1 percent of the element under study, reference spectra of pure copper and the pure element were photographed, the latter also through the stepped sector.

The exposures were adjusted so that the continuous spectral background was visible in the strongest step. The apparent intensity of each element line visible in the mixture with copper was estimated relative to selected copper lines throughout the spectrum. By reference to the auxiliary spectra, estimates were made of the intensity of any line masked by copper. To reduce these intensities estimated relative to copper to a true scale of relative intensity, accurate measurements of the true relative intensities of the selected copper lines, about 200 in number, were made by the standard methods of heterochromatic photographic

photometry. At wavelengths longer than 3300 Å measurements were made relative to an incandescent tungsten-strip filament operated at 2787 or 2881 °K. At shorter wavelengths the tungsten-strip is too faint; a false contribution is made to the spectrum by the intense light of longer wavelengths scattered by the grating. The lines from 2500 to 3300 Å were measured relative to a hydrogen arc lamp calibrated in this region by R. Stair at the National Bureau of Standards. Lacking a suitable energy calibration for the shortest wavelengths, the intensity estimates below 2500 Å were adjusted by a judicious extrapolation of our reduction factors. A more detailed discussion is given by Meggers, Corliss, and Scribner [1961].

An estimate of the accuracy of our intensities within a single spectrum has been obtained by comparing them with quantitative results published by other investigators. Frerichs [1926] has measured the relative intensities of lines in multiplets of Cr, Fe, Mn, Ti, and V by methods of photographic photometry. Comparisons made for 190 lines in 21 different multiplets show an average deviation of 14 percent. A second estimate results from comparison with the photoelectric measurements of intensities in the iron arc made by Crosswhite [1950]. The average difference between intensities of 330 iron lines common to the two sets, in the region 3175 to 5658 Å, is 27 percent. This comparison was made without any adjustment of intensities for possible temperature differences between the two light sources. Crosswhite estimates an accuracy of 1 percent for his measurements.

A more fruitful comparison was made with the relative *f*-values reported by King and King [1938] for Ti I. A plot of $\log [I\lambda^3/gf]$ versus upper excitation potential for 59 multiplets of Ti I yielded a straight line characteristic of a Boltzmann distribution of energy-state population. The average deviation from the line was 25 percent. The Kings state that their average deviations of individual measurements from the mean values vary from 4 to 15 percent for different lines. The foregoing comparisons suggest that a fair estimate of the average deviation of our intensity values is about 25 percent.

Although our original intention was to determine the relative intensities of spectral lines for purposes of quantitative spectrochemical analysis, it became evident from comparisons

such as that mentioned above that useful f -values could be derived from our measurements. A Boltzmann population distribution was demonstrated by the linearity of the plots and a temperature for the arc could be calculated from the slope of the line. In view of the

often-stated dissatisfaction of astronomers with the quantity and quality of available f -values, we decided to make a careful investigation for the conversion of our intensity measurements into f -values.

3. Conversion to Transition Probabilities

A uniform set of observations of line intensities for a large number of spectra, all measured on the same scale and in the same light source, will have a number of inherent advantages for the determination of transition probabilities.

1. The effective temperature of the source can be accurately determined by using the observed intensities and published values of relative transition probabilities for many different spectra.

2. The degree of ionization can be measured for many different elements by using the observed intensities and published values of absolute transition probabilities for arc and spark lines. With this information a best value for the electron density in the source can be determined.

3. The degree of ionization for each element observed in the source can then be computed.

4. With this information, relative transition probabilities on a uniform scale for all observed lines which have been classified in the energy-level structure of any spectrum can be calculated.

5. The uniform relative scale can be normalized to the absolute scale by comparison with published absolute transition probabilities for many different spectra.

There is a reasonable expectation that the general mean values of temperature, electron density, and normalization factor so obtained will provide more accurate calibrations than any calibration with f -values from only a single spectrum. Furthermore, these mean values can be applied to spectra for which no f -values are presently available. In this way, calibrated

f -values can be obtained for any element observable in the standard light source.

The practical realization in the copper arc of the procedure outlined above is based on the following assumptions:

1. *The arc is characterized by an effective temperature and electron density which do not change from one observation to the next.* This effective temperature is both defined and obtained by use of the Boltzmann equation, as shown in section 4. To attain this condition the size, shape, spacing and cooling of the electrodes, and the current in the arc were all carefully controlled. Such care is normal in spectrochemical procedures employed in this work.

2. *Atoms of each added element enter the arc stream at the same rate, which is 1/1000 the rate of entry of copper atoms.* The mixtures with copper powder were accurately weighed and thoroughly mixed before compressing into pellets at uniform pressure. The low concentration does not affect the thermal properties of the copper electrodes so that the added element should enter the arc stream uniformly with the copper.

3. *Atoms of each added element leave the arc stream at a rate which depends on atomic weight in a sufficiently well-known way.* This problem is discussed in section 6.

4. *Atoms of each added element exist in the arc stream at a concentration so low that self-absorption of lines is negligible.* Comparisons made with published sets of relative f -values show that this condition has been satisfied, with the exception of the resonance lines of a few simple spectra.

4. Temperature of the Copper Arc

Conversion of our intensities into transition probabilities requires first of all an accurate value of the effective temperature of the arc. Although the temperature in the arc stream is a function of the axial and radial position, we deal here with an effective value which is

inherently weighted according to the intensity distribution in the arc. Furthermore, the method of temperature measurement is based on comparison of published relative transition probabilities of atomic lines with intensities of the same lines measured in the copper arc.

This yields precisely the temperature appropriate to the calculation of transition probabilities from our intensities.

The Einstein-Boltzmann equation for the intensity of a spectral line can be written in the form

$$I = \frac{N}{u} h \nu g A e^{-\frac{E}{kT}} \quad (1)$$

where N is the particle density and u is the partition function for any particular atom or ion; h is Planck's constant; k is Boltzmann's constant; E is the energy and g the statistical weight of the upper level; A is Einstein's transition probability, I is the intensity and ν is the frequency of the line; and T is the absolute temperature of a source which follows a Boltzmannian distribution of energy. This can also be written in the form

$$I = \frac{N}{u} \frac{8\pi^2 e^2 h}{m} \frac{gf}{\lambda^3} e^{-\frac{E}{kT}} \quad (2)$$

where f is Ladenburg's oscillator strength for the emitted line, e/m is the specific charge of the electron, and λ is the wavelength of the line.

Now if, for a given spectrum, we plot $\log [gA/I\lambda]$ or $\log [gf/I\lambda^3]$ versus E , we will obtain a straight line if the source has a Boltzmannian distribution. From the slope of the line, which will be $-1/kT$, we can determine T .

Work of Allen and Asaad [1955] and trials of our own have shown that many of the calculated transition probabilities are unsuitable for this work. We have confined ourselves to experimentally determined values based on independent temperature determinations. A thorough search of the literature, aided by the NBS Atomic Physics Data Center, disclosed 31 sets of relative transition probabilities for 20 atomic species from which temperatures could be derived by comparison with the intensities in the NBS Tables. The data originated in the five laboratories listed below.

Physical Institute of the State University
at Leningrad 11 sets

Physical Laboratory of the
University of Utrecht 10 sets

Norman Bridge Laboratory of the California Institute of Technology 7 sets

Physical Institute, Academy of Sciences
USSR, Moscow 2 sets

Zeeman Laboratory at the
University of Amsterdam 1 set

In general, the various laboratories use dif-

ferent methods. At Leningrad, the anomalous dispersion of vapor in a furnace is measured by the "hook method" of Rogestwensky [1941]. The furnace temperature is measured with an optical pyrometer. At Utrecht, measurements are made usually with the arc methods originated by Ornstein and his coworkers, and carried on by Smit [1946]. They generally measure the temperature from the intensity distribution in the CN bands in the spectrum. The California experiments follow the method of total absorption as developed by King and King [1935]. The furnace temperature is measured with an optical pyrometer. A comparison of the temperatures determined from the data of the several laboratories is given in table 2, with the standard deviation of the individual determinations from the means.

TABLE 2. Comparison of temperatures derived from data of five laboratories

Spectrum	Temp.	Dev.
California		
Ca I	4200	620
Cr I	4280	540
Ni I	4660	240
Fe I	4820	0
Ti I	5080	260
V I	5310	490
Co I	5380	560
Av.	4820	390
$\sigma = 470$		
Leningrad		
Mn I	3900	1330
In I	4510	720
Cd I	4750	480
Ba I	5000	230
Sc I	5100	130
Zn I	5160	70
Ti I	5400	170
Co I	5480	250
Ga I	5780	520
V I	6100	870
Tl I	6400	1170
Av.	5230	540
$\sigma = 720$		
Utrecht		
Ba I	4250	870
Sr I	4410	710
Ag I	4600	520
Ca I	4880	240
Cd I	5080	40
K I	5100	0
Ti I	5260	140
Zn I	5600	480
Mg I	5780	660
Hg I	6250	1130
Av.	5120	480
$\sigma = 630$		
Moscow		
Fe I	4850	-----
Fe I	5320	-----
Amsterdam		
Fe I	5500	-----

The general average of the 31 individual determinations of the effective temperature of our arc, with the standard deviation of the mean, is

$$5100 \pm 110 \text{ }^{\circ}\text{K}.$$

The standard deviation of the individual determinations (σ) is 600 $\text{ }^{\circ}\text{K}$. The median value is also 5100 $\text{ }^{\circ}\text{K}$. Taken as a whole, the results exhibit a normal (Gaussian) distribution of values about the general mean, as is shown in table 3.

Consideration of the results in table 2 suggests that the temperature of the copper arc is substantially constant and that the variations arise from systematic errors in the various sets of transition probabilities. For example, the two sets of gf -values for V I are compared with the same intensities in each case. The temperature difference of 790 $\text{ }^{\circ}\text{K}$ can arise only from systematic errors inherent in one or both sets of gf -values. Similarly, the Utrecht values for Cd I are systematically smaller relative to the Leningrad values at the large values of E , so although identical NBS intensity numbers are used, the two plots yield temperatures which differ by 330 $\text{ }^{\circ}\text{K}$. The diversity of methods represented and the independent nature of the laboratories leads us to suppose that these systematic errors have offset one another to some extent in contributing to the general average value.

An example of a temperature plot with data from each of the three major laboratories is given in figures 1, 2, and 3. The agreement of

the experimental points with the best straight line drawn through them indicates that Boltzmann's law is adequately obeyed. A more detailed discussion of this temperature measurement is given by Corliss [1962a].

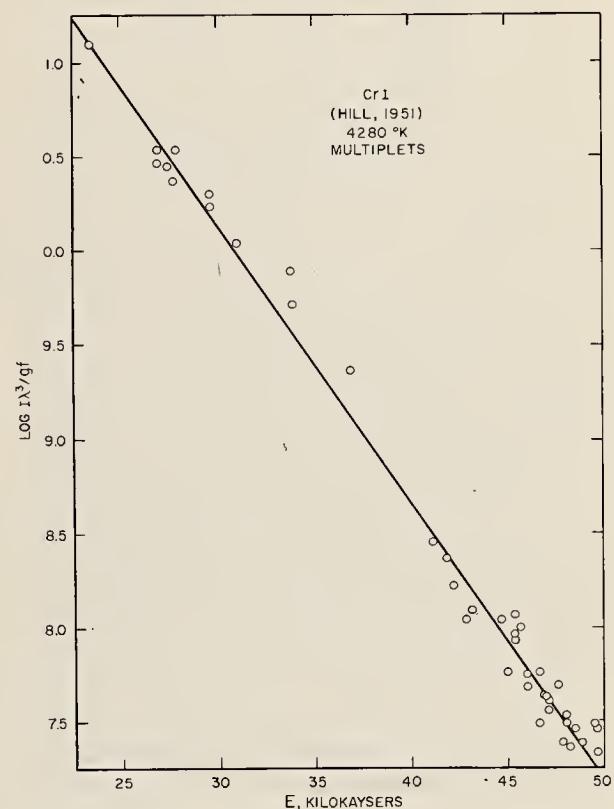


FIGURE 2. Log ratio of intensity $\times \lambda^3$ to gf -value for multiplets of Cr I in the copper arc plotted versus upper level. An arc temperature of 4280 $\text{ }^{\circ}\text{K}$ is derived from the slope of the line of best fit.

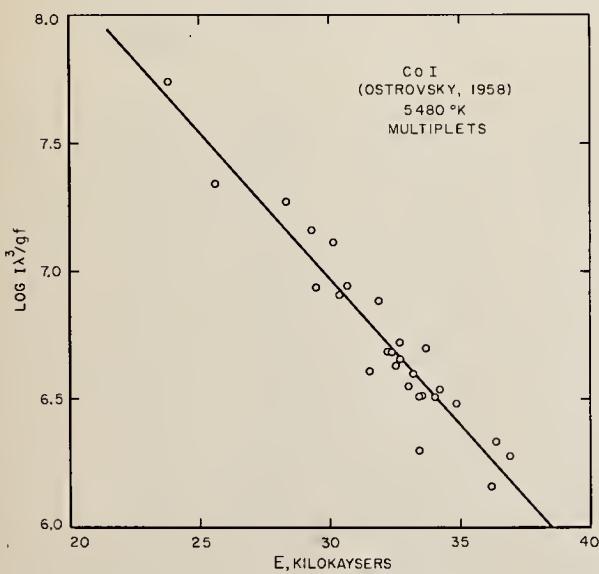


FIGURE 1. Log ratio of intensity $\times \lambda^3$ to gf -value for multiplets of Co I in the copper arc plotted versus upper level. An arc temperature of 5480 $\text{ }^{\circ}\text{K}$ is derived from the slope of the line of best fit.

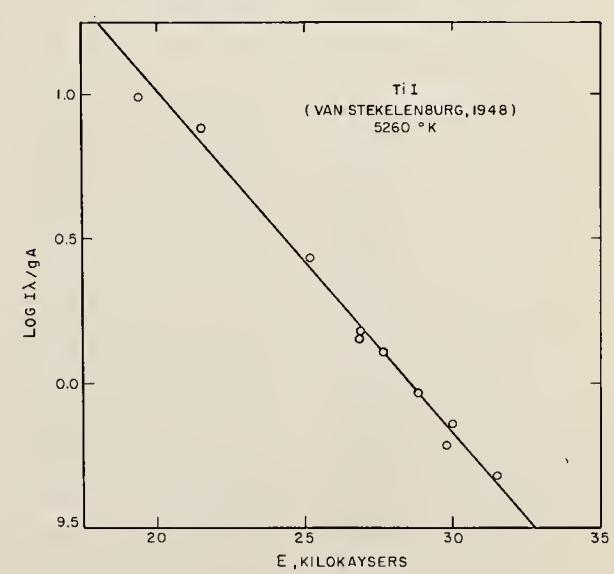


FIGURE 3. Log ratio of intensity in the copper arc $\times \lambda$ to gA for multiplets of Ti I plotted versus upper level. An arc temperature of 5260 $\text{ }^{\circ}\text{K}$ is derived from the slope of the line of best fit.

TABLE 3. Distribution of individual temperature determinations about the mean in intervals of σ

Interval	3300–3900	3900–4500	4500–5100	5100–5700	5700–6300	6300–6900
Individual determinations of temperature	3900	4200	4510	5100	5750	6400
		4250	4600	5160	5780	
		4280	4660	5260	6100	
		4410	4750	5310	6250	
		4820		5320		
		4850		5380		
		4880		5400		
		5000		5480		
		5080		5500		
		5080		5600		
		5100				
Observed fraction	0.03	0.13	0.36	0.32	0.13	0.03
Expected (Gaussian)	0.02	0.14	0.34	0.34	0.14	0.02

5. Degree of Ionization in the Copper Arc

With the temperature determined in the previous section it is possible to derive relative transition probabilities for the lines of a particular spectrum. If the relative transition probabilities for lines of both the first and second spectra of an element are to be determined on the same scale, the degree of ionization in the radiating gas must be determined. This can be done if absolute transition probabilities are known for arc and spark lines of a single element.

If in eq (2) we designate quantities associated with a neutral atom by the superscript $^{\circ}$, divide it by a similar equation in which quanti-

ties associated with ions are designated with the superscript $^+$, and solve for N^+/N° , we obtain

$$\frac{N^+}{N^{\circ}} = \frac{(I\lambda^3)^+}{(I\lambda^3)^{\circ}} \frac{u^+}{u^{\circ}} \frac{(gf)^{\circ}}{(gf)^+} e^{\frac{E^+ - E^{\circ}}{kT}} \quad (3)$$

Of the seventy elements in the NBS Tables of Spectral-Line Intensities, there are at present only eleven for which all the quantities on the right side of eq (3) are known. The data used in obtaining the numerical evaluations are given in table 4. The eleven atoms and ions

TABLE 4. Experimental determination of ionization for eleven elements in the copper arc

Atom or ion	Wavelength	Intensity	u	gf	E	$\log \frac{N^+}{N^{\circ}}$	Percent ionization
Be $^{\circ}$	3321	160	1.0	3.06	52.082	-1.236	5.5
Be $^+$	3130	800	2.0	1.50	31.932		
Mg $^{\circ}$	3838	940	1.0	6.0	47.957	-0.852	12.
Mg $^+$	2795	1600	2.0	1.80	35.72		
Ca $^{\circ}$	4226.73	1100	1.2	1.46	23.652	.957	90.
Ca $^+$	3933	6400	2.2	2.20	25.3		
Sc $^{\circ}$	5671	598	12.1	11.	29.16	.761	85.
Sc $^+$	3613	6606	23.2	6.9	27.65		
Ti $^{\circ}$	4305	1636	30.4	7.4	29.98	-.056	47.
Ti $^+$	3759	532	55.9	5.	31.36		
V $^{\circ}$	4111	2760	48.8	7.3	26.59	.284	66.
V $^+$	3093	1936	43.0	11.2	35.06		
Zn $^{\circ}$	4810	280	1.0	1.0	53.672	-2.931	0.12
Zn $^+$	2061	15.5	2.0	1.8	48.62		
Sr $^{\circ}$	4607.33	650	1.3	1.8	21.698	1.564	97.
Sr $^+$	4077	7800	2.2	1.87	24.19		
Cd $^{\circ}$	3261.06	32	1.0	0.0022	30.656	-0.608	20.
Cd $^+$	2265	170	2.0	1.8	45.01		
Ba $^{\circ}$	5535.48	650	2.5	1.92	18.060	1.569	97.
Ba $^+$	4554	8500	4.3	2.0	21.65		
Pb $^{\circ}$	2401.95	36	1.6	0.064	49.440	-0.260	35.
Pb $^+$	2203.53	9	2.1	0.604	59.448		

are listed in order of atomic number in column 1. The wavelengths and intensities taken from the NBS Tables are given in columns 2 and 3. In most cases the total intensity for a multiplet is used and only the first four figures of the wavelength of the leading line in the multiplet are given. In cases where a single line is used, the decimals are given. In column 4 are found the partition functions calculated by Claas [1951]. The sums of the absolute *gf*-values for the lines are listed in column 5. Because of the scarcity of experimental absolute values, especially for second spectra, we have used, with two exceptions, only absolute theoretical values or experimental relative values adjusted to an absolute scale derived from theoretical values. The energy levels of the upper states given in column 6 are in units of kilokaysers ($1 \text{ kK} = 1000 \text{ cm}^{-1}$). For multiplets, weighted mean values are given. Log N^+/N° and the percent ionization for each element are given in the last two columns. The principal source of error in these determinations lies in the absolute *gf*-values. The intensities contribute an uncertainty of about 25 percent and the arc temperature contributes from 2 to 12 percent, depending on the value of $(E^+ - E^\circ)$.

For the remaining 59 elements this procedure cannot be used. Instead, we compute the degree of ionization for all seventy elements by using a mean value of electron density obtained by solving Saha's equation for the eleven elements discussed above. We write Saha's equation in the form

$$\log N_e = 21.245 - 0.988 V - \log N^+/N^\circ - \log u^+/u^\circ, \quad (4)$$

where N_e is the electron density in cm^{-3} , V is the ionization potential of the atom in volts, and the temperature is taken to be $5100 \text{ }^\circ\text{K}$. The eleven computations are given in table 5. The mean value of electron density is $2.4 \times 10^{14} \text{ cm}^{-3}$, corresponding to a pressure of 170 dynes/cm² or $1.7 \times 10^{-4} \text{ atm}$ at $5100 \text{ }^\circ\text{K}$. The average deviation in $\log N_e$ given in table 5 corresponds to a range of N_e from 0.9 to $6 \times 10^{14} \text{ cm}^{-3}$. The standard deviation of the mean is 0.17 on a log scale.

A non-spectroscopic determination of N_e can be obtained from electrical and geometrical measurements on the copper arc, by using the continuity relationship that the current density is equal to the product of the charge of the electron, the electron density in the arc stream, and average velocity of the electrons

TABLE 5. Calculation of electron density N_e

Element	V	u°/u^+	$\log N_e$
Be	9.320	0.500	13.574
Mg	7.644	.500	14.846
Ca	6.111	.545	14.514
Sc	6.54	.522	14.306
Ti	6.82	.544	14.825
V	6.74	1.135	14.246
Zn	9.391	0.500	15.199
Sr	5.692	.591	14.285
Cd	8.991	.500	13.271
Ba	5.210	.582	14.764
Pb	7.415	.762	14.297
Average			14.375 ± 0.413

in the direction of the current. The current density midway between the electrodes in our arc was 170 amp/cm². From measurements of the drift velocities of electrons in air by Nielson and Bradbury [1937], a value of $4.5 \times 10^6 \text{ cm/sec}$ can be deduced for the conditions in our arc plasma. With this information we find an electron density of $2.4 \times 10^{14} \text{ cm}^{-3}$, the same as the spectroscopic value. The exact agreement is, of course, not significant, but it indicates that our result is fairly reliable. It also indicates that ionization in our arc is well described by Saha's equation. This matter is discussed in more detail by Corliss [1962b].

To calculate the degree of ionization for our seventy elements, we rewrite eq (4) by using the mean value of $\log N_e$:

$$\log N^+/N^\circ = 6.870 - 0.988 V - \log u^+/u^\circ. \quad (5)$$

The straight line in figure 4 is a plot of this equation. The slope of the line is fixed by the temperature determined in the foregoing section. The points represent the directly deter-

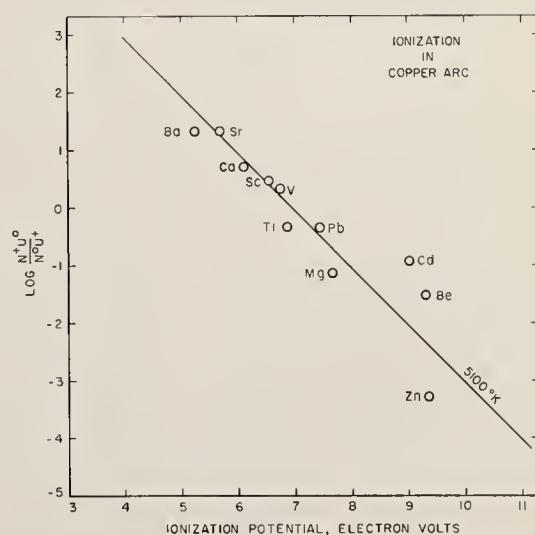


FIGURE 4. Degree of ionization in the copper arc. The points represent the experimentally determined values for eleven elements. The straight line represents Saha's ionization equation for a temperature of $5100 \text{ }^\circ\text{K}$ and an electron density of $2.4 \times 10^{14} \text{ cm}^{-3}$.

mined experimental values of ionization for the eleven elements in table 4. Their location with respect to the line indicates that this temperature is appropriate to the calculation of the degree of ionization as well as excitation.

To evaluate eq (5) we need good values of the ionization potentials and partition functions for each of the seventy elements. Ionization potentials listed in column 3 of table 6 are taken from Moore [1958] with the exception

TABLE 6. *Ionization potentials, partition functions, degree of ionization, and persistence for seventy elements in the copper arc*

Z	Element	V	u°	u^+	$\log N^+/N^\circ$	N°	N^+	p
		v				%	%	
3	Li	5.390	2.1	1.0	1.223	5.65	94.4	0.603
4	Be	9.320	1.0	2.0	-2.030	99.	0.91	.650
5	B	8.296	6.0	1.0	-2.104	99.	.78	.682
6	C	11.256	9.3	6.0	-4.441	100.	.0036	.701
11	Na	5.138	2.1	1.0	1.472	3.26	96.7	.818
12	Mg	7.644	1.0	2.0	-0.381	71.	29.4	.828
13	Al	5.984	5.9	1.0	.187	39.4	61.	.846
14	Si	8.149	9.5	5.7	-1.404	96.	3.8	.854
15	P	10.484	4.5	8.2	-3.228	100.	0.059	.871
19	K	4.339	2.2	1.0	2.241	0.571	99.4	.913
20	Ca	6.111	1.2	2.2	1.092	7.5	92.5	.918
21	Sc	6.54	12.1	23.2	0.692	16.9	83.	.938
22	Ti	6.82	30.4	55.9	.394	28.8	71.	.950
23	V	6.74	48.8	43.0	.155	41.	59.	.961
24	Cr	6.764	10.6	7.3	.026	49.5	51.5	.964
25	Mn	7.432	6.5	7.8	-.392	71.	28.9	.974
26	Fe	7.87	28.5	43.6	-.726	84.	15.8	.977
27	Co	7.86	33.1	30.0	-.942	90.	10.3	.987
28	Ni	7.633	30.6	11.0	-1.115	93.	7.1	.986
29	Cu	7.724	2.4	1.0	-1.141	93.	6.74	1.000
30	Zn	9.391	1.0	2.0	-2.107	99.2	0.776	1.006
31	Ga	6.00	5.2	1.0	0.226	37.3	62.7	1.017
32	Ge	7.899	7.7	4.4	-1.177	93.8	6.24	1.024
33	As	9.81	4.6	6.0	-2.706	99.8	0.197	1.030
34	Se	9.75	7.5	4.2	-3.015	99.9	.097	1.039
37	Rb	4.176	2.3	1.0	2.382	0.413	99.6	1.054
38	Sr	5.692	1.3	2.2	1.475	3.24	97.	1.058
39	Y	6.38	12.1	16.2	0.695	16.8	83.	1.061
40	Zr	6.84	35.3	46.6	.230	37.	63.	1.065
41	Nb	6.88	25.4	23.2	.031	48.	52.	1.068
42	Mo	7.10	8.7	7.5	-.204	62.	38.	1.074
44	Ru	7.364	33.6	23.3	-.564	79.	21.4	1.084
45	Rh	7.46	26.2	15.0	-.743	85.	15.3	1.087
46	Pd	8.33	3.1	7.5	-.973	90.	9.6	1.093
47	Ag	7.574	2.0	1.0	-0.914	89.1	10.9	1.095
48	Cd	8.991	1.0	2.0	-1.712	98.1	1.90	1.102
49	In	5.785	4.2	1.0	0.531	22.7	77.3	1.106
50	Sn	7.342	5.3	3.2	-.604	80.1	19.9	1.113
51	Sb	8.639	4.74	3.43	-1.805	98.4	1.55	1.117
52	Te	9.01	6.30	4.40	-2.185	99.	0.65	1.126
55	Cs	3.893	2.5	1.0	2.626	0.236	99.8	1.133
56	Ba	5.210	2.5	4.3	1.960	1.08	98.9	1.139
57	La	5.61	20.2	30.2	1.504	3.0	97.	1.141
58	Ce	(5.6)	110.	190.	1.56	2.8	97.	1.142
59	Pr	(5.5)	50.	86.	1.69	2.0	98.	1.143
60	Nd	(5.5)	50.	86.	1.66	2.2	98.	1.148
62	Sm	5.6	35.	57.	1.59	2.5	98.	1.155
63	Eu	5.67	9.2	15.7	1.499	3.1	96.9	1.157
64	Gd	6.16	51.	78.	0.967	9.7	90.3	1.163
65	Tb	(6)	50.	80.	1.09	8.	92.	1.165
66	Dy	(6)	36.	60.	1.09	8.	92.	1.169
67	Ho	(6)	36.	60.	1.09	8.	92.	1.171
68	Er	(6)	50.	80.	1.09	8.	92.	1.174
69	Tm	(6)	10.	17.	1.09	8.	92.	1.176
70	Yb	6.2	1.00	2.00	1.07	7.8	92.	1.180
71	Lu	6.15	8.52	1.39	0.002	49.9	50.1	1.182
72	Hf	6.8	13.9	12.3	.117	43.	57.	1.186
73	Ta	7.88	16.4	22.1	-.789	86.	14.0	1.188
74	W	7.98	11.9	12.8	-.978	90.	9.5	1.191
75	Re	7.87	6.7	7.0	-.892	89.	11.4	1.193
76	Os	8.5	19.0	17.6	-1.56	97.	2.7	1.197
77	Ir	9.1	20.9	14.	-2.31	99.	0.49	1.199
78	Pt	9.0	19.8	9.65	-2.34	99.	.45	1.202
79	Au	9.22	2.45	1.10	-2.588	99.7	.257	1.203
80	Hg	10.43	1.0	2.0	-3.129	99.9	.074	1.207
81	Tl	6.106	2.5	1.0	0.439	26.7	73.3	1.210
82	Pb	7.415	1.6	2.1	-.337	68.5	31.5	1.212
83	Bi	7.287	4.3	1.1	-.921	89.3	10.71	1.214
90	Th	(6)	19.0	34.3	1.13	7.	93.	1.233
92	U	(6)	54.	80.	1.04	8.	92.	1.238

of those for the rare earths and a few more recent values. Amongst the rare earths, fairly good spectroscopic values are available for Sm, Eu, Gd, Yb, and Lu. Ionization potentials of the remaining rare earths are not well established, but as a group these elements are remarkably uniform in their ease of ionization. The values given in parentheses are estimates based in some cases on adjusted non-spectroscopic values.

The partition functions for the 41 elements Li through Ge, Rb through Mo, Pd through Sn, Cs through La, and Hg through Bi in columns 4 and 5 of table 6 are taken from Claas [1951]. Partition functions for 18 additional elements for which knowledge of the spectral terms is reasonably complete were calculated from the equation

$$u = \sum_n g_n e^{-\frac{E_n}{kT}} \quad (6)$$

by summing over all levels up to 14 kK. Above that value the Boltzmann factor is less than 2 percent and the contributions to the sum become very small. Values calculated by this procedure differ from those calculated by Claas by less than 5 percent on the average.

The partition functions for the eleven remaining elements could not be accurately determined because knowledge of the spectral terms is incomplete or wholly lacking. Estimated or assumed values, based partly on predicted spectral structures and partly on comparison of the character of the observed spectrum with that of similar analyzed spectra, are given in parentheses. The assumed values

(in parentheses) probably differ from the true values by less than a factor of two. The more reliable values and estimates suggest that for most of the rare earths the value of u°/u^+ lies between 0.4 and 0.8; accordingly a value of 0.6 has been assumed for the inadequately analyzed rare earths. This may be accurate to 50 percent.

The evaluation of eq (5) for our seventy elements is given in column 6 of table 6, and the corresponding percentages of neutral atoms and ions are given in columns 7 and 8. It is interesting to note the periodicities of N^+/N° with atomic number. This ratio is monotonic over longer ranges of Z than the well-known periodicities of ionization potential.

At this point we may remark that for every thousand copper atoms in the arc stream, about 67 electrons are released into the gas from copper atoms. Even in the case of the most easily ionized added element, not more than one electron can be contributed for every thousand atoms of copper. It is clear then that the added elements cannot affect the electron density in the arc. Furthermore, the degree of double ionization in the arc is probably negligible. Of the elements added to the copper, the one which may be expected to yield the largest number of doubly charged ions is barium. Evaluation of eq (5) for the ratio Ba^{++}/Ba^+ shows that the proportion of barium that will be doubly ionized is only 0.02 percent.

A more detailed discussion of the degree of ionization in the copper arc is given by Corliss [1962b].

6. Persistence of Atoms in the Arc

The metallic atoms in the hot core of our copper arc are continuously lost by diffusion into the surrounding atmosphere and are continuously replaced by the evaporation of electrode material. In the steady state established immediately after the ignition of the arc, the atoms will be lost at the same rate that they are replaced but, because of their smaller velocities, heavier atoms will remain in the core longer than light ones. Even though all seventy elements are introduced into the arc at the same rate, the concentration of heavy elements will be greater than that of light ones and the intensities of their spectra will be affected accordingly. If the transition probabilities derived from our intensities are to be on a

uniform scale, a correction for this variable persistence of atoms in the arc stream must be made.

A recent study of this matter has been made by Raikhbaum and Malykh [1960]. They measured the mean time spent by atoms of Li, Na, Ca, Zn, Ag, Cd, and Tl in 10-amp d-c arcs in air between carbon electrodes. The arc gap was 5-mm. The measured times t in milliseconds are related to the atomic weights A by the following equation

$$t = 0.440 + 0.714 \log A,$$

from which their experimental points deviate by less than one percent. If we divide this

equation by the time spent in the arc by copper atoms, we will obtain the persistence of atoms in the arc stream relative to those of copper

$$p = 0.255 + 0.413 \log A. \quad (6)$$

From this we find, for example, that gold atoms persist in the arc twice as long as do those of lithium.

7. Normalization of the Scale

With the information worked out in the previous sections, we are in a position to calculate relative gf -values on a uniform scale for the classified lines of atoms or ions listed in the Tables of Spectral-Line Intensities. From eq (2), introducing the variable persistence p , we have

$$gf_{(relative)} = (u/Np) I\lambda^3 e^{-\frac{E}{kT}} \quad (7)$$

Since neither N nor I is known in absolute value, we cannot calculate absolute values of gf directly. We can, however, calibrate the relative scale against known absolute values of gf . A normalization factor C can be determined for every observed line for which an absolute gf -value is known.

$$C = (gf_{(absolute)} / I\lambda^3) (Np/u) e^{-\frac{E}{kT}} \quad (8)$$

Absolute f -values in the literature are notoriously inaccurate, and it is most important to choose carefully from them and to use as many reliable values as possible in order to arrive at a reasonably reliable value for C . An excellent and comprehensive critical discussion of f -values is given by Goldberg, Müller, and Aller [1960]. As an extreme example of the discordance amongst absolute f -values, we cite their Table 54, showing eight determinations of absolute values in Cr I. The extreme values disagree by a factor of 500!

For a uniformly radiating gas, it is reasonable to expect that the normalization factor from eq (8) would be a constant. Although we have treated our arc as a uniformly radiating gas in deriving an effective temperature and electron density, it is of course not so in fact. The temperature declines from a maximum at the axis to room temperature at the maximum radius of the arc. Furthermore, the arc has thin layers at the electrodes where the electric fields are very strong. The nonuniform excitation

Since eq (6) represents data obtained in an arc very similar to ours, we will use it to supply the necessary correction for the diffusion of both atoms and ions out of our arc. At the elevated temperature in the arc, it is reasonable to assume that the diffusion constants of ions are about the same as those of their parent atoms. The value of p for each element will be found in column 9 of table 6.

which exists outside the dominant region of uniform temperature and electron density in the core of the positive column produces a curious departure of the normalization factor from a constant value for extremely small and large values of E . Preliminary reductions of our intensities to absolute gf -values by using a constant value of C produced f -values for lines with the highest excitation potentials which were so large as to be at variance with the Thomas-Kuhn f -sum rule. It was this anomaly that drew our attention to the dependence of C on E for extreme values of E .

About 90 percent of the lines in our tables originate from upper levels between 15 and 50 kK. These lines are excited primarily in the core of the positive column of the arc under conditions characterized by the temperature and electron density determined in sections 4 and 5. Most of the lines from the higher levels are too weakly excited in this region to be observed. Such lines, however, are excited in the thin layers of higher excitation close to the electrodes and are observed in the integrated light of the arc used in our experiment. Since the intensity of these lines is higher than would be expected from the positive column alone, the value of C declines at large values of E . The lines of lowest excitation energy, on the other hand, are excited in the low-temperature regions of the positive column at abnormally large distances from the axis as well as in the core. As a consequence, a larger total volume of radiating gas is contributing to the intensity of these lines and the value of C declines somewhat at the lowest values of E (see eq (8)).

Thus, while C may be taken as a constant for most of our lines, the inhomogeneous nature of the radiating gas in our arc requires that C be treated as a function of E for lines with very low and very high excitation energies.

To evaluate this function we have made 37 determinations of C at values of E between 10

and 90 kK, carefully selecting the best available absolute transition probabilities that cover the range of E . Below 75 kK the only values used were experimental absolute values or experimental relative values adjusted to an experimental absolute scale or, in some cases, to a scale based on values calculated from wave functions. Above 75 kK no absolute values were available from the literature, so we extended the function with values we calculated by the method of Bates and Damgaard [1949]. Less than 0.1 percent of our lines originate at these high levels. The values of $\log C$ determined by the three kinds of absolute gf -values are given in tables 7, 8, and 9, and those below 75 kK are plotted in figure 5. The function used in the reduction of our intensity numbers to absolute transition probabilities is represented by the curve. The function has an essentially constant value of -16.61 between 15 and 50 kK and declines at smaller and larger values of E . This decline is a quantitative representation of the way in

which the excitation of the integrated radiation from the arc differs from that of a uniformly radiating gas at a temperature of 5100 °K and an electron density of $2.4 \times 10^{14} \text{ cm}^{-3}$.

The data from which our normalization function has been determined are presented in tables 7, 8, and 9. Following the atomic number and spectrum symbol, the wavelength (given to six figures) of the single line used or the wavelength (given to four figures) of the strongest line of the multiplet used is listed in column 3. The log of the relative intensity taken from the Tables of Spectral-Line Intensities is in column 4 and the upper level of the line is given in column 5 in kilokaysers. The log of the absolute gf -value used and the reference from which it is taken are given in the next columns. The value of $\log C$, calculated with the aid of eq (8), and its deviation from the adopted function are given in the last two columns. The values of N , p and u are taken from table 6, and the temperature used is 5100 °K, as determined in section 4. In cases

TABLE 7. Normalization factors determined from experimental absolute gf -values

Z	Spectrum	Wavelength	$\log I$	E	$\log gf$	Reference	$\log C$	Dev.
3	Li I	6707	3.556	14.9	0.176	Filippov [1931]	-16.474	0.28
11	Na I	5889	3.477	17.0	.322	Ladenburg et al. [1931]	-16.439	.18
12	Mg I	2852.13	3.778	35.1	.079	Ostrovsky et al. [1958b]	-16.595	.02
19	K I	7664	3.431	13.0	.296	Stephenson [1951]	-16.984	.00
24	Cr I	4254	3.585	23.4	-.041	Bell et al. [1958b]	-16.728	-.12
25	Mn I	4030	3.623	24.8	-.079	Bell et al. [1959]	-16.530	.08
26	Fe I	3719.94	2.778	26.9	-.541	Bell et al. [1958a]	-16.862	-.25
29	Cu I	3247.54	3.699	30.8	-.208	Bell et al. [1958a]	-16.626	.02
31	Ga I	4172	3.477	24.8	-.098	Ostrovsky et al. [1958a]	-16.599	.01
37	Rb I	7800	3.653	12.7	.299	Stephenson [1951]	-17.322	-.29
47	Ag I	4210.96	0.954	54.2	-.027	Terpstra and Smit [1958]	-16.806	.13
47	Ag I	5465	2.322	48.8	.993	Terpstra and Smit [1958]	-16.797	-.16
48	Cd I	3261.06	1.505	30.6	-2.638	King et al. [1940]	-16.404	.21
49	In I	3256	3.380	32.9	0.526	Ostrovsky et al. [1958a]	-16.623	-.01
55	Cs I	8521	3.362	11.5	.292	Minkowski et al. [1930]	-17.267	.00
56	Ba I	5535.48	2.813	18.1	.255	Kopfermann et al. [1951]	-16.307	.30
81	Tl I	3775.72	3.079	26.5	-.654	Filippov et al. [1933]	-16.596	.01
82	Pb I	2833.06	2.978	35.3	-.638	Bell et al. [1961]	-16.603	.01

TABLE 8. Normalization factors determined from experimental relative gf -values set to an absolute scale based on experimental absolute gf -values or on values calculated with wave functions

Z	Spectrum	Wavelength	$\log I$	E	$\log gf$	Relative reference	Absolute reference	$\log C$	Dev.
12	Mg I	2779	2.358	57.8	0.778	Kersten et al. [1941]	Treffitz [1950]	-17.211	0.02
12	Mg I	4703.02	0.845	56.3	-.426	Kersten et al. [1941]	Treffitz [1950]	-17.419	-.32
12	Mg I	5528.46	.778	53.1	-.545	Kersten et al. [1941]	Treffitz [1950]	-17.292	-.43
20	Ca I	3006	1.290	48.6	.174	Olsen et al. [1959]	Treffitz [1951]	-16.736	-.10
20	Ca I	4454	2.435	37.8	.656	Olsen et al. [1959]	Treffitz [1951]	-16.589	.02
20	Ca I	5349.47	1.204	40.5	-.110	Olsen et al. [1959]	Treffitz [1951]	-16.706	-.10
26	Fe I	4219.36	0.845	52.5	1.147	Carter [1949]	Bell et al. [1958a]	-16.546	.27
26	Fe I	4260	2.017	43.1	1.156	Carter [1949]	Bell et al. [1958a]	-16.568	.04
26	Fe I	4375	1.255	23.1	-2.144	King and King [1938]	Bell et al. [1958a]	-16.701	-.09
26	Fe I	5110.41	0.301	19.6	-3.384	King and King [1938]	Bell et al. [1958a]	-16.745	-.13
30	Zn I	2801	1.176	68.6	0.100	Schuttevaer et al. [1943]	mean of 8 authors	-17.818	.58
48	Cd I	3610	2.928	59.5	1.234	Hengstum et al. [1956]	King et al. [1940]	-17.596	-.20
80	Hg I	5460	2.954	62.4	0.905	Schouten and Smit [1943]	mean of 6 authors	-18.648	-.93
80	Hg I	5769.59	1.380	71.4	.548	Schouten and Smit [1943]	mean of 6 authors	-18.779	-.07

where several members of a multiplet are used, the total intensity, the sum of the gf -values, and a weighted mean value of E are given.

The value of the constant portion of the function ($\log C = -16.61$) from 15 to 50 kK is the mean of the 20 determinations which lie in this range. The average of the deviations from this mean is 0.10. The standard deviation of the individual determinations is 0.14 and the standard deviation of the mean is 0.03. These uncertainties in the determination of the normalization factor apply to the 90 percent of our lines which lie within this range of E .

We are now in a position to calculate transition probabilities on an absolute scale for the classified lines in our tables. We calculate gf from the formula

$$gf_{(absolute)} = C (u/Np) I \lambda^3 e^{-\frac{E}{kT}} \quad (9)$$

and gA from the formula

$$gA_{(absolute)} = 0.667 \times 10^{16} C (u/Np) I \lambda e^{-\frac{E}{kT}} \quad (10)$$

TABLE 9. Normalization factors for high levels determined from absolute gf -values calculated with the Coulomb approximation

Z	Spectrum	Wavelength	Log I	E	Log gf	Log C	Dev.
47	Ag II	2413.18	1.000	82.2	0.267	-19.869	0.11
47	Ag II	2437	1.000	81.0	.265	-19.739	.08
48	Cd II	2312.84	0.602	89.8	1.373	-20.307	.71
48	Cd II	2572.93	.699	83.0	-0.606	-21.681	-1.60
80	Hg I	3021.50	1.301	77.1	1.140	-17.967	1.37

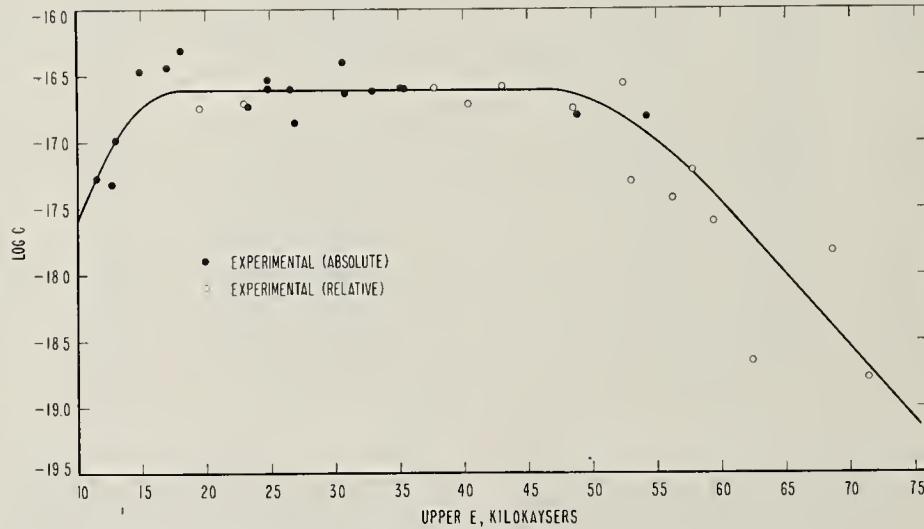


FIGURE 5. Normalization function for establishing the absolute scale. Ninety percent of our 25,000 gf -values are for lines with upper levels between 15 and 50 kK.

8. Accuracy of gf -Values

The accuracy of our gf -values can be considered from two points of view: as relative values within a single spectrum, or as absolute values. There are more factors, each with an associated uncertainty, that enter into the calculation of the absolute value than enter into the calculation of the relative value than enter

into the calculation of relative values within a single spectrum. In the case of relative values within a spectrum, the uncertainty in gf depends only on the uncertainties in I and T . The standard deviation of an individual determination of I is taken to be 32 percent ($\log = 0.12$) and we tabulate it in column 2 of table 10.

TABLE 10. Standard deviation of individual determinations of log gf-values

Due to error in <i>E</i>	As relative values within a spectrum			As absolute values				
	<i>I</i>	<i>T</i>	total (col. 2 + 3)	<i>u</i>	<i>N_e</i>	<i>T</i>	<i>C</i>	total (col. 4, 5, 6, 7, + 8)
15	0.12	0.038	0.13	0.044	0.17	0.038	0.031	0.24
25	.12	.062	.14	.044	.17	.062	.031	.25
35	.12	.088	.15	.044	.17	.088	.031	.27
45	.12	.112	.16	.044	.17	.112	.031	.28
50	.12	.125	.17	.044	.17	.125	.031	.29

Since *T* appears in the exponent of the Boltzmann factor, the resultant standard deviation in this factor is a function of *E*, and is tabulated in column 3. Here we have taken the standard deviation of the mean value of *T* as 2 percent. The standard deviation of individual determinations of log *gf* as relative values within a spectrum is the square root of the sums of the square of the errors in columns 2 and 3, and is given in column 4.

To obtain the standard deviation of an individual determination of log *gf* taken as an absolute value, we must add in the same way the standard deviations in columns 4, 5, 6, 7, and 8. The standard deviation of an individual determination of the log quotient of the partition functions u^+ / u° , the last term in eq (5), is given in column 5. The standard deviation of the mean of the eleven spectroscopically determined values of $\log N_e$, which occurs in the second term of eq (5), appears in the sixth column. The error associated with the Boltzmann factor reappears in the third term of eq (5) and is tabulated again in column 7. The standard deviation of the mean of the twenty determinations of the normalization function $\log C$, between 15 and 50 kK, appears in column 8. The total standard deviation of the individual determinations of log *gf* is given in column 9.

Converting the logarithms of the errors into numbers, we see that the relative *gf*-values within a spectrum may be expected to deviate from correct values by a factor that increases from 1.4 at 15 kK to 1.5 at 50 kK. Taken as absolute values, the factor of error increases from 1.7 at 15 kK to 2.0 at 50 kK. At smaller values of *E* the error is not likely to change much, because the decreasing error in the Boltzmann factor may be balanced by the increasing uncertainty in the normalization function. At larger values of *E* the error may be expected to increase more rapidly owing to the increasing error in the Boltzmann factor and the larger uncertainty in the normalization function. The reader is advised to note the val-

ue of *E* when considering the accuracy of a particular *gf*-value in our tables.

The largest single source of error is the uncertainty in the degree of ionization resulting from the determination of electron density in the arc. This error is systematic in nature; it arises mainly from the poor absolute *gf*-values upon which the determination of electron density is based. The next largest source of error is in the intensities; it is of a random nature, except at wavelengths less than 2500 Å, where it probably acquires a systematic component arising in the lack of adequate intensity standards at short wavelengths. The error due to the temperature is not significant below about 30 kK and equals that from the intensities at 50 kK. The partition-function errors are insignificant, except possibly for some of the rare earth elements. In the range between 15 and 50 kK, the error in the normalization function is surprisingly small and is not significant. In view of the relatively constant nature of the persistence function, its error, while unknown, is certainly negligible. Another possible error which may exist in a few cases, would arise from incorrect classification of a line, resulting in a wrong value of *E*.

Because of the scarcity and poor quality of *f*-values for spectra of ions in the literature, most of the calibrations reported in this work were made by using spectra of neutral atoms. Tests made with the few values available for ionic spectra did not indicate any systematic errors introduced on this account. It is possible, however, that the systematic error in the absolute values for ions may be slightly larger than that for neutral atoms. Not enough information about absolute *f*-values of ionic spectra is available yet to allow a significant test. One good set of relative *f*-values for lines of Ti II measured in a furnace by King [1941] yielded an arc temperature of 5570 °K, which is within the standard deviation for a single determination of the temperature of the copper arc.

9. Computation and Preparation of the Tables

At the beginning of the preparation of this table it was realized that equipment was available which would permit essentially automatic preparation of the finished book. It was therefore decided to attempt to produce this publication by completely automatic methods. An electronic computer could be used for the computation, then the magnetic tape output from the computer could be used to operate an automatic phototypesetting machine which would produce film ready for making the printing plates.

The basic input data for the computation were already available on a magnetic tape, having been prepared previously for the NBS Tables of Spectral-Line Intensities. The wavelength, element name, spectrum assignment, and the two energy levels for each classified line were selected from this tape. The other parameters in eq (9) and (10) for each element and spectrum were read into the computer from punched cards.

The computation could have been done in one step, with the output tape written in the form for use by the phototypesetting machine;

however, for purposes of checking, it was decided first to write the output data for printing on the off-line computer, then as a separate operation to convert this Binary-Coded-Decimal tape to a binary tape in the proper format for the phototypesetting machine.

The computer instruction coding for the first step was written entirely in the FORTRAN (FORmula TRANslating) automatic coding system. The coding for the second step was written mostly in FORTRAN, but the actual convert portion was written as a SUBROUTINE sub-program in FAP machine language. The first step required about 20 min running time, and the second step about 13 min on a 7090 computer.

The resulting binary tape, written in 256-character records, had to be rewritten onto 30 tapes of two-character records in order to match the input buffer. The pages were photographically typeset with a Mergenthaler Linofilm machine onto 8-in. wide film in 50-ft rolls. About 8 min were required to set each page. Printing plates were made from the film positives which are actual page size.

10. Results and Conclusion

The tables of transition probabilities are arranged alphabetically by spectrum symbol and by wavelength within each spectrum. They give the air wavelength in angstroms, the two energy levels to the nearest kayser, gA in units of 10^8 sec^{-1} , gf , and $\log gf$.

As an example of the work which can be done with these results, we present in figure 6 a curve of growth for Y II in the sun. The ordinates were taken from the Utrecht Preliminary

Photometric Catalogue of Fraunhofer Lines [1960]. The abscissae are calculated from our gf -values, with $X = gf\lambda e^{-E/kT}$ for about 65 unblended lines of Y II between 3100 and 7900 Å, where, in this case, E is the lower energy, and T is the boundary temperature of the solar atmosphere, taken as 4900 °K, following Claas [1951]. It is likely that the scatter of points would be reduced by a more refined theory of the curve of growth, but such treatment is beyond the scope of our work. This suffices to illustrate the precision to be expected from our gf -values in practical astrophysical work.

There are a number of possibilities concerning improvements that can be made in our tables in the future. In the first place, only 25,000 of the 39,000 lines in the Tables of Spectral-Line Intensities have yet been classified. About 11,000 of the unclassified lines are found in the spectra of the rare earth elements. There is presently a strenuous effort underway in many spectroscopic laboratories throughout the world to improve this situation (see the Transactions of the Joint Commission for Spectroscopy [1960]). Completion of this ef-

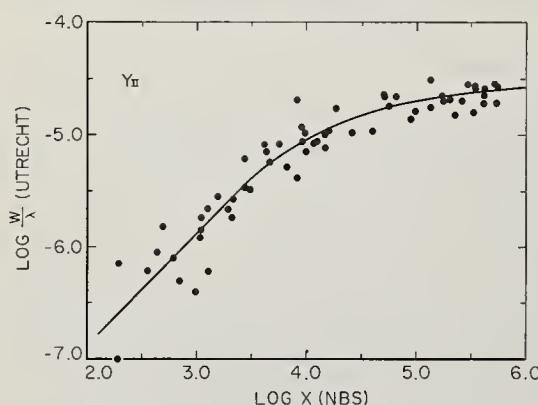


FIGURE 6. Curve of growth for lines of the second spectrum of yttrium in the sun. The axis of $\log X$ has not been normalized to the absolute scale of gf .

fort will not only permit one to calculate *gf*-values for these lines, but allow determination of more accurate partition functions and ionization potentials of the rare earths for revision of our present values. In the second place, as more accurate values of absolute transition probabilities for spectra of singly ionized atoms become available, it will be possible to obtain a more accurate value of the electron density in the arc. Furthermore, the normalization function can be determined more exactly.

For work with a particular spectrum for which a few very accurate absolute *gf*-values may be available in the literature, it might be worthwhile to make an additional adjustment of our scale. This can be done simply by adding to our log *gf*-values for that spectrum the difference between the more accurate value and ours. Some of these differences are given in the last column of table 7.

It is perhaps worth pointing out that by taking the minimum intensity reported in the Tables of Intensities at any given wavelength region and inserting it into eq (7) or (8), one can calculate a maximum value for the transition probability of an unreported line.

In summary, we have derived and assembled here the physical quantities and calibration functions necessary to calculate transition probabilities and oscillator strengths on an absolute scale from the intensity numbers in the NBS Tables of Spectral-Line Intensities. The calculations have been performed and the results are tabulated for 25,000 lines from 112 spectra of 70 elements. The particular significance of these results lies in the large number of values made available, the long range of wavelength encompassed, the inclusion of many lines from singly-ionized atoms, and from elements not previously investigated, the

use of a uniform scale, and the fact that this scale is absolute. The relative precision of the values is limited by random errors in the intensity numbers; the absolute accuracy of the values is further limited by systematic error in knowledge of the electron density in the arc. Notwithstanding these limitations, it is evident that much useful work in physics and astrophysics can be accomplished with them.

The idea of deriving transition probabilities from the spectral-line intensities measured in the NBS Spectroscopy Laboratory occurred to the first author during an NBS staff meeting lecture given by H. P. Broida many years ago. The idea was approved by W. F. Meggers, who encouraged him to carry it to completion. The author has had, in addition to the ever-present encouragement of Dr. Meggers, the advice and support of K. G. Kessler and the help of R. H. Garstang with various problems. L. M. Branscomb animated the discussion of the subject in several meetings which he arranged and has taken an active interest in the completion of this lengthy and ramified investigation. To these fine physicists the writers offer their sincere thanks.

Grateful thanks are also due to Paul Bamberg for preliminary work in computer coding, to George Shiner of The Information Processing Laboratory at Griffiss Air Force Base for permission to use their Linofilm machine, and to Ernest Goldman and Ira Ellis of the IBM Watson Research Center for helpful advice and for the actual operation of the Linofilm machine and associated magnetic tape equipment. We also thank the Mergenthaler Linotype Company, especially Jackson Burke and Charles Sobel, for furnishing the two printing grids and for their willing helpfulness during all phases of the preparation for printing.

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Tables of
Experimental Transition Probabilities
for Lines of 112 Spectra

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2721.77	Ag I	30242 - 66972	2.3	0.26	-0.59
3280.68	Ag I	0 - 30473	3.3	0.53	-0.28
3382.89	Ag I	0 - 29552	1.3	0.23	-0.64
4210.94	Ag I	30473 - 54214	2.6	0.68	-0.17
4476.08	Ag I	29552 - 51887	1.1	0.34	-0.47
4668.48	Ag I	30473 - 51887	1.4	0.46	-0.34
5209.07	Ag I	29552 - 48744	15.	6.1	0.79
5465.49	Ag I	30473 - 48764	16.	7.1	0.85
5471.55	Ag I	30473 - 48744	1.6	0.71	-0.15
7687.78	Ag I	29552 - 42556	1.4	1.2	0.08
8273.52	Ag I	30473 - 42556	2.3	2.3	0.37

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2331.37	Ag II	40741 - 83621	3.0	0.25	-0.61
2413.18	Ag II	40741 - 82168	16.	1.4	0.14
2437.79	Ag II	39164 - 80172	13.	1.2	0.06
2447.93	Ag II	46046 - 86884	4.5	0.40	-0.40

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2269.09	Al I	112 - 44169	1.2	0.092	-1.04
2367.06	Al I	0 - 42234	1.8	0.15	-0.81
2373.13	Al I	112 - 42238	3.7	0.31	-0.50
2373.36	Al I	112 - 42234	0.72	0.061	-1.22
2378.41	Al I	112 - 42144	0.18	0.015	-1.81
2567.99	Al I	0 - 38929	1.0	0.10	-0.98
2575.10	Al I	112 - 38934	2.1	0.21	-0.68
2575.41	Al I	112 - 38929	0.18	0.017	-1.76
2652.49	Al I	0 - 37689	0.48	0.050	-1.30
2660.39	Al I	112 - 37689	0.64	0.068	-1.17
3082.16	Al I	0 - 32435	2.7	0.38	-0.42
3092.71	Al I	112 - 32437	5.5	0.79	-0.10
3944.03	Al I	0 - 25348	0.66	0.15	-0.82
3961.53	Al I	112 - 25348	1.3	0.31	-0.51

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
1936.96	As I	0 - 51610	3.5	0.19	-0.71
1971.97	As I	0 - 50694	5.0	0.29	-0.53
1989.70	As I	10592 - 60835	9.8	0.58	-0.23
1990.48	As I	10592 - 60815	2.9	0.17	-0.76
1994.78	As I	18186 - 68301	1.9	0.11	-0.94
2003.34	As I	10915 - 60815	14.	0.83	-0.08
2009.19	As I	18648 - 68403	2.6	0.16	-0.81
2013.32	As I	18648 - 68301	1.9	0.12	-0.93
2165.52	As I	18648 - 64812	1.3	0.088	-1.05
2288.12	As I	10915 - 54605	15.	1.2	0.08
2344.03	As I	18186 - 60835	2.9	0.24	-0.62
2349.84	As I	10592 - 53136	26.	2.1	0.33
2369.67	As I	18648 - 60835	12.	0.98	-0.01
2370.77	As I	18648 - 60815	9.3	0.79	-0.10
2381.18	As I	10915 - 52898	5.4	0.46	-0.34
2437.23	As I	10592 - 51610	2.3	0.20	-0.69
2456.53	As I	10915 - 51610	9.3	0.84	-0.08
2492.91	As I	10592 - 50694	9.9	0.93	-0.03
2745.00	As I	18186 - 54605	19.	2.1	0.32
2780.22	As I	18648 - 54605	60.	6.9	0.84
2860.44	As I	18186 - 53136	33.	4.1	0.61
2898.71	As I	18648 - 53136	7.5	0.95	-0.02
2990.99	As I	18186 - 51610	0.94	0.13	-0.90
3032.85	As I	18648 - 51610	2.5	0.35	-0.45
3119.60	As I	18648 - 50694	1.1	0.17	-0.78

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2012.00	Au I	9161 - 58845	1.6	0.098	-1.01
2021.38	Au I	9161 - 58616	0.40	0.024	-1.61
2352.65	Au I	9161 - 51654	0.68	0.056	-1.25
2387.75	Au I	9161 - 51029	0.63	0.054	-1.27
2427.95	Au I	0 - 41174	1.8	0.16	-0.80
2544.19	Au I	21435 - 60729	0.46	0.044	-1.35
2590.04	Au I	21435 - 60033	0.84	0.084	-1.07
2641.49	Au I	9161 - 47007	1.3	0.14	-0.86
2675.95	Au I	0 - 37359	1.1	0.12	-0.91
2688.71	Au I	21435 - 58616	0.80	0.086	-1.06
2700.89	Au I	9161 - 46174	0.34	0.037	-1.43
2748.26	Au I	9161 - 45537	3.8	0.43	-0.36
2883.45	Au I	21435 - 56106	0.38	0.047	-1.33
3029.20	Au I	9161 - 42164	0.47	0.065	-1.18
3122.78	Au I	9161 - 41174	1.9	0.27	-0.57
3897.89	Au I	42164 - 67812	2.2	0.51	-0.29
4040.94	Au I	21435 - 46174	0.25	0.062	-1.21
4065.08	Au I	37359 - 61952	3.4	0.84	-0.08
4315.09	Au I	45537 - 68705	1.3	0.35	-0.45
4437.27	Au I	46174 - 68705	0.78	0.23	-0.64
4488.25	Au I	45537 - 67812	1.6	0.49	-0.31
4607.34	Au I	47007 - 68705	6.1	1.9	0.29
4792.60	Au I	41174 - 62034	2.9	0.98	-0.01
5837.40	Au I	37359 - 54485	1.0	0.52	-0.29
6278.18	Au I	21435 - 37359	0.048	0.028	-1.55
7510.75	Au I	41174 - 54485	3.1	2.6	0.42

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2088.93	B I	0 - 47857	1.5	0.099	-1.01
2089.59	B I	16 - 47857	2.4	0.16	-0.81
2496.78	B I	0 - 40040	7.0	0.66	-0.18
2497.73	B I	16 - 40040	14.	1.3	0.12

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2702.63	Ba I	0 – 36990	0.92	0.10	-1.00
3071.58	Ba I	0 – 32547	1.8	0.25	-0.60
3501.11	Ba I	0 – 28554	1.8	0.34	-0.47
3889.33	Ba I	0 – 25704	0.13	0.029	-1.54
3892.66	Ba I	11395 – 37077	1.4	0.31	-0.51
3909.91	Ba I	9034 – 34603	2.3	0.52	-0.29
3935.72	Ba I	9216 – 34617	3.2	0.74	-0.13
3937.87	Ba I	9216 – 34603	0.80	0.19	-0.73
3993.40	Ba I	9597 – 34631	4.2	1.0	0.00
3995.66	Ba I	9597 – 34617	0.69	0.17	-0.78
4132.43	Ba I	0 – 24192	0.076	0.019	-1.71
4283.10	Ba I	11395 – 34736	5.1	1.4	0.15
4350.33	Ba I	12637 – 35617	2.3	0.66	-0.18
4402.54	Ba I	12637 – 35344	3.1	0.91	-0.04
4431.89	Ba I	12266 – 34823	4.1	1.2	0.08
4488.97	Ba I	13515 – 35785	1.1	0.33	-0.48
4493.64	Ba I	13515 – 35762	1.3	0.38	-0.42
4505.92	Ba I	12637 – 34823	3.6	1.1	0.04
4523.24	Ba I	13515 – 35617	1.7	0.53	-0.27
4573.85	Ba I	12637 – 34494	2.0	0.64	-0.19
4579.64	Ba I	13515 – 35344	4.6	1.4	0.16
4599.75	Ba I	12637 – 34371	0.99	0.32	-0.50
4619.98	Ba I	12266 – 33905	0.44	0.14	-0.85
4673.62	Ba I	9597 – 30987	0.29	0.096	-1.02
4691.62	Ba I	13515 – 34823	3.7	1.2	0.09
4700.43	Ba I	12637 – 33905	0.67	0.22	-0.65
4726.45	Ba I	11395 – 32547	1.2	0.41	-0.39
4902.90	Ba I	13515 – 33905	0.42	0.15	-0.82
4947.33	Ba I	18060 – 38267	2.4	0.88	-0.05
5054.98	Ba I	18060 – 37837	1.5	0.56	-0.25
5159.92	Ba I	18060 – 37435	4.0	1.6	0.20
5267.03	Ba I	18060 – 37041	1.2	0.50	-0.30
5424.55	Ba I	12266 – 30696	2.3	1.0	0.00
5519.05	Ba I	12637 – 30751	3.4	1.6	0.20
5535.48	Ba I	0 – 18060	2.0	0.90	-0.05
5680.18	Ba I	9216 – 26816	0.073	0.035	-1.45
5777.62	Ba I	13515 – 30818	5.7	2.9	0.46
5800.23	Ba I	13515 – 30751	1.0	0.51	-0.29
5805.68	Ba I	9597 – 26816	0.26	0.13	-0.88
5826.28	Ba I	11395 – 28554	1.8	0.93	-0.03
5907.64	Ba I	9034 – 25957	0.15	0.078	-1.11
5971.70	Ba I	9216 – 25957	1.5	0.80	-0.09
5997.09	Ba I	9034 – 25704	1.4	0.76	-0.12
6019.47	Ba I	9034 – 25642	1.4	0.75	-0.12
6063.12	Ba I	9216 – 25704	3.1	1.7	0.24
6110.78	Ba I	9597 – 25957	5.2	2.9	0.47
6341.68	Ba I	9216 – 24980	1.2	0.73	-0.14
6450.85	Ba I	9034 – 24532	0.78	0.49	-0.31
6482.91	Ba I	11395 – 26816	2.5	1.6	0.20
6498.76	Ba I	9597 – 24980	4.0	2.5	0.40

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6527.31	Ba I	9216 - 24532	1.5	0.98	-0.01
6595.32	Ba I	9034 - 24192	1.3	0.86	-0.07
6675.27	Ba I	9216 - 24192	0.65	0.44	-0.36
6693.84	Ba I	9597 - 24532	0.72	0.48	-0.31
6771.85	Ba I	23074 - 37837	1.6	1.1	0.03
6865.69	Ba I	11395 - 25957	0.21	0.15	-0.83
6867.85	Ba I	22947 - 37504	1.1	0.76	-0.12
7059.94	Ba I	9597 - 23757	2.7	2.0	0.30
7120.33	Ba I	9034 - 23074	0.30	0.23	-0.64
7153.58	Ba I	23757 - 37732	0.60	0.46	-0.34
7195.24	Ba I	12266 - 26160	0.23	0.18	-0.75
7228.84	Ba I	22065 - 35894	1.2	0.94	-0.03
7280.30	Ba I	9216 - 22947	1.5	1.2	0.07
7392.41	Ba I	12637 - 26160	0.43	0.36	-0.45
7417.53	Ba I	9597 - 23074	0.033	0.027	-1.56
7459.78	Ba I	22947 - 36349	2.1	1.8	0.25
7488.08	Ba I	9597 - 22947	0.27	0.23	-0.64
7610.48	Ba I	23062 - 36200	1.4	1.2	0.08
7636.90	Ba I	23074 - 36165	0.68	0.60	-0.22
7642.91	Ba I	23757 - 36837	3.3	2.9	0.46
7672.09	Ba I	9034 - 22065	0.64	0.57	-0.25
7780.48	Ba I	9216 - 22065	0.39	0.36	-0.45
7839.57	Ba I	24980 - 37732	0.88	0.81	-0.09
7905.75	Ba I	13515 - 26160	0.72	0.67	-0.17
7911.34	Ba I	0 - 12637	0.0027	0.0026	-2.59
8210.24	Ba I	18060 - 30237	0.83	0.84	-0.08
8559.95	Ba I	11395 - 23074	0.76	0.84	-0.08
8860.98	Ba I	12637 - 23919	0.075	0.089	-1.05
8914.99	Ba I	12266 - 23480	0.078	0.093	-1.03

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2304.24	Ba II	4874 - 48259	3.1	0.25	-0.60
2335.27	Ba II	5675 - 48484	6.5	0.53	-0.27
2347.58	Ba II	5675 - 48259	0.68	0.056	-1.25
2528.51	Ba II	20262 - 59799	3.0	0.29	-0.54
2634.78	Ba II	21952 - 59895	5.3	0.55	-0.26
2771.36	Ba II	21952 - 58025	0.88	0.10	-0.99
3891.78	Ba II	20262 - 45949	15.	3.3	0.52
4130.66	Ba II	21952 - 46155	18.	4.6	0.66
4166.00	Ba II	21952 - 45949	2.2	0.58	-0.24
4524.93	Ba II	20262 - 42355	0.57	0.17	-0.76
4554.03	Ba II	0 - 21952	0.90	0.28	-0.55
4899.97	Ba II	21952 - 42355	1.9	0.68	-0.17
4934.09	Ba II	0 - 20262	0.19	0.068	-1.17
5853.68	Ba II	4874 - 21952	0.050	0.026	-1.59
6141.72	Ba II	5675 - 21952	0.38	0.21	-0.67
6496.90	Ba II	4874 - 20262	0.15	0.094	-1.03

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2174.94	Be I	21980 - 67944	1.2	0.085	-1.07
2348.61	Be I	0 - 42565	2.9	0.24	-0.61
2494.56	Be I	21979 - 62055	16.	1.5	0.17
2494.73	Be I	21982 - 62055	23.	2.1	0.33
2650.47	Be I	21980 - 59698	30.	3.1	0.50
3321.01	Be I	21979 - 52082	7.8	1.3	0.11
3321.34	Be I	21982 - 52082	13.	2.1	0.33
4572.67	Be I	42565 - 64428	5.5	1.7	0.23
8254.10	Be I	42565 - 54677	1.8	1.8	0.26

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3130.42	Be II	0 - 31935	68.	10.0	1.00
3131.07	Be II	0 - 31929	45.	6.7	0.82

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
1953.89	Bi I	0 - 51158	2.9	0.16	-0.78
1959.48	Bi I	0 - 51019	0.58	0.033	-1.48
2021.21	Bi I	0 - 49461	1.0	0.064	-1.19
2061.70	Bi I	0 - 48489	6.0	0.38	-0.42
2110.26	Bi I	0 - 47371	0.87	0.058	-1.24
2133.63	Bi I	11418 - 58272	2.8	0.19	-0.72
2228.25	Bi I	0 - 44865	0.14	0.010	-1.99
2230.61	Bi I	0 - 44817	0.63	0.047	-1.33
2276.58	Bi I	0 - 43912	0.18	0.014	-1.86
2400.88	Bi I	15437 - 57075	4.5	0.39	-0.41
2515.69	Bi I	11418 - 51158	0.54	0.052	-1.29
2524.49	Bi I	11418 - 51019	1.5	0.14	-0.84
2627.91	Bi I	11418 - 49461	12.	1.2	0.09
2696.76	Bi I	11418 - 48489	4.0	0.44	-0.36
2730.50	Bi I	21660 - 58272	7.2	0.80	-0.10
2780.52	Bi I	11418 - 47371	4.1	0.48	-0.32
2809.62	Bi I	15437 - 51019	3.3	0.39	-0.40
2897.98	Bi I	11418 - 45915	32.	4.0	0.60
2938.30	Bi I	15437 - 49461	61.	7.8	0.89
2989.03	Bi I	11418 - 44865	17.	2.3	0.36
2993.34	Bi I	11418 - 44817	4.2	0.57	-0.25
3024.64	Bi I	15437 - 48489	38.	5.3	0.72
3067.72	Bi I	0 - 32588	7.0	0.99	-0.00
3076.66	Bi I	11418 - 43912	0.67	0.095	-1.02
3397.21	Bi I	15437 - 44865	3.8	0.66	-0.18
3510.85	Bi I	15437 - 43912	2.7	0.51	-0.30
3596.11	Bi I	21660 - 49461	8.8	1.7	0.23
4121.53	Bi I	21660 - 45915	1.6	0.40	-0.40
4722.19	Bi I	11418 - 32588	0.18	0.060	-1.22

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2478.57	C I	21648 - 61982	19.	1.8	0.25

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2398.56	Ca I	0 - 41679	0.35	0.030	-1.52
2721.64	Ca I	0 - 36732	0.074	0.0082	-2.09
2994.96	Ca I	15158 - 48538	2.5	0.33	-0.48
2997.31	Ca I	15210 - 48564	1.4	0.19	-0.72
2999.64	Ca I	15210 - 48538	1.4	0.19	-0.72
3000.86	Ca I	15210 - 48524	1.4	0.19	-0.72
3006.86	Ca I	15316 - 48564	5.0	0.67	-0.17
3009.20	Ca I	15316 - 48538	2.1	0.29	-0.54
3624.11	Ca I	15158 - 42743	0.89	0.18	-0.76
3630.75	Ca I	15210 - 42745	1.8	0.35	-0.45
3644.41	Ca I	15316 - 42747	1.8	0.36	-0.45
3948.90	Ca I	15158 - 40474	0.12	0.029	-1.54
3957.05	Ca I	15210 - 40474	0.36	0.084	-1.07
3973.71	Ca I	15316 - 40474	1.4	0.34	-0.47
4226.73	Ca I	0 - 23652	1.0	0.28	-0.55
4283.01	Ca I	15210 - 38552	1.6	0.43	-0.37
4289.36	Ca I	15158 - 38465	1.4	0.38	-0.42
4298.99	Ca I	15210 - 38465	1.3	0.35	-0.46
4302.53	Ca I	15316 - 38552	7.1	2.0	0.30
4307.74	Ca I	15210 - 38418	1.6	0.45	-0.34
4318.65	Ca I	15316 - 38465	2.5	0.71	-0.15
4425.44	Ca I	15158 - 37748	1.6	0.47	-0.33
4434.96	Ca I	15210 - 37752	3.5	1.0	0.01
4435.69	Ca I	15210 - 37748	0.96	0.28	-0.55
4454.78	Ca I	15316 - 37757	7.5	2.2	0.35
4455.89	Ca I	15316 - 37752	0.97	0.29	-0.54
4456.62	Ca I	15316 - 37748	0.054	0.016	-1.80
4526.94	Ca I	21850 - 43933	0.50	0.15	-0.81
4578.56	Ca I	20335 - 42170	0.48	0.15	-0.82
4581.40	Ca I	20349 - 42171	0.96	0.30	-0.52
4585.87	Ca I	20371 - 42171	1.5	0.48	-0.31
4878.13	Ca I	21850 - 42344	1.1	0.38	-0.42
5041.62	Ca I	21850 - 41679	1.1	0.42	-0.38
5188.85	Ca I	23652 - 42919	2.7	1.1	0.03
5261.70	Ca I	20335 - 39335	1.1	0.45	-0.34
5262.25	Ca I	20335 - 39333	1.3	0.53	-0.27
5264.24	Ca I	20349 - 39340	1.1	0.45	-0.34
5265.56	Ca I	20349 - 39335	2.8	1.2	0.06
5270.28	Ca I	20371 - 39340	4.8	2.0	0.30
5349.47	Ca I	21850 - 40538	2.3	0.97	-0.01
5512.96	Ca I	23652 - 41786	0.52	0.24	-0.63
5581.97	Ca I	20349 - 38259	0.93	0.43	-0.36
5588.75	Ca I	20371 - 38259	5.4	2.5	0.41
5590.11	Ca I	20335 - 38219	0.77	0.36	-0.44
5594.45	Ca I	20349 - 38219	2.8	1.3	0.11
5598.47	Ca I	20335 - 38192	1.8	0.86	-0.07
5601.26	Ca I	20371 - 38219	0.92	0.43	-0.36
5602.84	Ca I	20349 - 38192	0.92	0.43	-0.37
5857.46	Ca I	23652 - 40720	3.6	1.8	0.27
6102.72	Ca I	15158 - 31540	0.43	0.24	-0.62

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6122.22	Ca I	15210 – 31540	1.2	0.68	-0.17
6161.29	Ca I	20349 – 36575	0.16	0.091	-1.04
6162.17	Ca I	15316 – 31540	1.8	1.0	0.01
6163.76	Ca I	20335 – 36555	0.16	0.090	-1.04
6166.44	Ca I	20335 – 36548	0.32	0.18	-0.74
6169.05	Ca I	20349 – 36555	0.37	0.21	-0.67
6169.56	Ca I	20371 – 36575	0.75	0.43	-0.37
6439.07	Ca I	20371 – 35897	3.2	2.0	0.30
6449.81	Ca I	20335 – 35835	0.81	0.51	-0.29
6455.60	Ca I	20349 – 35835	0.16	0.099	-1.00
6462.57	Ca I	20349 – 35819	3.2	2.0	0.30
6471.66	Ca I	20371 – 35819	0.36	0.23	-0.64
6493.78	Ca I	20335 – 35730	1.4	0.89	-0.05
6499.65	Ca I	20349 – 35730	0.35	0.22	-0.65
6572.78	Ca I	0 – 15210	0.00021	0.00014	-3.86
6717.68	Ca I	21850 – 36732	0.24	0.16	-0.78
7148.15	Ca I	21850 – 35835	0.95	0.73	-0.14
7202.19	Ca I	21850 – 35730	0.44	0.34	-0.46
7326.15	Ca I	23652 – 37298	0.47	0.37	-0.43

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3158.87	Ca II	25192 - 56839	6.9	1.0	0.02
3179.33	Ca II	25414 - 56859	17.	2.7	0.42
3181.28	Ca II	25414 - 56839	3.1	0.48	-0.32
3706.03	Ca II	25192 - 52167	2.9	0.60	-0.22
3736.90	Ca II	25414 - 52167	3.7	0.77	-0.11
3933.67	Ca II	0 - 25414	0.91	0.21	-0.68
3968.47	Ca II	0 - 25192	0.45	0.11	-0.97
8498.02	Ca II	13650 - 25414	0.0056	0.0061	-2.22
8542.09	Ca II	13711 - 25414	0.047	0.051	-1.29
8662.14	Ca II	13650 - 25192	0.025	0.028	-1.56

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2267.47	Cd I	30656 - 74745	0.33	0.025	-1.60
2288.02	Cd I	0 - 43692	12.	0.92	-0.04
2306.61	Cd I	30656 - 73996	1.3	0.11	-0.98
2329.28	Cd I	31827 - 74745	1.3	0.11	-0.96
2836.91	Cd I	30114 - 65354	0.87	0.10	-0.98
2880.77	Cd I	30656 - 65359	1.4	0.18	-0.76
2881.23	Cd I	30656 - 65354	0.35	0.044	-1.36
2980.63	Cd I	31827 - 65367	2.9	0.39	-0.41
3133.17	Cd I	30656 - 62563	0.87	0.13	-0.89
3261.06	Cd I	0 - 30656	0.0090	0.0014	-2.84
3403.65	Cd I	30114 - 59486	13.	2.2	0.35
3466.20	Cd I	30656 - 59498	41.	7.4	0.87
3467.66	Cd I	30656 - 59486	13.	2.4	0.37
3610.51	Cd I	31827 - 59516	62.	12.	1.08
3612.88	Cd I	31827 - 59498	12.	2.3	0.37
3614.45	Cd I	31827 - 59486	1.2	0.23	-0.63
4678.16	Cd I	30114 - 51484	8.0	2.6	0.42
4799.92	Cd I	30656 - 51484	14.	4.9	0.69
5085.82	Cd I	31827 - 51484	30.	12.	1.07
6438.47	Cd I	43692 - 59220	7.8	4.8	0.69

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2144.38	Cd II	0 – 46619	106.	7.3	0.86
2265.02	Cd II	0 – 44136	99.	7.7	0.88
2312.84	Cd II	46619 – 89844	60.	4.8	0.68
2572.93	Cd II	44136 – 82991	95.	9.5	0.98

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2519.02	Ce II	988 - 40674	2.0	0.19	-0.71
2592.34	Ce II	2635 - 41198	1.6	0.16	-0.79
2666.50	Ce II	3594 - 41085	4.9	0.52	-0.29
2673.07	Ce II	1410 - 38810	1.7	0.18	-0.74
2682.73	Ce II	3594 - 40858	3.8	0.41	-0.39
2695.96	Ce II	4911 - 41992	16.	1.7	0.24
2706.88	Ce II	4266 - 41198	8.5	0.93	-0.03
2708.13	Ce II	5119 - 42034	3.2	0.35	-0.45
2709.41	Ce II	5676 - 42573	3.8	0.41	-0.38
2715.17	Ce II	2581 - 39400	4.6	0.51	-0.29
2719.98	Ce II	5819 - 42573	3.8	0.42	-0.38
2724.95	Ce II	2635 - 39322	1.5	0.17	-0.77
2729.16	Ce II	5943 - 42573	3.1	0.35	-0.45
2732.04	Ce II	4266 - 40858	1.9	0.22	-0.66
2750.89	Ce II	5651 - 41992	8.6	0.98	-0.01
2761.42	Ce II	0 - 36202	2.5	0.29	-0.54
2762.22	Ce II	8403 - 44595	16.	1.8	0.26
2762.90	Ce II	6390 - 42573	3.8	0.44	-0.36
2780.01	Ce II	2581 - 38542	1.6	0.19	-0.72
2781.89	Ce II	988 - 36924	0.78	0.091	-1.04
2781.99	Ce II	6638 - 42573	3.9	0.45	-0.35
2810.18	Ce II	2563 - 38138	1.1	0.13	-0.88
2811.87	Ce II	2581 - 38134	0.93	0.11	-0.96
2814.81	Ce II	6518 - 42034	7.8	0.93	-0.03
2814.96	Ce II	7059 - 42573	6.5	0.77	-0.11
2817.50	Ce II	5716 - 41198	4.4	0.53	-0.28
2830.90	Ce II	7259 - 42573	29.	3.5	0.54
2835.60	Ce II	5943 - 41198	3.1	0.37	-0.43
2837.89	Ce II	6521 - 41748	2.6	0.31	-0.50
2839.36	Ce II	2596 - 37804	1.0	0.12	-0.91
2841.72	Ce II	8281 - 43461	3.0	0.37	-0.44
2842.52	Ce II	2635 - 37804	0.85	0.10	-0.99
2849.03	Ce II	3363 - 38453	1.4	0.18	-0.76
2854.67	Ce II	1874 - 36894	1.9	0.23	-0.64
2854.88	Ce II	2635 - 37652	2.3	0.28	-0.55
2855.45	Ce II	2642 - 37652	1.2	0.14	-0.85
2855.72	Ce II	2581 - 37588	1.1	0.14	-0.86
2859.52	Ce II	9634 - 44595	7.0	0.86	-0.07
2861.35	Ce II	988 - 35926	0.36	0.045	-1.35
2861.62	Ce II	2596 - 37531	1.1	0.14	-0.86
2862.79	Ce II	0 - 34921	0.61	0.075	-1.12
2866.81	Ce II	4523 - 39395	1.6	0.20	-0.70
2871.08	Ce II	988 - 35808	0.69	0.085	-1.07
2871.63	Ce II	0 - 34813	0.30	0.037	-1.44
2880.64	Ce II	5969 - 40674	4.7	0.58	-0.24
2881.13	Ce II	7294 - 41992	3.4	0.42	-0.38
2882.61	Ce II	6518 - 41198	5.4	0.67	-0.17
2892.03	Ce II	4266 - 38833	0.65	0.082	-1.09
2892.15	Ce II	6518 - 41085	1.2	0.15	-0.81
2894.09	Ce II	4266 - 38810	1.8	0.23	-0.63

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2894.22	Ce II	2382 - 36924	1.4	0.17	-0.77
2896.73	Ce II	2382 - 36894	1.9	0.24	-0.62
2908.42	Ce II	4460 - 38833	4.2	0.53	-0.27
2912.91	Ce II	10275 - 44595	5.9	0.76	-0.12
2915.56	Ce II	3363 - 37652	0.84	0.11	-0.97
2916.68	Ce II	4266 - 38542	1.5	0.19	-0.71
2918.67	Ce II	2642 - 36894	2.2	0.28	-0.56
2918.78	Ce II	4202 - 38453	0.84	0.11	-0.97
2922.58	Ce II	4323 - 38529	0.86	0.11	-0.96
2925.19	Ce II	2880 - 37056	1.7	0.22	-0.66
2929.11	Ce II	4323 - 38453	1.1	0.14	-0.87
2934.35	Ce II	4460 - 38529	0.87	0.11	-0.95
2940.79	Ce II	3594 - 37588	1.2	0.15	-0.82
2955.60	Ce II	7259 - 41083	3.1	0.41	-0.39
2955.94	Ce II	2382 - 36202	2.3	0.30	-0.53
2956.71	Ce II	0 - 33812	0.29	0.038	-1.42
2964.80	Ce II	5676 - 39395	5.0	0.66	-0.18
2965.27	Ce II	5119 - 38833	3.3	0.44	-0.36
2970.32	Ce II	3996 - 37652	1.2	0.16	-0.80
2972.58	Ce II	4911 - 38542	3.5	0.47	-0.33
2974.61	Ce II	4845 - 38453	1.7	0.23	-0.64
2976.91	Ce II	4266 - 37849	12.	1.5	0.19
2977.46	Ce II	5819 - 39395	6.7	0.89	-0.05
2981.91	Ce II	4323 - 37849	2.5	0.34	-0.47
2984.56	Ce II	2642 - 36138	0.90	0.12	-0.92
2985.82	Ce II	4323 - 37804	2.9	0.38	-0.42
2986.67	Ce II	1874 - 35346	0.36	0.048	-1.32
2990.87	Ce II	2382 - 35808	4.1	0.55	-0.26
2994.42	Ce II	4266 - 37652	3.1	0.42	-0.38
2995.64	Ce II	5437 - 38810	12.	1.7	0.22
2998.77	Ce II	4511 - 37849	1.5	0.20	-0.71
2999.43	Ce II	3594 - 36924	0.98	0.13	-0.88
3000.07	Ce II	2880 - 36202	1.4	0.19	-0.73
3002.14	Ce II	3594 - 36894	3.6	0.49	-0.31
3002.75	Ce II	4511 - 37804	5.4	0.73	-0.14
3003.56	Ce II	2642 - 35926	2.1	0.29	-0.54
3008.13	Ce II	6638 - 39872	4.5	0.62	-0.21
3008.79	Ce II	2581 - 35808	6.6	0.89	-0.05
3011.88	Ce II	4460 - 37652	1.4	0.19	-0.72
3017.20	Ce II	5676 - 38810	14.	2.0	0.30
3020.88	Ce II	5716 - 38810	2.9	0.40	-0.40
3021.04	Ce II	5437 - 38529	1.8	0.24	-0.61
3023.43	Ce II	4523 - 37588	1.7	0.23	-0.63
3026.62	Ce II	4202 - 37232	0.93	0.13	-0.89
3027.63	Ce II	4323 - 37342	0.64	0.088	-1.06
3028.96	Ce II	6390 - 39395	2.9	0.39	-0.41
3030.31	Ce II	5819 - 38810	6.8	0.93	-0.03
3032.73	Ce II	2382 - 35346	0.55	0.075	-1.12
3033.12	Ce II	4845 - 37804	2.2	0.30	-0.52
3037.73	Ce II	4323 - 37232	5.3	0.73	-0.14

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3039.51	Ce II	5651 - 38542	1.6	0.22	-0.66
3044.40	Ce II	5011 - 37849	1.3	0.18	-0.74
3046.71	Ce II	5716 - 38529	2.2	0.31	-0.50
3051.98	Ce II	4323 - 37079	4.8	0.67	-0.18
3055.24	Ce II	4511 - 37232	8.7	1.2	0.09
3056.78	Ce II	2642 - 35346	4.8	0.67	-0.17
3058.55	Ce II	5119 - 37804	1.3	0.18	-0.74
3059.74	Ce II	4523 - 37196	0.62	0.087	-1.06
3063.01	Ce II	7234 - 39872	36.	5.1	0.71
3068.68	Ce II	4266 - 36844	1.4	0.20	-0.70
3069.64	Ce II	4511 - 37079	2.1	0.30	-0.53
3071.11	Ce II	1874 - 34426	0.85	0.12	-0.92
3071.62	Ce II	2382 - 34929	1.1	0.16	-0.79
3072.39	Ce II	2382 - 34921	0.65	0.093	-1.03
3072.89	Ce II	5119 - 37652	2.8	0.40	-0.40
3076.25	Ce II	4845 - 37342	1.1	0.16	-0.79
3077.33	Ce II	5651 - 38138	2.0	0.29	-0.54
3079.64	Ce II	5676 - 38138	3.3	0.46	-0.33
3079.91	Ce II	1874 - 34333	0.97	0.14	-0.86
3082.30	Ce II	3704 - 36138	1.9	0.26	-0.58
3083.67	Ce II	6390 - 38810	13.	1.8	0.26
3084.44	Ce II	5437 - 37849	7.5	1.1	0.03
3090.37	Ce II	7523 - 39872	11.	1.5	0.18
3090.52	Ce II	2581 - 34929	0.99	0.14	-0.85
3091.29	Ce II	2581 - 34921	0.82	0.12	-0.93
3095.59	Ce II	5675 - 37971	1.4	0.20	-0.71
3096.50	Ce II	4911 - 37196	4.4	0.63	-0.20
3096.88	Ce II	1874 - 34155	0.66	0.096	-1.02
3102.56	Ce II	3704 - 35926	0.77	0.11	-0.95
3103.38	Ce II	3594 - 35808	6.4	0.92	-0.04
3104.01	Ce II	3996 - 36202	1.7	0.24	-0.62
3107.47	Ce II	6638 - 38810	7.9	1.1	0.06
3108.96	Ce II	8928 - 41083	7.5	1.1	0.04
3110.28	Ce II	3996 - 36138	6.1	0.88	-0.05
3111.17	Ce II	2635 - 34768	3.8	0.55	-0.26
3114.05	Ce II	1874 - 33977	0.44	0.065	-1.19
3123.57	Ce II	4511 - 36517	0.91	0.13	-0.87
3127.53	Ce II	3594 - 35559	3.6	0.53	-0.28
3130.33	Ce II	4266 - 36202	4.3	0.63	-0.20
3130.87	Ce II	0 - 31931	1.6	0.23	-0.63
3132.59	Ce II	2382 - 34295	1.8	0.27	-0.57
3133.33	Ce II	5943 - 37849	5.7	0.84	-0.07
3136.72	Ce II	4266 - 36138	3.5	0.52	-0.28
3137.60	Ce II	3363 - 35226	1.6	0.24	-0.62
3138.30	Ce II	3704 - 35559	0.80	0.12	-0.93
3142.31	Ce II	988 - 32802	0.83	0.12	-0.91
3144.60	Ce II	2635 - 34426	2.6	0.39	-0.41
3145.28	Ce II	2642 - 34426	3.8	0.56	-0.25
3146.23	Ce II	5119 - 36894	1.2	0.17	-0.76
3146.41	Ce II	2382 - 34155	3.5	0.52	-0.28

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3148.46	Ce II	3594 - 35346	1.7	0.25	-0.60
3148.65	Ce II	7059 - 38810	3.0	0.45	-0.35
3149.43	Ce II	4460 - 36202	0.96	0.14	-0.84
3151.13	Ce II	5119 - 36844	2.0	0.30	-0.52
3154.51	Ce II	2642 - 34333	1.7	0.26	-0.59
3155.69	Ce II	4523 - 36202	7.2	1.1	0.03
3164.15	Ce II	2382 - 33977	3.4	0.50	-0.30
3166.24	Ce II	2581 - 34155	1.8	0.27	-0.58
3166.61	Ce II	2596 - 34166	1.2	0.18	-0.73
3167.23	Ce II	9634 - 41198	4.0	0.60	-0.22
3167.32	Ce II	3996 - 35559	0.81	0.12	-0.92
3169.18	Ce II	5651 - 37196	8.3	1.3	0.10
3171.61	Ce II	2635 - 34155	3.5	0.53	-0.27
3172.30	Ce II	2642 - 34155	0.54	0.082	-1.09
3176.80	Ce II	8403 - 39872	8.2	1.2	0.09
3177.14	Ce II	4460 - 35926	0.90	0.14	-0.87
3178.75	Ce II	3363 - 34813	0.66	0.100	-1.00
3180.82	Ce II	2382 - 33812	0.50	0.075	-1.12
3183.52	Ce II	4523 - 35926	9.9	1.5	0.18
3184.21	Ce II	2581 - 33977	0.91	0.14	-0.86
3186.13	Ce II	5819 - 37196	7.1	1.1	0.03
3188.79	Ce II	3996 - 35346	3.1	0.47	-0.33
3189.64	Ce II	2635 - 33977	1.2	0.18	-0.75
3190.34	Ce II	2642 - 33977	2.3	0.36	-0.45
3194.83	Ce II	4911 - 36202	16.	2.4	0.39
3195.94	Ce II	2596 - 33876	0.51	0.078	-1.11
3199.28	Ce II	5676 - 36924	5.4	0.83	-0.08
3200.52	Ce II	4323 - 35559	0.82	0.13	-0.90
3201.71	Ce II	6913 - 38138	38.	5.9	0.77
3205.96	Ce II	7012 - 38195	3.9	0.60	-0.22
3210.95	Ce II	6518 - 37652	3.3	0.51	-0.29
3218.38	Ce II	3363 - 34426	2.7	0.42	-0.38
3218.94	Ce II	6913 - 37971	26.	4.1	0.61
3221.17	Ce II	4523 - 35559	16.	2.6	0.41
3222.41	Ce II	4202 - 35226	0.75	0.12	-0.93
3223.37	Ce II	7818 - 38833	2.1	0.32	-0.49
3225.67	Ce II	8403 - 39395	18.	2.8	0.45
3227.11	Ce II	2596 - 33574	7.6	1.2	0.08
3229.12	Ce II	4266 - 35226	1.7	0.26	-0.58
3229.36	Ce II	2596 - 33553	2.6	0.40	-0.40
3230.08	Ce II	988 - 31938	0.30	0.046	-1.33
3231.24	Ce II	3996 - 34934	7.6	1.2	0.08
3233.44	Ce II	2635 - 33553	1.5	0.24	-0.62
3234.16	Ce II	2642 - 33553	7.6	1.2	0.08
3234.89	Ce II	7234 - 38138	13.	2.0	0.30
3235.67	Ce II	4911 - 35808	1.5	0.24	-0.61
3236.74	Ce II	4460 - 35346	7.0	1.1	0.04
3243.37	Ce II	4523 - 35346	7.0	1.1	0.04
3245.17	Ce II	4460 - 35266	1.7	0.27	-0.57
3246.67	Ce II	3363 - 34155	2.5	0.40	-0.40

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3249.19	Ce II	2642 - 33410	1.0	0.16	-0.79
3249.43	Ce II	4460 - 35226	0.75	0.12	-0.92
3252.48	Ce II	7234 - 37971	5.3	0.85	-0.07
3254.01	Ce II	3704 - 34426	2.0	0.31	-0.51
3258.87	Ce II	7294 - 37971	3.7	0.59	-0.23
3260.98	Ce II	8176 - 38833	9.4	1.5	0.18
3263.45	Ce II	8176 - 38810	6.8	1.1	0.03
3263.88	Ce II	3704 - 34333	2.7	0.42	-0.37
3265.42	Ce II	7523 - 38138	1.7	0.28	-0.56
3271.15	Ce II	3594 - 34155	1.3	0.20	-0.69
3271.55	Ce II	6638 - 37196	3.0	0.48	-0.32
3272.25	Ce II	5651 - 36202	23.	3.6	0.56
3274.86	Ce II	5676 - 36202	7.5	1.2	0.08
3276.25	Ce II	2635 - 33149	1.4	0.22	-0.65
3279.01	Ce II	5437 - 35926	3.0	0.49	-0.31
3279.84	Ce II	2382 - 32863	1.8	0.28	-0.55
3280.49	Ce II	4460 - 34934	1.2	0.20	-0.70
3283.35	Ce II	7523 - 37971	3.7	0.60	-0.22
3283.68	Ce II	2635 - 33080	0.62	0.10	-1.00
3284.22	Ce II	5119 - 35559	0.84	0.14	-0.87
3285.22	Ce II	3996 - 34426	4.6	0.74	-0.13
3286.03	Ce II	4511 - 34934	1.6	0.26	-0.59
3290.34	Ce II	3594 - 33977	1.2	0.20	-0.71
3290.58	Ce II	4845 - 35226	0.76	0.12	-0.91
3293.59	Ce II	4460 - 34813	0.68	0.11	-0.96
3295.29	Ce II	3996 - 34333	3.3	0.53	-0.27
3296.19	Ce II	7259 - 37588	4.8	0.79	-0.10
3296.88	Ce II	6521 - 36844	5.4	0.89	-0.05
3300.15	Ce II	5819 - 36112	4.9	0.80	-0.09
3304.84	Ce II	5676 - 35926	5.1	0.84	-0.07
3306.63	Ce II	5969 - 36202	3.3	0.54	-0.27
3307.23	Ce II	2635 - 32863	1.3	0.21	-0.68
3308.02	Ce II	2581 - 32802	2.1	0.35	-0.46
3309.27	Ce II	5716 - 35926	2.1	0.35	-0.46
3311.50	Ce II	3363 - 33553	1.6	0.26	-0.59
3312.22	Ce II	8897 - 39079	10.	1.7	0.23
3313.30	Ce II	5965 - 36138	1.5	0.25	-0.61
3314.04	Ce II	0 - 30166	0.42	0.068	-1.16
3314.72	Ce II	3996 - 34155	3.1	0.52	-0.29
3317.80	Ce II	5676 - 35808	4.1	0.67	-0.17
3318.96	Ce II	5437 - 35559	2.5	0.42	-0.38
3320.42	Ce II	3704 - 33812	0.52	0.086	-1.07
3325.33	Ce II	8131 - 38195	7.1	1.2	0.07
3327.66	Ce II	2596 - 32638	0.37	0.062	-1.21
3327.90	Ce II	5676 - 35716	1.3	0.22	-0.66
3329.00	Ce II	4737 - 34768	2.2	0.37	-0.44
3331.22	Ce II	4323 - 34333	0.60	0.10	-1.00
3333.04	Ce II	0 - 29994	0.40	0.066	-1.18
3333.66	Ce II	5819 - 35808	2.1	0.34	-0.47
3334.46	Ce II	10058 - 40040	14.	2.3	0.35

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3339.51	Ce II	2382 - 32318	0.77	0.13	-0.89
3340.89	Ce II	5011 - 34934	1.3	0.21	-0.68
3341.87	Ce II	4511 - 34426	3.4	0.57	-0.24
3343.86	Ce II	5819 - 35716	6.7	1.1	0.05
3344.76	Ce II	4266 - 34155	5.7	0.96	-0.02
3346.52	Ce II	4460 - 34333	1.4	0.23	-0.64
3349.97	Ce II	5716 - 35559	2.8	0.47	-0.33
3352.28	Ce II	4511 - 34333	1.4	0.23	-0.64
3352.94	Ce II	3594 - 33410	1.9	0.31	-0.50
3353.33	Ce II	6390 - 36202	1.8	0.30	-0.52
3355.02	Ce II	1410 - 31208	1.1	0.19	-0.72
3356.41	Ce II	3363 - 33149	1.7	0.29	-0.53
3357.22	Ce II	4266 - 34044	3.1	0.52	-0.28
3360.54	Ce II	11310 - 41059	18.	3.1	0.49
3361.76	Ce II	3794 - 33531	1.9	0.33	-0.48
3364.35	Ce II	988 - 30703	0.49	0.083	-1.08
3366.55	Ce II	4460 - 34155	3.2	0.54	-0.27
3368.69	Ce II	2642 - 32318	0.43	0.073	-1.13
3371.17	Ce II	4511 - 34166	2.6	0.45	-0.35
3373.46	Ce II	2563 - 32198	1.5	0.26	-0.59
3373.73	Ce II	4523 - 34155	2.6	0.45	-0.35
3375.78	Ce II	8928 - 38542	3.5	0.60	-0.22
3377.13	Ce II	4911 - 34514	7.1	1.2	0.08
3379.17	Ce II	4460 - 34044	1.8	0.31	-0.50
3381.49	Ce II	6638 - 36202	2.3	0.40	-0.40
3383.69	Ce II	4266 - 33811	2.4	0.41	-0.39
3387.78	Ce II	5716 - 35226	1.4	0.24	-0.63
3390.52	Ce II	3594 - 33080	0.97	0.17	-0.78
3393.92	Ce II	4204 - 33660	1.1	0.20	-0.71
3394.14	Ce II	4523 - 33977	0.83	0.14	-0.84
3396.72	Ce II	3746 - 33177	0.39	0.067	-1.17
3400.25	Ce II	7523 - 36924	1.3	0.22	-0.66
3403.60	Ce II	4202 - 33574	0.87	0.15	-0.82
3404.91	Ce II	1874 - 31235	1.2	0.20	-0.70
3405.98	Ce II	4460 - 33812	2.9	0.51	-0.29
3407.24	Ce II	11743 - 41083	4.1	0.72	-0.14
3416.56	Ce II	5965 - 35226	1.6	0.28	-0.56
3416.86	Ce II	988 - 30246	0.63	0.11	-0.96
3417.45	Ce II	5676 - 34929	4.7	0.83	-0.08
3417.90	Ce II	8403 - 37652	2.8	0.48	-0.32
3420.18	Ce II	4323 - 33553	1.6	0.28	-0.55
3422.51	Ce II	8928 - 38138	3.2	0.56	-0.26
3422.71	Ce II	3594 - 32802	5.5	0.97	-0.01
3423.85	Ce II	9634 - 38833	5.5	0.97	-0.01
3425.34	Ce II	2382 - 31568	0.50	0.087	-1.06
3425.94	Ce II	7713 - 36894	1.9	0.34	-0.47
3426.21	Ce II	988 - 30166	1.7	0.30	-0.52
3426.58	Ce II	2563 - 31738	0.52	0.092	-1.04
3430.32	Ce II	7059 - 36202	3.1	0.56	-0.26
3431.50	Ce II	4911 - 34044	0.86	0.15	-0.82

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3433.09	Ce II	10275 - 39395	10.	1.8	0.26
3439.83	Ce II	4511 - 33574	1.6	0.29	-0.54
3441.21	Ce II	2880 - 31931	2.1	0.36	-0.44
3442.38	Ce II	4511 - 33553	1.6	0.29	-0.54
3442.96	Ce II	5119 - 34155	0.89	0.16	-0.80
3446.72	Ce II	2563 - 31568	0.57	0.10	-0.99
3451.56	Ce II	5965 - 34929	1.3	0.23	-0.64
3456.67	Ce II	988 - 29909	0.18	0.032	-1.49
3456.77	Ce II	6638 - 35559	2.0	0.36	-0.45
3459.83	Ce II	9634 - 38529	3.6	0.64	-0.19
3460.16	Ce II	2140 - 31033	0.25	0.044	-1.35
3461.34	Ce II	4266 - 33149	1.0	0.18	-0.74
3461.79	Ce II	7259 - 36138	1.0	0.19	-0.73
3463.22	Ce II	7059 - 35926	2.2	0.40	-0.40
3463.76	Ce II	5651 - 34514	1.5	0.27	-0.57
3464.21	Ce II	5119 - 33977	2.3	0.41	-0.39
3467.78	Ce II	1874 - 30703	0.22	0.041	-1.39
3468.11	Ce II	4323 - 33149	1.0	0.18	-0.74
3468.89	Ce II	988 - 29807	0.31	0.055	-1.26
3470.41	Ce II	988 - 29794	0.17	0.031	-1.50
3474.22	Ce II	3363 - 32139	0.59	0.11	-0.97
3475.68	Ce II	1874 - 30637	0.50	0.090	-1.04
3476.84	Ce II	10642 - 39395	29.	5.2	0.72
3477.45	Ce II	7059 - 35808	1.7	0.30	-0.52
3479.61	Ce II	0 - 28731	0.29	0.053	-1.28
3480.27	Ce II	0 - 28725	0.42	0.076	-1.12
3480.98	Ce II	12366 - 41085	7.4	1.3	0.13
3481.16	Ce II	5437 - 34155	1.0	0.19	-0.72
3482.14	Ce II	3704 - 32413	1.2	0.22	-0.67
3482.35	Ce II	4845 - 33553	2.8	0.50	-0.30
3484.74	Ce II	2880 - 31568	0.87	0.16	-0.80
3485.05	Ce II	0 - 28686	2.1	0.38	-0.42
3488.55	Ce II	7059 - 35716	3.7	0.68	-0.17
3490.13	Ce II	5651 - 34295	2.0	0.37	-0.43
3493.11	Ce II	4460 - 33080	0.89	0.16	-0.79
3493.72	Ce II	3704 - 32318	0.80	0.15	-0.83
3495.01	Ce II	3594 - 32198	0.60	0.11	-0.96
3495.94	Ce II	4266 - 32863	0.94	0.17	-0.76
3496.33	Ce II	2642 - 31235	0.46	0.085	-1.07
3501.45	Ce II	1874 - 30425	0.79	0.14	-0.84
3506.25	Ce II	2563 - 31076	0.25	0.047	-1.33
3507.95	Ce II	1410 - 29909	0.86	0.16	-0.80
3508.47	Ce II	2581 - 31076	0.51	0.093	-1.03
3508.71	Ce II	12366 - 40858	6.0	1.1	0.04
3510.69	Ce II	5819 - 34295	0.78	0.14	-0.84
3513.79	Ce II	988 - 29439	0.44	0.081	-1.09
3517.38	Ce II	7294 - 35716	13.	2.4	0.38
3518.37	Ce II	10115 - 38529	2.6	0.48	-0.32
3519.08	Ce II	2635 - 31043	0.88	0.16	-0.79
3520.52	Ce II	1410 - 29807	0.84	0.16	-0.81

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3520.98	Ce II	5651 - 34044	0.59	0.11	-0.96
3521.88	Ce II	4911 - 33297	3.6	0.66	-0.18
3524.07	Ce II	5965 - 34333	1.3	0.24	-0.63
3527.85	Ce II	0 - 28338	0.32	0.060	-1.22
3528.05	Ce II	5819 - 34155	0.91	0.17	-0.77
3529.04	Ce II	5716 - 34044	0.59	0.11	-0.96
3530.02	Ce II	2382 - 30703	0.86	0.16	-0.79
3530.95	Ce II	4737 - 33050	0.89	0.17	-0.78
3531.59	Ce II	4737 - 33045	0.89	0.17	-0.78
3532.61	Ce II	7259 - 35559	1.8	0.34	-0.47
3532.88	Ce II	0 - 28298	0.23	0.044	-1.36
3534.05	Ce II	4204 - 32492	5.2	0.98	-0.01
3534.44	Ce II	7523 - 35808	3.4	0.63	-0.20
3535.57	Ce II	2880 - 31156	0.52	0.098	-1.01
3536.70	Ce II	10275 - 38542	5.2	0.98	-0.01
3537.44	Ce II	5716 - 33977	1.4	0.27	-0.57
3538.79	Ce II	6518 - 34768	1.1	0.20	-0.69
3539.09	Ce II	2581 - 30829	4.2	0.78	-0.11
3541.66	Ce II	3704 - 31931	0.32	0.061	-1.21
3543.28	Ce II	9634 - 37849	3.4	0.65	-0.19
3543.52	Ce II	5943 - 34155	0.61	0.11	-0.94
3545.60	Ce II	2880 - 31076	1.2	0.23	-0.64
3545.78	Ce II	2382 - 30577	0.83	0.16	-0.80
3546.19	Ce II	1874 - 30065	1.2	0.24	-0.63
3547.00	Ce II	4323 - 32508	1.3	0.25	-0.60
3548.84	Ce II	9634 - 37804	2.6	0.48	-0.32
3551.66	Ce II	3704 - 31851	0.88	0.17	-0.78
3552.07	Ce II	3594 - 31738	0.39	0.073	-1.14
3552.73	Ce II	2563 - 30703	1.3	0.24	-0.62
3554.99	Ce II	2581 - 30703	2.2	0.42	-0.38
3558.71	Ce II	5716 - 33808	0.48	0.092	-1.04
3560.80	Ce II	5969 - 34044	16.	3.1	0.49
3561.54	Ce II	4166 - 32235	0.36	0.068	-1.17
3562.09	Ce II	4204 - 32269	0.72	0.14	-0.86
3563.82	Ce II	4266 - 32318	0.91	0.17	-0.76
3568.13	Ce II	9634 - 37652	4.5	0.86	-0.06
3569.32	Ce II	5651 - 33660	1.1	0.20	-0.69
3570.98	Ce II	2581 - 30577	0.22	0.043	-1.37
3573.70	Ce II	3594 - 31568	0.59	0.11	-0.95
3575.29	Ce II	8176 - 36138	1.1	0.21	-0.69
3576.23	Ce II	1410 - 29365	0.76	0.14	-0.84
3577.46	Ce II	3794 - 31738	7.4	1.4	0.15
3580.56	Ce II	1874 - 29794	0.36	0.069	-1.16
3583.66	Ce II	9634 - 37531	3.2	0.61	-0.21
3584.34	Ce II	4911 - 32802	1.1	0.20	-0.69
3586.75	Ce II	4266 - 32139	0.70	0.13	-0.87
3587.22	Ce II	5943 - 33812	0.56	0.11	-0.97
3587.64	Ce II	5943 - 33808	2.5	0.49	-0.31
3588.13	Ce II	7059 - 34921	1.5	0.30	-0.53
3588.43	Ce II	5437 - 33297	2.3	0.44	-0.35

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3590.60	Ce II	5969 - 33812	4.2	0.81	-0.09
3594.61	Ce II	0 - 27812	0.15	0.030	-1.52
3596.12	Ce II	8403 - 36202	2.8	0.53	-0.27
3596.73	Ce II	4523 - 32318	0.37	0.071	-1.15
3598.20	Ce II	2382 - 30166	0.70	0.14	-0.87
3599.97	Ce II	4737 - 32508	0.78	0.15	-0.82
3600.54	Ce II	6390 - 34155	2.3	0.45	-0.35
3603.36	Ce II	5119 - 32863	0.64	0.13	-0.90
3604.20	Ce II	988 - 28725	0.47	0.091	-1.04
3607.63	Ce II	5437 - 33149	4.2	0.82	-0.09
3609.69	Ce II	7234 - 34929	9.6	1.9	0.28
3610.91	Ce II	7341 - 35027	2.2	0.43	-0.37
3611.34	Ce II	2563 - 30246	0.57	0.11	-0.96
3611.65	Ce II	7878 - 35559	0.92	0.18	-0.74
3612.32	Ce II	4523 - 32198	0.71	0.14	-0.85
3613.70	Ce II	4266 - 31931	3.1	0.62	-0.21
3615.63	Ce II	5924 - 33574	0.66	0.13	-0.89
3616.20	Ce II	5651 - 33297	1.3	0.26	-0.58
3618.58	Ce II	4511 - 32139	1.3	0.26	-0.59
3619.92	Ce II	2563 - 30180	0.30	0.060	-1.22
3621.15	Ce II	5437 - 33045	0.45	0.089	-1.05
3622.15	Ce II	6913 - 34513	6.9	1.4	0.13
3622.44	Ce II	3363 - 30962	0.38	0.075	-1.13
3623.84	Ce II	6390 - 33977	12.	2.3	0.37
3624.18	Ce II	2581 - 30166	0.61	0.12	-0.92
3628.25	Ce II	2581 - 30135	0.40	0.079	-1.10
3630.42	Ce II	10115 - 37652	2.1	0.41	-0.38
3631.19	Ce II	3704 - 31235	1.2	0.24	-0.61
3632.11	Ce II	2642 - 30166	0.71	0.14	-0.85
3633.40	Ce II	0 - 27515	0.096	0.019	-1.72
3637.75	Ce II	3594 - 31076	0.52	0.10	-0.98
3638.28	Ce II	5819 - 33297	1.5	0.29	-0.53
3640.69	Ce II	6518 - 33977	0.59	0.12	-0.93
3644.29	Ce II	5716 - 33149	0.47	0.094	-1.03
3645.23	Ce II	5437 - 32863	1.3	0.26	-0.59
3645.45	Ce II	2642 - 30065	0.59	0.12	-0.93
3646.97	Ce II	2382 - 29794	1.5	0.29	-0.53
3647.75	Ce II	7523 - 34929	4.7	0.93	-0.03
3647.95	Ce II	8403 - 35808	6.0	1.2	0.08
3649.73	Ce II	4460 - 31851	0.33	0.065	-1.18
3650.12	Ce II	2596 - 29984	0.39	0.077	-1.11
3652.26	Ce II	11949 - 39322	4.0	0.81	-0.09
3653.11	Ce II	2880 - 30246	2.0	0.40	-0.40
3653.67	Ce II	3794 - 31156	4.0	0.81	-0.09
3654.97	Ce II	2642 - 29994	1.4	0.27	-0.57
3655.85	Ce II	2563 - 29909	7.6	1.5	0.18
3658.26	Ce II	2581 - 29909	0.19	0.038	-1.42
3659.23	Ce II	1410 - 28731	1.4	0.27	-0.56
3659.97	Ce II	1410 - 28725	1.1	0.22	-0.66
3660.16	Ce II	10275 - 37588	6.6	1.3	0.12

Wavelength	Spectrum	Energy Levels	gA 10 ⁸ /sec	gf	Log gf
A		K			
3660.64	Ce II	988 - 28298	2.4	0.48	-0.32
3661.73	Ce II	4266 - 31568	0.91	0.18	-0.74
3662.99	Ce II	4266 - 31559	0.68	0.14	-0.86
3663.70	Ce II	4911 - 32198	0.72	0.15	-0.84
3664.73	Ce II	5437 - 32717	0.52	0.11	-0.98
3665.05	Ce II	3854 - 31131	0.47	0.095	-1.02
3667.28	Ce II	5819 - 33080	0.93	0.19	-0.73
3667.98	Ce II	2880 - 30135	4.1	0.82	-0.09
3668.72	Ce II	0 - 27250	0.31	0.063	-1.20
3671.94	Ce II	2581 - 29807	0.55	0.11	-0.95
3672.79	Ce II	7294 - 34514	5.6	1.1	0.05
3673.64	Ce II	2581 - 29794	0.74	0.15	-0.83
3674.05	Ce II	9634 - 36844	2.7	0.55	-0.26
3676.16	Ce II	2596 - 29790	0.37	0.075	-1.13
3679.16	Ce II	2635 - 29807	0.37	0.075	-1.12
3679.42	Ce II	8176 - 35346	4.4	0.90	-0.05
3680.08	Ce II	2642 - 29807	0.74	0.15	-0.82
3680.85	Ce II	2635 - 29794	0.18	0.038	-1.43
3681.38	Ce II	8403 - 35559	3.8	0.76	-0.12
3682.08	Ce II	5651 - 32802	1.7	0.35	-0.45
3687.80	Ce II	3594 - 30703	0.96	0.20	-0.71
3688.66	Ce II	5943 - 33045	0.69	0.14	-0.85
3689.16	Ce II	4460 - 31559	0.30	0.062	-1.21
3693.42	Ce II	10275 - 37342	3.1	0.64	-0.20
3693.71	Ce II	8281 - 35346	0.89	0.18	-0.74
3694.91	Ce II	2382 - 29439	1.0	0.21	-0.69
3696.12	Ce II	3996 - 31043	0.33	0.068	-1.17
3697.66	Ce II	7259 - 34295	1.7	0.34	-0.47
3698.13	Ce II	4202 - 31235	0.35	0.071	-1.15
3698.36	Ce II	6521 - 33553	1.2	0.25	-0.61
3698.66	Ce II	2880 - 29909	0.53	0.11	-0.97
3699.92	Ce II	4911 - 31931	1.0	0.21	-0.68
3702.79	Ce II	3704 - 30703	0.60	0.12	-0.91
3704.98	Ce II	5819 - 32802	2.0	0.40	-0.40
3706.94	Ce II	4202 - 31171	0.62	0.13	-0.90
3707.39	Ce II	4166 - 31131	0.47	0.098	-1.01
3709.29	Ce II	4204 - 31156	5.8	1.2	0.08
3709.93	Ce II	988 - 27935	2.3	0.48	-0.32
3713.99	Ce II	988 - 27905	0.11	0.023	-1.65
3715.47	Ce II	6390 - 33297	1.3	0.26	-0.59
3716.37	Ce II	0 - 26900	2.3	0.47	-0.33
3716.93	Ce II	7259 - 34155	1.4	0.30	-0.53
3718.19	Ce II	1410 - 28298	1.0	0.22	-0.67
3718.38	Ce II	4204 - 31090	2.3	0.47	-0.32
3719.80	Ce II	2563 - 29439	0.72	0.15	-0.83
3722.10	Ce II	5514 - 32373	0.48	0.10	-1.00
3722.29	Ce II	2581 - 29439	0.51	0.11	-0.98
3722.76	Ce II	2596 - 29450	0.38	0.079	-1.10
3723.66	Ce II	4323 - 31171	0.24	0.050	-1.30
3724.64	Ce II	5011 - 31851	1.0	0.21	-0.68

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3725.68	Ce II	5969 - 32802	3.7	0.77	-0.11
3726.96	Ce II	988 - 27812	0.37	0.078	-1.11
3728.02	Ce II	5676 - 32492	4.0	0.83	-0.08
3728.18	Ce II	2635 - 29450	0.38	0.080	-1.10
3728.42	Ce II	5456 - 32269	6.1	1.3	0.11
3729.00	Ce II	4266 - 31076	0.27	0.056	-1.25
3729.92	Ce II	3363 - 30166	0.31	0.065	-1.19
3730.33	Ce II	11742 - 38542	6.1	1.3	0.10
3731.88	Ce II	8928 - 35716	2.2	0.47	-0.33
3732.46	Ce II	2382 - 29167	0.31	0.066	-1.18
3733.52	Ce II	4266 - 31043	0.80	0.17	-0.78
3737.52	Ce II	4460 - 31208	0.63	0.13	-0.88
3737.74	Ce II	6913 - 33660	1.8	0.38	-0.42
3740.13	Ce II	10115 - 36844	2.1	0.43	-0.36
3741.01	Ce II	2642 - 29365	0.25	0.052	-1.28
3741.73	Ce II	7259 - 33977	0.92	0.19	-0.72
3746.37	Ce II	4523 - 31208	0.35	0.074	-1.13
3748.06	Ce II	5819 - 32492	2.6	0.55	-0.26
3750.08	Ce II	6638 - 33297	1.8	0.37	-0.43
3751.00	Ce II	3594 - 30246	0.64	0.14	-0.87
3751.45	Ce II	10275 - 36924	7.0	1.5	0.17
3751.76	Ce II	2635 - 29281	0.12	0.026	-1.59
3752.34	Ce II	5676 - 32318	1.1	0.22	-0.65
3753.77	Ce II	12763 - 39395	4.2	0.90	-0.05
3755.43	Ce II	3363 - 29984	0.80	0.17	-0.77
3755.72	Ce II	5617 - 32235	1.3	0.28	-0.56
3757.22	Ce II	7818 - 34426	2.3	0.48	-0.32
3757.86	Ce II	2563 - 29167	0.51	0.11	-0.96
3760.40	Ce II	2581 - 29167	0.16	0.034	-1.47
3760.69	Ce II	4460 - 31043	0.40	0.085	-1.07
3762.98	Ce II	7341 - 33908	3.6	0.77	-0.11
3763.61	Ce II	4266 - 30829	0.44	0.094	-1.03
3764.12	Ce II	2880 - 29439	2.3	0.50	-0.30
3765.04	Ce II	4523 - 31076	1.1	0.23	-0.64
3765.89	Ce II	5651 - 32198	0.65	0.14	-0.86
3766.51	Ce II	3704 - 30246	0.70	0.15	-0.83
3768.00	Ce II	4511 - 31043	0.27	0.057	-1.24
3768.76	Ce II	8403 - 34929	4.8	1.0	0.01
3769.04	Ce II	1410 - 27935	0.22	0.048	-1.32
3769.94	Ce II	8403 - 34921	2.6	0.56	-0.25
3771.61	Ce II	4323 - 30829	1.5	0.32	-0.49
3772.65	Ce II	5819 - 32318	0.48	0.10	-0.99
3773.21	Ce II	1410 - 27905	0.19	0.042	-1.38
3773.44	Ce II	5437 - 31931	0.52	0.11	-0.96
3776.61	Ce II	3594 - 30065	1.0	0.22	-0.66
3777.67	Ce II	1874 - 28338	0.35	0.074	-1.13
3779.61	Ce II	4511 - 30962	0.23	0.049	-1.31
3781.10	Ce II	5119 - 31559	0.16	0.033	-1.48
3781.62	Ce II	4266 - 30703	3.1	0.66	-0.18
3782.53	Ce II	3996 - 30425	2.0	0.44	-0.36

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3783.04	Ce II	7234 - 33660	1.1	0.24	-0.62
3783.58	Ce II	5716 - 32139	1.5	0.32	-0.50
3786.63	Ce II	1410 - 27812	1.9	0.41	-0.39
3787.46	Ce II	11742 - 38138	1.5	0.32	-0.49
3787.57	Ce II	2635 - 29029	0.31	0.066	-1.18
3787.91	Ce II	988 - 27380	0.24	0.052	-1.29
3788.21	Ce II	4845 - 31235	0.25	0.054	-1.27
3788.75	Ce II	3794 - 30180	2.2	0.48	-0.32
3790.34	Ce II	5943 - 32318	0.19	0.042	-1.38
3791.69	Ce II	7294 - 33660	0.99	0.21	-0.67
3792.33	Ce II	3704 - 30065	1.2	0.27	-0.58
3793.52	Ce II	5965 - 32318	0.78	0.17	-0.78
3793.86	Ce II	7059 - 33410	0.46	0.100	-1.00
3794.68	Ce II	6518 - 32863	0.91	0.20	-0.71
3795.26	Ce II	3794 - 30135	0.73	0.16	-0.80
3796.67	Ce II	7713 - 34044	0.63	0.14	-0.86
3799.04	Ce II	3594 - 29909	0.39	0.085	-1.07
3801.53	Ce II	7234 - 33531	27.	5.9	0.77
3803.10	Ce II	2880 - 29167	2.6	0.56	-0.25
3803.84	Ce II	12260 - 38542	2.3	0.49	-0.31
3804.16	Ce II	5651 - 31931	0.35	0.076	-1.12
3807.69	Ce II	5676 - 31931	0.87	0.19	-0.72
3808.12	Ce II	2382 - 28634	2.9	0.64	-0.20
3809.22	Ce II	4911 - 31156	2.8	0.61	-0.21
3809.50	Ce II	4460 - 30703	0.37	0.081	-1.09
3810.10	Ce II	3746 - 29984	0.15	0.033	-1.48
3810.90	Ce II	5965 - 32198	0.75	0.16	-0.78
3811.62	Ce II	11743 - 37971	2.4	0.52	-0.28
3812.21	Ce II	4737 - 30962	1.3	0.29	-0.54
3814.93	Ce II	3704 - 29909	0.15	0.032	-1.49
3815.01	Ce II	2140 - 28345	0.22	0.049	-1.31
3815.83	Ce II	6518 - 32717	4.4	0.95	-0.02
3816.31	Ce II	5943 - 32139	0.37	0.081	-1.09
3817.46	Ce II	4845 - 31033	2.6	0.56	-0.25
3818.69	Ce II	4523 - 30703	0.50	0.11	-0.97
3819.02	Ce II	4460 - 30637	1.5	0.32	-0.50
3821.27	Ce II	2563 - 28725	0.50	0.11	-0.96
3821.70	Ce II	4266 - 30425	0.86	0.19	-0.73
3823.70	Ce II	8281 - 34426	2.1	0.47	-0.33
3823.90	Ce II	2581 - 28725	1.3	0.30	-0.53
3827.21	Ce II	5437 - 31559	0.63	0.14	-0.86
3829.69	Ce II	1410 - 27515	0.33	0.072	-1.14
3830.03	Ce II	6390 - 32492	1.4	0.32	-0.50
3830.56	Ce II	7713 - 33812	5.7	1.2	0.10
3832.75	Ce II	2642 - 28725	0.28	0.063	-1.20
3834.56	Ce II	2563 - 28634	1.4	0.31	-0.51
3834.78	Ce II	3996 - 30065	0.36	0.080	-1.10
3835.75	Ce II	7234 - 33297	0.52	0.11	-0.94
3836.11	Ce II	1874 - 27935	0.63	0.14	-0.86
3837.21	Ce II	2581 - 28634	0.31	0.069	-1.16

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3838.54	Ce II	2642 – 28686	3.2	0.70	-0.15
3839.50	Ce II	7259 – 33297	1.3	0.29	-0.54
3841.72	Ce II	10115 – 36138	2.9	0.64	-0.19
3842.05	Ce II	7059 – 33080	0.49	0.11	-0.97
3843.77	Ce II	8804 – 34813	3.2	0.70	-0.15
3845.28	Ce II	3996 – 29894	0.25	0.055	-1.26
3845.48	Ce II	10115 – 36112	2.3	0.51	-0.29
3846.55	Ce II	8176 – 34166	3.0	0.66	-0.18
3848.11	Ce II	4266 – 30246	1.1	0.24	-0.61
3848.60	Ce II	4204 – 30180	3.8	0.84	-0.08
3849.57	Ce II	1410 – 27380	0.12	0.027	-1.57
3850.12	Ce II	5965 – 31931	0.88	0.20	-0.71
3852.11	Ce II	2382 – 28335	0.26	0.057	-1.24
3853.16	Ce II	0 – 25945	1.1	0.25	-0.59
3854.19	Ce II	1874 – 27812	2.8	0.62	-0.21
3854.32	Ce II	1874 – 27811	2.8	0.62	-0.21
3855.30	Ce II	4204 – 30135	2.7	0.59	-0.23
3857.02	Ce II	5819 – 31738	2.7	0.60	-0.22
3857.24	Ce II	3363 – 29281	0.59	0.13	-0.88
3857.64	Ce II	2382 – 28298	0.95	0.21	-0.67
3857.82	Ce II	4511 – 30425	0.35	0.077	-1.11
3857.94	Ce II	3996 – 29909	0.20	0.045	-1.35
3862.47	Ce II	5676 – 31559	1.3	0.29	-0.54
3866.82	Ce II	988 – 26841	0.27	0.061	-1.21
3868.14	Ce II	3594 – 29439	0.70	0.16	-0.80
3868.50	Ce II	5716 – 31559	1.0	0.23	-0.63
3869.57	Ce II	9723 – 35559	1.2	0.28	-0.56
3870.87	Ce II	5514 – 31340	0.98	0.22	-0.66
3871.81	Ce II	7259 – 33079	0.37	0.083	-1.08
3873.26	Ce II	10115 – 35926	1.4	0.31	-0.51
3874.68	Ce II	8176 – 33977	3.5	0.78	-0.11
3875.04	Ce II	3996 – 29794	1.1	0.24	-0.62
3876.14	Ce II	4911 – 30703	0.88	0.20	-0.70
3876.97	Ce II	4460 – 30246	2.8	0.62	-0.21
3878.37	Ce II	1410 – 27187	2.1	0.47	-0.32
3879.31	Ce II	5437 – 31208	0.36	0.082	-1.09
3879.61	Ce II	12366 – 38134	2.6	0.58	-0.24
3880.41	Ce II	14276 – 40040	4.4	0.99	-0.00
3881.87	Ce II	2581 – 28335	0.45	0.10	-0.99
3882.45	Ce II	2596 – 28345	3.9	0.88	-0.06
3883.57	Ce II	2596 – 28338	0.36	0.080	-1.09
3884.20	Ce II	12457 – 38195	4.2	0.94	-0.03
3886.50	Ce II	4523 – 30246	0.44	0.10	-1.00
3888.39	Ce II	5119 – 30829	1.2	0.27	-0.57
3889.00	Ce II	4460 – 30166	0.54	0.12	-0.91
3889.30	Ce II	3746 – 29450	0.27	0.060	-1.22
3889.48	Ce II	2635 – 28338	0.19	0.044	-1.36
3889.99	Ce II	5456 – 31156	6.1	1.4	0.14
3890.76	Ce II	2140 – 27835	0.48	0.11	-0.96
3890.99	Ce II	2642 – 28335	0.55	0.12	-0.90

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3891.77	Ce II	4737 - 30425	0.23	0.053	-1.28
3893.23	Ce II	5283 - 30962	0.95	0.22	-0.67
3893.87	Ce II	7878 - 33553	0.85	0.19	-0.72
3894.32	Ce II	4323 - 29994	0.31	0.071	-1.15
3895.12	Ce II	3363 - 29029	2.0	0.45	-0.35
3896.80	Ce II	4511 - 30166	2.6	0.59	-0.23
3897.43	Ce II	10275 - 35926	1.1	0.25	-0.60
3898.27	Ce II	3794 - 29439	1.8	0.40	-0.39
3898.94	Ce II	1874 - 27515	0.57	0.13	-0.89
3899.39	Ce II	5514 - 31152	0.29	0.065	-1.18
3900.20	Ce II	8176 - 33808	0.91	0.21	-0.68
3901.30	Ce II	5943 - 31568	0.81	0.18	-0.73
3901.68	Ce II	9723 - 35346	1.2	0.27	-0.57
3903.34	Ce II	4523 - 30135	0.86	0.20	-0.71
3903.93	Ce II	12366 - 37974	3.4	0.79	-0.10
3904.34	Ce II	4460 - 30065	1.1	0.24	-0.62
3904.58	Ce II	7259 - 32863	0.47	0.11	-0.97
3906.92	Ce II	12260 - 37849	6.7	1.5	0.18
3907.29	Ce II	8928 - 34514	10.	2.3	0.37
3907.45	Ce II	4166 - 29750	0.53	0.12	-0.91
3908.09	Ce II	4845 - 30425	0.41	0.094	-1.03
3908.41	Ce II	6913 - 32492	4.2	0.96	-0.02
3908.54	Ce II	3704 - 29281	1.2	0.27	-0.57
3909.05	Ce II	8403 - 33977	0.40	0.091	-1.04
3909.31	Ce II	3594 - 29167	0.78	0.18	-0.75
3909.75	Ce II	4166 - 29736	0.43	0.100	-1.00
3909.93	Ce II	7234 - 32802	1.0	0.24	-0.63
3910.70	Ce II	9634 - 35198	2.3	0.52	-0.29
3911.30	Ce II	6638 - 32198	0.97	0.22	-0.65
3912.19	Ce II	4511 - 30065	0.85	0.19	-0.71
3912.44	Ce II	2382 - 27935	0.20	0.047	-1.33
3913.99	Ce II	4523 - 30065	0.42	0.097	-1.01
3914.95	Ce II	3746 - 29281	0.30	0.068	-1.17
3915.52	Ce II	5676 - 31208	2.0	0.47	-0.33
3916.14	Ce II	4266 - 29794	1.4	0.32	-0.50
3916.90	Ce II	2382 - 27905	0.29	0.066	-1.18
3917.25	Ce II	3508 - 29029	0.20	0.046	-1.34
3917.64	Ce II	5119 - 30637	1.00	0.23	-0.64
3918.28	Ce II	5617 - 31131	3.9	0.91	-0.04
3919.81	Ce II	5651 - 31156	2.5	0.57	-0.25
3921.73	Ce II	5716 - 31208	3.1	0.71	-0.15
3923.11	Ce II	4511 - 29994	2.1	0.48	-0.32
3924.64	Ce II	4511 - 29984	1.7	0.38	-0.42
3924.80	Ce II	4323 - 29794	0.25	0.057	-1.25
3927.00	Ce II	7259 - 32717	0.28	0.065	-1.19
3927.39	Ce II	2880 - 28335	0.26	0.060	-1.22
3927.57	Ce II	11742 - 37196	2.0	0.46	-0.34
3928.32	Ce II	4460 - 29909	0.56	0.13	-0.89
3929.96	Ce II	5651 - 31090	0.36	0.082	-1.08
3930.81	Ce II	7059 - 32492	0.84	0.20	-0.71

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3931.09	Ce II	1410 - 26841	1.2	0.27	-0.56
3931.37	Ce II	2382 - 27812	0.62	0.14	-0.84
3932.15	Ce II	5651 - 31076	0.78	0.18	-0.74
3933.73	Ce II	5676 - 31090	1.6	0.36	-0.44
3934.75	Ce II	5617 - 31024	0.17	0.041	-1.39
3935.93	Ce II	5676 - 31076	0.25	0.058	-1.24
3937.15	Ce II	12260 - 37652	1.8	0.42	-0.38
3937.63	Ce II	5819 - 31208	0.26	0.060	-1.22
3938.09	Ce II	4523 - 29909	2.0	0.47	-0.32
3939.52	Ce II	8532 - 33908	0.63	0.15	-0.83
3939.66	Ce II	1874 - 27250	0.096	0.022	-1.65
3940.34	Ce II	2563 - 27935	1.6	0.37	-0.43
3940.64	Ce II	3996 - 29365	0.31	0.071	-1.15
3940.97	Ce II	3363 - 28731	0.81	0.19	-0.73
3942.15	Ce II	0 - 25360	2.0	0.46	-0.34
3942.75	Ce II	6913 - 32269	19.	4.4	0.64
3943.14	Ce II	2581 - 27935	0.32	0.075	-1.12
3943.50	Ce II	8804 - 34155	0.68	0.16	-0.80
3943.89	Ce II	6390 - 31738	4.7	1.1	0.04
3944.84	Ce II	10115 - 35457	1.2	0.29	-0.54
3944.92	Ce II	2563 - 27905	0.17	0.041	-1.39
3946.68	Ce II	7818 - 33149	1.0	0.24	-0.62
3947.97	Ce II	3363 - 28686	0.80	0.19	-0.73
3949.39	Ce II	1874 - 27187	0.31	0.072	-1.14
3950.42	Ce II	5119 - 30425	0.77	0.18	-0.74
3952.11	Ce II	4511 - 29807	0.35	0.082	-1.09
3952.54	Ce II	2642 - 27935	6.5	1.5	0.18
3953.66	Ce II	3996 - 29281	1.0	0.24	-0.62
3953.95	Ce II	4523 - 29807	0.55	0.13	-0.89
3955.92	Ce II	4523 - 29794	0.55	0.13	-0.89
3956.06	Ce II	5819 - 31090	1.1	0.27	-0.57
3956.28	Ce II	4911 - 30180	3.9	0.91	-0.04
3957.15	Ce II	2642 - 27905	0.15	0.034	-1.47
3957.97	Ce II	7234 - 32492	1.2	0.27	-0.56
3958.27	Ce II	5819 - 31076	1.1	0.27	-0.57
3959.62	Ce II	4202 - 29450	0.59	0.14	-0.86
3959.80	Ce II	4737 - 29984	0.58	0.14	-0.87
3960.38	Ce II	5965 - 31208	0.52	0.12	-0.91
3960.91	Ce II	2596 - 27835	1.6	0.37	-0.43
3962.09	Ce II	7818 - 33050	1.4	0.32	-0.49
3963.37	Ce II	4911 - 30135	0.38	0.090	-1.04
3964.50	Ce II	2596 - 27812	0.80	0.19	-0.73
3967.05	Ce II	2635 - 27835	1.6	0.37	-0.43
3967.18	Ce II	5437 - 30637	0.69	0.16	-0.79
3967.53	Ce II	9723 - 34921	1.7	0.40	-0.40
3970.04	Ce II	11742 - 36924	4.1	0.97	-0.01
3970.42	Ce II	9634 - 34813	0.82	0.19	-0.71
3970.64	Ce II	2635 - 27812	0.34	0.081	-1.09
3971.68	Ce II	3996 - 29167	1.3	0.32	-0.50
3971.88	Ce II	2642 - 27812	0.23	0.054	-1.27

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3972.07	Ce II	6390 - 31559	1.6	0.37	-0.43
3974.19	Ce II	5011 - 30166	0.28	0.066	-1.18
3975.07	Ce II	7713 - 32863	2.3	0.53	-0.27
3976.78	Ce II	7059 - 32198	0.49	0.12	-0.93
3977.53	Ce II	8774 - 33908	0.40	0.094	-1.02
3977.77	Ce II	5943 - 31076	0.79	0.19	-0.73
3978.65	Ce II	4323 - 29450	2.5	0.59	-0.23
3980.88	Ce II	5716 - 30829	2.7	0.64	-0.20
3981.90	Ce II	5969 - 31076	0.22	0.051	-1.29
3982.89	Ce II	6638 - 31738	3.5	0.82	-0.08
3983.29	Ce II	4166 - 29263	0.95	0.23	-0.65
3984.68	Ce II	7713 - 32802	6.4	1.5	0.18
3986.40	Ce II	5965 - 31043	0.28	0.068	-1.17
3989.44	Ce II	7259 - 32318	2.7	0.63	-0.20
3990.11	Ce II	2880 - 27935	0.39	0.092	-1.04
3990.69	Ce II	5651 - 30703	0.32	0.077	-1.11
3992.13	Ce II	4323 - 29365	0.22	0.053	-1.28
3992.39	Ce II	3594 - 28635	1.8	0.43	-0.36
3992.91	Ce II	5924 - 30962	1.8	0.43	-0.36
3993.82	Ce II	7341 - 32373	6.7	1.6	0.21
3994.57	Ce II	5676 - 30703	0.52	0.12	-0.91
3995.42	Ce II	3704 - 28725	0.093	0.022	-1.65
3997.72	Ce II	8804 - 33812	1.6	0.37	-0.43
3999.24	Ce II	2382 - 27380	5.1	1.2	0.09
4000.80	Ce II	5437 - 30425	0.072	0.017	-1.76
4001.06	Ce II	5716 - 30703	0.52	0.12	-0.90
4001.56	Ce II	5011 - 29994	0.85	0.20	-0.69
4001.73	Ce II	3704 - 28686	0.37	0.088	-1.05
4002.81	Ce II	7294 - 32269	1.3	0.32	-0.50
4002.97	Ce II	3363 - 28338	0.27	0.064	-1.19
4003.17	Ce II	5011 - 29984	0.42	0.10	-0.99
4003.77	Ce II	7523 - 32492	7.0	1.7	0.23
4004.58	Ce II	7234 - 32198	0.69	0.17	-0.78
4005.64	Ce II	988 - 25945	0.44	0.11	-0.97
4007.45	Ce II	5119 - 30065	0.27	0.065	-1.18
4007.59	Ce II	4845 - 29790	0.75	0.18	-0.74
4008.66	Ce II	7259 - 32198	0.30	0.072	-1.14
4009.06	Ce II	7202 - 32139	0.39	0.094	-1.03
4010.14	Ce II	6638 - 31568	0.83	0.20	-0.70
4011.56	Ce II	5716 - 30637	0.45	0.11	-0.97
4012.39	Ce II	4523 - 29439	8.7	2.1	0.32
4014.90	Ce II	4266 - 29167	2.7	0.66	-0.18
4015.88	Ce II	8403 - 33297	2.4	0.59	-0.23
4017.60	Ce II	5819 - 30703	0.65	0.16	-0.80
4019.04	Ce II	8176 - 33050	1.8	0.43	-0.37
4019.90	Ce II	8176 - 33045	1.3	0.31	-0.51
4022.27	Ce II	9054 - 33908	2.7	0.66	-0.18
4024.35	Ce II	4523 - 29365	0.45	0.11	-0.96
4024.49	Ce II	3794 - 28634	2.2	0.53	-0.28
4025.15	Ce II	3508 - 28345	0.57	0.14	-0.86

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4027.05	Ce II	6913 - 31738	0.44	0.11	-0.97
4028.41	Ce II	2563 - 27380	1.5	0.37	-0.43
4030.16	Ce II	10115 - 34921	0.86	0.21	-0.68
4030.34	Ce II	2382 - 27187	0.44	0.11	-0.97
4031.34	Ce II	2581 - 27380	1.5	0.37	-0.43
4037.39	Ce II	8774 - 33536	0.58	0.14	-0.85
4037.67	Ce II	5943 - 30703	1.6	0.38	-0.42
4038.25	Ce II	10870 - 35626	3.2	0.77	-0.11
4039.89	Ce II	8789 - 33536	0.87	0.21	-0.67
4040.76	Ce II	3594 - 28335	5.0	1.2	0.09
4041.27	Ce II	5965 - 30703	0.52	0.13	-0.89
4042.14	Ce II	8928 - 33660	0.60	0.15	-0.83
4042.58	Ce II	3996 - 28725	2.4	0.60	-0.22
4045.21	Ce II	6521 - 31235	1.7	0.41	-0.39
4046.34	Ce II	4460 - 29167	1.9	0.46	-0.34
4047.28	Ce II	5283 - 29984	0.48	0.12	-0.93
4049.03	Ce II	3996 - 28686	0.30	0.073	-1.14
4050.81	Ce II	7059 - 31738	0.53	0.13	-0.89
4051.43	Ce II	5119 - 29794	0.76	0.19	-0.73
4051.99	Ce II	5965 - 30637	0.97	0.24	-0.62
4053.51	Ce II	0 - 24663	0.60	0.15	-0.83
4054.99	Ce II	2596 - 27250	0.79	0.20	-0.71
4055.16	Ce II	6518 - 31171	0.45	0.11	-0.95
4056.90	Ce II	8403 - 33045	0.76	0.19	-0.72
4058.24	Ce II	3704 - 28338	0.20	0.050	-1.30
4058.78	Ce II	3704 - 28335	0.12	0.029	-1.53
4062.22	Ce II	11016 - 35626	5.3	1.3	0.12
4062.94	Ce II	2581 - 27187	0.39	0.097	-1.01
4063.92	Ce II	3746 - 28345	0.27	0.067	-1.17
4064.91	Ce II	3704 - 28298	0.20	0.050	-1.30
4065.16	Ce II	7259 - 31851	0.55	0.14	-0.87
4066.50	Ce II	12260 - 36844	2.2	0.55	-0.26
4067.28	Ce II	8532 - 33111	2.6	0.65	-0.19
4068.84	Ce II	5676 - 30246	1.7	0.43	-0.36
4070.84	Ce II	12366 - 36924	1.9	0.47	-0.32
4071.08	Ce II	5437 - 29994	0.32	0.081	-1.09
4071.81	Ce II	2635 - 27187	1.8	0.46	-0.34
4072.92	Ce II	2642 - 27187	0.47	0.12	-0.94
4073.48	Ce II	3854 - 28396	4.5	1.1	0.05
4073.74	Ce II	8449 - 32989	1.9	0.47	-0.33
4074.65	Ce II	1410 - 25945	0.035	0.0086	-2.07
4075.71	Ce II	5651 - 30180	6.3	1.6	0.19
4075.85	Ce II	4911 - 29439	5.1	1.3	0.10
4076.24	Ce II	6518 - 31043	1.1	0.27	-0.57
4077.47	Ce II	2382 - 26900	0.68	0.17	-0.77
4078.32	Ce II	7722 - 32235	3.9	0.97	-0.02
4078.52	Ce II	7555 - 31967	1.8	0.45	-0.35
4079.02	Ce II	7059 - 31568	0.51	0.13	-0.90
4079.67	Ce II	7234 - 31738	0.89	0.22	-0.66
4080.44	Ce II	2880 - 27380	0.49	0.12	-0.91

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4081.22	Ce II	3854 - 28350	1.6	0.41	-0.39
4083.23	Ce II	5651 - 30135	3.7	0.92	-0.04
4083.48	Ce II	9054 - 33536	1.2	0.29	-0.53
4085.23	Ce II	5437 - 29909	1.7	0.42	-0.37
4086.42	Ce II	4266 - 28731	0.23	0.057	-1.24
4087.36	Ce II	4266 - 28725	0.68	0.17	-0.77
4087.57	Ce II	8532 - 32989	0.63	0.16	-0.80
4088.58	Ce II	6638 - 31090	0.22	0.056	-1.25
4088.85	Ce II	5716 - 30166	0.91	0.23	-0.64
4089.74	Ce II	7294 - 31738	0.44	0.11	-0.95
4089.86	Ce II	6518 - 30962	0.36	0.089	-1.05
4090.47	Ce II	6521 - 30962	0.64	0.16	-0.79
4090.95	Ce II	6638 - 31076	0.66	0.17	-0.78
4092.09	Ce II	4204 - 28634	0.13	0.033	-1.49
4092.72	Ce II	5819 - 30246	0.41	0.10	-0.99
4093.96	Ce II	4266 - 28686	0.41	0.10	-0.98
4098.98	Ce II	5676 - 30065	0.33	0.084	-1.08
4099.75	Ce II	8695 - 33080	0.39	0.098	-1.01
4101.77	Ce II	6968 - 31340	2.5	0.64	-0.19
4102.36	Ce II	8928 - 33297	0.69	0.17	-0.76
4104.43	Ce II	5437 - 29794	0.18	0.046	-1.34
4105.00	Ce II	8532 - 32885	2.2	0.56	-0.25
4106.13	Ce II	5819 - 30166	0.29	0.072	-1.14
4107.42	Ce II	3996 - 28335	1.2	0.31	-0.51
4107.80	Ce II	8774 - 33111	0.46	0.12	-0.93
4108.26	Ce II	7234 - 31568	0.15	0.039	-1.41
4109.56	Ce II	3508 - 27835	0.089	0.023	-1.65
4110.38	Ce II	8789 - 33111	1.8	0.47	-0.33
4110.84	Ce II	2581 - 26900	0.11	0.029	-1.54
4111.39	Ce II	5819 - 30135	1.0	0.26	-0.59
4111.93	Ce II	6390 - 30703	0.17	0.042	-1.37
4113.73	Ce II	3996 - 28298	0.24	0.060	-1.22
4114.15	Ce II	7259 - 31559	0.30	0.075	-1.12
4115.37	Ce II	7455 - 31747	2.7	0.68	-0.17
4117.01	Ce II	10870 - 35152	4.2	1.1	0.03
4117.29	Ce II	5965 - 30246	0.82	0.21	-0.68
4117.59	Ce II	10642 - 34921	3.1	0.78	-0.11
4118.14	Ce II	5617 - 29893	2.9	0.74	-0.13
4119.02	Ce II	4460 - 28731	0.69	0.18	-0.76
4119.79	Ce II	8774 - 33040	2.8	0.72	-0.14
4119.88	Ce II	2635 - 26900	0.50	0.13	-0.89
4120.83	Ce II	2581 - 26841	0.72	0.18	-0.74
4123.24	Ce II	5819 - 30065	2.0	0.51	-0.29
4123.49	Ce II	7722 - 31967	3.4	0.88	-0.06
4123.87	Ce II	6913 - 31156	5.3	1.4	0.13
4124.79	Ce II	5514 - 29751	1.8	0.47	-0.33
4125.78	Ce II	3704 - 27935	0.11	0.027	-1.56
4126.66	Ce II	4460 - 28686	0.15	0.039	-1.41
4127.37	Ce II	5514 - 29735	3.6	0.91	-0.04
4127.74	Ce II	4511 - 28731	0.69	0.18	-0.75

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4128.07	Ce II	3594 - 27812	0.41	0.11	-0.97
4128.36	Ce II	7523 - 31738	1.2	0.30	-0.53
4129.18	Ce II	5969 - 30180	0.35	0.089	-1.05
4130.71	Ce II	4523 - 28725	1.5	0.37	-0.43
4131.10	Ce II	2642 - 26841	0.77	0.20	-0.71
4132.31	Ce II	5716 - 29909	0.37	0.096	-1.02
4132.64	Ce II	6638 - 30829	0.28	0.071	-1.15
4133.80	Ce II	6968 - 31152	14.	3.7	0.57
4135.44	Ce II	4511 - 28686	0.72	0.18	-0.73
4135.89	Ce II	10642 - 34813	0.86	0.22	-0.66
4136.77	Ce II	5283 - 29450	0.19	0.048	-1.32
4136.90	Ce II	5969 - 30135	0.34	0.088	-1.06
4137.47	Ce II	5119 - 29281	0.85	0.22	-0.66
4137.65	Ce II	4166 - 28327	4.8	1.2	0.09
4138.35	Ce II	10870 - 35027	3.4	0.88	-0.06
4139.43	Ce II	3363 - 27515	0.11	0.028	-1.55
4140.75	Ce II	4202 - 28345	0.14	0.036	-1.45
4142.40	Ce II	5617 - 29751	2.8	0.73	-0.14
4142.83	Ce II	12763 - 36894	4.2	1.1	0.04
4144.49	Ce II	3854 - 27976	0.87	0.22	-0.65
4145.00	Ce II	5617 - 29735	2.5	0.63	-0.20
4146.23	Ce II	4523 - 28634	1.3	0.33	-0.48
4148.16	Ce II	5965 - 30065	0.34	0.087	-1.06
4148.90	Ce II	8789 - 32885	2.5	0.64	-0.19
4149.79	Ce II	5716 - 29807	1.6	0.40	-0.39
4149.94	Ce II	5819 - 29909	3.8	0.97	-0.01
4151.97	Ce II	5514 - 29592	4.9	1.3	0.10
4153.13	Ce II	1874 - 25945	0.28	0.073	-1.14
4153.93	Ce II	3746 - 27812	0.10	0.027	-1.57
4155.53	Ce II	9054 - 33111	1.7	0.45	-0.35
4159.03	Ce II	8281 - 32318	3.4	0.88	-0.05
4160.11	Ce II	4266 - 28296	0.34	0.089	-1.05
4161.18	Ce II	7722 - 31747	0.72	0.19	-0.73
4162.63	Ce II	7059 - 31076	0.82	0.21	-0.67
4163.52	Ce II	11016 - 35027	5.0	1.3	0.12
4165.61	Ce II	7341 - 31340	7.3	1.9	0.28
4166.65	Ce II	4737 - 28731	0.43	0.11	-0.95
4167.80	Ce II	9054 - 33040	2.4	0.61	-0.21
4169.77	Ce II	5819 - 29795	2.4	0.63	-0.20
4171.39	Ce II	5943 - 29909	0.22	0.056	-1.25
4172.16	Ce II	2880 - 26841	0.18	0.048	-1.32
4174.48	Ce II	4737 - 28686	0.31	0.080	-1.10
4175.24	Ce II	5965 - 29909	0.27	0.071	-1.15
4176.08	Ce II	3996 - 27935	0.28	0.073	-1.14
4176.70	Ce II	9054 - 32989	3.1	0.81	-0.09
4179.29	Ce II	3594 - 27515	0.14	0.036	-1.44
4181.08	Ce II	5119 - 29029	1.0	0.27	-0.58
4185.33	Ce II	3363 - 27250	0.61	0.16	-0.79
4186.60	Ce II	6968 - 30847	18.	4.6	0.67
4187.32	Ce II	4460 - 28335	1.3	0.35	-0.46

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4189.18	Ce II	5943 - 29807	0.18	0.049	-1.31
4189.64	Ce II	7294 - 31156	0.31	0.081	-1.09
4190.63	Ce II	7234 - 31090	0.91	0.24	-0.62
4193.09	Ce II	7234 - 31075	3.0	0.80	-0.10
4193.28	Ce II	8532 - 32373	2.8	0.75	-0.13
4193.87	Ce II	4460 - 28298	0.90	0.24	-0.63
4194.91	Ce II	9054 - 32885	1.6	0.43	-0.36
4195.82	Ce II	4511 - 28338	0.17	0.046	-1.34
4196.34	Ce II	3363 - 27187	1.1	0.30	-0.52
4197.51	Ce II	3996 - 27812	0.30	0.080	-1.10
4197.67	Ce II	3996 - 27811	0.39	0.10	-0.99
4198.00	Ce II	4911 - 28725	0.78	0.21	-0.69
4198.43	Ce II	4523 - 28335	0.45	0.12	-0.92
4198.67	Ce II	7341 - 31152	6.2	1.6	0.21
4201.24	Ce II	7294 - 31090	1.8	0.48	-0.32
4202.94	Ce II	3594 - 27380	1.7	0.46	-0.34
4204.74	Ce II	6390 - 30166	0.29	0.078	-1.11
4205.79	Ce II	7059 - 30829	0.18	0.047	-1.33
4205.89	Ce II	10275 - 34044	0.44	0.12	-0.94
4209.41	Ce II	5514 - 29263	0.86	0.23	-0.64
4210.00	Ce II	5283 - 29029	0.21	0.057	-1.25
4213.04	Ce II	5437 - 29167	0.31	0.083	-1.08
4214.04	Ce II	4911 - 28634	0.99	0.26	-0.58
4217.59	Ce II	8532 - 32235	2.3	0.62	-0.21
4222.60	Ce II	988 - 24663	1.4	0.37	-0.44
4223.88	Ce II	4266 - 27935	0.25	0.067	-1.17
4227.41	Ce II	5716 - 29365	0.33	0.088	-1.05
4227.75	Ce II	5617 - 29263	2.5	0.67	-0.17
4228.30	Ce II	7059 - 30703	0.41	0.11	-0.96
4230.12	Ce II	4202 - 27835	0.18	0.049	-1.31
4232.57	Ce II	5819 - 29439	0.48	0.13	-0.89
4234.21	Ce II	4202 - 27812	0.52	0.14	-0.86
4234.73	Ce II	6638 - 30246	0.36	0.097	-1.01
4236.02	Ce II	4737 - 28338	0.49	0.13	-0.88
4236.36	Ce II	8774 - 32373	0.66	0.18	-0.75
4239.91	Ce II	3854 - 27433	1.9	0.52	-0.29
4242.01	Ce II	7523 - 31090	0.46	0.12	-0.91
4242.72	Ce II	2382 - 25945	0.50	0.14	-0.87
4245.88	Ce II	5819 - 29365	1.0	0.28	-0.55
4245.98	Ce II	4266 - 27812	0.67	0.18	-0.74
4246.71	Ce II	2141 - 25682	0.47	0.13	-0.90
4247.45	Ce II	3363 - 26900	0.12	0.032	-1.50
4248.09	Ce II	10275 - 33808	0.83	0.22	-0.65
4248.68	Ce II	5514 - 29044	3.2	0.88	-0.06
4250.66	Ce II	3996 - 27515	0.070	0.019	-1.72
4251.60	Ce II	8804 - 32318	0.43	0.12	-0.93
4251.86	Ce II	4323 - 27835	0.12	0.033	-1.48
4253.36	Ce II	3746 - 27250	0.73	0.20	-0.70
4254.70	Ce II	6638 - 30135	0.29	0.080	-1.10
4255.78	Ce II	5676 - 29167	2.0	0.53	-0.27

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4256.16	Ce II	4323 - 27812	0.37	0.100	-1.00
4257.12	Ce II	3704 - 27187	0.20	0.056	-1.25
4259.75	Ce II	7234 - 30703	0.62	0.17	-0.77
4261.16	Ce II	8774 - 32235	0.85	0.23	-0.63
4263.43	Ce II	8403 - 31851	1.3	0.36	-0.44
4263.95	Ce II	8789 - 32235	0.53	0.15	-0.84
4264.37	Ce II	7259 - 30703	0.83	0.23	-0.65
4268.30	Ce II	5943 - 29365	0.19	0.052	-1.29
4269.25	Ce II	7818 - 31235	0.80	0.22	-0.66
4270.19	Ce II	4523 - 27935	1.4	0.38	-0.42
4270.72	Ce II	7722 - 31131	2.2	0.60	-0.22
4273.44	Ce II	8804 - 32198	0.95	0.26	-0.58
4275.56	Ce II	4523 - 27905	0.47	0.13	-0.89
4278.25	Ce II	10799 - 34166	0.55	0.15	-0.82
4278.87	Ce II	2581 - 25945	0.25	0.070	-1.16
4280.14	Ce II	5924 - 29281	0.46	0.13	-0.89
4281.00	Ce II	4460 - 27812	0.25	0.068	-1.17
4281.16	Ce II	4460 - 27811	0.18	0.051	-1.30
4285.37	Ce II	7341 - 30670	1.4	0.38	-0.42
4288.67	Ce II	2635 - 25945	0.25	0.070	-1.15
4289.45	Ce II	3594 - 26900	0.33	0.092	-1.04
4289.94	Ce II	2642 - 25945	2.5	0.70	-0.15
4292.58	Ce II	6518 - 29807	0.43	0.12	-0.92
4292.77	Ce II	4523 - 27812	0.25	0.068	-1.17
4294.76	Ce II	10275 - 33553	0.78	0.22	-0.67
4296.07	Ce II	8928 - 32198	1.5	0.41	-0.39
4296.37	Ce II	6521 - 29790	0.16	0.045	-1.35
4296.67	Ce II	4166 - 27433	3.9	1.1	0.03
4299.09	Ce II	3996 - 27250	0.13	0.036	-1.44
4299.36	Ce II	1410 - 24663	0.53	0.15	-0.83
4300.33	Ce II	3594 - 26841	1.3	0.36	-0.45
4302.65	Ce II	10642 - 33876	1.0	0.28	-0.55
4304.72	Ce II	5943 - 29167	0.50	0.14	-0.86
4305.14	Ce II	6913 - 30135	1.8	0.50	-0.30
4306.72	Ce II	4166 - 27379	1.5	0.42	-0.38
4309.58	Ce II	5969 - 29167	0.36	0.10	-1.00
4309.74	Ce II	3704 - 26900	0.67	0.19	-0.73
4310.70	Ce II	3996 - 27187	0.29	0.079	-1.10
4311.59	Ce II	7059 - 30246	0.49	0.14	-0.86
4313.10	Ce II	5119 - 28298	0.089	0.025	-1.61
4314.93	Ce II	6638 - 29807	0.22	0.061	-1.22
4315.41	Ce II	7259 - 30425	0.45	0.13	-0.90
4317.33	Ce II	8403 - 31559	0.89	0.25	-0.60
4320.72	Ce II	3704 - 26841	0.94	0.26	-0.58
4324.79	Ce II	7713 - 30829	0.80	0.22	-0.65
4326.83	Ce II	5924 - 29029	0.22	0.061	-1.21
4330.45	Ce II	2596 - 25682	0.37	0.11	-0.98
4331.76	Ce II	9723 - 32802	1.4	0.39	-0.41
4332.71	Ce II	5651 - 28725	0.88	0.25	-0.60
4334.87	Ce II	8278 - 31340	0.42	0.12	-0.93

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4335.49	Ce II	8176 - 31235	0.33	0.092	-1.04
4336.26	Ce II	5676 - 28731	1.1	0.32	-0.50
4337.78	Ce II	2635 - 25682	1.2	0.34	-0.47
4339.32	Ce II	10870 - 33908	4.2	1.2	0.07
4340.56	Ce II	8176 - 31208	0.41	0.11	-0.94
4342.14	Ce II	4911 - 27935	0.13	0.036	-1.44
4342.49	Ce II	10275 - 33297	0.73	0.21	-0.68
4345.83	Ce II	9634 - 32638	1.9	0.55	-0.26
4347.60	Ce II	8176 - 31171	0.32	0.091	-1.04
4349.79	Ce II	4266 - 27250	1.3	0.38	-0.42
4352.71	Ce II	4845 - 27812	1.2	0.35	-0.45
4356.75	Ce II	7234 - 30180	0.15	0.043	-1.36
4360.18	Ce II	6521 - 29450	0.35	0.099	-1.00
4360.44	Ce II	4323 - 27250	0.13	0.038	-1.42
4361.66	Ce II	4266 - 27187	0.24	0.067	-1.17
4363.39	Ce II	5819 - 28731	0.16	0.046	-1.33
4364.66	Ce II	3996 - 26900	1.6	0.45	-0.35
4367.00	Ce II	11016 - 33908	1.2	0.35	-0.46
4367.56	Ce II	8281 - 31171	0.40	0.12	-0.94
4368.23	Ce II	7294 - 30180	0.37	0.10	-0.98
4372.40	Ce II	4323 - 27187	0.18	0.053	-1.28
4373.22	Ce II	5437 - 28298	0.13	0.036	-1.44
4373.82	Ce II	4523 - 27380	0.069	0.020	-1.70
4375.17	Ce II	7059 - 29909	0.20	0.057	-1.24
4375.92	Ce II	3996 - 26841	0.91	0.26	-0.58
4380.06	Ce II	5011 - 27835	0.25	0.073	-1.14
4381.78	Ce II	5819 - 28634	0.32	0.091	-1.04
4382.17	Ce II	5514 - 28327	2.4	0.68	-0.17
4386.35	Ce II	7202 - 29994	0.29	0.084	-1.08
4386.70	Ce II	4460 - 27250	0.32	0.093	-1.03
4386.84	Ce II	1874 - 24663	0.65	0.19	-0.73
4388.01	Ce II	6968 - 29751	1.2	0.35	-0.46
4390.28	Ce II	11742 - 34514	2.5	0.72	-0.14
4391.66	Ce II	2596 - 25360	1.9	0.55	-0.26
4393.19	Ce II	5969 - 28725	0.45	0.13	-0.89
4394.78	Ce II	7059 - 29807	0.33	0.096	-1.02
4396.58	Ce II	7012 - 29751	0.27	0.079	-1.10
4398.79	Ce II	4460 - 27187	0.37	0.11	-0.97
4399.20	Ce II	2635 - 25360	0.57	0.17	-0.78
4400.54	Ce II	2642 - 25360	0.079	0.023	-1.64
4400.87	Ce II	5119 - 27835	0.16	0.046	-1.34
4403.30	Ce II	11341 - 34044	0.73	0.21	-0.67
4405.47	Ce II	5119 - 27812	0.16	0.046	-1.34
4407.28	Ce II	5651 - 28335	0.44	0.13	-0.89
4408.87	Ce II	7234 - 29909	0.40	0.12	-0.93
4410.64	Ce II	10870 - 33536	4.0	1.2	0.06
4410.76	Ce II	7455 - 30120	1.5	0.44	-0.35
4412.02	Ce II	5676 - 28335	0.33	0.096	-1.02
4413.80	Ce II	7259 - 29909	0.29	0.084	-1.08
4416.90	Ce II	4266 - 26900	0.54	0.16	-0.80

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4418.78	Ce II	6968 - 29592	3.7	1.1	0.03
4419.30	Ce II	5676 - 28298	0.18	0.053	-1.27
4423.68	Ce II	8532 - 31131	1.1	0.33	-0.48
4427.07	Ce II	3363 - 25945	0.41	0.12	-0.92
4427.92	Ce II	4323 - 26900	0.83	0.25	-0.61
4428.44	Ce II	4266 - 26841	0.53	0.16	-0.81
4429.27	Ce II	8774 - 31345	4.0	1.2	0.07
4432.72	Ce II	11742 - 34295	0.79	0.23	-0.63
4432.92	Ce II	5283 - 27835	0.16	0.047	-1.33
4433.73	Ce II	8281 - 30829	0.26	0.077	-1.11
4437.61	Ce II	6638 - 29167	0.37	0.11	-0.96
4439.24	Ce II	11016 - 33536	0.96	0.28	-0.55
4440.88	Ce II	6518 - 29029	0.40	0.12	-0.92
4443.75	Ce II	5437 - 27935	0.36	0.11	-0.97
4444.39	Ce II	7455 - 29949	2.0	0.59	-0.23
4444.70	Ce II	8532 - 31024	2.5	0.75	-0.13
4449.34	Ce II	4911 - 27380	1.6	0.46	-0.34
4450.73	Ce II	5514 - 27976	1.5	0.44	-0.36
4453.16	Ce II	4737 - 27187	0.11	0.032	-1.50
4454.99	Ce II	4460 - 26900	0.15	0.044	-1.36
4457.78	Ce II	8403 - 30829	0.22	0.067	-1.17
4460.21	Ce II	3854 - 26268	3.5	1.0	0.02
4461.14	Ce II	7341 - 29751	1.8	0.53	-0.28
4463.41	Ce II	7722 - 30120	1.8	0.55	-0.26
4464.17	Ce II	7341 - 29735	0.22	0.066	-1.18
4464.69	Ce II	8278 - 30670	0.72	0.21	-0.67
4467.54	Ce II	4523 - 26900	0.50	0.15	-0.83
4471.24	Ce II	5617 - 27976	3.4	1.0	0.00
4472.72	Ce II	3594 - 25945	0.61	0.18	-0.74
4474.69	Ce II	8789 - 31131	0.25	0.074	-1.13
4479.36	Ce II	4523 - 26841	1.2	0.37	-0.43
4483.90	Ce II	6968 - 29263	2.4	0.73	-0.14
4485.52	Ce II	7878 - 30166	0.37	0.11	-0.95
4486.91	Ce II	2382 - 24663	0.79	0.24	-0.62
4488.81	Ce II	8804 - 31076	0.24	0.073	-1.13
4492.95	Ce II	7341 - 29592	0.16	0.048	-1.32
4494.22	Ce II	6390 - 28634	0.41	0.12	-0.91
4495.39	Ce II	5011 - 27250	0.25	0.075	-1.12
4496.23	Ce II	8403 - 30637	0.72	0.22	-0.66
4497.85	Ce II	7722 - 29949	1.1	0.32	-0.49
4500.34	Ce II	9723 - 31938	0.62	0.19	-0.72
4508.08	Ce II	5011 - 27187	0.14	0.041	-1.38
4509.14	Ce II	7092 - 29263	0.29	0.089	-1.05
4510.17	Ce II	7818 - 29984	0.24	0.073	-1.14
4510.92	Ce II	8928 - 31090	0.29	0.087	-1.06
4515.86	Ce II	8532 - 30670	0.58	0.18	-0.75
4519.59	Ce II	10870 - 32989	0.98	0.30	-0.52
4522.08	Ce II	7059 - 29167	0.076	0.023	-1.63
4523.08	Ce II	4166 - 26268	1.2	0.35	-0.45
4527.35	Ce II	2581 - 24663	0.80	0.25	-0.61

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4528.47	Ce II	6968 - 29044	2.8	0.85	-0.07
4536.89	Ce II	12260 - 34295	1.2	0.38	-0.43
4537.88	Ce II	7878 - 29909	0.29	0.091	-1.04
4539.07	Ce II	11016 - 33040	1.1	0.35	-0.45
4539.75	Ce II	2642 - 24663	0.80	0.25	-0.60
4544.96	Ce II	3363 - 25360	0.24	0.076	-1.12
4545.87	Ce II	5943 - 27935	0.084	0.026	-1.58
4549.64	Ce II	11016 - 32989	0.70	0.22	-0.66
4550.30	Ce II	9054 - 31024	0.40	0.13	-0.90
4551.30	Ce II	5969 - 27935	0.61	0.19	-0.72
4554.56	Ce II	3996 - 25945	0.039	0.012	-1.92
4558.60	Ce II	4911 - 26841	0.12	0.039	-1.41
4560.28	Ce II	7341 - 29263	2.3	0.71	-0.15
4560.96	Ce II	5514 - 27433	0.65	0.20	-0.70
4562.36	Ce II	3854 - 25766	2.8	0.86	-0.07
4563.38	Ce II	6390 - 28298	0.075	0.023	-1.63
4565.84	Ce II	8774 - 30670	2.2	0.69	-0.16
4572.28	Ce II	5514 - 27379	0.22	0.068	-1.17
4572.79	Ce II	11949 - 33812	1.1	0.34	-0.47
4576.48	Ce II	9723 - 31568	0.38	0.12	-0.92
4582.50	Ce II	5617 - 27433	0.89	0.28	-0.55
4591.12	Ce II	8928 - 30703	0.67	0.21	-0.67
4593.93	Ce II	5617 - 27379	1.7	0.55	-0.26
4601.37	Ce II	10646 - 32373	0.30	0.095	-1.02
4604.21	Ce II	8281 - 29994	0.098	0.031	-1.51
4605.48	Ce II	9317 - 31024	0.20	0.065	-1.19
4606.40	Ce II	7341 - 29044	1.4	0.45	-0.35
4611.56	Ce II	12366 - 34044	1.2	0.37	-0.44
4613.02	Ce II	7059 - 28731	0.21	0.068	-1.16
4624.90	Ce II	9054 - 30670	2.2	0.71	-0.15
4628.16	Ce II	4166 - 25766	2.2	0.72	-0.14
4633.60	Ce II	7059 - 28634	0.10	0.034	-1.47
4636.74	Ce II	5819 - 27380	0.088	0.028	-1.55
4644.20	Ce II	8281 - 29807	0.29	0.095	-1.02
4647.38	Ce II	5676 - 27187	0.084	0.027	-1.57
4654.29	Ce II	4202 - 25682	0.16	0.054	-1.27
4659.94	Ce II	7713 - 29167	0.12	0.040	-1.40
4666.71	Ce II	4523 - 25945	0.049	0.016	-1.79
4670.74	Ce II	5437 - 26841	0.15	0.050	-1.30
4680.13	Ce II	8532 - 29893	0.78	0.26	-0.59
4680.99	Ce II	11016 - 32373	0.30	0.100	-1.00
4684.61	Ce II	7294 - 28634	1.0	0.33	-0.48
4685.23	Ce II	7012 - 28350	0.20	0.064	-1.19
4689.50	Ce II	8928 - 30246	0.11	0.035	-1.45
4690.17	Ce II	7012 - 28327	0.078	0.026	-1.59
4690.50	Ce II	8278 - 29592	0.14	0.046	-1.34
4692.06	Ce II	5943 - 27250	0.11	0.038	-1.42
4694.88	Ce II	6518 - 27812	0.20	0.067	-1.18
4707.94	Ce II	7092 - 28327	0.16	0.052	-1.28
4714.00	Ce II	8928 - 30135	1.2	0.39	-0.41

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4714.81	Ce II	8532 - 29735	0.52	0.17	-0.76
4717.88	Ce II	5651 - 26841	0.21	0.069	-1.16
4722.30	Ce II	4511 - 25682	0.056	0.019	-1.73
4723.31	Ce II	5676 - 26841	0.077	0.026	-1.59
4725.09	Ce II	4202 - 25360	0.17	0.057	-1.25
4730.13	Ce II	7202 - 28338	0.28	0.092	-1.03
4733.52	Ce II	10115 - 31235	0.80	0.27	-0.57
4735.35	Ce II	7523 - 28634	0.086	0.029	-1.54
4737.28	Ce II	8789 - 29893	1.7	0.58	-0.24
4739.12	Ce II	7202 - 28298	0.14	0.046	-1.34
4739.53	Ce II	10058 - 31152	0.78	0.26	-0.58
4741.64	Ce II	8281 - 29365	0.21	0.071	-1.15
4747.14	Ce II	11743 - 32802	1.9	0.66	-0.18
4749.50	Ce II	12763 - 33812	0.26	0.088	-1.06
4752.24	Ce II	12260 - 33297	0.40	0.14	-0.87
4755.54	Ce II	5819 - 26841	0.13	0.044	-1.36
4757.84	Ce II	7713 - 28725	0.44	0.15	-0.82
4759.92	Ce II	8804 - 29807	0.084	0.029	-1.54
4763.90	Ce II	8278 - 29263	0.31	0.11	-0.98
4768.77	Ce II	7012 - 27976	0.32	0.11	-0.96
4773.94	Ce II	7455 - 28396	0.81	0.28	-0.56
4780.23	Ce II	11949 - 32863	0.36	0.12	-0.91
4789.69	Ce II	5969 - 26841	0.078	0.027	-1.57
4835.63	Ce II	7722 - 28396	0.16	0.057	-1.24
4846.57	Ce II	7722 - 28350	0.20	0.071	-1.15
4858.72	Ce II	9317 - 29893	0.22	0.078	-1.11
4874.01	Ce II	8928 - 29439	0.33	0.12	-0.93
4891.90	Ce II	10799 - 31235	0.23	0.083	-1.08
4893.97	Ce II	10704 - 31131	0.72	0.26	-0.59
4914.94	Ce II	7092 - 27433	0.13	0.046	-1.34
4928.09	Ce II	7092 - 27379	0.063	0.023	-1.64
4943.45	Ce II	9726 - 29949	0.78	0.28	-0.55
4943.84	Ce II	7713 - 27935	0.11	0.040	-1.39
4944.62	Ce II	8131 - 28350	0.41	0.15	-0.82
4961.49	Ce II	5617 - 25766	0.040	0.015	-1.83
4977.23	Ce II	7294 - 27380	0.16	0.059	-1.23
4986.42	Ce II	8278 - 28327	0.41	0.15	-0.81
4991.02	Ce II	11310 - 31340	0.58	0.22	-0.66
5011.77	Ce II	8449 - 28396	0.47	0.18	-0.76
5022.87	Ce II	8424 - 28327	0.54	0.20	-0.69
5027.29	Ce II	11455 - 31340	0.20	0.074	-1.13
5031.97	Ce II	11341 - 31208	0.38	0.14	-0.84
5037.77	Ce II	8131 - 27976	0.49	0.19	-0.73
5044.01	Ce II	9772 - 29592	1.1	0.43	-0.36
5075.30	Ce II	7202 - 26900	0.73	0.28	-0.55
5076.47	Ce II	11458 - 31152	0.65	0.25	-0.60
5079.68	Ce II	11166 - 30847	4.3	1.7	0.22
5117.18	Ce II	11310 - 30847	1.5	0.58	-0.24
5117.95	Ce II	10058 - 29592	0.12	0.048	-1.32
5147.55	Ce II	10314 - 29735	0.76	0.30	-0.52

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5163.27	Ce II	11341 - 30703	0.50	0.20	-0.70
5187.45	Ce II	9772 - 29044	2.1	0.85	-0.07
5191.68	Ce II	7012 - 26268	0.72	0.29	-0.53
5205.52	Ce II	10058 - 29263	0.22	0.091	-1.04
5210.34	Ce II	7713 - 26900	0.087	0.035	-1.45
5226.36	Ce II	7713 - 26841	0.11	0.047	-1.33
5232.91	Ce II	10646 - 29751	0.97	0.40	-0.40
5234.01	Ce II	8278 - 27379	0.20	0.082	-1.09
5235.77	Ce II	11949 - 31043	0.23	0.096	-1.02
5237.05	Ce II	10646 - 29735	0.32	0.13	-0.88
5239.83	Ce II	9317 - 28396	0.080	0.033	-1.48
5252.62	Ce II	9317 - 28350	0.35	0.15	-0.84
5258.40	Ce II	5651 - 24663	0.047	0.019	-1.71
5265.71	Ce II	10058 - 29044	0.75	0.31	-0.51
5274.24	Ce II	8424 - 27379	1.2	0.50	-0.30
5275.78	Ce II	10314 - 29263	0.20	0.083	-1.08
5330.58	Ce II	7012 - 25766	0.43	0.18	-0.74
5353.53	Ce II	7092 - 25766	1.0	0.44	-0.35
5359.48	Ce II	11341 - 29994	0.18	0.077	-1.12
5393.39	Ce II	8897 - 27433	1.1	0.49	-0.31
5409.22	Ce II	8897 - 27379	1.0	0.45	-0.34
5417.84	Ce II	8928 - 27380	0.055	0.024	-1.62
5459.21	Ce II	13028 - 31340	0.64	0.28	-0.55
5464.20	Ce II	11455 - 29751	0.41	0.18	-0.74
5472.30	Ce II	10058 - 28327	0.68	0.31	-0.51
5512.09	Ce II	8131 - 26268	0.72	0.33	-0.49
5513.11	Ce II	11458 - 29592	0.091	0.042	-1.38
5516.08	Ce II	13028 - 31152	0.30	0.14	-0.86
5518.49	Ce II	9317 - 27433	0.21	0.097	-1.01
5550.04	Ce II	10314 - 28327	0.16	0.074	-1.13
5561.46	Ce II	11760 - 29735	0.11	0.051	-1.29
5610.26	Ce II	8449 - 26268	0.21	0.098	-1.01
5613.70	Ce II	11455 - 29263	0.21	0.10	-1.00
5637.39	Ce II	11310 - 29044	0.29	0.14	-0.87
5668.94	Ce II	8131 - 25766	0.23	0.11	-0.96
5683.77	Ce II	11455 - 29044	0.17	0.084	-1.08
5711.45	Ce II	11760 - 29263	0.31	0.15	-0.82
5715.29	Ce II	12457 - 29949	0.30	0.15	-0.83
5768.90	Ce II	10646 - 27976	0.35	0.17	-0.76
5771.98	Ce II	10058 - 27379	0.051	0.026	-1.59
5783.99	Ce II	11760 - 29044	0.082	0.041	-1.38
5817.78	Ce II	8176 - 25360	0.063	0.032	-1.50
5858.56	Ce II	10314 - 27379	0.074	0.038	-1.42
5975.87	Ce II	10704 - 27433	0.31	0.17	-0.78
5995.35	Ce II	10704 - 27379	0.30	0.16	-0.78
6034.20	Ce II	11760 - 28327	0.18	0.096	-1.02
6035.49	Ce II	13028 - 29592	0.25	0.14	-0.86
6043.39	Ce II	9726 - 26268	0.34	0.18	-0.73
6098.34	Ce II	14276 - 30670	0.49	0.27	-0.56
6108.74	Ce II	13527 - 29893	0.24	0.13	-0.88

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6232.45	Ce II	9726 - 25766	0.063	0.037	-1.44
6272.05	Ce II	12457 - 28396	0.27	0.16	-0.81
6299.51	Ce II	15282 - 31152	0.35	0.21	-0.68
6371.11	Ce II	12705 - 28396	0.19	0.11	-0.94
6466.90	Ce II	14276 - 29735	0.16	0.10	-1.00
6675.54	Ce II	12457 - 27433	0.060	0.040	-1.40
6744.70	Ce II	13527 - 28350	0.11	0.077	-1.11
6755.08	Ce II	13527 - 28327	0.034	0.023	-1.64
6919.27	Ce II	13527 - 27976	0.062	0.045	-1.35
7115.08	Ce II	14276 - 28327	0.11	0.081	-1.09
7150.23	Ce II	15282 - 29263	0.23	0.18	-0.75
7189.40	Ce II	13527 - 27433	0.12	0.090	-1.05
7238.36	Ce II	12457 - 26268	0.12	0.092	-1.03
7361.89	Ce II	12366 - 25945	0.031	0.025	-1.60
7390.45	Ce II	0 - 13527	0.00067	0.00055	-3.26
7972.34	Ce II	988 - 13527	0.00062	0.00059	-3.23
8025.56	Ce II	0 - 12457	0.0013	0.0012	-2.91
8250.64	Ce II	1410 - 13527	0.00053	0.00054	-3.27
8405.24	Ce II	2382 - 14276	0.00075	0.00079	-3.10
8702.38	Ce II	3794 - 15282	0.0026	0.0029	-2.54
8716.66	Ce II	988 - 12457	0.00034	0.00038	-3.42
8772.14	Ce II	2880 - 14276	0.0035	0.0040	-2.40

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2174.60	Co I	0 - 45971	1.1	0.081	-1.09
2268.17	Co I	4143 - 48217	1.7	0.13	-0.88
2274.49	Co I	0 - 43952	0.54	0.042	-1.38
2284.85	Co I	816 - 44568	0.64	0.050	-1.30
2287.81	Co I	4143 - 47839	4.9	0.39	-0.41
2291.46	Co I	4690 - 48317	1.8	0.14	-0.86
2295.23	Co I	0 - 43555	0.61	0.048	-1.32
2296.05	Co I	5076 - 48616	1.9	0.15	-0.83
2296.71	Co I	4690 - 48217	3.8	0.30	-0.53
2303.97	Co I	3483 - 46873	1.3	0.10	-1.00
2304.18	Co I	816 - 44202	0.91	0.073	-1.14
2305.18	Co I	816 - 44183	1.1	0.087	-1.06
2309.02	Co I	0 - 43295	6.8	0.54	-0.26
2316.16	Co I	1407 - 44568	1.6	0.13	-0.88
2316.86	Co I	1407 - 44556	2.0	0.16	-0.79
2323.14	Co I	816 - 43848	8.0	0.65	-0.19
2325.55	Co I	1407 - 44394	2.3	0.19	-0.72
2335.99	Co I	1407 - 44202	5.9	0.49	-0.31
2338.67	Co I	1809 - 44556	8.2	0.67	-0.17
2339.05	Co I	816 - 43555	1.9	0.15	-0.82
2346.16	Co I	816 - 43426	2.4	0.20	-0.70
2350.28	Co I	4690 - 47225	2.2	0.18	-0.74
2351.39	Co I	1407 - 43922	0.69	0.057	-1.24
2352.85	Co I	3483 - 45971	14.	1.1	0.05
2353.42	Co I	816 - 43295	8.7	0.72	-0.14
2355.48	Co I	1407 - 43848	3.0	0.25	-0.60
2358.18	Co I	1809 - 44202	3.0	0.25	-0.60
2365.07	Co I	0 - 42269	3.3	0.27	-0.56
2369.68	Co I	4143 - 46330	4.2	0.36	-0.45
2370.51	Co I	816 - 42988	1.1	0.090	-1.05
2371.44	Co I	17234 - 59389	13.	1.1	0.06
2371.86	Co I	1407 - 43555	1.9	0.16	-0.80
2372.83	Co I	1407 - 43538	0.50	0.042	-1.37
2377.22	Co I	5076 - 47129	3.5	0.29	-0.53
2380.48	Co I	816 - 42811	7.1	0.61	-0.22
2384.86	Co I	0 - 41918	5.6	0.47	-0.32
2387.46	Co I	4690 - 46563	2.3	0.19	-0.71
2400.84	Co I	4690 - 46330	1.00	0.086	-1.06
2402.06	Co I	816 - 42434	6.5	0.56	-0.25
2406.27	Co I	4143 - 45688	1.7	0.15	-0.82
2407.25	Co I	0 - 41529	25.	2.2	0.34
2410.51	Co I	14036 - 55509	20.	1.8	0.25
2411.62	Co I	816 - 42269	31.	2.7	0.43
2412.76	Co I	1809 - 43243	12.	1.1	0.03
2413.19	Co I	5076 - 46502	2.3	0.20	-0.71
2413.58	Co I	14399 - 55819	10.	0.91	-0.04
2414.46	Co I	1407 - 42811	36.	3.2	0.50
2415.30	Co I	1809 - 43200	40.	3.5	0.55
2422.56	Co I	13796 - 55061	20.	1.7	0.23
2424.93	Co I	0 - 41226	22.	1.9	0.28

Wavelength A	Spectrum Co I	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2425.59	Co I	4690 - 45905	1.2	0.11	-0.96
2429.23	Co I	816 - 41969	0.72	0.064	-1.20
2432.21	Co I	816 - 41918	24.	2.2	0.33
2435.83	Co I	0 - 41041	4.0	0.35	-0.45
2436.66	Co I	1407 - 42434	23.	2.1	0.32
2439.05	Co I	1809 - 42797	23.	2.1	0.32
2441.05	Co I	17234 - 58187	85.	7.6	0.88
2456.24	Co I	3483 - 44183	3.9	0.35	-0.45
2460.21	Co I	15184 - 55819	4.3	0.39	-0.41
2460.81	Co I	1809 - 42434	4.7	0.43	-0.37
2462.12	Co I	13796 - 54399	7.7	0.70	-0.15
2463.78	Co I	1407 - 41983	0.73	0.067	-1.18
2464.62	Co I	1407 - 41969	0.42	0.038	-1.42
2467.69	Co I	1407 - 41918	2.5	0.23	-0.65
2470.28	Co I	3483 - 43952	7.3	0.67	-0.17
2473.90	Co I	816 - 41226	0.85	0.078	-1.11
2476.64	Co I	3483 - 43848	7.1	0.65	-0.18
2483.61	Co I	4143 - 44394	7.5	0.69	-0.16
2493.93	Co I	8461 - 48546	3.8	0.35	-0.45
2494.73	Co I	3483 - 43555	1.6	0.15	-0.81
2495.55	Co I	4143 - 44202	6.3	0.59	-0.23
2496.71	Co I	4143 - 44183	6.3	0.59	-0.23
2502.28	Co I	7442 - 47394	1.2	0.11	-0.96
2504.52	Co I	3483 - 43399	7.6	0.72	-0.15
2506.88	Co I	4690 - 44568	6.6	0.62	-0.21
2507.68	Co I	4690 - 44556	5.3	0.50	-0.30
2511.02	Co I	3483 - 43295	28.	2.6	0.42
2512.90	Co I	7442 - 47225	3.8	0.36	-0.45
2513.12	Co I	4143 - 43922	1.8	0.17	-0.76
2517.87	Co I	4690 - 44394	15.	1.4	0.16
2521.36	Co I	0 - 39649	20.	1.9	0.28
2528.97	Co I	816 - 40346	16.	1.6	0.19
2530.13	Co I	4690 - 44202	12.	1.2	0.06
2532.18	Co I	5076 - 44556	16.	1.5	0.19
2535.36	Co I	7442 - 46873	2.2	0.21	-0.68
2535.96	Co I	1407 - 40828	19.	1.8	0.25
2536.49	Co I	4143 - 43555	12.	1.2	0.07
2544.25	Co I	1809 - 41102	15.	1.5	0.17
2544.86	Co I	4143 - 43426	3.2	0.32	-0.50
2548.34	Co I	7442 - 46672	15.	1.5	0.16
2549.30	Co I	1407 - 40622	1.8	0.17	-0.76
2553.00	Co I	4690 - 43848	4.4	0.43	-0.37
2553.37	Co I	4143 - 43295	5.0	0.49	-0.31
2555.07	Co I	5076 - 44202	6.5	0.64	-0.20
2556.76	Co I	4143 - 43243	3.1	0.30	-0.52
2562.15	Co I	1809 - 40828	7.8	0.77	-0.11
2567.35	Co I	1407 - 40346	8.2	0.81	-0.09
2572.24	Co I	4690 - 43555	1.7	0.17	-0.77
2573.40	Co I	4690 - 43538	1.2	0.12	-0.93
2573.54	Co I	4143 - 42988	1.2	0.12	-0.94

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2574.35	Co I	816 - 39649	5.7	0.56	-0.25
2575.73	Co I	1809 - 40622	0.27	0.027	-1.57
2580.84	Co I	4690 - 43426	2.0	0.20	-0.70
2585.34	Co I	8461 - 47129	5.7	0.57	-0.25
2590.59	Co I	7442 - 46032	5.7	0.57	-0.24
2591.69	Co I	4690 - 43264	1.9	0.19	-0.72
2594.16	Co I	1809 - 40346	0.55	0.056	-1.25
2600.98	Co I	3483 - 41918	0.65	0.066	-1.18
2606.12	Co I	5076 - 43436	1.7	0.17	-0.77
2610.76	Co I	4143 - 42434	0.50	0.051	-1.29
2614.13	Co I	1407 - 39649	0.46	0.047	-1.33
2616.26	Co I	8461 - 46672	5.1	0.52	-0.28
2617.86	Co I	5076 - 43264	1.3	0.13	-0.88
2622.06	Co I	4143 - 42269	1.2	0.12	-0.91
2622.43	Co I	4690 - 42811	1.4	0.14	-0.84
2627.64	Co I	3483 - 41529	2.7	0.28	-0.55
2644.78	Co I	8461 - 46260	2.3	0.24	-0.61
2646.42	Co I	4143 - 41918	3.5	0.37	-0.43
2648.64	Co I	3483 - 41226	7.3	0.76	-0.12
2649.94	Co I	8461 - 46186	3.0	0.32	-0.50
2650.27	Co I	5076 - 42797	1.4	0.15	-0.83
2675.98	Co I	5076 - 42434	1.5	0.17	-0.78
2679.76	Co I	8461 - 45767	4.0	0.43	-0.37
2685.34	Co I	4690 - 41918	2.0	0.22	-0.66
2695.85	Co I	4143 - 41226	1.8	0.20	-0.70
2705.85	Co I	13796 - 50742	6.2	0.68	-0.17
2715.99	Co I	16468 - 53276	30.	3.3	0.52
2731.12	Co I	16471 - 53075	20.	2.3	0.36
2740.46	Co I	7442 - 43922	4.8	0.54	-0.26
2745.10	Co I	16778 - 53196	30.	3.4	0.53
2761.37	Co I	4143 - 40346	0.74	0.084	-1.07
2764.19	Co I	3483 - 39649	1.2	0.14	-0.86
2766.22	Co I	17234 - 53374	22.	2.5	0.39
2778.82	Co I	15184 - 51160	16.	1.8	0.26
2796.23	Co I	5076 - 40828	0.34	0.040	-1.40
2797.08	Co I	8461 - 44202	1.3	0.16	-0.81
2803.77	Co I	4690 - 40346	0.75	0.088	-1.05
2815.56	Co I	4143 - 39649	0.99	0.12	-0.93
2820.01	Co I	8461 - 43911	0.49	0.059	-1.23
2837.15	Co I	16778 - 52014	11.	1.3	0.10
2850.04	Co I	8461 - 43538	1.1	0.14	-0.86
2862.61	Co I	1407 - 36330	0.20	0.024	-1.62
2872.50	Co I	8461 - 43264	0.49	0.061	-1.22
2886.44	Co I	816 - 35451	0.39	0.048	-1.31
2899.82	Co I	16471 - 50945	6.8	0.86	-0.06
2903.20	Co I	16468 - 50903	3.2	0.40	-0.40
2927.67	Co I	16778 - 50925	11.	1.5	0.17
2928.81	Co I	0 - 34134	0.043	0.0056	-2.25
2929.51	Co I	16468 - 50593	11. .	1.4	0.15
2957.68	Co I	16778 - 50579	3.1	0.40	-0.40

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2987.16	Co I	0 - 33467	0.83	0.11	-0.96
2989.59	Co I	0 - 33440	0.82	0.11	-0.96
2995.15	Co I	17234 - 50611	3.6	0.48	-0.32
3000.55	Co I	816 - 34134	0.17	0.023	-1.65
3013.60	Co I	0 - 33173	0.36	0.049	-1.31
3017.55	Co I	816 - 33946	0.96	0.13	-0.88
3026.37	Co I	15184 - 48217	8.5	1.2	0.07
3034.43	Co I	1407 - 34352	0.090	0.012	-1.91
3042.48	Co I	816 - 33674	0.27	0.038	-1.42
3044.00	Co I	0 - 32842	3.1	0.44	-0.36
3048.89	Co I	1407 - 34196	0.63	0.088	-1.05
3060.05	Co I	15774 - 48444	9.0	1.3	0.10
3061.82	Co I	816 - 33467	2.1	0.30	-0.53
3062.20	Co I	816 - 33463	0.059	0.0083	-2.08
3064.37	Co I	816 - 33440	0.082	0.012	-1.94
3072.34	Co I	1407 - 33946	1.3	0.18	-0.74
3082.62	Co I	0 - 32431	0.60	0.086	-1.07
3086.78	Co I	1809 - 34196	1.2	0.17	-0.76
3089.60	Co I	816 - 33173	0.37	0.053	-1.27
3098.20	Co I	1407 - 33674	0.35	0.051	-1.29
3121.42	Co I	0 - 32028	0.27	0.040	-1.40
3121.57	Co I	816 - 32842	0.12	0.018	-1.75
3137.33	Co I	1809 - 33674	0.56	0.083	-1.08
3139.94	Co I	816 - 32654	0.33	0.048	-1.32
3147.06	Co I	1407 - 33173	0.58	0.086	-1.07
3152.71	Co I	16196 - 47905	8.3	1.2	0.09
3154.68	Co I	16471 - 48160	38.	5.7	0.75
3158.78	Co I	816 - 32465	0.40	0.060	-1.22
3188.37	Co I	15774 - 47129	9.3	1.4	0.15
3219.15	Co I	816 - 31871	0.095	0.015	-1.83
3232.87	Co I	16471 - 47394	10.	1.6	0.20
3243.84	Co I	15184 - 46003	12.	1.9	0.29
3247.18	Co I	15184 - 45971	14.	2.1	0.33
3254.21	Co I	15184 - 45905	20.	3.2	0.50
3260.82	Co I	16471 - 47129	19.	3.0	0.48
3271.78	Co I	15774 - 46330	7.8	1.2	0.10
3283.46	Co I	16778 - 47225	39.	6.3	0.80
3287.19	Co I	15774 - 46186	4.7	0.76	-0.12
3307.15	Co I	15774 - 46003	7.2	1.2	0.07
3314.08	Co I	14036 - 44202	6.3	1.0	0.02
3319.48	Co I	23612 -- 53728	58.	9.5	0.98
3322.20	Co I	16471 - 46563	16.	2.6	0.42
3325.24	Co I	16196 - 46260	12.	1.9	0.29
3326.99	Co I	23612 - 53660	84.	14.	1.15
3334.14	Co I	3483 - 33467	1.1	0.19	-0.73
3339.78	Co I	23856 - 53789	47.	7.8	0.89
3342.73	Co I	16778 - 46685	11.	1.8	0.26
3346.94	Co I	23856 - 53725	47.	7.8	0.89
3348.11	Co I	16471 - 46330	7.0	1.2	0.07
3354.38	Co I	4143 - 33946	1.1	0.19	-0.72

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3361.56	Co I	24628 - 54367	29.	5.0	0.70
3362.80	Co I	24628 - 54356	29.	5.0	0.70
3367.11	Co I	3483 - 33173	0.86	0.15	-0.84
3370.33	Co I	4690 - 34352	0.23	0.040	-1.40
3373.23	Co I	18390 - 48026	11.	1.8	0.26
3385.22	Co I	4143 - 33674	1.7	0.28	-0.55
3388.17	Co I	4690 - 34196	2.2	0.39	-0.41
3395.38	Co I	4690 - 34134	4.4	0.76	-0.12
3405.12	Co I	3483 - 32842	15.	2.7	0.43
3409.18	Co I	4143 - 33467	7.3	1.3	0.11
3412.34	Co I	4143 - 33440	11.	1.9	0.28
3412.63	Co I	0 - 29295	1.1	0.20	-0.70
3414.74	Co I	5076 - 34352	1.1	0.19	-0.72
3417.16	Co I	4690 - 33946	5.1	0.89	-0.05
3424.51	Co I	16778 - 45971	13.	2.2	0.34
3428.23	Co I	24628 - 53789	20.	3.5	0.55
3431.58	Co I	816 - 29949	1.6	0.28	-0.56
3433.04	Co I	5076 - 34196	9.1	1.6	0.20
3438.91	Co I	26450 - 55521	24.	4.3	0.63
3442.93	Co I	1407 - 30444	1.1	0.20	-0.70
3443.64	Co I	4143 - 33173	13.	2.4	0.38
3446.09	Co I	25938 - 54948	32.	5.7	0.76
3449.17	Co I	4690 - 33674	7.3	1.3	0.11
3449.44	Co I	3483 - 32465	2.6	0.46	-0.33
3453.50	Co I	3483 - 32431	26.	4.6	0.66
3455.23	Co I	1809 - 30743	0.80	0.14	-0.84
3456.93	Co I	816 - 29735	0.065	0.012	-1.93
3461.18	Co I	25569 - 54452	83.	15.	1.17
3462.80	Co I	5076 - 33946	9.7	1.8	0.24
3465.80	Co I	0 - 28845	2.3	0.42	-0.38
3471.38	Co I	25569 - 54367	26.	4.7	0.67
3474.02	Co I	0 - 28777	3.6	0.64	-0.19
3478.56	Co I	18390 - 47129	5.1	0.92	-0.04
3483.41	Co I	4143 - 32842	0.13	0.024	-1.61
3485.37	Co I	25139 - 53822	98.	18.	1.25
3489.40	Co I	7442 - 36092	17.	3.1	0.49
3491.32	Co I	1809 - 30444	0.34	0.063	-1.20
3495.69	Co I	5076 - 33674	4.3	0.78	-0.11
3496.68	Co I	4143 - 32733	0.66	0.12	-0.92
3502.28	Co I	3483 - 32028	11.	2.0	0.30
3502.62	Co I	1407 - 29949	0.36	0.066	-1.18
3506.32	Co I	4143 - 32654	9.4	1.7	0.24
3509.84	Co I	4690 - 33173	4.5	0.83	-0.08
3510.43	Co I	816 - 29295	0.75	0.14	-0.86
3512.64	Co I	4690 - 33151	7.4	1.4	0.14
3513.48	Co I	816 - 29270	2.0	0.37	-0.44
3518.35	Co I	8461 - 36875	21.	3.9	0.60
3520.08	Co I	816 - 29216	0.16	0.030	-1.52
3521.57	Co I	3483 - 31871	2.9	0.55	0.26
3523.43	Co I	5076 - 33449	6.5	1.2	0.08

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3526.85	Co I	0 – 28346	2.6	0.48	-0.32
3529.03	Co I	1407 – 29735	1.6	0.30	-0.52
3529.81	Co I	4143 – 32465	9.4	1.8	0.24
3533.36	Co I	1809 – 30103	1.3	0.24	-0.63
3543.26	Co I	15184 – 43399	7.6	1.4	0.16
3548.44	Co I	13796 – 41969	1.8	0.34	-0.47
3550.60	Co I	1407 – 29563	0.31	0.058	-1.23
3552.99	Co I	15774 – 43911	3.1	0.59	-0.23
3558.78	Co I	4690 – 32782	0.14	0.026	-1.59
3560.89	Co I	5076 – 33151	1.8	0.33	-0.48
3564.95	Co I	4690 – 32733	1.2	0.23	-0.63
3569.38	Co I	7442 – 35451	26.	5.0	0.70
3574.96	Co I	4690 – 32654	2.2	0.42	-0.38
3575.36	Co I	816 – 28777	1.2	0.22	-0.65
3578.08	Co I	18390 – 46330	3.2	0.61	-0.21
3578.90	Co I	14036 – 41970	0.91	0.17	-0.76
3585.16	Co I	4143 – 32028	1.2	0.23	-0.64
3587.19	Co I	8461 – 36330	26.	5.0	0.70
3594.87	Co I	1407 – 29216	1.00	0.19	-0.71
3602.08	Co I	1809 – 29563	0.92	0.18	-0.75
3605.36	Co I	4143 – 31871	0.88	0.17	-0.76
3611.70	Co I	18775 – 46455	12.	2.4	0.38
3615.39	Co I	15774 – 43426	1.8	0.36	-0.44
3620.43	Co I	18390 – 46003	2.5	0.48	-0.32
3624.33	Co I	14399 – 41983	0.62	0.12	-0.92
3624.96	Co I	5076 – 32654	0.089	0.017	-1.76
3627.81	Co I	4143 – 31700	0.93	0.18	-0.74
3631.39	Co I	816 – 28346	0.053	0.010	-1.98
3632.84	Co I	23184 – 50703	19.	3.8	0.58
3634.71	Co I	23208 – 50712	22.	4.4	0.64
3636.72	Co I	15774 – 43264	1.8	0.35	-0.45
3639.44	Co I	15774 – 43243	4.8	0.96	-0.02
3641.79	Co I	16471 – 43922	3.7	0.74	-0.13
3643.18	Co I	16471 – 43911	4.3	0.85	-0.07
3647.66	Co I	1809 – 29216	0.051	0.010	-2.00
3649.35	Co I	23184 – 50579	27.	5.4	0.73
3652.54	Co I	1407 – 28777	0.060	0.012	-1.92
3654.45	Co I	15774 – 43130	1.5	0.30	-0.52
3656.97	Co I	4690 – 32028	0.056	0.011	-1.95
3662.16	Co I	18390 – 45688	13.	2.7	0.43
3676.55	Co I	23184 – 50376	37.	7.5	0.87
3683.05	Co I	16778 – 43922	11.	2.2	0.34
3684.48	Co I	16778 – 43911	2.2	0.44	-0.36
3690.72	Co I	16468 – 43555	1.7	0.35	-0.46
3693.11	Co I	16778 – 43848	6.4	1.3	0.11
3693.48	Co I	16471 – 43538	5.8	1.2	0.08
3702.24	Co I	23208 – 50211	39.	7.9	0.90
3704.06	Co I	8461 – 35451	1.8	0.37	-0.43
3707.47	Co I	16471 – 43436	1.4	0.29	-0.53
3708.82	Co I	16471 – 43426	5.7	1.2	0.07

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3712.18	Co I	16468 - 43399	1.2	0.24	-0.61
3726.66	Co I	13796 - 40622	0.26	0.054	-1.27
3730.48	Co I	15184 - 41983	4.7	0.99	-0.00
3732.40	Co I	15184 - 41969	6.3	1.3	0.12
3733.49	Co I	16778 - 43555	4.9	1.0	0.01
3734.14	Co I	16471 - 43243	2.3	0.47	-0.33
3735.93	Co I	16778 - 43538	3.9	0.82	-0.08
3745.50	Co I	7442 - 34134	0.42	0.088	-1.06
3749.94	Co I	16471 - 43130	2.6	0.56	-0.25
3751.63	Co I	16778 - 43426	1.2	0.25	-0.60
3754.35	Co I	20501 - 47129	2.7	0.58	-0.24
3755.45	Co I	16778 - 43399	2.9	0.60	-0.22
3760.39	Co I	14036 - 40622	0.30	0.065	-1.19
3774.60	Co I	16778 - 43264	1.4	0.29	-0.53
3777.54	Co I	16778 - 43243	0.73	0.16	-0.81
3808.11	Co I	3483 - 29735	0.031	0.0067	-2.18
3814.46	Co I	15774 - 41983	0.97	0.21	-0.67
3816.33	Co I	15774 - 41970	1.9	0.42	-0.37
3816.47	Co I	15774 - 41969	1.6	0.35	-0.45
3841.46	Co I	7442 - 33467	0.074	0.016	-1.79
3842.05	Co I	7442 - 33463	1.8	0.39	-0.41
3845.47	Co I	7442 - 33440	8.8	2.0	0.29
3861.16	Co I	8461 - 34352	1.1	0.24	-0.62
3873.12	Co I	3483 - 29295	2.2	0.50	-0.31
3873.96	Co I	4143 - 29949	1.3	0.30	-0.53
3876.84	Co I	3483 - 29270	0.11	0.025	-1.61
3881.87	Co I	4690 - 30444	0.43	0.098	-1.01
3884.62	Co I	8461 - 34196	0.18	0.041	-1.38
3885.29	Co I	7442 - 33173	0.069	0.016	-1.81
3892.12	Co I	20501 - 46186	1.3	0.30	-0.52
3893.07	Co I	18775 - 44455	0.80	0.18	-0.74
3894.08	Co I	8461 - 34134	12.	2.8	0.45
3894.98	Co I	5076 - 30743	0.33	0.076	-1.12
3898.49	Co I	15184 - 40828	0.29	0.065	-1.18
3904.05	Co I	28845 - 54452	5.9	1.3	0.13
3906.29	Co I	4143 - 29735	0.063	0.014	-1.84
3909.93	Co I	0 - 25569	0.023	0.0052	-2.28
3917.11	Co I	18390 - 43911	3.4	0.79	-0.10
3922.75	Co I	8461 - 33946	0.12	0.028	-1.56
3925.16	Co I	21216 - 46685	1.8	0.41	-0.38
3929.25	Co I	28346 - 53789	5.5	1.3	0.11
3933.91	Co I	4690 - 30103	0.016	0.0038	-2.42
3935.97	Co I	7442 - 32842	1.6	0.38	-0.42
3940.89	Co I	5076 - 30444	0.090	0.021	-1.68
3941.73	Co I	3483 - 28845	0.090	0.021	-1.68
3945.33	Co I	7442 - 32782	0.22	0.052	-1.28
3952.33	Co I	3483 - 28777	0.016	0.0038	-2.42
3952.92	Co I	7442 - 32733	0.39	0.093	-1.03
3957.94	Co I	4690 - 29949	0.10	0.024	-1.62
3961.00	Co I	21216 - 46455	2.4	0.57	-0.24

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3969.12	Co I	20501 - 45688	4.3	1.0	0.01
3972.53	Co I	28346 - 53512	16.	3.7	0.57
3973.15	Co I	15184 - 40346	0.85	0.20	-0.70
3974.73	Co I	4143 - 29295	0.038	0.0089	-2.05
3977.18	Co I	18775 - 43911	0.70	0.17	-0.78
3978.66	Co I	4143 - 29270	0.056	0.013	-1.88
3979.52	Co I	816 - 25938	0.018	0.0043	-2.36
3987.12	Co I	4143 - 29216	0.018	0.0044	-2.36
3990.30	Co I	15774 - 40828	0.73	0.18	-0.76
3991.54	Co I	29270 - 54316	15.	3.5	0.55
3991.69	Co I	4690 - 29735	0.032	0.0077	-2.12
3994.54	Co I	5076 - 30103	0.024	0.0057	-2.25
3995.31	Co I	7442 - 32465	6.0	1.4	0.16
3997.91	Co I	8461 - 33467	1.3	0.31	-0.51
4013.94	Co I	16196 - 41102	0.80	0.19	-0.72
4019.30	Co I	4690 - 29563	0.010	0.0025	-2.60
4020.90	Co I	3483 - 28346	0.11	0.026	-1.58
4023.40	Co I	15774 - 40622	0.23	0.056	-1.25
4027.04	Co I	1407 - 26232	0.012	0.0029	-2.53
4035.55	Co I	28845 - 53618	18.	4.5	0.65
4045.39	Co I	8461 - 33173	0.46	0.11	-0.95
4052.92	Co I	28845 - 53512	11.	2.8	0.45
4057.20	Co I	1809 - 26450	0.0052	0.0013	-2.89
4058.19	Co I	4143 - 28777	0.029	0.0072	-2.14
4058.60	Co I	16196 - 40828	0.87	0.22	-0.67
4066.37	Co I	7442 - 32028	0.31	0.077	-1.11
4068.54	Co I	15774 - 40346	1.3	0.32	-0.49
4086.31	Co I	15184 - 39649	2.2	0.54	-0.27
4092.39	Co I	7442 - 31871	0.72	0.18	-0.74
4104.75	Co I	18775 - 43130	0.67	0.17	-0.77
4110.54	Co I	8461 - 32782	0.62	0.16	-0.80
4118.77	Co I	8461 - 32733	3.1	0.79	-0.10
4121.32	Co I	7442 - 31700	3.7	0.93	-0.03
4158.42	Co I	23184 - 47225	1.9	0.48	-0.32
4162.17	Co I	28845 - 52864	8.7	2.3	0.35
4187.25	Co I	16471 - 40346	0.27	0.071	-1.15
4190.71	Co I	0 - 23856	0.0086	0.0023	-2.65
4234.00	Co I	0 - 23612	0.0020	0.00054	-3.27
4252.31	Co I	816 - 24326	0.0062	0.0017	-2.77
4285.79	Co I	1407 - 24733	0.0028	0.00077	-3.11
4331.24	Co I	27497 - 50579	3.2	0.90	-0.04
4339.62	Co I	20501 - 43538	1.1	0.32	-0.49
4371.13	Co I	16778 - 39649	0.19	0.055	-1.26
4373.63	Co I	28346 - 51204	3.6	1.0	0.01
4391.57	Co I	24326 - 47091	1.3	0.37	-0.44
4417.40	Co I	24733 - 47365	1.7	0.50	-0.30
4421.34	Co I	23612 - 46223	1.0	0.30	-0.52
4431.62	Co I	23208 - 45767	0.77	0.23	-0.65
4445.72	Co I	25041 - 47528	1.4	0.42	-0.37
4466.89	Co I	24326 - 46707	3.7	1.1	0.04

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4469.56	Co I	23856 - 46223	5.2	1.5	0.19
4471.55	Co I	24733 - 47091	2.6	0.77	-0.11
4478.32	Co I	25041 - 47365	1.6	0.47	-0.33
4483.93	Co I	25233 - 47528	1.4	0.43	-0.36
4494.76	Co I	28471 - 50712	2.4	0.72	-0.14
4517.11	Co I	25233 - 47365	2.8	0.85	-0.07
4530.96	Co I	23612 - 45676	11.	3.4	0.53
4533.99	Co I	25041 - 47091	4.9	1.5	0.18
4543.81	Co I	21920 - 43922	1.7	0.52	-0.29
4549.66	Co I	24733 - 46707	6.0	1.9	0.27
4565.59	Co I	24326 - 46223	7.9	2.5	0.39
4570.02	Co I	29295 - 51170	2.6	0.82	-0.09
4580.14	Co I	7442 - 29270	0.0075	0.0024	-2.62
4581.60	Co I	23856 - 45676	8.8	2.8	0.44
4594.63	Co I	29295 - 51053	5.9	1.9	0.27
4596.90	Co I	29295 - 51042	5.9	1.9	0.27
4623.04	Co I	25740 - 47365	1.1	0.34	-0.46
4625.78	Co I	29949 - 51561	3.2	1.0	0.01
4629.38	Co I	24628 - 46223	6.7	2.1	0.33
4663.41	Co I	25269 - 46707	11.	3.5	0.54
4682.38	Co I	25740 - 47091	6.8	2.2	0.35
4693.21	Co I	26063 - 47365	6.3	2.1	0.32
4698.38	Co I	26250 - 47528	1.7	0.56	-0.25
4727.94	Co I	3483 - 24628	0.0021	0.00070	-3.15
4734.83	Co I	26250 - 47365	1.1	0.37	-0.43
4749.68	Co I	24628 - 45676	4.6	1.5	0.19
4754.36	Co I	26063 - 47091	1.2	0.41	-0.39
4768.08	Co I	25740 - 46707	1.4	0.48	-0.32
4771.11	Co I	25269 - 46223	4.1	1.4	0.15
4776.32	Co I	26598 - 47528	5.7	2.0	0.29
4780.01	Co I	26450 - 47365	7.4	2.5	0.40
4792.86	Co I	26232 - 47091	16.	5.4	0.73
4813.48	Co I	25938 - 46707	9.5	3.3	0.52
4840.27	Co I	25569 - 46223	11.	3.9	0.59
4843.46	Co I	26450 - 47091	1.6	0.55	-0.26
4867.88	Co I	25139 - 45676	20.	7.1	0.85
4882.72	Co I	26232 - 46707	2.6	0.92	-0.04
4899.52	Co I	16471 - 36875	0.12	0.043	-1.37
5108.89	Co I	31700 - 51268	5.1	2.0	0.30
5122.77	Co I	29563 - 49078	5.8	2.3	0.36
5125.69	Co I	31700 - 51204	6.7	2.6	0.42
5126.20	Co I	29216 - 48719	5.4	2.1	0.32
5133.45	Co I	31700 - 51174	8.4	3.3	0.52
5146.74	Co I	28777 - 48202	9.6	3.8	0.58
5154.05	Co I	31871 - 51268	8.5	3.4	0.53
5156.34	Co I	32733 - 52121	9.7	3.9	0.59
5176.08	Co I	16778 - 36092	0.21	0.084	-1.08
5212.71	Co I	28346 - 47524	13.	5.1	0.71
5230.22	Co I	14036 - 33151	0.22	0.090	-1.04
5235.21	Co I	17234 - 36330	0.45	0.19	-0.73

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5247.93	Co I	14399 - 33449	0.24	0.099	-1.00
5250.00	Co I	33674 - 52717	6.4	2.7	0.42
5254.65	Co I	32028 - 51053	4.2	1.7	0.24
5257.62	Co I	32028 - 51042	8.4	3.5	0.54
5265.82	Co I	29216 - 48202	2.5	1.0	0.01
5266.30	Co I	29735 - 48719	8.2	3.4	0.54
5266.49	Co I	16468 - 35451	0.35	0.15	-0.83
5268.52	Co I	30103 - 49078	8.9	3.7	0.57
5276.19	Co I	33173 - 52121	9.9	4.1	0.62
5280.65	Co I	29270 - 48202	12.	5.2	0.71
5283.49	Co I	33173 - 52095	5.0	2.1	0.32
5287.57	Co I	29295 - 48202	2.0	0.83	-0.08
5287.81	Co I	32654 - 51561	4.1	1.7	0.24
5301.06	Co I	13796 - 32654	0.097	0.041	-1.39
5310.20	Co I	33946 - 52772	2.7	1.2	0.06
5312.66	Co I	33946 - 52764	11.	4.6	0.66
5316.78	Co I	32465 - 51268	5.3	2.2	0.35
5321.72	Co I	33674 - 52460	2.1	0.89	-0.05
5325.28	Co I	32431 - 51202	7.9	3.3	0.52
5325.95	Co I	33946 - 52717	3.3	1.4	0.14
5331.47	Co I	14399 - 33151	0.094	0.040	-1.40
5332.67	Co I	28777 - 47524	1.9	0.82	-0.09
5333.65	Co I	32431 - 51174	3.9	1.7	0.22
5334.84	Co I	32431 - 51170	3.9	1.7	0.22
5341.33	Co I	33440 - 52156	7.1	3.0	0.48
5342.71	Co I	32431 - 51143	26.	11.	1.05
5343.39	Co I	32465 - 51174	13.	5.6	0.75
5347.49	Co I	33467 - 52162	4.0	1.7	0.24
5349.09	Co I	33467 - 52156	4.0	1.7	0.24
5352.05	Co I	28845 - 47524	13.	5.5	0.74
5353.48	Co I	33440 - 52114	15.	6.5	0.81
5359.18	Co I	33467 - 52121	8.1	3.5	0.54
5362.77	Co I	34134 - 52775	14.	6.0	0.77
5369.58	Co I	14036 - 32654	0.13	0.057	-1.25
5381.10	Co I	15774 - 34352	0.037	0.016	-1.79
5381.75	Co I	34196 - 52772	5.5	2.4	0.38
5407.51	Co I	33674 - 52162	8.2	3.6	0.56
5436.99	Co I	33173 - 51561	3.8	1.7	0.22
5444.57	Co I	32842 - 51204	11.	5.0	0.70
5452.30	Co I	30743 - 49078	2.4	1.1	0.04
5454.56	Co I	32842 - 51170	8.9	4.0	0.60
5469.30	Co I	15184 - 33463	0.034	0.015	-1.82
5470.46	Co I	30444 - 48719	2.9	1.3	0.11
5477.08	Co I	29949 - 48202	2.6	1.2	0.06
5483.34	Co I	13796 - 32028	0.14	0.063	-1.20
5483.96	Co I	29295 - 47524	2.2	0.99	-0.00
5489.65	Co I	32842 - 51053	4.0	1.8	0.25
5495.67	Co I	27497 - 45688	0.66	0.30	-0.52
5523.29	Co I	18775 - 36875	0.16	0.071	-1.15
5524.98	Co I	33173 - 51268	3.7	1.7	0.22

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5530.77	Co I	13796 - 31871	0.054	0.025	-1.60
5558.82	Co I	28471 - 46455	0.68	0.32	-0.50
5590.73	Co I	16471 - 34352	0.099	0.047	-1.33
5636.12	Co I	33463 - 51201	3.2	1.5	0.19
5647.22	Co I	18390 - 36092	0.18	0.087	-1.06
5659.11	Co I	16468 - 34134	0.021	0.010	-2.00
5830.08	Co I	28777 - 45925	0.75	0.38	-0.42
5890.48	Co I	16468 - 33440	0.063	0.033	-1.49
5915.54	Co I	17234 - 34134	0.077	0.040	-1.39
5935.39	Co I	15184 - 32028	0.021	0.011	-1.95
5946.49	Co I	29563 - 46375	1.1	0.57	-0.24
5984.08	Co I	14036 - 30743	0.017	0.0092	-2.04
5991.88	Co I	16778 - 33463	0.092	0.050	-1.31
6000.67	Co I	29216 - 45877	1.5	0.83	-0.08
6006.36	Co I	35451 - 52095	3.9	2.1	0.33
6007.67	Co I	36330 - 52971	-4.4	2.4	0.38
6049.10	Co I	36330 - 52857	4.4	2.4	0.38
6082.44	Co I	28346 - 44782	2.3	1.3	0.10
6086.65	Co I	27497 - 43922	0.71	0.40	-0.40
6093.13	Co I	14036 - 30444	0.028	0.016	-1.81
6116.98	Co I	14399 - 30743	0.022	0.012	-1.91
6122.65	Co I	28777 - 45106	1.3	0.71	-0.15
6189.00	Co I	13796 - 29949	0.025	0.014	-1.85
6230.97	Co I	14399 - 30444	0.016	0.0095	-2.02
6249.51	Co I	16468 - 32465	0.036	0.021	-1.67
6257.58	Co I	29949 - 45925	1.1	0.66	-0.18
6273.03	Co I	32782 - 48719	2.0	1.2	0.06
6282.63	Co I	14036 - 29949	0.036	0.021	-1.67
6320.41	Co I	35451 - 51268	3.7	2.2	0.34
6347.83	Co I	35451 - 51200	3.6	2.2	0.34
6395.20	Co I	30743 - 46375	1.2	0.71	-0.15
6417.82	Co I	18775 - 34352	0.063	0.039	-1.41
6429.91	Co I	17234 - 32782	0.024	0.015	-1.82
6450.24	Co I	13796 - 29295	0.076	0.048	-1.32
6455.00	Co I	29295 - 44782	3.0	1.9	0.28
6477.88	Co I	30444 - 45877	1.5	0.93	-0.03
6490.34	Co I	16468 - 31871	0.022	0.014	-1.85
6551.44	Co I	15184 - 30444	0.0086	0.0055	-2.26
6563.42	Co I	16468 - 31700	0.055	0.036	-1.45
6595.90	Co I	29949 - 45106	1.1	0.71	-0.15
6632.44	Co I	18390 - 33463	0.092	0.060	-1.22
6678.81	Co I	15774 - 30743	0.014	0.0095	-2.02
6771.06	Co I	15184 - 29949	0.039	0.027	-1.58
6814.94	Co I	15774 - 30444	0.056	0.039	-1.41
6872.40	Co I	16196 - 30743	0.061	0.043	-1.36
6937.81	Co I	21920 - 36330	0.060	0.043	-1.37
7016.61	Co I	16196 - 30444	0.046	0.034	-1.47
7027.81	Co I	31700 - 45925	1.6	1.2	0.08
7052.89	Co I	15774 - 29949	0.10	0.075	-1.13
7054.04	Co I	21920 - 36092	0.14	0.10	-0.99

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
7084.99	Co I	15184 - 29295	0.18	0.14	-0.86
7113.56	Co I	31871 - 45925	1.7	1.3	0.10
7134.32	Co I	32733 - 46746	1.9	1.4	0.16
7154.71	Co I	16471 - 30444	0.023	0.018	-1.75
7159.18	Co I	32782 - 46746	2.4	1.8	0.26
7193.60	Co I	32028 - 45925	0.93	0.72	-0.14
7285.28	Co I	23153 - 36875	0.10	0.082	-1.09
7354.59	Co I	15184 - 28777	0.012	0.0098	-2.01
7388.70	Co I	21920 - 35451	0.12	0.098	-1.01
7417.38	Co I	16471 - 29949	0.038	0.031	-1.50
7457.36	Co I	31700 - 45106	1.8	1.5	0.18
7533.48	Co I	32654 - 45925	0.78	0.66	-0.18
7553.99	Co I	31871 - 45106	1.5	1.3	0.12
7564.96	Co I	39649 - 52864	2.4	2.0	0.31
7586.72	Co I	23153 - 36330	0.065	0.056	-1.25
7590.57	Co I	16778 - 29949	0.0086	0.0075	-2.13
7606.30	Co I	32782 - 45925	1.6	1.4	0.13
7610.24	Co I	21216 - 34352	0.060	0.052	-1.28
7712.68	Co I	20501 - 33463	0.11	0.095	-1.02
7734.23	Co I	33449 - 46375	1.2	1.0	0.02
7743.27	Co I	31871 - 44782	0.58	0.52	-0.28
7838.17	Co I	32028 - 44782	1.8	1.6	0.21
7840.05	Co I	33173 - 45925	1.0	0.93	-0.03
7855.85	Co I	33151 - 45877	0.80	0.74	-0.13
7869.90	Co I	33173 - 45877	0.60	0.56	-0.25
7871.39	Co I	33674 - 46375	0.71	0.66	-0.18
7908.71	Co I	32465 - 45106	2.6	2.4	0.39
7926.55	Co I	34134 - 46746	1.6	1.5	0.17
7987.38	Co I	16778 - 29295	0.038	0.036	-1.44
8007.27	Co I	33440 - 45925	6.2	6.0	0.78
8022.13	Co I	33463 - 45925	1.2	1.2	0.08
8029.26	Co I	32654 - 45106	1.3	1.3	0.10
8043.33	Co I	33946 - 46375	2.9	2.8	0.45
8056.06	Co I	33467 - 45877	2.9	2.8	0.45
8066.49	Co I	34352 - 46746	0.80	0.78	-0.11
8093.96	Co I	32431 - 44782	3.0	3.0	0.47
8116.41	Co I	32465 - 44782	0.61	0.60	-0.22
8152.11	Co I	32842 - 45106	0.50	0.50	-0.30
8193.03	Co I	33674 - 45877	2.1	2.1	0.32
8208.66	Co I	34196 - 46375	2.0	2.0	0.30
8372.84	Co I	32842 - 44782	3.1	3.3	0.52
8378.39	Co I	33173 - 45106	1.2	1.3	0.10
8574.57	Co I	21780 - 33440	0.026	0.029	-1.54
8575.35	Co I	22475 - 34134	0.079	0.088	-1.06
8586.74	Co I	33463 - 45106	0.53	0.58	-0.23
8589.73	Co I	33467 - 45106	1.4	1.6	0.19
8661.09	Co I	21920 - 33463	0.027	0.030	-1.52
8819.15	Co I	41529 - 52864	6.4	7.5	0.87

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2245.13	Co II	4029 - 48556	27.	2.0	0.31
2283.52	Co II	4029 - 47807	12.	0.97	-0.01
2286.16	Co II	3350 - 47078	169.	13.	1.12
2292.00	Co II	17772 - 61388	77.	6.0	0.78
2293.39	Co II	4561 - 48151	17.	1.3	0.12
2307.86	Co II	4029 - 47346	169.	13.	1.13
2311.60	Co II	4561 - 47807	125.	10.	1.00
2314.05	Co II	4950 - 48151	136.	11.	1.04
2314.98	Co II	5204 - 48388	116.	9.3	0.97
2324.32	Co II	4029 - 47039	53.	4.3	0.63
2326.14	Co II	4561 - 47537	59.	4.8	0.68
2326.48	Co II	3350 - 46321	44.	3.5	0.55
2329.10	Co II	18338 - 61260	62.	5.0	0.70
2330.35	Co II	4950 - 47848	48.	3.9	0.59
2344.26	Co II	5204 - 47848	64.	5.3	0.72
2347.39	Co II	4950 - 47537	90.	7.4	0.87
2361.53	Co II	5204 - 47537	12.	1.0	0.00
2363.79	Co II	4029 - 46321	166.	14.	1.14
2375.18	Co II	4950 - 47039	20.	1.7	0.23
2378.62	Co II	3350 - 45379	158.	13.	1.13
2383.46	Co II	4029 - 45972	178.	15.	1.18
2386.36	Co II	4561 - 46453	116.	9.9	1.00
2388.92	Co II	3350 - 45198	278.	24.	1.38
2389.54	Co II	4950 - 46786	89.	7.6	0.88
2393.90	Co II	4561 - 46321	28.	2.4	0.38
2397.39	Co II	9813 - 51512	229.	20.	1.29
2404.17	Co II	5204 - 46786	64.	5.5	0.74
2407.67	Co II	10708 - 52230	127.	11.	1.04
2408.75	Co II	4950 - 46453	47.	4.1	0.61
2414.06	Co II	4561 - 45972	70.	6.1	0.79
2416.90	Co II	11322 - 52684	78.	6.8	0.83
2417.65	Co II	4029 - 45379	119.	10.	1.02
2423.62	Co II	5204 - 46453	21.	1.8	0.26
2428.29	Co II	4029 - 45198	14.	1.3	0.10
2436.98	Co II	4950 - 45972	13.	1.1	0.05
2449.16	Co II	4561 - 45379	11.	0.97	-0.02
2450.00	Co II	10708 - 51512	67.	6.0	0.78
2464.20	Co II	9813 - 50382	49.	4.5	0.65
2485.36	Co II	9813 - 50036	16.	1.5	0.17
2486.44	Co II	10708 - 50914	62.	5.7	0.76
2506.46	Co II	9813 - 49698	302.	28.	1.45
2512.40	Co II	24075 - 63865	56.	5.3	0.72
2519.82	Co II	10708 - 50382	171.	16.	1.21
2524.96	Co II	11322 - 50914	188.	18.	1.25
2528.62	Co II	9813 - 49348	569.	55.	1.74
2541.94	Co II	10708 - 50036	108.	11.	1.02
2546.74	Co II	24412 - 63665	56.	5.5	0.74
2559.41	Co II	11322 - 50382	174.	17.	1.23
2564.04	Co II	10708 - 49698	206.	20.	1.31
2574.86	Co II	13405 - 52230	35.	3.5	0.54

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2580.33	Co II	9813 - 48556	412.	41.	1.61
2582.24	Co II	11322 - 50036	220.	22.	1.34
2587.22	Co II	10708 - 49348	194.	19.	1.29
2614.36	Co II	17772 - 56011	244.	25.	1.40
2632.24	Co II	18032 - 56011	215.	22.	1.35
2663.53	Co II	9813 - 47346	65.	6.9	0.84
2694.68	Co II	10708 - 47807	27.	3.0	0.47

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2364.71	Cr I	0 - 42275	0.39	0.033	-1.49
2383.33	Cr I	8308 - 50253	6.0	0.51	-0.29
2408.62	Cr I	8308 - 49812	8.4	0.73	-0.14
2496.31	Cr I	7927 - 47975	11.	1.1	0.02
2502.53	Cr I	8095 - 48043	7.4	0.70	-0.16
2504.31	Cr I	8095 - 48014	13.	1.2	0.08
2508.11	Cr I	7927 - 47786	3.2	0.30	-0.52
2508.98	Cr I	7927 - 47772	3.8	0.36	-0.44
2513.62	Cr I	8095 - 47866	2.6	0.25	-0.61
2516.92	Cr I	8095 - 47814	7.1	0.67	-0.17
2518.71	Cr I	8095 - 47786	5.1	0.49	-0.31
2519.52	Cr I	8308 - 47986	27.	2.5	0.41
2527.12	Cr I	8308 - 47866	12.	1.2	0.08
2530.45	Cr I	8308 - 47814	2.6	0.25	-0.60
2545.64	Cr I	7751 - 47022	2.7	0.26	-0.58
2549.54	Cr I	7811 - 47022	8.6	0.84	-0.07
2553.06	Cr I	7811 - 46968	2.1	0.21	-0.68
2557.15	Cr I	7927 - 47022	4.3	0.42	-0.37
2560.69	Cr I	7927 - 46968	7.0	0.68	-0.17
2571.74	Cr I	8095 - 46968	8.1	0.80	-0.10
2577.65	Cr I	8095 - 46878	5.3	0.52	-0.28
2588.20	Cr I	8095 - 46720	2.5	0.26	-0.59
2591.85	Cr I	8308 - 46878	20.	2.0	0.31
2603.57	Cr I	8308 - 46705	2.0	0.21	-0.68
2622.86	Cr I	8308 - 46422	1.9	0.20	-0.71
2625.32	Cr I	8095 - 46174	1.1	0.12	-0.94
2626.60	Cr I	8308 - 46368	0.94	0.097	-1.01
2629.82	Cr I	8095 - 46109	0.88	0.091	-1.04
2642.12	Cr I	24200 - 62037	14.	1.4	0.16
2678.16	Cr I	7927 - 45255	1.4	0.15	-0.83
2688.04	Cr I	8095 - 45286	2.4	0.26	-0.58
2690.26	Cr I	8095 - 45255	1.0	0.11	-0.95
2700.60	Cr I	8095 - 45113	0.66	0.072	-1.14
2701.99	Cr I	8308 - 45306	4.5	0.50	-0.30
2702.53	Cr I	24200 - 61191	6.7	0.74	-0.13
2703.48	Cr I	8308 - 45286	2.8	0.30	-0.52
2705.43	Cr I	24056 - 61008	6.7	0.73	-0.13
2716.18	Cr I	8308 - 45113	1.7	0.18	-0.74
2726.51	Cr I	7593 - 44259	13.	1.4	0.15
2731.91	Cr I	7593 - 44187	8.2	0.92	-0.04
2736.47	Cr I	7593 - 44126	4.8	0.54	-0.27
2739.38	Cr I	23934 - 60428	26.	3.0	0.47
2741.07	Cr I	24056 - 60528	36.	4.1	0.61
2742.17	Cr I	24200 - 60657	37.	4.1	0.62
2748.29	Cr I	7751 - 44126	3.1	0.35	-0.46
2751.60	Cr I	7927 - 44259	1.3	0.15	-0.82
2752.88	Cr I	7811 - 44126	3.1	0.35	-0.46
2754.90	Cr I	24834 - 61123	8.6	0.97	-0.01
2756.75	Cr I	24897 - 61161	8.6	0.98	-0.01
2757.10	Cr I	7927 - 44187	4.4	0.50	-0.30

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2761.76	Cr I	7927 - 44126	2.6	0.29	-0.53
2763.06	Cr I	27817 - 63998	9.7	1.1	0.04
2764.35	Cr I	8095 - 44259	2.4	0.27	-0.56
2767.54	Cr I	25038 - 61161	8.6	0.99	-0.00
2769.92	Cr I	8095 - 44187	7.3	0.84	-0.08
2771.45	Cr I	23934 - 60005	6.5	0.75	-0.13
2779.14	Cr I	25106 - 61078	8.6	1.00	-0.00
2780.70	Cr I	8308 - 44259	19.	2.2	0.34
2826.75	Cr I	27817 - 63183	9.6	1.2	0.06
2846.02	Cr I	27704 - 62830	9.5	1.2	0.06
2849.29	Cr I	27817 - 62903	19.	2.3	0.37
2871.63	Cr I	8095 - 42908	2.3	0.28	-0.55
2879.27	Cr I	7927 - 42648	2.5	0.31	-0.51
2881.14	Cr I	24056 - 58754	11.	1.4	0.13
2887.00	Cr I	7811 - 42439	3.2	0.39	-0.40
2891.42	Cr I	24200 - 58775	19.	2.4	0.37
2893.25	Cr I	8095 - 42648	7.4	0.93	-0.03
2894.17	Cr I	7751 - 42293	3.5	0.44	-0.35
2896.75	Cr I	7927 - 42439	4.0	0.50	-0.30
2899.21	Cr I	7811 - 42293	1.4	0.18	-0.74
2904.68	Cr I	24940 - 59358	20.	2.5	0.40
2905.49	Cr I	7811 - 42218	3.1	0.40	-0.40
2909.05	Cr I	7927 - 42293	4.8	0.61	-0.21
2910.90	Cr I	8095 - 42439	5.0	0.64	-0.19
2911.14	Cr I	8308 - 42648	5.0	0.63	-0.20
2913.73	Cr I	25177 - 59488	23.	2.9	0.47
2967.64	Cr I	8095 - 41782	7.8	1.0	0.01
2971.11	Cr I	7927 - 41575	7.4	0.98	-0.01
2975.48	Cr I	7811 - 41409	7.0	0.94	-0.03
2980.79	Cr I	7751 - 41289	5.0	0.66	-0.18
2985.85	Cr I	7927 - 41409	7.1	0.94	-0.02
2986.00	Cr I	8095 - 41575	23.	3.1	0.49
2986.47	Cr I	8308 - 41782	34.	4.6	0.66
2988.65	Cr I	7593 - 41043	8.7	1.2	0.07
2991.89	Cr I	7811 - 41225	6.7	0.90	-0.04
2994.07	Cr I	7593 - 40983	3.0	0.40	-0.40
2995.10	Cr I	7593 - 40971	3.9	0.52	-0.28
2996.58	Cr I	7927 - 41289	10.0	1.3	0.13
2998.79	Cr I	7593 - 40930	2.7	0.36	-0.44
3000.89	Cr I	8095 - 41409	15.	2.1	0.32
3005.06	Cr I	8308 - 41575	12.	1.6	0.19
3013.03	Cr I	7751 - 40930	2.0	0.28	-0.56
3013.71	Cr I	7811 - 40983	10.	1.4	0.15
3014.76	Cr I	7811 - 40971	10.	1.4	0.15
3014.92	Cr I	7927 - 41083	21.	2.9	0.46
3015.19	Cr I	7751 - 40906	10.	1.4	0.14
3017.57	Cr I	8095 - 41225	44.	6.1	0.78
3018.50	Cr I	7811 - 40930	6.2	0.85	-0.07
3018.82	Cr I	7927 - 41043	3.5	0.48	-0.32
3020.67	Cr I	7811 - 40906	6.2	0.85	-0.07

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3021.56	Cr I	8308 - 41393	47.	6.4	0.80
3024.35	Cr I	7927 - 40983	16.	2.2	0.35
3029.16	Cr I	7927 - 40930	2.5	0.34	-0.46
3030.24	Cr I	8095 - 41086	11.	1.5	0.17
3031.35	Cr I	7927 - 40906	2.0	0.28	-0.55
3034.19	Cr I	8095 - 41043	5.9	0.81	-0.09
3037.04	Cr I	8308 - 41225	8.7	1.2	0.08
3039.78	Cr I	24200 - 57088	29.	4.0	0.61
3040.85	Cr I	8095 - 40971	8.1	1.1	0.05
3053.88	Cr I	8308 - 41043	11.	1.5	0.17
3065.07	Cr I	24940 - 57557	34.	4.7	0.68
3073.68	Cr I	25177 - 57702	34.	4.8	0.68
3077.83	Cr I	25106 - 57587	22.	3.1	0.49
3095.86	Cr I	21841 - 54133	7.8	1.1	0.05
3109.34	Cr I	24834 - 56986	10.	1.5	0.18
3110.86	Cr I	24897 - 57033	10.	1.5	0.18
3119.25	Cr I	25038 - 57088	18.	2.6	0.42
3119.71	Cr I	24940 - 56986	15.	2.2	0.34
3148.44	Cr I	23934 - 55686	29.	4.4	0.64
3155.15	Cr I	24056 - 55741	35.	5.2	0.72
3163.76	Cr I	24200 - 55799	35.	5.3	0.72
3188.01	Cr I	24092 - 55451	21.	3.2	0.51
3198.11	Cr I	24092 - 55353	7.9	1.2	0.08
3229.20	Cr I	27817 - 58775	14.	2.2	0.34
3237.73	Cr I	23934 - 54811	20.	3.2	0.50
3245.54	Cr I	23934 - 54736	38.	6.0	0.77
3251.84	Cr I	24056 - 54799	41.	6.4	0.81
3257.82	Cr I	24200 - 54887	41.	6.5	0.81
3259.98	Cr I	24200 - 54866	31.	4.9	0.69
3326.59	Cr I	24940 - 54993	9.3	1.5	0.19
3329.05	Cr I	25177 - 55207	11.	1.8	0.25
3343.34	Cr I	24897 - 54799	10.	1.7	0.24
3346.02	Cr I	24200 - 54078	29.	4.9	0.69
3346.74	Cr I	24056 - 53927	28.	4.8	0.68
3349.07	Cr I	24282 - 54133	19.	3.3	0.51
3349.32	Cr I	25038 - 54887	18.	3.1	0.49
3351.60	Cr I	25038 - 54866	11.	1.8	0.25
3351.97	Cr I	0 - 29825	0.038	0.0065	-2.19
3353.03	Cr I	31055 - 60871	29.	4.9	0.69
3362.21	Cr I	20519 - 50253	9.8	1.7	0.22
3376.40	Cr I	31048 - 60657	16.	2.8	0.45
3379.17	Cr I	20517 - 50102	5.5	0.94	-0.03
3433.60	Cr I	20519 - 49635	44.	7.7	0.89
3434.11	Cr I	20524 - 49635	9.0	1.6	0.20
3436.19	Cr I	20524 - 49618	26.	4.5	0.66
3441.12	Cr I	20521 - 49573	11.	2.0	0.31
3441.44	Cr I	20524 - 49573	23.	4.1	0.61
3443.79	Cr I	23934 - 52963	8.7	1.5	0.19
3445.62	Cr I	20524 - 49538	28.	4.9	0.69
3447.02	Cr I	20517 - 49520	5.0	0.90	-0.05

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
3447.43	Cr I	20521 - 49520	28.	4.9	0.69
3447.76	Cr I	20524 - 49520	11.	2.0	0.31
3453.33	Cr I	20517 - 49467	30.	5.4	0.73
3453.74	Cr I	20521 - 49467	6.2	1.1	0.05
3455.60	Cr I	20524 - 49454	20.	3.6	0.55
3460.43	Cr I	24282 - 53172	29.	5.2	0.72
3465.25	Cr I	20521 - 49371	9.8	1.8	0.25
3467.02	Cr I	24282 - 53117	11.	2.0	0.30
3467.72	Cr I	24056 - 52885	19.	3.5	0.54
3469.59	Cr I	24304 - 53117	13.	2.4	0.38
3472.76	Cr I	21841 - 50628	3.1	0.56	-0.25
3472.91	Cr I	23934 - 52720	6.3	1.1	0.06
3473.61	Cr I	21848 - 50628	7.7	1.4	0.15
3481.30	Cr I	21841 - 50557	14.	2.5	0.40
3481.54	Cr I	24200 - 52915	15.	2.8	0.44
3494.97	Cr I	24056 - 52660	15.	2.7	0.43
3510.54	Cr I	24200 - 52678	21.	3.9	0.59
3550.64	Cr I	25771 - 53927	38.	7.1	0.85
3558.52	Cr I	25206 - 53299	23.	4.4	0.65
3566.16	Cr I	25360 - 53394	38.	7.2	0.86
3573.64	Cr I	21848 - 49823	22.	4.2	0.63
3574.04	Cr I	21840 - 49812	14.	2.6	0.42
3574.80	Cr I	21857 - 49823	58.	11.	1.05
3578.69	Cr I	0 - 27935	8.3	1.6	0.20
3584.33	Cr I	25771 - 53663	49.	9.5	0.98
3593.49	Cr I	0 - 27820	7.0	1.4	0.13
3601.67	Cr I	21841 - 49598	59.	11.	1.06
3602.57	Cr I	21848 - 49598	6.7	1.3	0.11
3603.74	Cr I	21848 - 49589	15.	2.9	0.46
3605.33	Cr I	0 - 27729	5.2	1.0	0.01
3608.40	Cr I	31049 - 58754	20.	3.8	0.58
3609.48	Cr I	20521 - 48218	5.0	0.99	-0.01
3610.05	Cr I	20517 - 48210	5.0	0.99	-0.01
3612.61	Cr I	31055 - 58728	35.	6.9	0.84
3615.64	Cr I	0 - 27650	0.035	0.0069	-2.16
3632.84	Cr I	20524 - 48043	17.	3.3	0.52
3636.59	Cr I	20524 - 48014	43.	8.5	0.93
3639.80	Cr I	20519 - 47986	77.	15.	1.19
3640.39	Cr I	20523 - 47986	11.	2.1	0.33
3641.47	Cr I	20521 - 47975	8.7	1.7	0.24
3641.83	Cr I	20524 - 47975	27.	5.4	0.73
3646.16	Cr I	20524 - 47942	5.8	1.1	0.06
3648.53	Cr I	20517 - 47918	11.	2.1	0.32
3649.00	Cr I	20521 - 47918	27.	5.3	0.73
3653.91	Cr I	20517 - 47877	21.	4.2	0.62
3656.26	Cr I	20524 - 47866	26.	5.3	0.73
3662.84	Cr I	20521 - 47814	5.6	1.1	0.05
3663.21	Cr I	20524 - 47814	15.	3.0	0.48
3665.98	Cr I	20524 - 47794	5.6	1.1	0.05
3666.64	Cr I	20521 - 47786	9.3	1.9	0.27

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3668.03	Cr I	20517 - 47772	5.6	1.1	0.05
3676.32	Cr I	24092 - 51287	13.	2.6	0.41
3679.82	Cr I	20521 - 47689	3.7	0.74	-0.13
3681.69	Cr I	24092 - 51247	3.6	0.74	-0.13
3685.55	Cr I	20519 - 47645	12.	2.4	0.38
3686.80	Cr I	20524 - 47640	13.	2.6	0.41
3687.25	Cr I	20517 - 47629	13.	2.6	0.41
3687.54	Cr I	20521 - 47631	7.2	1.5	0.17
3688.46	Cr I	20517 - 47621	1.8	0.37	-0.43
3716.53	Cr I	31393 - 58292	16.	3.2	0.51
3730.81	Cr I	0 - 26796	0.036	0.0076	-2.12
3732.03	Cr I	0 - 26787	0.042	0.0087	-2.06
3742.97	Cr I	20519 - 47229	8.3	1.8	0.24
3743.58	Cr I	20524 - 47229	42.	8.8	0.94
3743.88	Cr I	20519 - 47222	50.	10.	1.02
3744.49	Cr I	20524 - 47222	7.5	1.6	0.20
3748.61	Cr I	20521 - 47190	5.0	1.0	0.02
3749.00	Cr I	20524 - 47190	30.	6.3	0.80
3757.17	Cr I	20517 - 47126	4.1	0.86	-0.06
3757.66	Cr I	20521 - 47126	20.	4.1	0.62
3758.04	Cr I	20524 - 47126	4.1	0.86	-0.06
3767.43	Cr I	20519 - 47055	1.6	0.34	-0.47
3768.24	Cr I	20517 - 47047	18.	3.8	0.58
3768.73	Cr I	20521 - 47047	6.4	1.4	0.14
3788.86	Cr I	24277 - 50663	14.	2.9	0.47
3790.45	Cr I	24286 - 50661	14.	2.9	0.47
3791.38	Cr I	24286 - 50655	19.	4.0	0.60
3792.14	Cr I	24300 - 50663	19.	4.0	0.60
3793.29	Cr I	24300 - 50655	17.	3.7	0.56
3793.88	Cr I	24304 - 50655	19.	4.0	0.60
3794.61	Cr I	24282 - 50628	12.	2.6	0.41
3797.13	Cr I	24300 - 50628	20.	4.4	0.64
3797.72	Cr I	24304 - 50628	29.	6.2	0.79
3804.80	Cr I	24282 - 50558	74.	16.	1.20
3806.83	Cr I	27817 - 54078	25.	5.4	0.73
3807.93	Cr I	24304 - 50557	15.	3.3	0.52
3815.43	Cr I	21841 - 48042	15.	3.4	0.53
3818.48	Cr I	20524 - 46705	4.5	0.98	-0.01
3819.56	Cr I	21841 - 48014	15.	3.4	0.53
3823.52	Cr I	7751 - 33897	0.12	0.026	-1.58
3826.42	Cr I	21848 - 47975	11.	2.5	0.39
3830.03	Cr I	27825 - 53927	30.	6.6	0.82
3841.28	Cr I	21841 - 47866	32.	7.0	0.85
3848.98	Cr I	21841 - 47814	16.	3.5	0.54
3849.36	Cr I	24282 - 50253	19.	4.3	0.63
3850.04	Cr I	21848 - 47814	24.	5.3	0.72
3852.22	Cr I	7811 - 33762	0.23	0.051	-1.29
3854.22	Cr I	21848 - 47786	16.	3.5	0.54
3855.29	Cr I	21857 - 47788	8.8	2.0	0.29
3855.57	Cr I	24282 - 50211	19.	4.3	0.63

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
3857.63	Cr I	21857 - 47772	21.	4.8	0.68
3874.53	Cr I	24300 - 50102	9.4	2.1	0.33
3883.29	Cr I	31352 - 57097	205.	46.	1.67
3883.66	Cr I	24277 - 50019	6.2	1.4	0.15
3885.22	Cr I	7811 - 33542	0.87	0.20	-0.70
3886.79	Cr I	8095 - 33816	0.63	0.14	-0.85
3891.93	Cr I	23934 - 49621	7.2	1.6	0.22
3894.04	Cr I	7751 - 33424	0.39	0.088	-1.05
3902.92	Cr I	7927 - 33542	0.55	0.13	-0.90
3903.16	Cr I	7811 - 33425	0.088	0.020	-1.70
3908.76	Cr I	8095 - 33672	1.5	0.35	-0.46
3911.82	Cr I	27729 - 53284	26.	5.9	0.77
3915.84	Cr I	24282 - 49812	15.	3.5	0.54
3916.24	Cr I	7811 - 33338	0.28	0.064	-1.20
3917.60	Cr I	23163 - 48682	3.6	0.84	-0.08
3919.16	Cr I	8308 - 33816	3.2	0.73	-0.14
3921.02	Cr I	7927 - 33424	0.89	0.20	-0.69
3926.65	Cr I	36578 - 62038	13.	2.9	0.47
3928.64	Cr I	8095 - 33542	0.92	0.21	-0.67
3941.49	Cr I	8308 - 33672	0.65	0.15	-0.82
3951.10	Cr I	24286 - 49589	3.7	0.86	-0.07
3952.40	Cr I	24304 - 49598	5.1	1.2	0.08
3953.16	Cr I	24300 - 49589	4.4	1.0	0.01
3963.69	Cr I	20520 - 45741	93.	22.	1.34
3969.06	Cr I	20519 - 45707	5.7	1.4	0.13
3969.75	Cr I	20524 - 45707	75.	18.	1.25
3971.26	Cr I	21848 - 47022	5.9	1.4	0.14
3976.66	Cr I	20524 - 45663	74.	18.	1.24
3978.68	Cr I	21841 - 46968	5.8	1.4	0.14
3979.80	Cr I	21848 - 46968	2.9	0.69	-0.16
3981.23	Cr I	21857 - 46968	5.8	1.4	0.14
3983.91	Cr I	20521 - 45615	45.	11.	1.03
3984.34	Cr I	20524 - 45615	9.0	2.1	0.33
3989.99	Cr I	31393 - 56449	47.	11.	1.05
3991.12	Cr I	20517 - 45566	44.	11.	1.03
3991.67	Cr I	20521 - 45566	7.2	1.7	0.24
3992.84	Cr I	21841 - 46878	13.	3.1	0.49
3993.97	Cr I	21848 - 46878	2.9	0.68	-0.17
4001.44	Cr I	31378 - 56362	47.	11.	1.05
4014.67	Cr I	31378 - 56280	9.0	2.2	0.34
4022.26	Cr I	31355 - 56210	25.	6.1	0.79
4025.01	Cr I	20521 - 45359	3.2	0.77	-0.11
4026.17	Cr I	20524 - 45354	5.3	1.3	0.11
4027.10	Cr I	20524 - 45349	3.7	0.90	-0.05
4030.68	Cr I	31352 - 56155	25.	6.1	0.79
4039.10	Cr I	31048 - 55799	56.	14.	1.13
4048.78	Cr I	31049 - 55741	45.	11.	1.04
4058.77	Cr I	31055 - 55686	35.	8.5	0.93
4065.72	Cr I	20524 - 45113	1.7	0.43	-0.36
4066.94	Cr I	21841 - 46422	5.2	1.3	0.11

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4074.86	Cr I	35934 - 60468	15.	3.7	0.56
4076.06	Cr I	33060 - 57587	14.	3.6	0.55
4077.09	Cr I	21848 - 46368	2.6	0.64	-0.20
4077.68	Cr I	33040 - 57557	14.	3.5	0.55
4104.87	Cr I	20521 - 44875	1.6	0.42	-0.38
4109.58	Cr I	21848 - 46174	2.4	0.62	-0.21
4120.61	Cr I	21848 - 46109	2.4	0.61	-0.21
4121.82	Cr I	24056 - 48310	4.1	1.0	0.02
4122.16	Cr I	21857 - 46109	2.1	0.53	-0.28
4123.39	Cr I	24200 - 48446	4.2	1.1	0.03
4126.52	Cr I	20519 - 44746	5.5	1.4	0.14
4127.30	Cr I	33113 - 57335	12.	3.1	0.49
4127.64	Cr I	21857 - 46077	2.4	0.61	-0.21
4131.36	Cr I	31009 - 55207	12.	3.0	0.48
4152.78	Cr I	31028 - 55102	8.3	2.2	0.33
4153.82	Cr I	20524 - 44591	4.4	1.1	0.06
4161.42	Cr I	35934 - 59957	34.	8.8	0.95
4163.62	Cr I	20524 - 44534	5.2	1.3	0.13
4165.52	Cr I	35884 - 59884	29.	7.6	0.88
4169.84	Cr I	33113 - 57088	14.	3.7	0.56
4170.20	Cr I	33060 - 57033	12.	3.1	0.49
4172.77	Cr I	37234 - 61192	18.	4.8	0.68
4175.94	Cr I	24286 - 48226	2.9	0.77	-0.12
4179.26	Cr I	25106 - 49028	19.	5.1	0.71
4184.90	Cr I	24897 - 48786	4.0	1.0	0.02
4186.36	Cr I	31049 - 54929	8.3	2.2	0.34
4190.13	Cr I	23163 - 47022	2.7	0.70	-0.15
4191.27	Cr I	20521 - 44373	2.9	0.77	-0.11
4192.10	Cr I	32097 - 55945	11.	2.9	0.46
4193.66	Cr I	31048 - 54887	23.	6.1	0.78
4194.95	Cr I	31055 - 54887	20.	5.2	0.72
4197.23	Cr I	31048 - 54866	12.	3.0	0.48
4198.52	Cr I	31055 - 54866	23.	6.1	0.78
4203.59	Cr I	20517 - 44300	2.0	0.54	-0.27
4204.47	Cr I	32097 - 55875	13.	3.4	0.53
4208.36	Cr I	31055 - 54811	9.8	2.6	0.42
4209.37	Cr I	31049 - 54799	30.	7.8	0.89
4209.76	Cr I	25038 - 48786	4.6	1.2	0.09
4211.35	Cr I	24304 - 48043	4.0	1.1	0.02
4216.36	Cr I	24304 - 48014	3.9	1.1	0.02
4217.63	Cr I	24282 - 47986	7.8	2.1	0.32
4221.57	Cr I	24834 - 48515	4.4	1.2	0.07
4222.73	Cr I	24300 - 47975	3.9	1.0	0.02
4238.96	Cr I	24282 - 47866	3.8	1.0	0.01
4240.70	Cr I	24056 - 47630	5.2	1.4	0.15
4254.35	Cr I	0 - 23499	2.0	0.54	-0.27
4255.50	Cr I	24200 - 47693	6.3	1.7	0.24
4261.35	Cr I	23499 - 46959	4.4	1.2	0.08
4263.14	Cr I	31048 - 54498	29.	7.9	0.90
4271.06	Cr I	25038 - 48445	3.1	0.86	-0.07

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4272.91	Cr I	23386 - 46783	3.0	0.82	-0.09
4274.80	Cr I	0 - 23386	1.5	0.41	-0.39
4280.40	Cr I	31049 - 54405	22.	6.1	0.79
4289.72	Cr I	0 - 23305	0.95	0.26	-0.58
4291.96	Cr I	27597 - 50890	7.0	1.9	0.29
4295.76	Cr I	21841 - 45113	3.7	1.0	0.01
4297.74	Cr I	31055 - 54317	19.	5.3	0.72
4300.51	Cr I	27704 - 50950	6.1	1.7	0.23
4301.18	Cr I	27817 - 51060	8.2	2.3	0.36
4305.45	Cr I	23305 - 46525	2.0	0.56	-0.25
4319.64	Cr I	23305 - 46449	2.4	0.66	-0.18
4325.08	Cr I	23934 - 47048	4.6	1.3	0.11
4337.57	Cr I	7811 - 30859	0.62	0.17	-0.76
4339.45	Cr I	7927 - 30965	0.93	0.26	-0.58
4339.72	Cr I	7751 - 30787	0.30	0.084	-1.07
4340.13	Cr I	21841 - 44875	2.5	0.70	-0.15
4344.51	Cr I	8095 - 31106	1.6	0.46	-0.33
4346.83	Cr I	24056 - 47055	5.6	1.6	0.20
4351.05	Cr I	7811 - 30787	0.30	0.085	-1.07
4351.77	Cr I	8308 - 31280	2.0	0.58	-0.24
4359.63	Cr I	7927 - 30859	0.46	0.13	-0.88
4363.13	Cr I	23934 - 46847	5.3	1.5	0.18
4371.28	Cr I	8095 - 30965	0.43	0.12	-0.90
4373.25	Cr I	7927 - 30787	0.056	0.016	-1.79
4374.16	Cr I	24200 - 47055	8.4	2.4	0.38
4375.33	Cr I	24056 - 46905	5.4	1.5	0.19
4381.11	Cr I	21848 - 44667	1.9	0.54	-0.26
4384.98	Cr I	8308 - 31106	0.45	0.13	-0.88
4387.50	Cr I	24092 - 46878	4.5	1.3	0.11
4391.75	Cr I	8095 - 30859	0.058	0.017	-1.78
4403.50	Cr I	32097 - 54800	17.	5.0	0.70
4410.30	Cr I	24300 - 46968	1.8	0.54	-0.27
4411.09	Cr I	24304 - 46968	4.6	1.3	0.13
4412.25	Cr I	8308 - 30965	0.030	0.0087	-2.06
4413.87	Cr I	28637 - 51287	8.7	2.6	0.41
4424.28	Cr I	24282 - 46878	4.5	1.3	0.12
4428.50	Cr I	24304 - 46878	1.8	0.53	-0.27
4430.49	Cr I	24282 - 46847	3.6	1.1	0.02
4432.18	Cr I	23163 - 45719	2.6	0.76	-0.12
4458.54	Cr I	24282 - 46705	7.8	2.3*	0.37
4459.74	Cr I	24304 - 46720	2.2	0.65	-0.19
4465.36	Cr I	24300 - 46688	2.2	0.65	-0.19
4482.88	Cr I	27176 - 49477	4.1	1.2	0.09
4488.05	Cr I	24092 - 46368	2.8	0.85	-0.07
4489.47	Cr I	28682 - 50950	8.4	2.5	0.41
4492.31	Cr I	27223 - 49477	8.1	2.5	0.39
4496.86	Cr I	7593 - 29825	0.41	0.12	-0.91
4498.73	Cr I	23512 - 45734	2.6	0.80	-0.10
4500.30	Cr I	24834 - 47048	5.8	1.7	0.24
4501.11	Cr I	23512 - 45722	2.6	0.79	-0.10

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4501.79	Cr I	23512 - 45719	1.2	0.36	-0.45
4506.85	Cr I	33763 - 55945	7.9	2.4	0.38
4511.90	Cr I	24897 - 47055	7.7	2.4	0.37
4514.37	Cr I	33763 - 55908	3.9	1.2	0.08
4514.53	Cr I	23499 - 45643	1.9	0.59	-0.23
4521.14	Cr I	33763 - 55875	7.8	2.4	0.38
4526.11	Cr I	24897 - 46986	1.9	0.58	-0.23
4526.47	Cr I	20519 - 42606	8.7	2.7	0.43
4527.34	Cr I	20524 - 42606	1.6	0.50	-0.30
4529.85	Cr I	20519 - 42589	0.54	0.17	-0.78
4530.74	Cr I	20524 - 42589	8.7	2.7	0.43
4535.15	Cr I	20521 - 42565	1.1	0.33	-0.48
4535.72	Cr I	20524 - 42565	5.4	1.7	0.22
4539.79	Cr I	20517 - 42539	0.94	0.29	-0.54
4540.50	Cr I	20521 - 42539	5.4	1.7	0.22
4540.72	Cr I	25038 - 47055	19.	6.0	0.78
4541.07	Cr I	20524 - 42539	0.81	0.25	-0.60
4541.51	Cr I	24834 - 46847	1.5	0.46	-0.34
4542.62	Cr I	24897 - 46905	1.9	0.58	-0.24
4544.62	Cr I	20517 - 42515	3.2	0.99	-0.00
4545.34	Cr I	20521 - 42515	0.53	0.17	-0.78
4545.96	Cr I	7593 - 29585	0.35	0.11	-0.97
4556.17	Cr I	25106 - 47048	3.9	1.2	0.08
4564.17	Cr I	38538 - 60441	8.8	2.7	0.44
4565.51	Cr I	7927 - 29825	0.075	0.023	-1.63
4569.64	Cr I	25177 - 47055	7.8	2.4	0.39
4571.68	Cr I	20519 - 42387	2.6	0.81	-0.09
4575.12	Cr I	27176 - 49027	2.7	0.86	-0.07
4580.06	Cr I	7593 - 29421	0.20	0.063	-1.20
4586.14	Cr I	25106 - 46905	1.9	0.59	-0.23
4591.39	Cr I	7811 - 29585	0.21	0.067	-1.18
4595.59	Cr I	33763 - 55517	23.	7.3	0.86
4600.10	Cr I	20519 - 42252	1.0	0.32	-0.50
4600.75	Cr I	8095 - 29825	0.30	0.096	-1.02
4601.02	Cr I	20524 - 42252	1.0	0.32	-0.50
4613.37	Cr I	7751 - 29421	0.13	0.043	-1.37
4616.14	Cr I	7927 - 29585	0.35	0.11	-0.95
4619.55	Cr I	24092 - 45734	4.0	1.3	0.11
4621.96	Cr I	20524 - 42154	1.7	0.55	-0.26
4622.49	Cr I	28637 - 50264	12.	3.7	0.57
4622.76	Cr I	24092 - 45719	1.3	0.43	-0.37
4626.19	Cr I	7811 - 29421	0.31	0.100	-1.00
4632.18	Cr I	28682 - 50264	3.9	1.2	0.10
4637.18	Cr I	20521 - 42080	0.84	0.27	-0.57
4637.77	Cr I	20524 - 42080	0.96	0.31	-0.51
4639.52	Cr I	25089 - 46637	3.6	1.2	0.06
4646.17	Cr I	8308 - 29825	0.99	0.32	-0.49
4646.81	Cr I	25011 - 46525	1.7	0.56	-0.25
4648.13	Cr I	20517 - 42026	0.48	0.15	-0.81
4648.87	Cr I	20521 - 42026	0.48	0.15	-0.81

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4649.46	Cr I	20524 - 42026	0.71	0.23	-0.64
4651.28	Cr I	7927 - 29421	0.33	0.11	-0.97
4652.16	Cr I	8095 - 29585	0.50	0.16	-0.79
4654.74	Cr I	24971 - 46449	2.6	0.83	-0.08
4656.19	Cr I	24897 - 46368	1.3	0.43	-0.36
4663.33	Cr I	25011 - 46449	3.0	0.97	-0.01
4663.83	Cr I	25089 - 46525	5.2	1.7	0.23
4664.80	Cr I	25206 - 46637	7.2	2.3	0.37
4665.90	Cr I	28679 - 50105	5.7	1.9	0.27
4666.22	Cr I	23934 - 45358	1.1	0.36	-0.44
4666.51	Cr I	25360 - 46783	5.6	1.8	0.26
4669.34	Cr I	25549 - 46959	3.9	1.3	0.10
4680.54	Cr I	25089 - 46449	3.0	0.98	-0.01
4680.87	Cr I	24940 - 46298	1.3	0.43	-0.36
4689.37	Cr I	25206 - 46525	5.2	1.7	0.24
4693.95	Cr I	24056 - 45354	3.1	1.0	0.01
4695.15	Cr I	24056 - 45349	1.2	0.41	-0.39
4697.06	Cr I	21841 - 43125	1.6	0.54	-0.27
4698.46	Cr I	25360 - 46637	18.	6.0	0.78
4700.61	Cr I	21857 - 43125	0.98	0.33	-0.49
4708.04	Cr I	25549 - 46783	15.	5.0	0.70
4718.43	Cr I	25772 - 46959	20.	6.6	0.82
4723.10	Cr I	24834 - 46000	3.0	0.99	-0.00
4724.42	Cr I	24897 - 46058	3.1	1.0	0.02
4727.15	Cr I	24200 - 45349	2.5	0.83	-0.08
4730.71	Cr I	24834 - 45966	7.4	2.5	0.39
4737.35	Cr I	24897 - 46000	8.9	3.0	0.48
4745.31	Cr I	21841 - 42908	0.50	0.17	-0.77
4752.08	Cr I	33763 - 54800	22.	7.5	0.88
4756.11	Cr I	25038 - 46058	22.	7.4	0.87
4764.29	Cr I	28637 - 49621	7.1	2.4	0.38
4766.63	Cr I	28679 - 49653	3.2	1.1	0.04
4767.86	Cr I	28682 - 49650	4.5	1.5	0.18
4789.32	Cr I	20519 - 41393	3.3	1.1	0.05
4792.51	Cr I	25106 - 45966	6.0	2.1	0.31
4801.03	Cr I	25177 - 46000	7.5	2.6	0.42
4829.38	Cr I	20524 - 41225	1.8	0.62	-0.21
4836.86	Cr I	25038 - 45707	0.84	0.29	-0.53
4861.20	Cr I	20521 - 41086	0.27	0.095	-1.02
4861.84	Cr I	20524 - 41086	1.1	0.41	-0.39
4870.80	Cr I	24834 - 45358	7.7	2.7	0.44
4885.78	Cr I	20521 - 40983	0.56	0.20	-0.70
4885.96	Cr I	24897 - 45358	1.0	0.37	-0.44
4887.01	Cr I	24897 - 45354	7.0	2.5	0.40
4888.53	Cr I	20521 - 40971	0.30	0.11	-0.97
4903.24	Cr I	20517 - 40906	0.55	0.20	-0.70
4922.27	Cr I	25038 - 45349	14.	5.1	0.71
4936.33	Cr I	25106 - 45358	5.8	2.1	0.33
4942.50	Cr I	7593 - 27820	0.028	0.010	-2.00
4954.81	Cr I	25177 - 45354	5.8	2.2	0.33

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4964.93	Cr I	7593 - 27729	0.014	0.0050	-2.30
5013.32	Cr I	21841 - 41782	1.2	0.45	-0.35
5051.90	Cr I	7593 - 27382	0.0058	0.0022	-2.65
5065.91	Cr I	21841 - 41575	0.32	0.12	-0.91
5067.71	Cr I	21848 - 41575	0.80	0.31	-0.51
5072.92	Cr I	7593 - 27300	0.014	0.0055	-2.26
5110.75	Cr I	21848 - 41409	0.55	0.22	-0.67
5113.13	Cr I	21857 - 41409	0.31	0.12	-0.92
5123.46	Cr I	8308 - 27820	0.0067	0.0026	-2.58
5139.65	Cr I	27597 - 47048	4.4	1.7	0.24
5144.67	Cr I	21857 - 41289	0.26	0.10	-0.99
5166.23	Cr I	27704 - 47055	6.6	2.6	0.42
5177.43	Cr I	27650 - 46959	3.2	1.3	0.11
5184.59	Cr I	27500 - 46783	6.2	2.5	0.40
5192.00	Cr I	27382 - 46637	6.0	2.4	0.38
5193.49	Cr I	27597 - 46847	1.1	0.43	-0.37
5196.44	Cr I	21848 - 41086	1.4	0.58	-0.24
5200.19	Cr I	27300 - 46525	2.9	1.2	0.07
5204.52	Cr I	7593 - 26802	1.6	0.65	-0.19
5206.04	Cr I	7593 - 26796	2.5	1.0	0.01
5208.44	Cr I	7593 - 26788	3.3	1.3	0.12
5214.13	Cr I	27176 - 46349	1.5	0.61	-0.22
5221.75	Cr I	27223 - 46368	2.3	0.96	-0.02
5224.94	Cr I	27825 - 46959	7.6	3.1	0.49
5226.89	Cr I	21857 - 40983	0.20	0.082	-1.09
5238.97	Cr I	21848 - 40930	0.32	0.13	-0.89
5243.40	Cr I	27382 - 46449	2.4	0.99	-0.01
5247.56	Cr I	7751 - 26802	0.088	0.036	-1.44
5254.92	Cr I	27500 - 46525	4.9	2.0	0.31
5255.13	Cr I	27935 - 46959	5.5	2.3	0.36
5261.75	Cr I	29825 - 48824	2.7	1.1	0.05
5264.15	Cr I	7811 - 26802	0.16	0.067	-1.17
5265.16	Cr I	27650 - 46637	2.5	1.1	0.02
5265.72	Cr I	7811 - 26796	0.055	0.023	-1.64
5272.01	Cr I	27820 - 46783	3.2	1.3	0.12
5273.44	Cr I	27825 - 46783	2.6	1.1	0.04
5275.17	Cr I	23305 - 42256	2.3	0.96	-0.02
5275.69	Cr I	23305 - 42255	0.86	0.36	-0.44
5276.03	Cr I	23305 - 42253	1.7	0.72	-0.14
5280.29	Cr I	27176 - 46109	1.4	0.59	-0.23
5287.19	Cr I	27729 - 46637	0.81	0.34	-0.47
5296.69	Cr I	7927 - 26802	0.10	0.044	-1.36
5297.36	Cr I	23386 - 42258	1.7	0.73	-0.14
5298.27	Cr I	7927 - 26796	0.20	0.086	-1.07
5300.75	Cr I	7927 - 26788	0.026	0.011	-1.96
5304.21	Cr I	27935 - 46783	1.5	0.62	-0.20
5312.88	Cr I	27820 - 46637	2.0	0.86	-0.06
5318.78	Cr I	27729 - 46525	2.0	0.84	-0.07
5328.34	Cr I	23499 - 42261	8.2	3.5	0.54
5329.17	Cr I	23499 - 42258	1.7	0.74	-0.13

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5329.72	Cr I	23499 - 42256	0.41	0.17	-0.76
5340.44	Cr I	27729 - 46449	1.2	0.50	-0.30
5344.76	Cr I	27820 - 46525	0.80	0.34	-0.47
5345.81	Cr I	8095 - 26796	0.24	0.10	-0.98
5348.32	Cr I	8095 - 26787	0.12	0.051	-1.29
5386.98	Cr I	27176 - 45734	2.0	0.85	-0.07
5387.57	Cr I	27163 - 45719	1.4	0.61	-0.21
5390.39	Cr I	27176 - 45722	0.63	0.27	-0.56
5400.61	Cr I	27223 - 45734	2.8	1.2	0.08
5405.00	Cr I	27223 - 45719	1.4	0.62	-0.21
5409.79	Cr I	8308 - 26787	0.45	0.20	-0.70
5442.41	Cr I	27597 - 45966	0.85	0.38	-0.42
5463.97	Cr I	27704 - 46000	1.4	0.62	-0.21
5480.50	Cr I	27817 - 46058	1.4	0.65	-0.19
5628.64	Cr I	27597 - 45358	1.5	0.70	-0.15
5642.36	Cr I	31106 - 48824	1.1	0.51	-0.29
5649.37	Cr I	30965 - 48661	1.7	0.83	-0.08
5664.04	Cr I	27704 - 45354	1.5	0.71	-0.15
5682.48	Cr I	30965 - 48559	1.0	0.50	-0.30
5694.73	Cr I	31106 - 48661	3.5	1.7	0.23
5698.33	Cr I	31280 - 48824	6.3	3.1	0.49
5702.31	Cr I	27817 - 45349	1.5	0.73	-0.14
5712.64	Cr I	36578 - 54078	4.1	2.0	0.30
5712.78	Cr I	24282 - 41782	0.55	0.27	-0.57
5719.82	Cr I	24304 - 41782	0.16	0.081	-1.09
5746.43	Cr I	28679 - 46077	0.57	0.28	-0.55
5753.69	Cr I	36552 - 53927	2.4	1.2	0.08
5781.20	Cr I	24282 - 41575	0.26	0.13	-0.88
5781.81	Cr I	23934 - 41225	0.12	0.059	-1.23
5783.11	Cr I	28679 - 45966	1.8	0.90	-0.04
5783.93	Cr I	26796 - 44081	1.3	0.66	-0.18
5785.00	Cr I	26787 - 44069	1.1	0.53	-0.28
5785.82	Cr I	26802 - 44081	0.85	0.43	-0.37
5787.99	Cr I	26796 - 44069	2.6	1.3	0.12
5791.00	Cr I	26787 - 44051	7.9	4.0	0.60
6330.10	Cr I	7593 - 23386	0.0051	0.0030	-2.52
6362.87	Cr I	7593 - 23305	0.0030	0.0018	-2.74
6661.08	Cr I	33816 - 48824	3.8	2.5	0.40
6669.26	Cr I	33672 - 48661	2.1	1.4	0.14
6881.62	Cr I	27729 - 42256	0.19	0.13	-0.87
6882.38	Cr I	27729 - 42255	0.34	0.24	-0.62
6883.03	Cr I	27729 - 42253	0.75	0.53	-0.27
6924.13	Cr I	27820 - 42258	0.95	0.68	-0.17
6925.20	Cr I	27820 - 42256	0.61	0.44	-0.36
6978.48	Cr I	27935 - 42261	1.1	0.84	-0.08
6979.82	Cr I	27935 - 42258	0.46	0.33	-0.48
7185.52	Cr I	31393 - 45306	0.65	0.50	-0.30
7236.20	Cr I	41393 - 55209	3.5	2.8	0.44
7355.90	Cr I	23305 - 36896	0.80	0.65	-0.19
7400.21	Cr I	23386 - 36896	1.2	1.0	0.01

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7462.31	Cr I	23499 - 36896	1.4	1.2	0.08
7942.04	Cr I	35398 - 47986	2.5	2.4	0.38
8163.18	Cr I	35398 - 47645	1.0	1.0	0.00
8348.28	Cr I	21841 - 33816	0.038	0.040	-1.40
8450.26	Cr I	21841 - 33672	0.025	0.026	-1.58
8455.24	Cr I	21848 - 33672	0.012	0.013	-1.88
8548.86	Cr I	21848 - 33542	0.024	0.026	-1.58
8947.15	Cr I	25039 - 36212	0.36	0.43	-0.37
8976.83	Cr I	24898 - 36034	0.17	0.20	-0.69

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2055.52	Cr II	0 - 48632	9.1	0.58	-0.24
2061.49	Cr II	0 - 48491	7.3	0.46	-0.33
2065.42	Cr II	0 - 48399	4.8	0.31	-0.52
2534.34	Cr II	12497 - 51943	6.4	0.62	-0.21
2653.59	Cr II	12033 - 49706	19.	2.0	0.29
2658.59	Cr II	11962 - 49565	18.	1.9	0.28
2661.73	Cr II	12148 - 49706	5.3	0.57	-0.25
2663.42	Cr II	12304 - 49838	25.	2.6	0.42
2663.68	Cr II	11962 - 49493	5.1	0.54	-0.26
2666.02	Cr II	12148 - 49646	33.	3.5	0.55
2668.71	Cr II	12033 - 49493	21.	2.2	0.34
2671.81	Cr II	12148 - 49565	26.	2.8	0.45
2672.83	Cr II	12304 - 49706	21.	2.3	0.36
2677.16	Cr II	12304 - 49646	132.	14.	1.15
2678.79	Cr II	12033 - 49352	23.	2.4	0.39
2680.34	Cr II	40415 - 77714	6.2	0.67	-0.17
2687.09	Cr II	12148 - 49352	16.	1.8	0.25
2688.29	Cr II	30157 - 67344	17.	1.8	0.25
2691.04	Cr II	12497 - 49646	21.	2.3	0.36
2693.52	Cr II	30219 - 67334	11.	1.2	0.08
2697.91	Cr II	30299 - 67354	11.	1.2	0.08
2698.41	Cr II	12304 - 49352	13.	1.4	0.14
2698.69	Cr II	11962 - 49006	12.	1.3	0.11
2703.86	Cr II	12033 - 49006	2.4	0.26	-0.59
2708.79	Cr II	33521 - 70427	21.	2.3	0.36
2709.31	Cr II	33418 - 70317	12.	1.3	0.11
2712.31	Cr II	12148 - 49006	9.5	1.0	0.02
2717.51	Cr II	31083 - 67871	17.	1.9	0.27
2718.43	Cr II	31532 - 68306	14.	1.6	0.20
2722.75	Cr II	12033 - 48750	11.	1.2	0.08
2724.04	Cr II	31169 - 67868	5.6	0.63	-0.20
2727.26	Cr II	31219 - 67876	14.	1.6	0.20
2740.10	Cr II	12148 - 48632	4.4	0.50	-0.30
2742.03	Cr II	12033 - 48491	5.9	0.67	-0.18
2743.64	Cr II	11962 - 48399	15.	1.7	0.22
2746.21	Cr II	29952 - 66355	11.	1.2	0.09
2748.98	Cr II	12033 - 48399	20.	2.3	0.36
2750.73	Cr II	12148 - 48491	24.	2.7	0.43
2751.87	Cr II	12304 - 48632	18.	2.0	0.31
2754.28	Cr II	31086 - 67380	11.	1.3	0.11
2757.72	Cr II	12148 - 48399	21.	2.4	0.38
2758.98	Cr II	38270 - 74505	22.	2.5	0.40
2759.39	Cr II	31219 - 67449	25.	2.9	0.46
2759.73	Cr II	31169 - 67394	14.	1.6	0.21
2762.59	Cr II	12304 - 48491	46.	5.3	0.72
2766.54	Cr II	12497 - 48632	48.	5.5	0.74
2778.06	Cr II	39825 - 75810	16.	1.9	0.27
2780.30	Cr II	33521 - 69478	27.	3.1	0.49
2785.70	Cr II	33619 - 69506	24.	2.8	0.44
2787.63	Cr II	30865 - 66727	11.	1.3	0.12

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2792.16	Cr II	33694 - 69498	30.	3.5	0.54
2800.77	Cr II	33694 - 69388	24.	2.8	0.45
2812.01	Cr II	33619 - 69171	27.	3.2	0.50
2818.36	Cr II	33521 - 68993	21.	2.5	0.40
2822.01	Cr II	33418 - 68844	15.	1.8	0.25
2822.37	Cr II	30392 - 65813	56.	6.6	0.82
2830.47	Cr II	30299 - 65618	55.	6.7	0.82
2834.26	Cr II	34631 - 69903	24.	3.0	0.47
2835.63	Cr II	12497 - 47752	132.	16.	1.20
2836.48	Cr II	35608 - 70852	16.	1.9	0.27
2838.79	Cr II	38270 - 73486	19.	2.3	0.37
2840.02	Cr II	30219 - 65420	36.	4.3	0.64
2843.25	Cr II	12304 - 47465	84.	10.	1.01
2849.84	Cr II	12148 - 47228	59.	7.2	0.86
2851.36	Cr II	30157 - 65218	39.	4.7	0.67
2853.22	Cr II	30219 - 65257	17.	2.0	0.31
2855.07	Cr II	32855 - 67871	18.	2.2	0.34
2855.68	Cr II	12033 - 47041	40.	4.9	0.69
2856.77	Cr II	19631 - 54626	14.	1.8	0.25
2857.40	Cr II	19798 - 54785	12.	1.4	0.16
2858.91	Cr II	12497 - 47465	31.	3.8	0.58
2860.93	Cr II	11962 - 46906	19.	2.4	0.38
2862.57	Cr II	12304 - 47228	38.	4.7	0.67
2865.11	Cr II	12148 - 47041	34.	4.2	0.63
2865.33	Cr II	19528 - 54418	8.5	1.0	0.02
2866.74	Cr II	12033 - 46906	27.	3.4	0.53
2867.10	Cr II	19631 - 54500	14.	1.8	0.25
2867.65	Cr II	11962 - 46824	21.	2.6	0.41
2870.44	Cr II	19798 - 54626	35.	4.3	0.63
2873.48	Cr II	12033 - 46824	6.9	0.85	-0.07
2873.82	Cr II	19631 - 54418	14.	1.8	0.25
2875.99	Cr II	20024 - 54785	53.	6.6	0.82
2876.24	Cr II	12148 - 46906	10.	1.3	0.10
2877.98	Cr II	12304 - 47041	8.1	1.0	0.00
2878.45	Cr II	12497 - 47228	3.4	0.42	-0.37
2880.87	Cr II	19798 - 54500	16.	2.0	0.29
2888.74	Cr II	36273 - 70880	19.	2.4	0.38
2889.82	Cr II	32854 - 67449	18.	2.2	0.35
2896.46	Cr II	32854 - 67369	18.	2.2	0.35
2897.67	Cr II	35608 - 70108	19.	2.4	0.38
2898.54	Cr II	31219 - 65710	28.	3.6	0.55
2899.48	Cr II	32855 - 67334	18.	2.2	0.35
2903.97	Cr II	31118 - 65543	8.5	1.1	0.03
2911.68	Cr II	35569 - 69903	16.	2.0	0.30
2915.23	Cr II	35611 - 69903	7.9	1.0	0.00
2915.46	Cr II	39825 - 74114	8.3	1.1	0.03
2921.24	Cr II	40202 - 74424	33.	4.3	0.63
2921.82	Cr II	31169 - 65384	20.	2.5	0.41
2927.08	Cr II	38563 - 72717	23.	3.0	0.47
2928.15	Cr II	30308 - 64449	25.	3.2	0.50

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2928.30	Cr II	31219 - 65257	31.	4.0	0.60
2929.44	Cr II	36273 - 70399	9.6	1.2	0.09
2930.85	Cr II	29952 - 64063	11.	1.4	0.15
2932.70	Cr II	31169 - 65257	8.5	1.1	0.04
2933.97	Cr II	31083 - 65157	17.	2.2	0.34
2935.14	Cr II	30865 - 64924	28.	3.6	0.56
2940.22	Cr II	42987 - 76988	17.	2.2	0.35
2946.84	Cr II	34813 - 68738	22.	2.8	0.45
2953.36	Cr II	29952 - 63802	16.	2.1	0.33
2953.71	Cr II	34631 - 68477	16.	2.0	0.31
2961.73	Cr II	30308 - 64062	17.	2.2	0.34
2966.05	Cr II	31219 - 64924	14.	1.9	0.27
2971.91	Cr II	30392 - 64031	66.	8.8	0.94
2976.72	Cr II	30865 - 64449	9.8	1.3	0.12
2979.74	Cr II	30299 - 63849	61.	8.1	0.91
2985.32	Cr II	30219 - 63707	36.	4.8	0.68
2989.19	Cr II	30157 - 63601	49.	6.6	0.82
3026.65	Cr II	35708 - 68738	35.	4.8	0.68
3032.93	Cr II	21823 - 54785	5.5	0.75	-0.12
3041.74	Cr II	35611 - 68477	22.	3.1	0.49
3050.14	Cr II	34813 - 67589	44.	6.1	0.79
3059.52	Cr II	21825 - 54500	4.6	0.64	-0.19
3067.16	Cr II	21824 - 54418	5.3	0.75	-0.13
3118.65	Cr II	19528 - 51584	32.	4.7	0.67
3120.37	Cr II	19631 - 51670	60.	8.7	0.94
3122.60	Cr II	33694 - 65710	11.	1.6	0.20
3124.94	Cr II	19798 - 51789	66.	9.7	0.99
3128.70	Cr II	19631 - 51584	16.	2.4	0.37
3132.06	Cr II	20024 - 51943	85.	13.	1.10
3136.68	Cr II	19798 - 51670	20.	2.9	0.46
3147.23	Cr II	20024 - 51789	20.	3.0	0.47
3180.70	Cr II	20513 - 51943	35.	5.2	0.72
3181.43	Cr II	20520 - 51943	4.6	0.70	-0.16
3197.08	Cr II	20520 - 51789	32.	4.9	0.69
3208.59	Cr II	20513 - 51670	4.5	0.69	-0.16
3209.18	Cr II	20518 - 51670	25.	3.8	0.58
3217.40	Cr II	20513 - 51584	20.	3.1	0.49
3234.06	Cr II	34631 - 65543	11.	1.7	0.24
3295.43	Cr II	33694 - 64031	12.	2.0	0.30
3307.02	Cr II	33619 - 63849	9.2	1.5	0.18
3324.06	Cr II	19631 - 49706	5.8	0.96	-0.02
3328.35	Cr II	19528 - 49565	3.2	0.54	-0.27
3336.33	Cr II	19528 - 49493	9.6	1.6	0.21
3339.80	Cr II	19631 - 49565	13.	2.2	0.34
3342.59	Cr II	19798 - 49706	12.	2.0	0.29
3347.84	Cr II	19631 - 49493	9.7	1.6	0.21
3358.50	Cr II	19798 - 49565	18.	3.0	0.48
3360.30	Cr II	25034 - 54785	35.	5.9	0.77
3361.77	Cr II	25047 - 54785	14.	2.3	0.37
3368.05	Cr II	20024 - 49706	46.	7.9	0.90

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3378.34	Cr II	25034 - 54626	12.	2.0	0.31
3379.37	Cr II	25043 - 54626	6.8	1.2	0.07
3379.83	Cr II	25047 - 54626	21.	3.5	0.55
3382.68	Cr II	19798 - 49352	14.	2.4	0.39
3391.43	Cr II	19528 - 49006	8.9	1.5	0.19
3392.99	Cr II	25036 - 54500	12.	2.0	0.31
3393.84	Cr II	25043 - 54500	15.	2.6	0.42
3394.30	Cr II	25047 - 54500	12.	2.1	0.31
3402.40	Cr II	25036 - 54418	6.7	1.2	0.07
3403.32	Cr II	19631 - 49006	16.	2.8	0.45
3408.76	Cr II	20024 - 49352	36.	6.3	0.80
3421.21	Cr II	19528 - 48750	18.	3.2	0.51
3422.74	Cr II	19798 - 49006	25.	4.5	0.65
3433.31	Cr II	19631 - 48750	13.	2.3	0.36
3495.38	Cr II	19798 - 48399	3.4	0.62	-0.21
3511.84	Cr II	20024 - 48491	3.4	0.64	-0.20
3585.30	Cr II	21823 - 49706	14.	2.8	0.44
3677.68	Cr II	21823 - 49006	3.2	0.65	-0.19
3677.89	Cr II	21824 - 49006	4.8	0.98	-0.01
3712.95	Cr II	21824 - 48750	6.2	1.3	0.10
4012.47	Cr II	45670 - 70585	44.	11.	1.02
4558.66	Cr II	32854 - 54785	4.2	1.3	0.12

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10⁸/sec		
4555.36	Cs I	0 - 21947	1.4	0.42	-0.37
4593.18	Cs I	0 - 21766	0.65	0.21	-0.69
5663.80	Cs I	11178 - 28829	0.88	0.43	-0.37
5844.70	Cs I	11732 - 28836	0.76	0.39	-0.41
6010.33	Cs I	11178 - 27811	1.9	1.0	0.01
6034.09	Cs I	11732 - 28300	0.38	0.21	-0.68
6212.87	Cs I	11732 - 27823	2.9	1.7	0.23
6217.27	Cs I	11732 - 27811	0.19	0.11	-0.95
6354.98	Cs I	11178 - 26911	0.48	0.29	-0.53
6586.51	Cs I	11732 - 26911	0.60	0.39	-0.41
6723.28	Cs I	11178 - 26048	3.2	2.2	0.34
6973.29	Cs I	11732 - 26069	3.3	2.4	0.39
6983.49	Cs I	11732 - 26048	0.58	0.42	-0.37
7609.01	Cs I	11178 - 24317	0.44	0.39	-0.41
8015.71	Cs I	14500 - 26971	1.5	1.4	0.16
8079.02	Cs I	14597 - 26971	2.0	2.0	0.29
8521.10	Cs I	0 - 11732	1.3	1.4	0.15
8761.38	Cs I	11178 - 22589	4.3	5.0	0.70
8943.50	Cs I	0 - 11178	0.48	0.57	-0.24

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2024.34	Cu I	0 – 49383	0.17	0.010	-1.99
2138.53	Cu I	11203 – 57949	0.51	0.035	-1.46
2165.09	Cu I	0 – 46173	0.26	0.018	-1.74
2178.94	Cu I	0 – 45879	0.31	0.022	-1.66
2181.72	Cu I	0 – 45821	0.23	0.016	-1.79
2199.58	Cu I	11203 – 56651	2.4	0.17	-0.76
2214.58	Cu I	11203 – 56344	0.93	0.068	-1.17
2225.70	Cu I	0 – 44916	0.10	0.0078	-2.11
2227.78	Cu I	13245 – 58119	2.2	0.16	-0.80
2230.08	Cu I	11203 – 56030	2.3	0.17	-0.77
2293.84	Cu I	11203 – 54784	1.0	0.082	-1.09
2441.64	Cu I	0 – 40944	0.064	0.0057	-2.24
2492.15	Cu I	0 – 40114	0.31	0.029	-1.54
2618.37	Cu I	11203 – 49383	4.3	0.44	-0.35
2766.37	Cu I	13245 – 49383	0.91	0.10	-0.98
2824.37	Cu I	11203 – 46598	3.1	0.37	-0.43
2882.93	Cu I	11203 – 45879	0.25	0.032	-1.50
2961.16	Cu I	11203 – 44963	0.97	0.13	-0.90
2997.36	Cu I	13245 – 46598	0.26	0.036	-1.45
3010.84	Cu I	11203 – 44406	0.25	0.033	-1.48
3036.10	Cu I	13245 – 46173	0.36	0.050	-1.30
3063.41	Cu I	13245 – 45879	0.22	0.030	-1.52
3093.99	Cu I	11203 – 43514	0.070	0.010	-2.00
3194.10	Cu I	13245 – 44544	0.31	0.047	-1.32
3208.23	Cu I	13245 – 44406	0.093	0.014	-1.84
3247.54	Cu I	0 – 30784	4.1	0.64	-0.19
3273.96	Cu I	0 – 30535	1.9	0.31	-0.51
3279.82	Cu I	13245 – 43726	0.13	0.020	-1.69
3307.95	Cu I	40909 – 71131	5.1	0.84	-0.08
3337.84	Cu I	11203 – 41153	0.11	0.018	-1.74
3599.13	Cu I	43514 – 71291	2.4	0.47	-0.32
3602.03	Cu I	43514 – 71268	2.4	0.48	-0.32
4022.63	Cu I	30535 – 55388	0.77	0.19	-0.73
4275.11	Cu I	39019 – 62403	2.6	0.72	-0.14
4530.78	Cu I	30784 – 52849	0.65	0.20	-0.70
4651.12	Cu I	40909 – 62403	5.7	1.8	0.27
5105.54	Cu I	11203 – 30784	0.051	0.020	-1.70
5153.24	Cu I	30535 – 49935	4.7	1.9	0.27
5218.20	Cu I	30784 – 49942	5.8	2.4	0.38
5220.07	Cu I	30784 – 49935	0.95	0.40	-0.40
5292.52	Cu I	43514 – 62403	3.2	1.4	0.13
5700.24	Cu I	13245 – 30784	0.014	0.0069	-2.16
5782.13	Cu I	13245 – 30535	0.054	0.027	-1.57
7933.13	Cu I	30535 – 43137	1.3	1.2	0.09
8092.63	Cu I	30784 – 43137	2.6	2.6	0.41

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
1999.69	Cu II	21929 - 71920	7.9	0.47	-0.33
2035.84	Cu II	23998 - 73102	3.5	0.22	-0.66
2037.12	Cu II	22847 - 71920	4.6	0.29	-0.54
2043.79	Cu II	21929 - 70842	9.0	0.57	-0.25
2112.09	Cu II	26265 - 73596	3.6	0.24	-0.61
2135.98	Cu II	21929 - 68731	14.	0.93	-0.03
2192.26	Cu II	22847 - 68448	4.6	0.33	-0.48
2247.00	Cu II	21929 - 66419	9.1	0.69	-0.16
2369.89	Cu II	26265 - 68448	5.0	0.42	-0.37

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10⁸/sec		
3003.76	Dy II	0 - 33382	0.27	0.037	-1.44
3141.12	Dy II	0 - 31826	0.82	0.12	-0.92
3184.77	Dy II	828 - 32218	0.46	0.071	-1.15
3193.31	Dy II	0 - 31307	0.60	0.092	-1.04
3225.08	Dy II	828 - 31826	0.51	0.080	-1.10
3280.08	Dy II	828 - 31307	1.6	0.26	-0.58
3319.88	Dy II	0 - 30113	1.3	0.22	-0.66
3341.87	Dy II	4341 - 34256	1.2	0.19	-0.71
3388.87	Dy II	4756 - 34256	2.7	0.46	-0.34
3393.59	Dy II	828 - 30287	5.4	0.93	-0.03
3396.17	Dy II	0 - 29437	1.5	0.26	-0.58
3407.79	Dy II	0 - 29336	5.9	1.0	0.01
3413.78	Dy II	828 - 30113	1.8	0.32	-0.50
3414.83	Dy II	4341 - 33617	2.0	0.34	-0.46
3434.37	Dy II	0 - 29109	2.0	0.35	-0.46
3441.45	Dy II	828 - 29769	1.7	0.30	-0.53
3445.58	Dy II	0 - 29014	3.8	0.68	-0.17
3460.97	Dy II	0 - 28885	4.4	0.79	-0.10
3463.88	Dy II	4756 - 33617	0.75	0.13	-0.87
3494.49	Dy II	828 - 29437	5.2	0.94	-0.02
3506.81	Dy II	828 - 29336	1.5	0.28	-0.56
3523.98	Dy II	4341 - 32710	13.	2.4	0.39
3524.61	Dy II	4341 - 32705	0.49	0.091	-1.04
3531.70	Dy II	0 - 28307	19.	3.5	0.55
3534.96	Dy II	828 - 29109	4.8	0.89	-0.05
3538.50	Dy II	0 - 28252	3.7	0.70	-0.15
3546.84	Dy II	828 - 29014	1.5	0.28	-0.55
3563.14	Dy II	828 - 28885	2.2	0.43	-0.37
3576.25	Dy II	4756 - 32710	13.	2.5	0.41
3576.89	Dy II	4756 - 32705	5.0	0.95	-0.02
3585.08	Dy II	0 - 27886	2.6	0.49	-0.31
3586.11	Dy II	4341 - 32218	1.4	0.28	-0.55
3617.24	Dy II	4341 - 31979	0.33	0.064	-1.19
3637.27	Dy II	4341 - 31826	0.84	0.17	-0.78
3640.24	Dy II	4756 - 32218	2.9	0.58	-0.23
3643.89	Dy II	0 - 27435	0.28	0.055	-1.26
3645.41	Dy II	828 - 28252	9.6	1.9	0.28
3672.31	Dy II	4756 - 31979	2.4	0.48	-0.32
3673.15	Dy II	0 - 27217	0.25	0.050	-1.30
3694.81	Dy II	828 - 27886	3.5	0.72	-0.14
3707.42	Dy II	4341 - 31307	0.65	0.13	-0.87
3724.42	Dy II	4341 - 31183	3.1	0.65	-0.18
3753.50	Dy II	0 - 26634	0.75	0.16	-0.80
3757.37	Dy II	828 - 27435	3.2	0.67	-0.18
3788.46	Dy II	828 - 27217	1.0	0.23	-0.65
3836.50	Dy II	4341 - 30399	3.7	0.82	-0.09
3853.03	Dy II	4341 - 30287	1.8	0.40	-0.40
3869.87	Dy II	4341 - 30175	1.2	0.28	-0.56
3872.13	Dy II	0 - 25818	3.1	0.69	-0.16
3874.00	Dy II	828 - 26634	0.65	0.15	-0.84

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3879.10	Dy II	4341 - 30113	0.69	0.16	-0.81
3898.54	Dy II	4756 - 30399	9.4	2.2	0.33
3914.86	Dy II	4341 - 29878	0.72	0.17	-0.78
3915.58	Dy II	4756 - 30287	0.81	0.19	-0.73
3931.55	Dy II	4341 - 29769	2.7	0.63	-0.20
3932.97	Dy II	4756 - 30175	0.54	0.12	-0.91
3942.52	Dy II	4756 - 30113	0.77	0.18	-0.74
3944.70	Dy II	0 - 25343	3.9	0.91	-0.04
3968.42	Dy II	0 - 25192	4.9	1.1	0.06
3979.47	Dy II	4756 - 29878	0.37	0.087	-1.06
3983.67	Dy II	4341 - 29437	1.9	0.45	-0.34
3996.70	Dy II	4756 - 29769	2.1	0.50	-0.30
4000.48	Dy II	828 - 25818	3.5	0.83	-0.08
4036.34	Dy II	4341 - 29109	0.46	0.11	-0.95
4050.58	Dy II	4756 - 29437	1.9	0.48	-0.32
4073.15	Dy II	4341 - 28885	2.6	0.64	-0.19
4077.98	Dy II	828 - 25343	2.8	0.71	-0.15
4103.34	Dy II	828 - 25192	1.5	0.37	-0.43
4105.05	Dy II	4756 - 29109	0.22	0.056	-1.25
4111.34	Dy II	0 - 24316	0.43	0.11	-0.96
4143.10	Dy II	4756 - 28885	1.3	0.34	-0.47
4206.54	Dy II	0 - 23766	0.094	0.025	-1.60
4256.33	Dy II	828 - 24316	0.13	0.036	-1.44
4308.67	Dy II	0 - 23203	0.23	0.065	-1.19
4328.90	Dy II	4341 - 27435	0.091	0.026	-1.59
4358.46	Dy II	828 - 23766	0.052	0.015	-1.83
4374.24	Dy II	0 - 22855	0.066	0.019	-1.73
4449.71	Dy II	0 - 22467	0.14	0.041	-1.39
4468.17	Dy II	828 - 23203	0.057	0.017	-1.77
4620.03	Dy II	828 - 22467	0.026	0.0084	-2.08
4664.68	Dy II	4341 - 25773	0.055	0.018	-1.75
4760.02	Dy II	4341 - 25343	0.028	0.0094	-2.03
4957.36	Dy II	0 - 20166	0.080	0.030	-1.53
5169.67	Dy II	828 - 20166	0.020	0.0078	-2.11
5399.94	Dy II	4341 - 22855	0.0093	0.0041	-2.39
5515.40	Dy II	4341 - 22467	0.0085	0.0039	-2.41

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2358.51	Er II	0 - 42387	1.8	0.15	-0.83
2383.28	Er II	440 - 42387	1.8	0.15	-0.81
2446.39	Er II	0 - 40864	3.9	0.35	-0.45
2478.32	Er II	440 - 40778	1.2	0.11	-0.96
2802.53	Er II	0 - 35672	1.8	0.21	-0.68
2837.12	Er II	7150 - 42386	3.2	0.39	-0.41
2858.57	Er II	0 - 34972	0.80	0.098	-1.01
2929.72	Er II	440 - 34563	0.61	0.078	-1.11
2944.06	Er II	440 - 34397	0.58	0.076	-1.12
2965.21	Er II	7150 - 40864	2.2	0.29	-0.54
3019.76	Er II	0 - 33106	0.42	0.057	-1.24
3064.84	Er II	0 - 32619	0.22	0.031	-1.51
3073.34	Er II	0 - 32528	2.2	0.31	-0.51
3084.03	Er II	0 - 32416	2.1	0.30	-0.52
3106.79	Er II	440 - 32619	0.82	0.12	-0.92
3115.52	Er II	440 - 32528	0.47	0.069	-1.16
3116.94	Er II	0 - 32074	0.48	0.070	-1.15
3121.90	Er II	0 - 32023	0.48	0.070	-1.16
3132.03	Er II	0 - 31919	0.40	0.059	-1.23
3141.13	Er II	440 - 32267	1.4	0.20	-0.69
3160.34	Er II	440 - 32074	0.62	0.093	-1.03
3183.42	Er II	440 - 31844	1.2	0.19	-0.73
3264.79	Er II	0 - 30621	5.8	0.93	-0.03
3277.70	Er II	0 - 30500	0.20	0.031	-1.50
3312.42	Er II	440 - 30621	5.0	0.82	-0.09
3318.78	Er II	0 - 30123	0.18	0.029	-1.53
3346.04	Er II	440 - 30318	2.7	0.46	-0.34
3348.14	Er II	0 - 29859	0.33	0.056	-1.25
3350.27	Er II	5133 - 34972	2.7	0.45	-0.35
3368.07	Er II	440 - 30123	2.8	0.48	-0.32
3372.76	Er II	0 - 29641	13.	2.2	0.35
3374.16	Er II	0 - 29628	1.7	0.28	-0.55
3385.08	Er II	440 - 29973	3.3	0.56	-0.25
3389.74	Er II	0 - 29492	0.74	0.13	-0.89
3396.84	Er II	5133 - 34563	2.0	0.34	-0.47
3398.28	Er II	440 - 29859	0.36	0.062	-1.21
3425.08	Er II	440 - 29628	0.46	0.081	-1.09
3433.12	Er II	0 - 29120	0.40	0.071	-1.15
3441.15	Er II	440 - 29492	1.3	0.23	-0.64
3448.07	Er II	5404 - 34397	1.1	0.20	-0.71
3469.74	Er II	0 - 28812	0.37	0.067	-1.17
3485.82	Er II	440 - 29120	1.5	0.27	-0.57
3499.11	Er II	440 - 29011	9.9	1.8	0.26
3505.07	Er II	7150 - 35672	2.6	0.48	-0.32
3573.85	Er II	5133 - 33106	0.69	0.13	-0.88
3580.49	Er II	440 - 28361	1.3	0.25	-0.60
3616.58	Er II	0 - 27643	3.2	0.63	-0.20
3633.56	Er II	0 - 27514	1.0	0.20	-0.69
3637.16	Er II	5133 - 32619	1.0	0.21	-0.68
3646.79	Er II	7150 - 34563	0.46	0.091	-1.04

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3652.86	Er II	7195 - 34563	3.3	0.67	-0.17
3669.01	Er II	7150 - 34397	3.1	0.62	-0.21
3675.18	Er II	7195 - 34397	0.51	0.10	-0.99
3684.27	Er II	5133 - 32267	1.4	0.28	-0.56
3692.64	Er II	440 - 27514	7.4	1.5	0.18
3710.76	Er II	5133 - 32074	0.11	0.024	-1.63
3721.45	Er II	5404 - 32267	0.36	0.076	-1.12
3734.59	Er II	0 - 26769	0.21	0.043	-1.36
3742.65	Er II	5133 - 31844	2.9	0.61	-0.22
3781.03	Er II	5404 - 31844	1.3	0.28	-0.55
3787.90	Er II	0 - 26392	0.39	0.085	-1.07
3797.07	Er II	440 - 26769	0.44	0.095	-1.02
3830.53	Er II	0 - 26099	2.3	0.52	-0.29
3851.60	Er II	7150 - 33106	1.5	0.33	-0.48
3858.39	Er II	7195 - 33106	2.6	0.57	-0.24
3882.87	Er II	7150 - 32896	5.0	1.1	0.06
3896.25	Er II	440 - 26099	3.1	0.71	-0.15
3912.43	Er II	0 - 25552	0.070	0.016	-1.79
3932.28	Er II	7195 - 32619	3.1	0.71	-0.15
4009.16	Er II	0 - 24936	0.12	0.029	-1.53
4048.35	Er II	7150 - 31844	0.86	0.21	-0.67
4081.21	Er II	440 - 24936	0.25	0.062	-1.21
4104.00	Er II	5133 - 29492	0.10	0.026	-1.59
4234.76	Er II	5404 - 29011	0.20	0.054	-1.26
4301.61	Er II	440 - 23681	0.11	0.030	-1.52
4303.81	Er II	5133 - 28361	0.17	0.048	-1.32
4500.75	Er II	0 - 22212	0.046	0.014	-1.86
4878.33	Er II	7150 - 27643	0.043	0.015	-1.81

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2709.99	Eu I	0 - 36890	6.8	0.75	-0.13
2723.96	Eu I	0 - 36700	2.5	0.28	-0.55
2731.37	Eu I	0 - 36601	1.7	0.20	-0.71
2732.61	Eu I	0 - 36584	1.4	0.16	-0.81
2735.25	Eu I	0 - 36549	2.8	0.31	-0.51
2743.28	Eu I	0 - 36442	2.3	0.27	-0.58
2745.61	Eu I	0 - 36411	1.3	0.15	-0.82
2747.83	Eu I	0 - 36381	2.6	0.30	-0.52
2878.87	Eu I	0 - 34726	2.2	0.27	-0.57
2892.54	Eu I	0 - 34562	4.2	0.52	-0.28
2893.03	Eu I	0 - 34556	2.9	0.37	-0.44
2908.99	Eu I	0 - 34366	3.2	0.40	-0.40
2958.91	Eu I	0 - 33786	0.51	0.067	-1.17
3058.98	Eu I	0 - 32681	1.6	0.22	-0.66
3106.18	Eu I	0 - 32185	3.7	0.53	-0.28
3111.43	Eu I	0 - 32130	11.	1.6	0.19
3185.54	Eu I	0 - 31383	0.37	0.057	-1.24
3210.57	Eu I	0 - 31138	3.9	0.60	-0.22
3212.81	Eu I	0 - 31116	9.6	1.5	0.17
3213.75	Eu I	0 - 31107	3.8	0.60	-0.23
3235.13	Eu I	0 - 30902	0.41	0.065	-1.19
3241.40	Eu I	0 - 30842	0.82	0.13	-0.89
3246.03	Eu I	0 - 30798	0.40	0.064	-1.19
3247.55	Eu I	0 - 30784	0.89	0.14	-0.85
3322.26	Eu I	0 - 30091	0.61	0.10	-1.00
3334.33	Eu I	0 - 29982	6.6	1.1	0.04
3350.40	Eu I	0 - 29839	0.76	0.13	-0.89
3457.05	Eu I	0 - 28918	0.46	0.082	-1.09
3467.88	Eu I	0 - 28828	0.45	0.080	-1.09
3589.27	Eu I	0 - 27853	0.31	0.060	-1.22
3719.16	Eu I	14564 - 41444	6.5	1.4	0.13
3732.20	Eu I	14068 - 40854	2.9	0.60	-0.22
3774.10	Eu I	16612 - 43101	11.	2.3	0.35
3811.33	Eu I	14068 - 40298	14.	3.0	0.48
3865.57	Eu I	15582 - 41444	31.	7.0	0.84
3872.72	Eu I	15582 - 41396	7.7	1.7	0.24
3884.75	Eu I	14564 - 40298	18.	4.2	0.62
3900.51	Eu I	13222 - 38852	5.7	1.3	0.11
3917.29	Eu I	13049 - 38569	17.	4.0	0.60
3918.52	Eu I	13779 - 39291	3.7	0.86	-0.06
3949.60	Eu I	13049 - 38361	3.3	0.78	-0.11
3955.75	Eu I	15582 - 40854	6.7	1.6	0.20
3963.61	Eu I	15952 - 41175	3.7	0.87	-0.06
3967.18	Eu I	14068 - 39268	3.2	0.76	-0.12
3978.42	Eu I	13457 - 38586	3.6	0.85	-0.07
3986.60	Eu I	13457 - 38534	3.1	0.73	-0.13
4078.24	Eu I	13779 - 38292	2.5	0.63	-0.20
4106.88	Eu I	12924 - 37266	2.5	0.64	-0.19
4127.28	Eu I	16080 - 40302	7.5	1.9	0.28
4137.07	Eu I	16080 - 40245	3.7	0.95	-0.02

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4157.72	Eu I	13049 - 37094	1.2	0.32	-0.50
4182.22	Eu I	13222 - 37126	4.3	1.1	0.06
4244.74	Eu I	13049 - 36601	1.6	0.44	-0.36
4298.73	Eu I	13779 - 37035	6.2	1.7	0.24
4329.36	Eu I	13457 - 36549	3.3	0.92	-0.04
4329.97	Eu I	13779 - 36867	3.0	0.84	-0.08
4331.18	Eu I	12924 - 36006	1.2	0.33	-0.48
4337.68	Eu I	13457 - 36504	3.2	0.91	-0.04
4387.88	Eu I	13222 - 36006	2.8	0.82	-0.08
4535.59	Eu I	15952 - 37994	2.6	0.80	-0.10
4594.03	Eu I	0 - 21761	6.7	2.1	0.33
4602.63	Eu I	16080 - 37800	1.2	0.37	-0.43
4627.22	Eu I	0 - 21605	5.6	1.8	0.25
4661.88	Eu I	0 - 21445	4.6	1.5	0.17
4713.59	Eu I	15680 - 36890	1.3	0.44	-0.36
4740.50	Eu I	13457 - 34546	0.61	0.21	-0.69
4792.59	Eu I	13457 - 34317	0.97	0.33	-0.48
4829.30	Eu I	15680 - 36381	1.5	0.51	-0.29
4830.33	Eu I	17341 - 38037	3.7	1.3	0.11
4840.47	Eu I	17341 - 37994	2.3	0.81	-0.09
4849.64	Eu I	15952 - 36567	2.5	0.87	-0.06
4867.62	Eu I	13779 - 34317	2.3	0.81	-0.09
4884.05	Eu I	16080 - 36549	1.5	0.55	-0.26
4894.68	Eu I	16080 - 36504	3.7	1.3	0.12
4900.86	Eu I	14068 - 34467	1.4	0.50	-0.31
4907.18	Eu I	14068 - 34440	3.4	1.2	0.09
4911.40	Eu I	14068 - 34423	4.1	1.5	0.17
4953.52	Eu I	15891 - 36073	1.9	0.70	-0.15
4960.21	Eu I	15891 - 36045	1.9	0.70	-0.15
4962.55	Eu I	15952 - 36098	1.9	0.71	-0.15
4975.76	Eu I	17945 - 38037	2.9	1.1	0.03
5013.17	Eu I	14564 - 34506	4.3	1.6	0.21
5022.91	Eu I	14564 - 34467	3.9	1.5	0.17
5029.54	Eu I	14564 - 34440	2.4	0.93	-0.03
5033.55	Eu I	15952 - 35813	3.1	1.2	0.07
5067.95	Eu I	13222 - 32948	1.2	0.45	-0.35
5092.69	Eu I	16612 - 36242	2.9	1.1	0.06
5096.44	Eu I	19447 - 39063	7.8	3.1	0.48
5114.37	Eu I	13049 - 32596	2.3	0.91	-0.04
5124.77	Eu I	15891 - 35398	2.8	1.1	0.04
5129.10	Eu I	13457 - 32948	2.6	1.0	0.01
5130.08	Eu I	15891 - 35378	2.8	1.1	0.04
5133.52	Eu I	12924 - 32398	2.8	1.1	0.05
5160.07	Eu I	13222 - 32596	3.8	1.5	0.19
5166.70	Eu I	13049 - 32398	2.8	1.1	0.05
5193.74	Eu I	17341 - 36589	2.7	1.1	0.03
5199.85	Eu I	17341 - 36567	8.6	3.5	0.54
5200.96	Eu I	15952 - 35174	3.1	1.3	0.10
5206.44	Eu I	16612 - 35813	4.3	1.7	0.24
5215.10	Eu I	13779 - 32948	12.	4.9	0.69

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5223.49	Eu I	13457 - 32596	4.3	1.8	0.25
5239.24	Eu I	13049 - 32130	1.5	0.63	-0.20
5266.40	Eu I	13779 - 32762	3.0	1.2	0.09
5271.96	Eu I	15582 - 34545	9.8	4.1	0.61
5272.48	Eu I	13457 - 32418	1.5	0.61	-0.22
5282.82	Eu I	15582 - 34506	3.7	1.6	0.20
5287.25	Eu I	13222 - 32130	0.67	0.28	-0.55
5289.25	Eu I	17707 - 36608	2.7	1.1	0.06
5291.26	Eu I	19273 - 38167	8.4	3.5	0.55
5293.68	Eu I	15582 - 34467	1.5	0.62	-0.20
5294.64	Eu I	17707 - 36589	5.4	2.3	0.36
5303.85	Eu I	16612 - 35461	3.0	1.2	0.10
5350.41	Eu I	17945 - 36630	1.4	0.59	-0.23
5351.69	Eu I	15421 - 34102	1.7	0.73	-0.14
5352.84	Eu I	17945 - 36622	1.7	0.74	-0.13
5355.10	Eu I	16612 - 35280	2.8	1.2	0.09
5357.61	Eu I	13457 - 32117	7.0	3.0	0.48
5360.83	Eu I	15138 - 33786	1.2	0.53	-0.27
5361.61	Eu I	16080 - 34726	3.2	1.4	0.14
5376.94	Eu I	16612 - 35205	3.2	1.4	0.15
5392.94	Eu I	15249 - 33786	2.5	1.1	0.04
5402.77	Eu I	13222 - 31726	5.2	2.3	0.36
5405.33	Eu I	16612 - 35107	1.4	0.60	-0.22
5411.86	Eu I	17341 - 35813	1.7	0.73	-0.14
5421.07	Eu I	16612 - 35053	1.6	0.69	-0.16
5426.94	Eu I	15680 - 34102	2.1	0.91	-0.04
5443.56	Eu I	15421 - 33786	0.79	0.35	-0.46
5451.51	Eu I	13779 - 32117	4.9	2.2	0.34
5452.94	Eu I	13049 - 31383	2.7	1.2	0.08
5457.62	Eu I	19273 - 37591	2.3	1.0	0.01
5472.32	Eu I	13457 - 31726	1.1	0.48	-0.32
5488.65	Eu I	12924 - 31138	1.2	0.54	-0.26
5495.20	Eu I	12924 - 31116	0.45	0.20	-0.69
5500.83	Eu I	15952 - 34126	0.35	0.16	-0.80
5510.52	Eu I	14068 - 32210	1.6	0.74	-0.13
5526.63	Eu I	13049 - 31138	0.30	0.14	-0.86
5533.25	Eu I	13049 - 31116	0.30	0.14	-0.86
5542.54	Eu I	17341 - 35378	1.0	0.46	-0.33
5547.44	Eu I	12924 - 30945	1.9	0.86	-0.06
5570.33	Eu I	13779 - 31726	1.8	0.84	-0.08
5577.14	Eu I	13457 - 31383	2.1	0.99	-0.00
5579.63	Eu I	14564 - 32481	1.1	0.52	-0.28
5580.03	Eu I	13222 - 31138	1.2	0.57	-0.24
5586.24	Eu I	13049 - 30945	0.87	0.41	-0.39
5586.83	Eu I	13222 - 31116	0.76	0.36	-0.45
5592.25	Eu I	12924 - 30801	0.17	0.078	-1.11
5599.80	Eu I	13049 - 30902	0.17	0.081	-1.09
5605.86	Eu I	17341 - 35174	0.58	0.27	-0.57
5618.81	Eu I	13222 - 31014	0.37	0.18	-0.75
5622.44	Eu I	14068 - 31849	0.75	0.36	-0.45

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5632.54	Eu I	13049 - 30798	0.70	0.33	-0.48
5645.80	Eu I	0 - 17707	0.050	0.024	-1.62
5651.11	Eu I	17707 - 35398	0.52	0.25	-0.61
5673.85	Eu I	13222 - 30842	0.57	0.28	-0.56
5681.10	Eu I	13222 - 30819	0.26	0.12	-0.91
5684.24	Eu I	19447 - 37035	1.5	0.72	-0.14
5730.87	Eu I	13457 - 30902	0.59	0.29	-0.54
5739.00	Eu I	19447 - 36867	3.2	1.6	0.19
5765.20	Eu I	0 - 17341	0.072	0.036	-1.44
5783.69	Eu I	14564 - 31849	2.3	1.2	0.07
5792.72	Eu I	19631 - 36890	0.80	0.40	-0.39
5800.27	Eu I	13779 - 31014	0.61	0.31	-0.51
5830.98	Eu I	13779 - 30924	6.0	3.1	0.49
5845.77	Eu I	19447 - 36549	1.3	0.68	-0.17
5860.97	Eu I	19447 - 36504	1.3	0.68	-0.17
5864.77	Eu I	19364 - 36411	0.71	0.37	-0.44
5895.31	Eu I	19544 - 36502	0.73	0.38	-0.42
5902.97	Eu I	19764 - 36700	1.4	0.73	-0.14
5909.94	Eu I	15680 - 32596	0.20	0.10	-0.99
5915.74	Eu I	15582 - 32481	1.2	0.62	-0.21
5925.30	Eu I	19712 - 36584	0.60	0.32	-0.50
5926.52	Eu I	16080 - 32948	0.49	0.26	-0.59
5942.72	Eu I	19462 - 36285	2.1	1.1	0.04
5953.49	Eu I	19794 - 36586	1.4	0.73	-0.14
5954.28	Eu I	19794 - 36584	1.5	0.81	-0.09
5963.76	Eu I	15421 - 32185	1.3	0.70	-0.15
5967.10	Eu I	13457 - 30211	4.0	2.2	0.33
5968.43	Eu I	19631 - 36381	0.72	0.38	-0.42
5971.69	Eu I	19544 - 36285	1.4	0.75	-0.13
5972.75	Eu I	15680 - 32418	2.6	1.4	0.14
5980.47	Eu I	19364 - 36081	0.66	0.35	-0.45
5983.14	Eu I	15421 - 32130	0.39	0.21	-0.68
5983.78	Eu I	19364 - 36072	1.2	0.64	-0.20
5992.83	Eu I	16080 - 32762	4.2	2.2	0.35
6004.36	Eu I	15138 - 31788	0.79	0.43	-0.37
6005.61	Eu I	15680 - 32327	0.23	0.12	-0.90
6012.20	Eu I	15582 - 32210	0.89	0.48	-0.32
6012.56	Eu I	15249 - 31876	1.4	0.77	-0.11
6015.58	Eu I	19462 - 36081	2.7	1.4	0.16
6018.15	Eu I	0 - 16612	0.074	0.040	-1.40
6023.15	Eu I	15138 - 31736	0.78	0.43	-0.37
6029.00	Eu I	15421 - 32003	2.3	1.3	0.10
6044.66	Eu I	15249 - 31788	0.80	0.44	-0.36
6057.36	Eu I	15680 - 32185	2.0	1.1	0.04
6075.58	Eu I	15421 - 31876	1.2	0.68	-0.17
6077.38	Eu I	15680 - 32130	0.44	0.24	-0.61
6083.84	Eu I	13779 - 30211	2.1	1.1	0.06
6099.35	Eu I	13222 - 29613	1.7	0.97	-0.01
6108.15	Eu I	19364 - 35732	2.4	1.4	0.14
6118.78	Eu I	16080 - 32418	1.9	1.1	0.03

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6124.67	Eu I	15680 - 32003	0.86	0.48	-0.32
6178.76	Eu I	19273 - 35453	4.0	2.3	0.36
6188.13	Eu I	13457 - 29613	1.9	1.1	0.03
6195.07	Eu I	13049 - 29186	0.88	0.51	-0.29
6207.60	Eu I	16080 - 32185	0.23	0.13	-0.88
6230.51	Eu I	15680 - 31726	0.20	0.12	-0.93
6233.73	Eu I	16080 - 32117	1.4	0.79	-0.10
6250.47	Eu I	12924 - 28918	0.32	0.19	-0.73
6262.25	Eu I	13222 - 29186	1.6	0.93	-0.03
6266.95	Eu I	0 - 15952	0.0073	0.0043	-2.37
6285.95	Eu I	12924 - 28828	0.090	0.053	-1.27
6291.34	Eu I	0 - 15891	0.0081	0.0048	-2.32
6299.77	Eu I	13049 - 28918	1.0	0.60	-0.22
6313.78	Eu I	13779 - 29613	0.18	0.11	-0.97
6318.58	Eu I	19631 - 35453	0.58	0.35	-0.46
6335.82	Eu I	13049 - 28828	0.45	0.27	-0.56
6350.04	Eu I	12924 - 28667	0.69	0.42	-0.38
6355.89	Eu I	13457 - 29186	0.40	0.24	-0.61
6369.25	Eu I	13222 - 28918	0.37	0.23	-0.64
6382.73	Eu I	15138 - 30801	0.56	0.34	-0.47
6383.86	Eu I	15138 - 30798	0.79	0.49	-0.31
6400.93	Eu I	13049 - 28667	0.70	0.43	-0.37
6406.11	Eu I	13222 - 28828	0.23	0.14	-0.85
6410.04	Eu I	12924 - 28520	1.0	0.62	-0.21
6411.32	Eu I	15249 - 30842	1.5	0.90	-0.05
6428.29	Eu I	15249 - 30801	0.56	0.35	-0.46
6439.93	Eu I	15421 - 30945	0.20	0.12	-0.90
6457.96	Eu I	15421 - 30902	1.3	0.83	-0.08
6470.70	Eu I	14068 - 29518	0.090	0.056	-1.25
6483.02	Eu I	15421 - 30842	0.20	0.12	-0.91
6501.55	Eu I	15421 - 30798	0.49	0.31	-0.51
6519.59	Eu I	15680 - 31014	0.69	0.44	-0.36
6522.72	Eu I	15891 - 31217	0.18	0.12	-0.93
6549.12	Eu I	15952 - 31217	0.092	0.059	-1.23
6567.87	Eu I	15680 - 30902	0.84	0.54	-0.26
6593.79	Eu I	15680 - 30842	0.50	0.33	-0.49
6603.55	Eu I	15680 - 30819	0.20	0.13	-0.89
6685.21	Eu I	14564 - 29518	0.35	0.23	-0.63
6693.96	Eu I	16080 - 31014	1.9	1.3	0.12
6701.06	Eu I	19447 - 34366	0.37	0.25	-0.61
6710.45	Eu I	21761 - 36659	1.2	0.83	-0.08
6744.88	Eu I	16080 - 30902	0.61	0.41	-0.38
6782.54	Eu I	16080 - 30819	0.59	0.41	-0.39
6787.48	Eu I	15891 - 30619	0.26	0.18	-0.75
6802.72	Eu I	14068 - 28764	1.5	1.1	0.03
6816.06	Eu I	15952 - 30619	2.1	1.5	0.16
6834.30	Eu I	21445 - 36073	0.98	0.69	-0.16
6840.93	Eu I	21605 - 36219	1.6	1.1	0.04
6844.83	Eu I	16612 - 31217	0.38	0.27	-0.57
6847.04	Eu I	21445 - 36045	1.2	0.84	-0.07

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
6864.54	Eu I	0 - 14564	0.049	0.035	-1.46
6898.21	Eu I	21605 - 36098	1.9	1.4	0.14
6903.67	Eu I	21761 - 36242	5.6	4.0	0.60
6910.17	Eu I	21605 - 36073	1.2	0.87	-0.06
6914.82	Eu I	21761 - 36219	2.8	2.0	0.30
7040.20	Eu I	14564 - 28764	2.0	1.5	0.17
7074.54	Eu I	16080 - 30211	0.30	0.22	-0.65
7106.48	Eu I	0 - 14068	0.016	0.012	-1.92
7164.66	Eu I	21445 - 35398	0.65	0.50	-0.30
7175.55	Eu I	15680 - 29613	0.64	0.49	-0.31
7224.68	Eu I	21445 - 35282	1.1	0.90	-0.05
7258.72	Eu I	21605 - 35378	1.6	1.3	0.11
7262.77	Eu I	15421 - 29186	0.57	0.45	-0.34
7281.53	Eu I	21445 - 35174	1.1	0.89	-0.05
7297.56	Eu I	21761 - 35461	0.68	0.54	-0.27
7310.46	Eu I	21605 - 35280	1.2	0.93	-0.03
7313.63	Eu I	15249 - 28918	0.21	0.17	-0.76
7336.18	Eu I	15891 - 29518	1.1	0.92	-0.03
7346.25	Eu I	21445 - 35053	0.36	0.30	-0.53
7356.65	Eu I	21445 - 35034	0.36	0.29	-0.53
7362.25	Eu I	15249 - 28828	0.19	0.15	-0.81
7369.60	Eu I	15952 - 29518	1.2	0.94	-0.03
7387.36	Eu I	16080 - 29613	0.079	0.065	-1.19
7389.16	Eu I	15138 - 28667	0.20	0.17	-0.78
7404.41	Eu I	21605 - 35107	1.1	0.92	-0.04
7436.59	Eu I	21761 - 35205	2.2	1.9	0.27
7470.53	Eu I	15138 - 28520	0.14	0.11	-0.94
7491.00	Eu I	21761 - 35107	0.57	0.48	-0.32
7528.70	Eu I	17341 - 30619	1.4	1.2	0.08
7533.02	Eu I	15249 - 28520	0.089	0.076	-1.12
7547.32	Eu I	15421 - 28667	0.10	0.088	-1.06
7583.91	Eu I	15582 - 28764	2.8	2.4	0.38
7742.57	Eu I	17707 - 30619	1.8	1.6	0.22
7746.19	Eu I	16612 - 29518	1.6	1.5	0.16
7803.32	Eu I	15952 - 28764	0.15	0.14	-0.85
7818.21	Eu I	19631 - 32418	0.43	0.39	-0.40
7887.99	Eu I	17945 - 30619	1.1	1.0	0.02
8015.47	Eu I	19712 - 32185	0.35	0.34	-0.47
8209.80	Eu I	17341 - 29518	0.57	0.58	-0.24
8226.81	Eu I	16612 - 28764	0.29	0.29	-0.53
8464.71	Eu I	17707 - 29518	0.15	0.16	-0.80
8642.67	Eu I	19447 - 31014	0.80	0.90	-0.05
8727.77	Eu I	19447 - 30902	0.27	0.31	-0.51
8782.46	Eu I	19631 - 31014	0.23	0.27	-0.57
8790.88	Eu I	19447 - 30819	0.44	0.51	-0.29
8870.30	Eu I	19631 - 30902	0.68	0.81	-0.09

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2499.39	Eu II	1669 - 41667	0.15	0.014	-1.86
2554.78	Eu II	16861 - 55991	3.5	0.34	-0.46
2559.18	Eu II	17004 - 56067	3.6	0.35	-0.46
2564.17	Eu II	17004 - 55991	21.	2.1	0.32
2568.17	Eu II	17141 - 56067	14.	1.4	0.15
2574.76	Eu II	17141 - 55968	3.5	0.35	-0.45
2577.14	Eu II	16861 - 55652	30.	3.0	0.48
2581.86	Eu II	17248 - 55968	3.6	0.36	-0.45
2635.50	Eu II	0 - 37932	0.080	0.0084	-2.08
2638.77	Eu II	1669 - 39554	4.0	0.42	-0.38
2641.27	Eu II	0 - 37849	0.94	0.099	-1.00
2668.34	Eu II	1669 - 39135	2.3	0.24	-0.61
2678.29	Eu II	1669 - 38996	0.88	0.095	-1.02
2685.66	Eu II	0 - 37224	0.54	0.058	-1.24
2692.03	Eu II	1669 - 38805	1.9	0.21	-0.68
2701.14	Eu II	0 - 37011	1.5	0.16	-0.79
2701.90	Eu II	0 - 37000	1.7	0.19	-0.73
2705.28	Eu II	0 - 36954	0.50	0.055	-1.26
2716.98	Eu II	1669 - 38464	2.2	0.25	-0.60
2727.78	Eu II	0 - 36649	8.1	0.91	-0.04
2729.33	Eu II	0 - 36628	0.37	0.041	-1.39
2729.44	Eu II	1669 - 38296	1.2	0.13	-0.88
2740.62	Eu II	1669 - 38146	0.47	0.053	-1.27
2744.26	Eu II	0 - 36429	0.22	0.025	-1.61
2747.29	Eu II	1669 - 38058	0.20	0.023	-1.64
2752.17	Eu II	1669 - 37994	0.26	0.029	-1.54
2781.89	Eu II	1669 - 37606	1.2	0.14	-0.84
2802.84	Eu II	1669 - 37337	4.6	0.54	-0.27
2811.75	Eu II	1669 - 37224	0.52	0.061	-1.21
2813.94	Eu II	0 - 35527	4.9	0.59	-0.23
2816.18	Eu II	1669 - 37168	1.3	0.15	-0.82
2820.78	Eu II	0 - 35441	2.8	0.34	-0.47
2828.72	Eu II	1669 - 37011	0.89	0.11	-0.97
2829.30	Eu II	1669 - 37003	0.27	0.032	-1.50
2833.26	Eu II	1669 - 36954	0.31	0.037	-1.43
2843.96	Eu II	1669 - 36821	0.17	0.021	-1.69
2859.67	Eu II	1669 - 36628	0.52	0.064	-1.19
2862.57	Eu II	0 - 34923	0.35	0.043	-1.37
2864.42	Eu II	11128 - 46029	0.74	0.091	-1.04
2876.06	Eu II	1669 - 36429	0.11	0.014	-1.85
2887.85	Eu II	0 - 34618	0.092	0.012	-1.94
2906.68	Eu II	0 - 34394	3.5	0.44	-0.35
2917.44	Eu II	1669 - 35936	0.051	0.0065	-2.19
2925.04	Eu II	1669 - 35847	1.4	0.18	-0.74
2947.29	Eu II	0 - 33920	0.058	0.0076	-2.12
2952.68	Eu II	1669 - 35527	0.30	0.040	-1.40
2959.47	Eu II	0 - 33780	0.033	0.0043	-2.37
2960.21	Eu II	1669 - 35441	0.39	0.051	-1.29
2991.33	Eu II	0 - 33420	0.26	0.034	-1.46
2995.22	Eu II	1669 - 35046	0.047	0.0064	-2.20

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3006.26	Eu II	1669 - 34923	0.052	0.0071	-2.15
3040.77	Eu II	1669 - 34546	0.036	0.0050	-2.31
3054.94	Eu II	1669 - 34394	0.37	0.051	-1.29
3069.11	Eu II	24208 - 56781	6.3	0.90	-0.05
3077.36	Eu II	0 - 32486	0.15	0.021	-1.68
3097.45	Eu II	1669 - 33944	0.12	0.018	-1.75
3173.61	Eu II	0 - 31501	0.047	0.0072	-2.15
3266.39	Eu II	23774 - 54380	17.	2.7	0.43
3272.77	Eu II	23774 - 54321	24.	3.9	0.59
3277.78	Eu II	23774 - 54274	33.	5.4	0.73
3301.95	Eu II	24208 - 54484	25.	4.1	0.61
3308.02	Eu II	24208 - 54429	23.	3.8	0.58
3313.33	Eu II	24208 - 54380	23.	3.8	0.58
3319.89	Eu II	24208 - 54321	11.	1.8	0.25
3321.86	Eu II	11128 - 41223	0.86	0.14	-0.85
3338.75	Eu II	26838 - 56781	9.9	1.6	0.22
3367.64	Eu II	10082 - 39768	0.29	0.049	-1.31
3369.06	Eu II	10643 - 40317	1.0	0.17	-0.77
3380.25	Eu II	24208 - 53783	10.	1.8	0.25
3391.99	Eu II	10082 - 39554	1.1	0.19	-0.73
3396.58	Eu II	26838 - 56271	58.	10.0	1.00
3425.02	Eu II	11128 - 40317	1.1	0.19	-0.72
3426.44	Eu II	9923 - 39099	0.24	0.043	-1.37
3440.82	Eu II	27256 - 56311	9.8	1.7	0.24
3441.00	Eu II	10082 - 39135	0.79	0.14	-0.85
3445.18	Eu II	10082 - 39099	0.24	0.043	-1.36
3457.56	Eu II	10082 - 38996	0.24	0.043	-1.37
3461.38	Eu II	9923 - 38805	0.63	0.11	-0.95
3505.30	Eu II	1669 - 30189	0.032	0.0059	-2.23
3521.09	Eu II	26173 - 54565	84.	16.	1.20
3531.15	Eu II	26173 - 54484	13.	2.5	0.40
3532.23	Eu II	27256 - 55559	9.4	1.8	0.24
3538.08	Eu II	26173 - 54429	12.	2.2	0.34
3542.15	Eu II	9923 - 38146	0.61	0.12	-0.94
3552.52	Eu II	10643 - 38784	0.87	0.17	-0.78
3603.20	Eu II	10313 - 38058	0.61	0.12	-0.93
3611.57	Eu II	10313 - 37994	0.30	0.059	-1.23
3616.15	Eu II	26838 - 54484	8.6	1.7	0.23
3622.54	Eu II	11128 - 38725	0.46	0.091	-1.04
3632.18	Eu II	10082 - 37606	0.34	0.067	-1.18
3673.19	Eu II	27104 - 54321	8.6	1.7	0.24
3674.63	Eu II	10643 - 37849	0.18	0.037	-1.43
3678.26	Eu II	27256 - 54435	8.7	1.8	0.25
3688.42	Eu II	0 - 27104	0.97	0.20	-0.70
3710.87	Eu II	10643 - 37584	0.17	0.035	-1.45
3713.45	Eu II	10082 - 37003	0.23	0.048	-1.32
3714.90	Eu II	10313 - 37224	0.25	0.051	-1.29
3724.94	Eu II	0 - 26839	2.8	0.59	-0.23
3729.74	Eu II	11128 - 37932	0.15	0.032	-1.50
3741.31	Eu II	11128 - 37849	1.1	0.23	-0.63

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3743.56	Eu II	9923 - 36628	0.24	0.050	-1.30
3761.12	Eu II	10643 - 37224	0.69	0.15	-0.83
3765.93	Eu II	10082 - 36628	0.21	0.045	-1.35
3788.76	Eu II	27104 - 53490	5.6	1.2	0.08
3791.50	Eu II	10643 - 37011	0.12	0.026	-1.59
3799.01	Eu II	10313 - 36628	0.29	0.064	-1.20
3819.67	Eu II	0 - 26173	4.8	1.0	0.02
3826.68	Eu II	26838 - 52963	15.	3.3	0.52
3844.23	Eu II	10643 - 36649	0.33	0.072	-1.14
3907.10	Eu II	1669 - 27256	4.7	1.1	0.03
3917.70	Eu II	9923 - 35441	0.039	0.0091	-2.04
3928.87	Eu II	10082 - 35527	0.071	0.016	-1.78
3930.48	Eu II	1669 - 27104	5.3	1.2	0.09
3942.21	Eu II	10082 - 35441	0.040	0.0093	-2.03
3943.08	Eu II	23774 - 49128	6.7	1.6	0.20
3964.90	Eu II	10313 - 35527	0.16	0.039	-1.41
3971.96	Eu II	1669 - 26838	3.5	0.84	-0.08
4011.69	Eu II	24208 - 49128	10.	2.5	0.39
4017.58	Eu II	10643 - 35527	0.21	0.050	-1.30
4085.38	Eu II	9923 - 34394	0.12	0.031	-1.51
4096.80	Eu II	10643 - 35046	0.092	0.023	-1.63
4112.04	Eu II	10082 - 34394	0.093	0.023	-1.63
4129.70	Eu II	0 - 24208	1.9	0.49	-0.31
4151.52	Eu II	10313 - 34394	0.031	0.0080	-2.09
4205.05	Eu II	0 - 23774	3.2	0.84	-0.08
4355.09	Eu II	26173 - 49128	15.	4.2	0.63
4383.17	Eu II	26838 - 49647	5.2	1.5	0.17
4405.27	Eu II	16861 - 39554	0.099	0.029	-1.54
4434.81	Eu II	27104 - 49647	8.4	2.5	0.39
4435.56	Eu II	1669 - 24208	0.85	0.25	-0.60
4464.97	Eu II	27256 - 49647	5.3	1.6	0.20
4485.15	Eu II	26838 - 49128	1.5	0.46	-0.34
4522.57	Eu II	1669 - 23774	0.17	0.052	-1.28
5818.74	Eu II	9923 - 27104	0.031	0.016	-1.81
5872.98	Eu II	10082 - 27104	0.017	0.0087	-2.06
5953.84	Eu II	10313 - 27104	0.0051	0.0027	-2.56
5966.07	Eu II	10082 - 26838	0.058	0.031	-1.51
6049.51	Eu II	10313 - 26838	0.075	0.041	-1.38
6173.05	Eu II	10643 - 26838	0.060	0.035	-1.46
6303.41	Eu II	10313 - 26173	0.035	0.021	-1.68
6437.64	Eu II	10643 - 26173	0.13	0.081	-1.09
6645.11	Eu II	11128 - 26173	0.39	0.26	-0.59
7077.10	Eu II	10082 - 24208	0.082	0.062	-1.21
7194.81	Eu II	10313 - 24208	0.14	0.11	-0.95
7217.55	Eu II	9923 - 23774	0.13	0.10	-1.00
7301.17	Eu II	10082 - 23774	0.12	0.098	-1.01
7370.22	Eu II	10643 - 24208	0.19	0.15	-0.82
7426.57	Eu II	10313 - 23774	0.070	0.058	-1.24

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2084.12	Fe I	0 - 47967	4.3	0.28	-0.55
2166.77	Fe I	0 - 46137	8.5	0.60	-0.22
2178.09	Fe I	416 - 46314	4.2	0.30	-0.52
2191.84	Fe I	704 - 46314	2.1	0.15	-0.82
2196.04	Fe I	888 - 46410	2.2	0.16	-0.80
2297.79	Fe I	416 - 43923	1.3	0.100	-1.00
2439.74	Fe I	19390 - 60366	32.	2.8	0.45
2440.11	Fe I	19788 - 60758	23.	2.1	0.32
2442.57	Fe I	19621 - 60549	46.	4.1	0.62
2443.87	Fe I	6928 - 47835	4.9	0.44	-0.36
2447.71	Fe I	0 - 40842	0.98	0.088	-1.05
2453.47	Fe I	7377 - 48123	6.3	0.57	-0.24
2457.60	Fe I	6928 - 47606	17.	1.5	0.18
2462.18	Fe I	416 - 41018	1.6	0.15	-0.83
2462.64	Fe I	0 - 40594	9.2	0.84	-0.08
2463.73	Fe I	7728 - 48305	3.8	0.35	-0.46
2465.15	Fe I	7377 - 47930	14.	1.3	0.11
2467.73	Fe I	7728 - 48239	3.8	0.35	-0.46
2468.88	Fe I	6928 - 47420	13.	1.2	0.06
2472.34	Fe I	6928 - 47363	12.	1.1	0.06
2472.88	Fe I	704 - 41131	14.	1.3	0.10
2474.81	Fe I	7728 - 48123	23.	2.1	0.33
2479.48	Fe I	7986 - 48305	7.7	0.71	-0.15
2479.78	Fe I	704 - 41018	15.	1.4	0.14
2483.27	Fe I	0 - 40257	34.	3.1	0.49
2484.19	Fe I	888 - 41131	14.	1.3	0.11
2486.37	Fe I	0 - 40207	1.1	0.099	-1.00
2486.69	Fe I	7728 - 47930	7.1	0.66	-0.18
2487.06	Fe I	8155 - 48351	10.	0.93	-0.03
2487.37	Fe I	704 - 40895	0.51	0.047	-1.33
2488.15	Fe I	416 - 40594	35.	3.2	0.51
2489.5	Fe I	978 - 41131	28.	2.6	0.41
2490.64	Fe I	704 - 40842	26.	2.4	0.38
2491.16	Fe I	888 - 41018	21.	2.0	0.29
2496.53	Fe I	7377 - 47420	13.	1.2	0.08
2498.89	Fe I	416 - 40422	1.3	0.12	-0.92
2501.13	Fe I	0 - 39970	10.	0.95	-0.02
2501.70	Fe I	6928 - 46889	2.8	0.26	-0.58
2507.90	Fe I	7728 - 47590	9.5	0.90	-0.05
2510.83	Fe I	416 - 40231	11.	1.0	0.01
2512.36	Fe I	416 - 40207	0.84	0.080	-1.10
2517.66	Fe I	7986 - 47693	8.8	0.84	-0.08
2518.10	Fe I	704 - 40405	8.9	0.85	-0.07
2519.63	Fe I	8155 - 47831	6.1	0.58	-0.24
2522.85	Fe I	0 - 39626	29.	2.7	0.44
2524.29	Fe I	888 - 40491	6.6	0.63	-0.20
2527.43	Fe I	416 - 39970	16.	1.5	0.18
2529.13	Fe I	704 - 40231	6.1	0.59	-0.23
2529.83	Fe I	888 - 40405	2.1	0.20	-0.71
2530.69	Fe I	704 - 40207	0.85	0.082	-1.09

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2535.60	Fe I	978 - 40405	9.0	0.87	-0.06
2540.98	Fe I	888 - 40231	9.8	0.95	-0.02
2542.10	Fe I	21039 - 60365	76.	7.4	0.87
2543.92	Fe I	20875 - 60172	75.	7.3	0.86
2544.71	Fe I	20641 - 59927	32.	3.2	0.50
2545.98	Fe I	704 - 39970	9.1	0.89	-0.05
2549.61	Fe I	416 - 39626	6.7	0.66	-0.18
2576.69	Fe I	6928 - 45726	5.9	0.58	-0.23
2584.54	Fe I	6928 - 45608	15.	1.5	0.17
2599.57	Fe I	7377 - 45833	18.	1.9	0.27
2605.65	Fe I	6928 - 45295	4.2	0.43	-0.37
2606.82	Fe I	7377 - 45726	9.5	0.97	-0.01
2618.02	Fe I	7728 - 45914	7.5	0.77	-0.11
2623.53	Fe I	7728 - 45833	9.2	0.95	-0.02
2629.59	Fe I	978 - 38996	0.36	0.037	-1.43
2632.24	Fe I	7986 - 45965	5.1	0.53	-0.27
2635.81	Fe I	7986 - 45914	10.	1.1	0.02
2641.65	Fe I	7377 - 45221	3.1	0.33	-0.49
2644.00	Fe I	8155 - 45965	7.7	0.81	-0.09
2647.56	Fe I	416 - 38175	0.21	0.023	-1.65
2656.15	Fe I	19390 - 57028	16.	1.7	0.23
2662.06	Fe I	7728 - 45282	1.6	0.17	-0.77
2666.82	Fe I	6928 - 44415	4.2	0.45	-0.35
2679.06	Fe I	6928 - 44244	7.2	0.78	-0.11
2689.21	Fe I	7377 - 44551	5.3	0.57	-0.24
2699.11	Fe I	7377 - 44415	3.4	0.37	-0.43
2706.02	Fe I	19390 - 56334	23.	2.5	0.40
2706.58	Fe I	7728 - 44664	8.2	0.90	-0.04
2708.57	Fe I	20641 - 57550	30.	3.2	0.51
2710.55	Fe I	12969 - 49851	3.3	0.36	-0.44
2711.65	Fe I	7377 - 44244	3.2	0.36	-0.45
2718.44	Fe I	7986 - 44761	4.7	0.52	-0.28
2719.02	Fe I	0 - 36767	13.	1.4	0.15
2720.90	Fe I	416 - 37158	6.6	0.74	-0.13
2723.58	Fe I	704 - 37410	4.2	0.46	-0.34
2724.96	Fe I	7728 - 44415	3.4	0.38	-0.42
2726.05	Fe I	8155 - 44827	3.8	0.43	-0.37
2728.02	Fe I	7377 - 44023	2.3	0.26	-0.59
2728.82	Fe I	19788 - 56423	19.	2.2	0.34
2733.58	Fe I	6928 - 43500	23.	2.6	0.42
2734.00	Fe I	7986 - 44551	1.3	0.15	-0.82
2734.27	Fe I	17550 - 54112	9.3	1.0	0.02
2735.48	Fe I	7377 - 43923	10.	1.2	0.07
2737.31	Fe I	888 - 37410	4.2	0.47	-0.33
2742.26	Fe I	7728 - 44184	3.2	0.36	-0.44
2742.41	Fe I	704 - 37158	3.1	0.35	-0.46
2743.56	Fe I	7728 - 44166	2.0	0.23	-0.64
2744.07	Fe I	978 - 37410	1.8	0.20	-0.69
2744.53	Fe I	7986 - 44411	2.6	0.29	-0.53
2746.98	Fe I	6928 - 43321	12.	1.4	0.13

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2750.14	Fe I	416 - 36767	3.5	0.40	-0.40
2750.88	Fe I	17550 - 53892	9.1	1.0	0.01
2753.69	Fe I	8155 - 44459	1.8	0.20	-0.70
2754.04	Fe I	7986 - 44285	1.7	0.19	-0.72
2756.26	Fe I	416 - 36686	1.2	0.13	-0.87
2757.32	Fe I	8155 - 44411	3.5	0.39	-0.40
2759.82	Fe I	8155 - 44378	0.86	0.098	-1.01
2761.78	Fe I	7986 - 44184	6.1	0.70	-0.16
2762.03	Fe I	7728 - 43923	6.0	0.69	-0.16
2763.11	Fe I	7986 - 44166	2.0	0.23	-0.64
2764.33	Fe I	17727 - 53892	6.1	0.70	-0.16
2766.91	Fe I	8155 - 44285	0.84	0.096	-1.02
2772.08	Fe I	6928 - 42992	5.2	0.60	-0.22
2774.73	Fe I	8155 - 44184	1.2	0.14	-0.85
2778.22	Fe I	6928 - 42912	4.3	0.50	-0.30
2781.84	Fe I	7986 - 43923	1.3	0.15	-0.81
2788.10	Fe I	6928 - 42784	19.	2.3	0.35
2789.80	Fe I	21716 - 57550	8.7	1.0	0.01
2791.79	Fe I	19621 - 55430	9.1	1.1	0.02
2795.01	Fe I	0 - 35768	0.077	0.0090	-2.05
2797.78	Fe I	7377 - 43109	2.4	0.29	-0.54
2804.52	Fe I	7377 - 43023	4.5	0.53	-0.28
2806.98	Fe I	7377 - 42992	4.7	0.56	-0.25
2813.29	Fe I	7377 - 42912	12.	1.4	0.16
2817.51	Fe I	7728 - 43210	0.63	0.075	-1.12
2823.28	Fe I	7728 - 43138	15.	1.8	0.27
2825.56	Fe I	7728 - 43109	4.6	0.55	-0.26
2825.69	Fe I	0 - 35379	0.10	0.012	-1.90
2828.81	Fe I	7986 - 43326	0.82	0.098	-1.01
2832.44	Fe I	7728 - 43023	9.6	1.2	0.06
2835.46	Fe I	0 - 35257	0.084	0.010	-1.99
2838.12	Fe I	7986 - 43210	3.2	0.38	-0.42
2840.42	Fe I	416 - 35612	0.093	0.011	-1.95
2843.63	Fe I	7377 - 42533	2.4	0.29	-0.54
2843.98	Fe I	7986 - 43138	8.1	0.98	-0.01
2845.60	Fe I	7728 - 42860	2.0	0.25	-0.61
2848.72	Fe I	7986 - 43079	0.49	0.060	-1.22
2851.80	Fe I	8155 - 43210	12.	1.5	0.17
2863.44	Fe I	11976 - 46889	4.6	0.56	-0.25
2863.86	Fe I	704 - 35612	0.15	0.018	-1.73
2866.63	Fe I	7986 - 42860	0.73	0.089	-1.05
2869.31	Fe I	416 - 35257	0.27	0.034	-1.47
2872.34	Fe I	7728 - 42533	1.3	0.16	-0.78
2874.17	Fe I	0 - 34782	0.30	0.037	-1.43
2875.30	Fe I	11976 - 46745	2.2	0.28	-0.56
2877.30	Fe I	11976 - 46721	4.4	0.55	-0.26
2887.81	Fe I	21716 - 56334	4.1	0.51	-0.29
2894.50	Fe I	18378 - 52916	23.	2.8	0.45
2895.04	Fe I	12561 - 47093	3.9	0.49	-0.31
2899.42	Fe I	18378 - 52858	11.	1.4	0.15

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2901.92	Fe I	19350 - 53800	6.3	0.80	-0.10
2907.52	Fe I	21999 - 56383	10.	1.3	0.12
2912.16	Fe I	0 - 34329	0.53	0.068	-1.17
2918.03	Fe I	26106 - 60366	44.	5.6	0.75
2920.69	Fe I	12969 - 47197	5.0	0.65	-0.19
2923.29	Fe I	26351 - 60549	44.	5.7	0.75
2923.85	Fe I	21716 - 55907	20.	2.5	0.41
2929.01	Fe I	416 - 34547	0.57	0.073	-1.14
2936.90	Fe I	0 - 34040	2.0	0.26	-0.59
2941.34	Fe I	704 - 34692	0.39	0.050	-1.30
2947.88	Fe I	416 - 34329	2.2	0.28	-0.55
2948.43	Fe I	21999 - 55906	14.	1.8	0.26
2953.94	Fe I	704 - 34547	1.7	0.23	-0.65
2957.36	Fe I	888 - 34692	0.96	0.13	-0.90
2959.99	Fe I	21716 - 55490	31.	4.1	0.61
2965.26	Fe I	978 - 34692	0.54	0.071	-1.15
2966.90	Fe I	0 - 33695	3.9	0.51	-0.29
2969.36	Fe I	888 - 34556	0.12	0.015	-1.82
2969.48	Fe I	6928 - 40594	1.3	0.17	-0.77
2970.10	Fe I	888 - 34547	0.98	0.13	-0.89
2973.13	Fe I	704 - 34329	1.6	0.22	-0.67
2973.24	Fe I	416 - 34040	3.0	0.40	-0.40
2976.13	Fe I	18378 - 51969	2.6	0.34	-0.47
2980.54	Fe I	22249 - 55791	4.0	0.53	-0.27
2981.45	Fe I	416 - 33947	0.68	0.091	-1.04
2981.85	Fe I	17550 - 51077	2.7	0.36	-0.45
2983.57	Fe I	0 - 33507	3.0	0.40	-0.39
2984.78	Fe I	6928 - 40422	1.8	0.24	-0.61
2986.46	Fe I	888 - 34363	0.033	0.0044	-2.35
2987.29	Fe I	7377 - 40842	2.1	0.28	-0.56
2990.39	Fe I	21999 - 55430	19.	2.6	0.42
2994.43	Fe I	416 - 33802	2.8	0.38	-0.42
2996.39	Fe I	19552 - 52916	2.9	0.39	-0.40
2999.51	Fe I	6928 - 40257	5.2	0.71	-0.15
3000.45	Fe I	11976 - 45295	3.0	0.41	-0.39
3000.95	Fe I	704 - 34017	2.8	0.37	-0.43
3003.03	Fe I	7728 - 41018	1.8	0.24	-0.61
3007.14	Fe I	11976 - 45221	2.1	0.28	-0.55
3007.28	Fe I	704 - 33947	0.25	0.033	-1.48
3008.14	Fe I	888 - 34122	2.3	0.32	-0.50
3009.57	Fe I	7377 - 40594	4.5	0.61	-0.21
3011.48	Fe I	22249 - 55446	20.	2.7	0.43
3016.18	Fe I	7986 - 41131	1.5	0.20	-0.69
3017.63	Fe I	888 - 34017	0.50	0.069	-1.16
3018.98	Fe I	7728 - 40842	3.1	0.43	-0.37
3020.49	Fe I	704 - 33802	1.4	0.20	-0.71
3020.64	Fe I	0 - 33096	5.5	0.75	-0.13
3021.07	Fe I	416 - 33507	3.5	0.48	-0.32
3024.03	Fe I	888 - 33947	0.64	0.088	-1.05
3025.64	Fe I	19390 - 52431	50.	6.8	0.84

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3025.84	Fe I	978 - 34017	0.96	0.13	-0.88
3026.46	Fe I	7986 - 41018	3.3	0.45	-0.35
3030.15	Fe I	19621 - 52613	54.	7.4	0.87
3031.22	Fe I	19788 - 52769	55.	7.6	0.88
3031.64	Fe I	8155 - 41131	3.6	0.49	-0.31
3037.39	Fe I	888 - 33802	2.3	0.31	-0.50
3040.43	Fe I	7377 - 40257	2.5	0.35	-0.46
3041.64	Fe I	12561 - 45428	4.5	0.62	-0.21
3041.74	Fe I	7728 - 40594	2.0	0.27	-0.57
3042.02	Fe I	8155 - 41018	1.1	0.15	-0.82
3042.66	Fe I	7986 - 40842	3.3	0.46	-0.34
3047.60	Fe I	704 - 33507	2.9	0.40	-0.40
3055.26	Fe I	12561 - 45282	3.7	0.51	-0.29
3057.45	Fe I	6928 - 39626	8.1	1.1	0.05
3059.09	Fe I	416 - 33096	2.0	0.28	-0.56
3067.24	Fe I	7377 - 39970	5.5	0.78	-0.11
3075.72	Fe I	7728 - 40231	5.0	0.72	-0.15
3083.74	Fe I	7986 - 40405	3.8	0.53	-0.27
3091.58	Fe I	8155 - 40491	3.2	0.46	-0.34
3099.90	Fe I	8155 - 40405	8.6	1.2	0.10
3100.30	Fe I	7986 - 40231	3.9	0.56	-0.25
3100.67	Fe I	7728 - 39970	3.6	0.52	-0.28
3116.63	Fe I	8155 - 40231	0.90	0.13	-0.88
3125.65	Fe I	7986 - 39970	1.5	0.23	-0.65
3175.45	Fe I	19351 - 50833	16.	2.4	0.38
3180.23	Fe I	19757 - 51192	34.	5.2	0.71
3184.90	Fe I	416 - 31805	0.086	0.013	-1.89
3191.66	Fe I	0 - 31323	0.087	0.013	-1.87
3192.80	Fe I	20020 - 51331	17.	2.7	0.43
3193.23	Fe I	0 - 31307	0.14	0.021	-1.68
3196.93	Fe I	19562 - 50833	55.	8.5	0.93
3199.52	Fe I	19562 - 50808	32.	4.9	0.69
3200.48	Fe I	19913 - 51149	36.	5.6	0.75
3205.40	Fe I	20020 - 51208	27.	4.2	0.62
3210.83	Fe I	19913 - 51048	17.	2.6	0.41
3211.99	Fe I	19351 - 50475	33.	5.1	0.70
3214.04	Fe I	19757 - 50862	70.	11.	1.03
3214.40	Fe I	704 - 31805	0.086	0.013	-1.87
3215.94	Fe I	19913 - 50999	17.	2.6	0.41
3217.38	Fe I	19351 - 50423	11.	1.7	0.22
3219.58	Fe I	19757 - 50808	28.	4.3	0.63
3219.81	Fe I	19562 - 50611	16.	2.4	0.39
3222.07	Fe I	19351 - 50378	73.	11.	1.06
3225.79	Fe I	19351 - 50342	107.	17.	1.22
3230.97	Fe I	19757 - 50699	16.	2.5	0.40
3233.97	Fe I	19562 - 50475	15.	2.4	0.38
3239.44	Fe I	19562 - 50423	65.	10.	1.01
3244.19	Fe I	19562 - 50378	48.	7.5	0.88
3265.62	Fe I	17550 - 48163	18.	2.9	0.47
3271.00	Fe I	17727 - 48290	22.	3.5	0.54

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3286.76	Fe I	17550 - 47967	38.	6.2	0.79
3305.97	Fe I	17727 - 47967	38.	6.3	0.80
3306.35	Fe I	17927 - 48163	40.	6.6	0.82
3355.23	Fe I	26627 - 56423	29.	4.8	0.68
3369.55	Fe I	21999 - 51668	22.	3.8	0.58
3370.79	Fe I	21716 - 51374	32.	5.4	0.73
3383.98	Fe I	17550 - 47093	9.1	1.6	0.19
3392.31	Fe I	17727 - 47197	8.2	1.4	0.15
3392.66	Fe I	17550 - 47017	17.	2.9	0.46
3399.34	Fe I	17727 - 47136	25.	4.4	0.64
3404.36	Fe I	17727 - 47093	17.	3.0	0.48
3407.46	Fe I	17550 - 46889	33.	5.7	0.76
3413.14	Fe I	17727 - 47017	26.	4.5	0.66
3417.84	Fe I	17927 - 47177	18.	3.1	0.49
3418.51	Fe I	17927 - 47172	18.	3.1	0.49
3422.66	Fe I	17927 - 47136	9.3	1.6	0.21
3424.29	Fe I	17550 - 46745	17.	3.0	0.47
3426.39	Fe I	17550 - 46727	7.4	1.3	0.11
3426.64	Fe I	17727 - 46902	7.7	1.4	0.13
3427.12	Fe I	17550 - 46721	34.	5.9	0.77
3428.20	Fe I	17727 - 46889	8.8	1.5	0.19
3440.61	Fe I	0 - 29056	2.8	0.50	-0.30
3440.99	Fe I	416 - 29469	0.64	0.11	-0.95
3443.88	Fe I	704 - 29733	0.34	0.061	-1.21
3445.15	Fe I	17727 - 46745	17.	3.0	0.48
3447.28	Fe I	17727 - 46727	5.3	0.94	-0.03
3450.33	Fe I	17927 - 46902	8.9	1.6	0.20
3451.92	Fe I	17927 - 46889	8.8	1.6	0.20
3452.28	Fe I	7728 - 36686	0.49	0.088	-1.06
3465.86	Fe I	888 - 29733	0.52	0.094	-1.03
3475.45	Fe I	704 - 29469	0.64	0.12	-0.93
3476.70	Fe I	978 - 29733	0.28	0.050	-1.30
3485.34	Fe I	17727 - 46410	5.9	1.1	0.03
3490.58	Fe I	416 - 29056	0.58	0.11	-0.98
3495.29	Fe I	20641 - 49243	11.	2.1	0.32
3497.11	Fe I	17550 - 46137	7.4	1.3	0.13
3497.84	Fe I	888 - 29469	0.19	0.036	-1.45
3506.50	Fe I	18378 - 46889	6.7	1.2	0.09
3513.82	Fe I	6928 - 35379	1.7	0.32	-0.50
3521.26	Fe I	7377 - 35768	1.7	0.32	-0.49
3526.04	Fe I	704 - 29056	0.13	0.024	-1.61
3526.17	Fe I	7728 - 36079	0.69	0.13	-0.89
3533.20	Fe I	23245 - 51540	23.	4.3	0.63
3536.56	Fe I	23193 - 51461	56.	11.	1.02
3541.09	Fe I	22997 - 51229	65.	12.	1.09
3542.08	Fe I	23111 - 51335	61.	11.	1.06
3553.74	Fe I	28820 - 56951	32.	6.0	0.78
3554.93	Fe I	22846 - 50968	73.	14.	1.14
3558.52	Fe I	7986 - 36079	3.5	0.66	-0.18
3565.38	Fe I	7728 - 35768	7.8	1.5	0.17

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3570.10	Fe I	7377 - 35379	18.	3.4	0.53
3581.20	Fe I	6928 - 34844	23.	4.4	0.64
3584.66	Fe I	21716 - 49604	27.	5.2	0.72
3585.32	Fe I	7728 - 35612	1.7	0.33	-0.49
3585.71	Fe I	7377 - 35257	1.3	0.25	-0.61
3586.11	Fe I	26106 - 53983	52.	10.	1.00
3586.99	Fe I	7986 - 35856	2.0	0.39	-0.41
3589.11	Fe I	6928 - 34782	0.26	0.050	-1.30
3594.64	Fe I	22997 - 50808	21.	4.0	0.60
3603.21	Fe I	21716 - 49461	33.	6.3	0.80
3605.46	Fe I	21999 - 49727	51.	10.	1.00
3606.68	Fe I	21716 - 49434	65.	13.	1.10
3608.86	Fe I	8155 - 35856	10.	2.0	0.30
3610.16	Fe I	22650 - 50342	48.	9.3	0.97
3617.79	Fe I	24336 - 51969	40.	7.9	0.90
3618.77	Fe I	7986 - 35612	9.5	1.9	0.27
3621.46	Fe I	21999 - 49604	50.	9.9	1.00
3622.00	Fe I	22249 - 49851	35.	6.9	0.84
3623.19	Fe I	19390 - 46982	9.5	1.9	0.27
3625.15	Fe I	22846 - 50423	12.	2.4	0.38
3631.46	Fe I	7728 - 35257	8.6	1.7	0.23
3632.04	Fe I	24772 - 52297	26.	5.2	0.71
3638.30	Fe I	22249 - 49727	28.	5.6	0.75
3640.39	Fe I	21999 - 49461	45.	9.0	0.95
3645.82	Fe I	25091 - 52512	20.	4.0	0.61
3647.84	Fe I	7377 - 34782	6.1	1.2	0.08
3649.51	Fe I	21716 - 49109	31.	6.1	0.79
3651.47	Fe I	22249 - 49628	64.	13.	1.11
3659.52	Fe I	19788 - 47107	9.9	2.0	0.30
3669.52	Fe I	21999 - 49243	32.	6.4	0.81
3677.63	Fe I	22249 - 49433	41.	8.4	0.92
3679.92	Fe I	0 - 27167	0.29	0.059	-1.23
3682.21	Fe I	28605 - 55754	79.	16.	1.21
3683.06	Fe I	416 - 27560	0.055	0.011	-1.95
3684.11	Fe I	21999 - 49135	21.	4.4	0.64
3686.00	Fe I	23711 - 50833	34.	7.0	0.85
3687.46	Fe I	6928 - 34040	2.5	0.51	-0.30
3689.46	Fe I	23711 - 50808	34.	7.0	0.85
3694.01	Fe I	24507 - 51570	72.	15.	1.17
3695.05	Fe I	20875 - 47930	12.	2.5	0.40
3701.09	Fe I	24181 - 51192	85.	17.	1.24
3704.46	Fe I	21716 - 48703	14.	3.0	0.47
3705.57	Fe I	416 - 27395	0.38	0.079	-1.10
3707.82	Fe I	704 - 27666	0.14	0.030	-1.53
3709.25	Fe I	7377 - 34329	2.9	0.59	-0.23
3716.45	Fe I	23711 - 50611	15.	3.2	0.51
3719.94	Fe I	0 - 26875	2.5	0.52	-0.29
3722.56	Fe I	704 - 27560	0.40	0.084	-1.08
3724.38	Fe I	18378 - 45221	5.9	1.2	0.09
3726.92	Fe I	24507 - 51331	8.7	1.8	0.26

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3727.62	Fe I	7728 - 34547	2.7	0.57	-0.25
3732.40	Fe I	17727 - 44512	7.2	1.5	0.18
3733.32	Fe I	888 - 27666	0.36	0.076	-1.12
3734.87	Fe I	6928 - 33695	20.	4.2	0.62
3737.13	Fe I	416 - 27167	1.5	0.32	-0.49
3738.31	Fe I	26351 - 53094	26.	5.5	0.74
3743.36	Fe I	7986 - 34692	2.3	0.48	-0.32
3745.56	Fe I	704 - 27395	1.2	0.24	-0.61
3745.90	Fe I	978 - 27666	0.31	0.066	-1.18
3748.26	Fe I	888 - 27560	0.71	0.15	-0.83
3749.49	Fe I	7377 - 34040	13.	2.7	0.43
3753.61	Fe I	17550 - 44184	3.9	0.82	-0.09
3758.24	Fe I	7728 - 34329	10.	2.2	0.34
3760.05	Fe I	19390 - 45978	5.5	1.2	0.07
3760.53	Fe I	17927 - 44512	0.97	0.21	-0.69
3763.79	Fe I	7986 - 34547	6.2	1.3	0.12
3765.54	Fe I	26106 - 52655	50.	11.	1.02
3767.19	Fe I	8155 - 34692	4.6	0.97	-0.01
3774.83	Fe I	17927 - 44411	0.59	0.13	-0.90
3776.46	Fe I	17550 - 44023	0.53	0.11	-0.94
3785.95	Fe I	19621 - 46027	2.9	0.62	-0.21
3786.68	Fe I	8155 - 34556	0.11	0.024	-1.62
3787.88	Fe I	8155 - 34547	1.7	0.36	-0.44
3790.10	Fe I	7986 - 34363	0.21	0.045	-1.35
3794.34	Fe I	19788 - 46136	3.0	0.65	-0.19
3795.00	Fe I	7986 - 34329	2.3	0.49	-0.31
3797.52	Fe I	26106 - 52431	21.	4.5	0.65
3798.51	Fe I	7377 - 33695	0.93	0.20	-0.70
3799.55	Fe I	7728 - 34040	1.5	0.33	-0.48
3805.34	Fe I	26628 - 52899	45.	9.7	0.99
3806.70	Fe I	26351 - 52613	21.	4.7	0.67
3807.54	Fe I	17927 - 44184	1.7	0.37	-0.44
3812.96	Fe I	7728 - 33947	1.0	0.22	-0.66
3815.84	Fe I	11976 - 38175	16.	3.6	0.56
3820.43	Fe I	6928 - 33096	12.	2.7	0.43
3821.18	Fe I	26351 - 52514	25.	5.4	0.73
3824.44	Fe I	0 - 26140	0.28	0.061	-1.22
3825.88	Fe I	7377 - 33507	8.9	1.9	0.29
3827.82	Fe I	12561 - 38678	15.	3.4	0.53
3833.31	Fe I	20641 - 46721	3.5	0.78	-0.11
3834.22	Fe I	7728 - 33802	3.9	0.86	-0.06
3839.26	Fe I	24575 - 50614	9.3	2.1	0.31
3840.44	Fe I	7986 - 34017	2.6	0.57	-0.25
3841.05	Fe I	12969 - 38996	10.	2.3	0.36
3843.26	Fe I	24575 - 50587	16.	3.5	0.55
3846.80	Fe I	26225 - 52213	20.	4.5	0.66
3849.97	Fe I	8155 - 34122	1.7	0.37	-0.43
3850.82	Fe I	7986 - 33947	0.22	0.049	-1.31
3852.58	Fe I	17550 - 43500	0.93	0.21	-0.68
3856.37	Fe I	416 - 26340	0.31	0.070	-1.15

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3859.22	Fe I	19390 - 45295	4.7	1.0	0.02
3859.91	Fe I	0 - 25900	1.4	0.31	-0.51
3865.53	Fe I	8155 - 34017	1.1	0.25	-0.61
3867.22	Fe I	24336 - 50187	5.0	1.1	0.05
3872.50	Fe I	7986 - 33802	1.0	0.23	-0.63
3873.76	Fe I	19621 - 45428	2.8	0.64	-0.20
3878.02	Fe I	7728 - 33507	1.4	0.32	-0.50
3878.58	Fe I	704 - 26479	0.33	0.074	-1.13
3885.51	Fe I	19552 - 45282	1.9	0.44	-0.36
3886.28	Fe I	416 - 26140	0.63	0.14	-0.84
3887.05	Fe I	7377 - 33096	0.88	0.20	-0.70
3888.52	Fe I	12969 - 38678	4.2	0.96	-0.02
3893.39	Fe I	23784 - 49461	7.7	1.7	0.24
3895.66	Fe I	888 - 26550	0.14	0.032	-1.50
3897.90	Fe I	21716 - 47363	4.9	1.1	0.05
3898.01	Fe I	8155 - 33802	0.11	0.024	-1.61
3899.71	Fe I	704 - 26340	0.21	0.047	-1.33
3902.95	Fe I	12561 - 38175	5.8	1.3	0.12
3903.90	Fe I	24119 - 49727	4.2	0.95	-0.02
3906.48	Fe I	888 - 26479	0.055	0.012	-1.90
3916.73	Fe I	26106 - 51630	6.4	1.5	0.17
3917.18	Fe I	7986 - 33507	0.11	0.026	-1.58
3918.65	Fe I	24339 - 49851	7.1	1.6	0.22
3920.26	Fe I	978 - 26479	0.14	0.032	-1.49
3922.91	Fe I	416 - 25900	0.18	0.042	-1.38
3927.92	Fe I	888 - 26340	0.26	0.061	-1.21
3930.30	Fe I	704 - 26140	0.27	0.062	-1.21
3935.82	Fe I	22838 - 48239	3.5	0.80	-0.10
3940.88	Fe I	7728 - 33096	0.041	0.0095	-2.02
3942.44	Fe I	22947 - 48305	2.5	0.57	-0.24
3948.78	Fe I	26351 - 51668	11.	2.7	0.42
3949.96	Fe I	17550 - 42860	1.4	0.33	-0.48
3951.17	Fe I	26406 - 51708	9.8	2.3	0.36
3952.61	Fe I	21716 - 47008	2.6	0.61	-0.21
3956.46	Fe I	26106 - 51374	11.	2.6	0.41
3956.68	Fe I	21716 - 46982	9.1	2.1	0.33
3966.07	Fe I	12969 - 38175	0.43	0.10	-1.00
3966.63	Fe I	25900 - 51103	8.9	2.1	0.32
3967.42	Fe I	26628 - 51826	10.0	2.4	0.37
3969.26	Fe I	11976 - 37163	4.4	1.0	0.02
3971.33	Fe I	21716 - 46889	3.2	0.75	-0.12
3977.74	Fe I	17727 - 42860	2.4	0.57	-0.24
3981.77	Fe I	21999 - 47107	2.7	0.64	-0.19
3983.96	Fe I	21999 - 47093	5.4	1.3	0.11
3997.40	Fe I	21999 - 47008	11.	2.5	0.40
3998.06	Fe I	21716 - 46721	3.7	0.88	-0.05
4005.25	Fe I	12561 - 37521	3.6	0.87	-0.06
4009.72	Fe I	17927 - 42860	1.4	0.34	-0.46
4014.53	Fe I	28820 - 53722	17.	4.2	0.62
4021.87	Fe I	22249 - 47107	5.4	1.3	0.12

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4045.82	Fe I	11976 - 36686	22.	5.3	0.72
4062.44	Fe I	22947 - 47556	4.6	1.1	0.06
4063.60	Fe I	12561 - 37163	9.9	2.5	0.39
4071.74	Fe I	12969 - 37521	9.1	2.3	0.36
4107.49	Fe I	22838 - 47177	5.6	1.4	0.16
4109.81	Fe I	22947 - 47272	4.3	1.1	0.04
4118.55	Fe I	28820 - 53094	33.	8.4	0.92
4127.61	Fe I	23052 - 47272	2.9	0.74	-0.13
4132.06	Fe I	12969 - 37163	2.7	0.69	-0.16
4134.68	Fe I	22838 - 47017	5.5	1.4	0.15
4143.42	Fe I	24575 - 48703	16.	4.1	0.62
4143.87	Fe I	12561 - 36686	2.9	0.76	-0.12
4147.67	Fe I	11976 - 36079	0.12	0.032	-1.49
4154.50	Fe I	22838 - 46902	5.3	1.4	0.14
4156.80	Fe I	22838 - 46889	5.3	1.4	0.14
4175.64	Fe I	22947 - 46889	4.7	1.2	0.09
4181.76	Fe I	22838 - 46745	10.	2.7	0.43
4184.90	Fe I	22838 - 46727	3.9	1.0	0.01
4187.04	Fe I	19757 - 43634	6.9	1.8	0.26
4187.80	Fe I	19562 - 43435	6.5	1.7	0.23
4191.44	Fe I	19913 - 43764	4.4	1.2	0.06
4198.31	Fe I	19351 - 43163	5.1	1.3	0.13
4199.10	Fe I	24575 - 48383	25.	6.5	0.82
4202.03	Fe I	11976 - 35768	2.0	0.52	-0.29
4203.99	Fe I	22947 - 46727	1.8	0.48	-0.32
4210.35	Fe I	20020 - 43764	2.2	0.59	-0.23
4216.19	Fe I	0 - 23711	0.0031	0.00082	-3.09
4219.36	Fe I	28820 - 52514	27.	7.3	0.86
4222.22	Fe I	19757 - 43435	2.0	0.54	-0.27
4227.43	Fe I	26875 - 50523	38.	10.	1.00
4233.61	Fe I	20020 - 43634	5.9	1.6	0.20
4235.94	Fe I	19562 - 43163	7.9	2.1	0.33
4238.82	Fe I	27395 - 50980	9.4	2.5	0.40
4247.43	Fe I	27167 - 50704	9.0	2.4	0.39
4250.13	Fe I	19913 - 43435	6.1	1.6	0.22
4250.79	Fe I	12561 - 36079	1.5	0.41	-0.38
4260.48	Fe I	19351 - 42816	15.	4.2	0.62
4271.16	Fe I	19757 - 43163	5.7	1.5	0.19
4271.76	Fe I	11976 - 35379	5.2	1.4	0.16
4282.41	Fe I	17550 - 40895	2.0	0.55	-0.26
4294.13	Fe I	11976 - 35257	0.71	0.20	-0.71
4299.24	Fe I	19562 - 42816	5.2	1.4	0.16
4307.91	Fe I	12561 - 35768	5.9	1.6	0.22
4315.09	Fe I	17727 - 40895	1.5	0.42	-0.38
4325.76	Fe I	12969 - 36079	6.1	1.7	0.24
4337.05	Fe I	12561 - 35612	0.23	0.064	-1.19
4352.74	Fe I	17927 - 40895	1.0	0.29	-0.54
4369.77	Fe I	24575 - 47453	2.2	0.64	-0.19
4375.93	Fe I	0 - 22846	0.0094	0.0027	-2.57
4383.55	Fe I	11976 - 34782	7.7	2.2	0.35

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4404.75	Fe I	12561 - 35257	4.4	1.3	0.11
4415.12	Fe I	12969 - 35612	2.8	0.81	-0.09
4427.31	Fe I	416 - 22997	0.0099	0.0029	-2.54
4442.34	Fe I	17727 - 40231	1.1	0.32	-0.50
4443.20	Fe I	23052 - 45552	1.9	0.57	-0.24
4447.72	Fe I	17927 - 40405	1.1	0.33	-0.48
4459.12	Fe I	17550 - 39970	1.00	0.30	-0.53
4461.65	Fe I	704 - 23111	0.0052	0.0015	-2.81
4466.55	Fe I	22838 - 45221	5.3	1.6	0.20
4476.02	Fe I	22947 - 45282	5.4	1.6	0.21
4482.17	Fe I	888 - 23193	0.0053	0.0016	-2.80
4494.57	Fe I	17727 - 39970	1.2	0.37	-0.44
4528.62	Fe I	17550 - 39626	1.8	0.57	-0.25
4531.15	Fe I	11976 - 34040	0.076	0.023	-1.63
4602.94	Fe I	11976 - 33695	0.088	0.028	-1.55
4736.78	Fe I	25900 - 47006	2.5	0.84	-0.08
4859.75	Fe I	23193 - 43764	1.3	0.45	-0.35
4871.32	Fe I	23111 - 43634	3.7	1.3	0.12
4872.15	Fe I	23245 - 43764	2.2	0.79	-0.10
4878.22	Fe I	23270 - 43764	0.77	0.27	-0.56
4890.77	Fe I	23193 - 43634	2.2	0.77	-0.11
4891.50	Fe I	22997 - 43435	4.7	1.7	0.22
4903.32	Fe I	23245 - 43634	0.62	0.22	-0.65
4919.00	Fe I	23111 - 43435	2.9	1.1	0.03
4920.50	Fe I	22846 - 43163	6.5	2.4	0.37
4957.31	Fe I	22997 - 43163	2.2	0.81	-0.09
4957.61	Fe I	22650 - 42816	6.4	2.4	0.38
5001.87	Fe I	31307 - 51294	4.7	1.7	0.24
5005.72	Fe I	31323 - 51294	3.9	1.5	0.16
5006.13	Fe I	22846 - 42816	1.3	0.47	-0.33
5012.07	Fe I	6928 - 26875	0.0067	0.0025	-2.60
5041.76	Fe I	11976 - 31805	0.023	0.0086	-2.07
5049.82	Fe I	18378 - 38175	0.27	0.10	-0.98
5051.64	Fe I	7377 - 27167	0.0061	0.0023	-2.63
5068.79	Fe I	23711 - 43435	0.60	0.23	-0.63
5083.34	Fe I	7728 - 27395	0.0052	0.0020	-2.69
5098.71	Fe I	17550 - 37158	0.10	0.040	-1.39
5110.41	Fe I	0 - 19562	0.0014	0.00057	-3.25
5133.68	Fe I	33695 - 53169	13.	5.1	0.71
5139.26	Fe I	24181 - 43634	1.6	0.64	-0.19
5139.48	Fe I	23711 - 43163	2.0	0.79	-0.10
5167.49	Fe I	11976 - 31323	0.26	0.11	-0.98
5171.60	Fe I	11976 - 31307	0.12	0.048	-1.31
5191.47	Fe I	24507 - 43764	2.7	1.1	0.04
5192.36	Fe I	24181 - 43435	3.7	1.5	0.18
5194.95	Fe I	12561 - 31805	0.070	0.028	-1.55
5202.34	Fe I	17550 - 36767	0.24	0.096	-1.02
5216.28	Fe I	12969 - 32134	0.064	0.026	-1.58
5226.88	Fe I	24507 - 43634	2.0	0.81	-0.09
5227.19	Fe I	12561 - 31686	0.27	0.11	-0.95

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5232.94	Fe I	23711 - 42816	5.8	2.4	0.37
5266.58	Fe I	24181 - 43163	2.9	1.2	0.08
5269.54	Fe I	6928 - 25900	0.098	0.041	-1.39
5270.36	Fe I	12969 - 31937	0.20	0.082	-1.09
5281.80	Fe I	24507 - 43435	1.3	0.53	-0.28
5283.63	Fe I	26140 - 45061	4.0	1.7	0.22
5302.31	Fe I	26479 - 45334	2.7	1.1	0.06
5324.18	Fe I	25900 - 44677	6.3	2.7	0.43
5328.05	Fe I	7377 - 26140	0.087	0.037	-1.43
5328.53	Fe I	12561 - 31323	0.052	0.022	-1.65
5339.94	Fe I	26340 - 45061	1.4	0.60	-0.22
5341.03	Fe I	12969 - 31686	0.042	0.018	-1.75
5364.88	Fe I	35856 - 54491	7.6	3.3	0.52
5367.46	Fe I	35612 - 54237	8.6	3.7	0.57
5369.96	Fe I	35257 - 53874	12.	5.1	0.71
5371.49	Fe I	7728 - 26340	0.062	0.027	-1.57
5383.37	Fe I	34782 - 53353	17.	7.2	0.86
5393.18	Fe I	26140 - 44677	1.8	0.80	-0.10
5397.13	Fe I	7377 - 25900	0.032	0.014	-1.85
5404.15	Fe I	35768 - 54267	22.	9.5	0.98
5405.78	Fe I	7986 - 26479	0.038	0.017	-1.78
5410.91	Fe I	36079 - 54555	12.	5.1	0.71
5415.21	Fe I	35379 - 53841	18.	7.8	0.89
5424.08	Fe I	34844 - 53275	19.	8.6	0.93
5429.70	Fe I	7728 - 26140	0.039	0.017	-1.76
5434.53	Fe I	8155 - 26550	0.028	0.012	-1.91
5445.04	Fe I	35379 - 54379	6.3	2.8	0.45
5446.92	Fe I	7986 - 26340	0.031	0.014	-1.86
5455.61	Fe I	8155 - 26479	0.022	0.0097	-2.01
5497.52	Fe I	8155 - 26340	0.0084	0.0038	-2.42
5501.47	Fe I	7728 - 25900	0.0047	0.0021	-2.67
5506.78	Fe I	7986 - 26140	0.0100	0.0045	-2.34
5569.62	Fe I	27560 - 45509	2.4	1.1	0.04
5572.85	Fe I	27395 - 45334	3.4	1.6	0.20
5576.11	Fe I	27666 - 45595	0.86	0.40	-0.40
5586.76	Fe I	27167 - 45061	4.2	2.0	0.29
5602.96	Fe I	27666 - 45509	0.96	0.45	-0.35
5615.65	Fe I	26875 - 44677	4.7	2.2	0.35
5624.55	Fe I	27560 - 45334	1.1	0.54	-0.26
5658.83	Fe I	27395 - 45061	1.3	0.61	-0.21
5763.01	Fe I	33947 - 51294	3.1	1.6	0.19
6024.06	Fe I	36686 - 53282	4.9	2.7	0.43
6065.49	Fe I	21039 - 37521	0.16	0.090	-1.04
6136.62	Fe I	19788 - 36079	0.28	0.16	-0.81
6137.70	Fe I	20875 - 37163	0.25	0.14	-0.85
6191.56	Fe I	19621 - 35768	0.17	0.098	-1.01
6230.73	Fe I	20641 - 36686	0.22	0.13	-0.89
6246.34	Fe I	29056 - 45061	0.82	0.48	-0.32
6252.56	Fe I	19390 - 35379	0.092	0.054	-1.27
6265.14	Fe I	17550 - 33507	0.023	0.013	-1.87

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6301.52	Fe I	29469 - 45334	0.77	0.46	-0.34
6318.02	Fe I	19788 - 35612	0.041	0.025	-1.61
6393.60	Fe I	19621 - 35257	0.076	0.046	-1.33
6400.02	Fe I	29056 - 44677	1.7	1.1	0.03
6411.66	Fe I	29469 - 45061	1.2	0.75	-0.13
6421.36	Fe I	18378 - 33947	0.042	0.026	-1.58
6430.85	Fe I	17550 - 33096	0.041	0.026	-1.59
6494.98	Fe I	19390 - 34782	0.20	0.13	-0.89
6546.24	Fe I	22249 - 37521	0.088	0.057	-1.25
6592.92	Fe I	21999 - 37163	0.12	0.079	-1.10
6677.99	Fe I	21716 - 36686	0.21	0.14	-0.85
6945.21	Fe I	19552 - 33947	0.023	0.016	-1.78
6978.86	Fe I	20038 - 34363	0.019	0.014	-1.85
7130.94	Fe I	34017 - 48037	1.8	1.4	0.14
7164.47	Fe I	33802 - 47756	2.3	1.7	0.24
7187.34	Fe I	33096 - 47006	4.7	3.7	0.56
7207.41	Fe I	33507 - 47378	3.1	2.4	0.39
7389.42	Fe I	34692 - 48221	1.9	1.6	0.20
7411.18	Fe I	34547 - 48037	2.2	1.8	0.25
7445.78	Fe I	34329 - 47756	4.1	3.4	0.53
7495.09	Fe I	34040 - 47378	4.9	4.1	0.61
7511.04	Fe I	33695 - 47006	7.4	6.3	0.80
7531.17	Fe I	35257 - 48532	1.8	1.5	0.18
7568.92	Fe I	34547 - 47756	0.90	0.77	-0.11
7583.80	Fe I	24339 - 37521	0.068	0.059	-1.23
7586.04	Fe I	34782 - 47961	3.1	2.7	0.43
7620.54	Fe I	38175 - 51294	1.8	1.5	0.19
7661.22	Fe I	34329 - 47378	0.55	0.49	-0.31
7664.30	Fe I	24119 - 37163	0.093	0.082	-1.08
7748.28	Fe I	23784 - 36686	0.14	0.12	-0.91
7780.59	Fe I	36079 - 48928	4.0	3.6	0.55
7832.22	Fe I	35768 - 48532	5.1	4.7	0.67
7937.17	Fe I	34782 - 47378	4.0	3.8	0.58
7945.88	Fe I	35379 - 47961	4.6	4.4	0.64
7998.97	Fe I	35257 - 47756	4.4	4.2	0.63
8028.34	Fe I	36079 - 48532	1.1	1.1	0.04
8046.07	Fe I	35612 - 48037	4.1	3.9	0.60
8085.20	Fe I	35856 - 48221	3.5	3.5	0.54
8198.95	Fe I	35768 - 47961	1.0	1.0	0.01
8220.41	Fe I	34844 - 47006	8.1	8.2	0.92
8232.35	Fe I	35612 - 47756	0.97	0.99	-0.00
8327.06	Fe I	17727 - 29733	0.083	0.086	-1.06
8331.94	Fe I	35379 - 47378	2.7	2.8	0.45
8339.43	Fe I	35768 - 47756	1.3	1.4	0.14
8387.78	Fe I	17550 - 29469	0.068	0.072	-1.14
8468.41	Fe I	17927 - 29733	0.025	0.027	-1.56
8514.08	Fe I	17727 - 29469	0.018	0.019	-1.71
8515.11	Fe I	24339 - 36079	0.038	0.042	-1.38
8611.81	Fe I	22947 - 34556	0.050	0.056	-1.25
8661.91	Fe I	17927 - 29469	0.070	0.079	-1.10

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
8674.75	Fe I	22838 - 34363	0.072	0.081	-1.09
8688.63	Fe I	17550 - 29056	0.13	0.14	-0.85
8757.19	Fe I	22947 - 34363	0.065	0.074	-1.13
8764.00	Fe I	37521 - 48928	3.6	4.1	0.61
8793.38	Fe I	37163 - 48532	2.5	2.9	0.46
8824.23	Fe I	17727 - 29056	0.073	0.085	-1.07
8866.96	Fe I	36686 - 47961	3.7	4.3	0.64
8999.56	Fe I	22838 - 33947	0.18	0.22	-0.65

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2332.80	Fe II	385 - 43239	15.	1.2	0.09
2338.00	Fe II	863 - 43621	9.5	0.78	-0.11
2343.49	Fe II	0 - 42658	20.	1.7	0.22
2348.10	Fe II	1873 - 44447	12.	1.0	0.00
2348.30	Fe II	668 - 43239	8.6	0.71	-0.15
2359.10	Fe II	863 - 43239	8.7	0.72	-0.14
2360.00	Fe II	1873 - 44233	11.	0.96	-0.02
2360.29	Fe II	2430 - 44785	12.	0.98	-0.01
2364.83	Fe II	385 - 42658	15.	1.2	0.09
2368.60	Fe II	2838 - 45044	14.	1.2	0.09
2373.73	Fe II	0 - 42115	17.	1.5	0.17
2375.19	Fe II	3118 - 45207	11.	0.96	-0.02
2379.28	Fe II	2430 - 44447	21.	1.8	0.26
2380.76	Fe II	668 - 42658	13.	1.1	0.04
2382.04	Fe II	0 - 41968	92.	7.8	0.89
2383.24	Fe II	2838 - 44785	14.	1.2	0.06
2384.39	Fe II	3118 - 45044	11.	0.93	-0.03
2388.63	Fe II	385 - 42237	26.	2.3	0.35
2395.62	Fe II	385 - 42115	96.	8.3	0.92
2399.24	Fe II	668 - 42335	34.	2.9	0.47
2404.43	Fe II	863 - 42440	7.0	0.61	-0.21
2404.88	Fe II	668 - 42237	100.	8.6	0.94
2406.66	Fe II	863 - 42401	33.	2.9	0.46
2410.52	Fe II	863 - 42335	33.	2.8	0.45
2411.07	Fe II	977 - 42440	25.	2.2	0.33
2413.31	Fe II	977 - 42401	26.	2.3	0.36
2424.14	Fe II	22637 - 63876	172.	15.	1.18
2430.07	Fe II	22810 - 63949	130.	11.	1.06
2444.51	Fe II	20831 - 61726	159.	14.	1.15
2445.56	Fe II	21812 - 62690	124.	11.	1.05
2458.78	Fe II	25805 - 66464	331.	30.	1.48
2493.18	Fe II	21430 - 61528	723.	67.	1.83
2511.76	Fe II	21712 - 61513	283.	27.	1.43
2525.39	Fe II	21252 - 60838	275.	26.	1.42
2526.30	Fe II	20831 - 60402	192.	18.	1.26
2529.55	Fe II	22637 - 62158	252.	24.	1.38
2533.63	Fe II	21430 - 60888	277.	27.	1.43
2534.42	Fe II	21712 - 61157	241.	23.	1.37
2536.82	Fe II	21582 - 60990	478.	46.	1.66
2538.81	Fe II	21430 - 60807	276.	27.	1.43
2539.00	Fe II	21252 - 60625	274.	26.	1.42
2543.38	Fe II	21582 - 60888	139.	13.	1.13
2550.02	Fe II	26353 - 65556	120.	12.	1.07
2562.53	Fe II	7955 - 46967	136.	13.	1.13
2563.47	Fe II	8392 - 47390	98.	9.7	0.99
2566.91	Fe II	8680 - 47626	48.	4.7	0.68
2574.37	Fe II	20831 - 59663	150.	15.	1.17
2577.92	Fe II	8847 - 47626	72.	7.2	0.86
2582.58	Fe II	8680 - 47390	68.	6.8	0.84
2585.88	Fe II	0 - 38660	42.	4.2	0.63

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2591.54	Fe II	8392 - 46967	62.	6.2	0.79
2593.73	Fe II	8847 - 47390	69.	6.9	0.84
2598.37	Fe II	385 - 38859	45.	4.6	0.66
2599.40	Fe II	0 - 38459	124.	13.	1.10
2607.09	Fe II	668 - 39013	47.	4.8	0.68
2611.87	Fe II	385 - 38660	53.	5.4	0.73
2613.82	Fe II	863 - 39109	24.	2.5	0.39
2617.62	Fe II	668 - 38859	22.	2.3	0.36
2620.41	Fe II	863 - 39013	6.6	0.68	-0.17
2621.67	Fe II	977 - 39109	13.	1.3	0.12
2625.67	Fe II	385 - 38459	28.	2.8	0.45
2628.29	Fe II	977 - 39013	23.	2.4	0.38
2631.05	Fe II	22810 - 60807	2249.	234.	2.37
2631.32	Fe II	668 - 38660	36.	3.8	0.58
2664.66	Fe II	27315 - 64832	342.	36.	1.56
2666.64	Fe II	27620 - 65110	247.	26.	1.42
2703.99	Fe II	27315 - 64286	195.	21.	1.33
2714.41	Fe II	7955 - 44785	73.	8.1	0.91
2727.54	Fe II	8392 - 45044	75.	8.4	0.92
2730.74	Fe II	8680 - 45290	40.	4.5	0.65
2736.97	Fe II	8680 - 45207	44.	4.9	0.69
2739.55	Fe II	7955 - 44447	265.	30.	1.47
2743.20	Fe II	8847 - 45290	126.	14.	1.15
2746.48	Fe II	8680 - 45080	178.	20.	1.30
2749.18	Fe II	8680 - 45044	50.	5.7	0.76
2749.32	Fe II	8392 - 44754	232.	26.	1.42
2753.29	Fe II	26353 - 62662	373.	42.	1.63
2755.74	Fe II	7955 - 44233	251.	29.	1.46
2767.50	Fe II	26170 - 62293	831.	95.	1.98
2926.59	Fe II	7955 - 42115	12.	1.5	0.18
2944.40	Fe II	13673 - 47626	32.	4.2	0.62
3227.75	Fe II	13474 - 44447	79.	12.	1.09

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2294.20	Ga I	0 - 43574	0.067	0.0053	-2.27
2338.28	Ga I	826 - 43578	0.23	0.019	-1.73
2371.32	Ga I	0 - 42158	0.14	0.012	-1.93
2418.70	Ga I	826 - 42158	0.63	0.056	-1.25
2450.07	Ga I	0 - 40803	4.1	0.37	-0.43
2500.17	Ga I	826 - 40811	7.3	0.68	-0.17
2500.70	Ga I	826 - 40803	0.67	0.063	-1.20
2624.82	Ga I	826 - 38913	0.086	0.0089	-2.05
2659.87	Ga I	0 - 37585	0.82	0.087	-1.06
2719.65	Ga I	826 - 37585	2.0	0.22	-0.66
2874.24	Ga I	0 - 34782	5.9	0.73	-0.14
2943.64	Ga I	826 - 34787	11.	1.5	0.17
2944.18	Ga I	826 - 34782	1.8	0.24	-0.63
4032.98	Ga I	0 - 24788	0.98	0.24	-0.62
4172.06	Ga I	826 - 24788	2.0	0.53	-0.27

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2778.76	Gd I	215 - 36192	2.2	0.26	-0.59
2787.68	Gd I	533 - 36395	3.6	0.41	-0.38
2903.75	Gd I	1719 - 36147	2.0	0.26	-0.59
3043.01	Gd I	999 - 33852	3.5	0.48	-0.32
3046.48	Gd I	533 - 33348	3.8	0.54	-0.27
3059.92	Gd I	215 - 32886	2.2	0.31	-0.51
3069.42	Gd I	215 - 32785	1.4	0.20	-0.70
3087.05	Gd I	0 - 32384	1.7	0.24	-0.62
3111.19	Gd I	1719 - 33852	4.8	0.70	-0.15
3119.01	Gd I	533 - 32585	2.3	0.33	-0.48
3127.25	Gd I	999 - 32967	2.0	0.30	-0.53
3136.93	Gd I	0 - 31869	3.0	0.44	-0.36
3137.30	Gd I	0 - 31865	3.0	0.44	-0.36
3138.71	Gd I	533 - 32384	2.2	0.32	-0.50
3158.63	Gd I	215 - 31865	3.7	0.56	-0.25
3167.20	Gd I	999 - 32564	1.8	0.28	-0.56
3190.28	Gd I	533 - 31869	4.2	0.64	-0.20
3199.30	Gd I	1719 - 32967	5.7	0.87	-0.06
3199.58	Gd I	533 - 31778	3.0	0.45	-0.34
3203.41	Gd I	999 - 32207	2.3	0.35	-0.45
3215.26	Gd I	999 - 32092	1.0	0.16	-0.80
3232.78	Gd I	533 - 31457	3.8	0.59	-0.23
3266.73	Gd I	533 - 31136	8.7	1.4	0.14
3267.64	Gd I	215 - 30809	3.7	0.60	-0.22
3282.25	Gd I	999 - 31457	4.5	0.73	-0.14
3291.48	Gd I	1719 - 32092	9.2	1.5	0.17
3294.08	Gd I	533 - 30882	6.5	1.1	0.03
3357.61	Gd I	533 - 30308	2.8	0.48	-0.32
3373.84	Gd I	0 - 29631	1.1	0.18	-0.74
3397.22	Gd I	1719 - 31147	3.6	0.63	-0.20
3406.92	Gd I	533 - 29877	2.3	0.40	-0.40
3411.02	Gd I	999 - 30308	2.9	0.50	-0.30
3423.90	Gd I	999 - 30197	14.	2.5	0.39
3455.27	Gd I	1719 - 30652	2.9	0.52	-0.28
3486.20	Gd I	533 - 29209	2.2	0.39	-0.41
3497.09	Gd I	533 - 29120	0.86	0.16	-0.80
3513.65	Gd I	999 - 29451	9.0	1.7	0.22
3525.15	Gd I	999 - 29359	1.1	0.21	-0.67
3583.65	Gd I	215 - 28112	0.74	0.14	-0.85
3588.21	Gd I	0 - 27861	0.55	0.11	-0.97
3596.84	Gd I	999 - 28793	0.99	0.19	-0.72
3604.87	Gd I	1719 - 29451	12.	2.3	0.37
3648.48	Gd I	1719 - 29120	1.00	0.20	-0.70
3658.19	Gd I	533 - 27861	1.4	0.28	-0.55
3674.05	Gd I	215 - 27425	6.2	1.3	0.10
3679.21	Gd I	533 - 27705	2.3	0.47	-0.33
3684.13	Gd I	0 - 27136	12.	2.3	0.37
3696.93	Gd I	0 - 27042	0.56	0.12	-0.94
3713.57	Gd I	215 - 27136	12.	2.4	0.38
3715.92	Gd I	215 - 27119	0.58	0.12	-0.92

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3717.48	Gd I	533 - 27425	13.	2.6	0.42
3726.57	Gd I	215 - 27042	0.51	0.11	-0.97
3732.32	Gd I	1719 - 28504	2.2	0.47	-0.33
3732.67	Gd I	533 - 27316	1.3	0.28	-0.55
3736.44	Gd I	1719 - 28475	0.85	0.18	-0.75
3739.76	Gd I	999 - 27731	3.3	0.70	-0.16
3744.83	Gd I	1719 - 28415	5.0	1.1	0.02
3751.10	Gd I	215 - 26866	0.54	0.11	-0.94
3757.94	Gd I	533 - 27136	5.9	1.2	0.09
3760.47	Gd I	7562 - 34147	4.2	0.90	-0.05
3762.20	Gd I	999 - 27572	5.6	1.2	0.08
3771.26	Gd I	533 - 27042	1.4	0.29	-0.53
3773.45	Gd I	7654 - 34147	8.5	1.8	0.26
3776.83	Gd I	7235 - 33705	7.5	1.6	0.21
3783.05	Gd I	999 - 27425	18.	3.9	0.59
3795.75	Gd I	999 - 27337	1.0	0.22	-0.66
3804.39	Gd I	7427 - 33705	7.6	1.6	0.22
3824.15	Gd I	7562 - 33705	4.6	1.0	0.00
3832.97	Gd I	533 - 26615	1.0	0.23	-0.64
3838.90	Gd I	999 - 27041	0.23	0.052	-1.29
3840.26	Gd I	215 - 26248	0.56	0.12	-0.91
3843.28	Gd I	1719 - 27731	9.9	2.2	0.34
3846.49	Gd I	6976 - 32967	4.7	1.0	0.02
3858.45	Gd I	6976 - 32886	4.0	0.89	-0.05
3864.79	Gd I	999 - 26866	0.67	0.15	-0.82
3866.99	Gd I	1719 - 27572	10.	2.3	0.36
3873.57	Gd I	6976 - 32785	6.8	1.5	0.19
3874.46	Gd I	533 - 26336	0.72	0.16	-0.79
3887.73	Gd I	533 - 26248	0.33	0.075	-1.12
3892.72	Gd I	7103 - 32785	1.2	0.27	-0.57
3897.32	Gd I	7235 - 32886	1.8	0.42	-0.38
3902.71	Gd I	999 - 26615	1.5	0.34	-0.47
3904.29	Gd I	215 - 25821	0.93	0.21	-0.67
3905.65	Gd I	1719 - 27316	2.7	0.62	-0.21
3912.75	Gd I	7235 - 32785	2.1	0.48	-0.32
3926.68	Gd I	7427 - 32886	3.1	0.72	-0.14
3934.79	Gd I	533 - 25940	4.8	1.1	0.05
3935.38	Gd I	0 - 25403	0.75	0.18	-0.76
3941.80	Gd I	1719 - 27081	2.5	0.59	-0.23
3942.63	Gd I	215 - 25572	2.2	0.51	-0.29
3943.24	Gd I	0 - 25353	0.93	0.22	-0.66
3943.62	Gd I	7235 - 32585	5.7	1.3	0.13
3945.54	Gd I	999 - 26337	6.4	1.5	0.17
3953.37	Gd I	533 - 25821	2.3	0.55	-0.26
3958.68	Gd I	0 - 25254	0.36	0.085	-1.07
3960.11	Gd I	6976 - 32221	4.4	1.0	0.02
3965.04	Gd I	7235 - 32448	1.9	0.46	-0.34
3966.28	Gd I	1719 - 26925	3.2	0.76	-0.12
3969.00	Gd I	215 - 25403	2.7	0.63	-0.20
3972.71	Gd I	0 - 25165	1.3	0.30	-0.52

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3974.81	Gd I	1719 - 26870	1.6	0.38	-0.42
3979.33	Gd I	215 - 25338	2.6	0.62	-0.21
3987.84	Gd I	0 - 25069	1.5	0.36	-0.44
3992.69	Gd I	533 - 25572	1.2	0.29	-0.54
4000.18	Gd I	6786 - 31778	1.4	0.33	-0.48
4006.96	Gd I	215 - 25165	0.36	0.086	-1.06
4008.33	Gd I	999 - 25940	1.3	0.32	-0.49
4013.43	Gd I	7427 - 32336	3.8	0.92	-0.04
4015.22	Gd I	7235 - 32133	3.6	0.87	-0.06
4015.58	Gd I	1719 - 26615	1.0	0.25	-0.60
4017.25	Gd I	7562 - 32448	7.9	1.9	0.28
4017.71	Gd I	6976 - 31859	9.5	2.3	0.36
4019.73	Gd I	533 - 25403	1.1	0.26	-0.58
4023.14	Gd I	1719 - 26568	5.4	1.3	0.11
4023.35	Gd I	533 - 25381	2.9	0.70	-0.16
4027.61	Gd I	999 - 25821	0.87	0.21	-0.68
4028.15	Gd I	6976 - 31795	23.	5.7	0.76
4030.88	Gd I	6976 - 31778	19.	4.5	0.66
4033.49	Gd I	7235 - 32020	16.	4.0	0.60
4035.40	Gd I	215 - 24989	1.1	0.27	-0.57
4036.84	Gd I	7235 - 32000	6.0	1.5	0.16
4043.71	Gd I	7427 - 32150	9.9	2.4	0.38
4044.02	Gd I	533 - 25254	0.15	0.036	-1.44
4045.01	Gd I	0 - 24715	4.8	1.2	0.07
4047.09	Gd I	7654 - 32356	6.9	1.7	0.23
4049.20	Gd I	7562 - 32252	6.7	1.6	0.22
4050.37	Gd I	7654 - 32336	6.9	1.7	0.23
4053.64	Gd I	999 - 25661	10.	2.5	0.39
4054.72	Gd I	0 - 24656	2.4	0.58	-0.24
4058.22	Gd I	215 - 24850	8.0	2.0	0.29
4059.88	Gd I	7235 - 31859	14.	3.6	0.55
4066.04	Gd I	7562 - 32150	6.3	1.6	0.19
4068.35	Gd I	7427 - 32000	12.	3.0	0.48
4068.74	Gd I	7562 - 32133	6.2	1.6	0.19
4078.70	Gd I	533 - 25044	9.2	2.3	0.36
4080.53	Gd I	215 - 24715	0.58	0.14	-0.84
4083.70	Gd I	6976 - 31457	10.	2.6	0.41
4090.41	Gd I	215 - 24656	1.9	0.48	-0.32
4091.75	Gd I	7427 - 31859	0.97	0.24	-0.61
4092.71	Gd I	1719 - 26146	4.8	1.2	0.08
4093.72	Gd I	7427 - 31848	5.8	1.5	0.16
4100.26	Gd I	999 - 25381	2.3	0.59	-0.23
4104.99	Gd I	7103 - 31457	2.0	0.49	-0.31
4112.94	Gd I	7562 - 31869	1.5	0.37	-0.43
4125.78	Gd I	8499 - 32730	1.6	0.40	-0.40
4134.16	Gd I	533 - 24715	2.3	0.59	-0.23
4138.03	Gd I	6976 - 31136	0.80	0.21	-0.69
4148.86	Gd I	1719 - 25815	1.2	0.30	-0.52
4149.48	Gd I	7235 - 31328	1.1	0.27	-0.56
4157.78	Gd I	999 - 25044	0.65	0.17	-0.77

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4171.71	Gd I	11830 - 35795	8.2	2.2	0.33
4175.54	Gd I	1719 - 25661	9.5	2.5	0.39
4182.77	Gd I	7235 - 31136	1.8	0.48	-0.32
4190.78	Gd I	999 - 24854	6.9	1.8	0.26
4191.63	Gd I	999 - 24850	2.4	0.63	-0.20
4208.08	Gd I	6550 - 30308	0.80	0.21	-0.67
4224.27	Gd I	7480 - 31147	1.2	0.33	-0.48
4225.03	Gd I	1719 - 25381	1.2	0.32	-0.49
4225.85	Gd I	1719 - 25376	18.	4.8	0.69
4245.34	Gd I	7103 - 30652	2.5	0.68	-0.17
4250.28	Gd I	6786 - 30308	0.97	0.26	-0.58
4260.12	Gd I	533 - 24000	2.1	0.56	-0.25
4262.09	Gd I	6786 - 30242	24.	6.5	0.82
4266.60	Gd I	999 - 24430	1.9	0.51	-0.29
4267.00	Gd I	215 - 23644	1.1	0.30	-0.52
4270.28	Gd I	6786 - 30197	0.79	0.22	-0.66
4274.17	Gd I	0 - 23390	0.65	0.18	-0.75
4285.82	Gd I	6550 - 29877	5.8	1.6	0.20
4286.12	Gd I	1719 - 25044	1.0	0.29	-0.54
4299.29	Gd I	6378 - 29631	5.4	1.5	0.18
4306.34	Gd I	0 - 23215	2.2	0.62	-0.21
4309.29	Gd I	7947 - 31147	5.0	1.4	0.14
4313.84	Gd I	215 - 23390	4.0	1.1	0.05
4314.40	Gd I	7480 - 30652	8.7	2.4	0.39
4320.52	Gd I	7103 - 30242	5.5	1.5	0.19
4327.12	Gd I	0 - 23104	3.9	1.1	0.04
4328.94	Gd I	7103 - 30197	1.8	0.50	-0.30
4329.58	Gd I	6786 - 29877	5.0	1.4	0.15
4331.38	Gd I	6550 - 29631	3.0	0.85	-0.07
4337.51	Gd I	• 6378 - 29426	1.7	0.47	-0.32
4346.46	Gd I	999 - 24000	5.6	1.6	0.20
4346.62	Gd I	215 - 23215	1.9	0.54	-0.27
4370.18	Gd I	6550 - 29426	2.3	0.67	-0.17
4373.83	Gd I	533 - 23390	2.1	0.61	-0.21
4376.07	Gd I	6786 - 29631	1.1	0.32	-0.50
4378.56	Gd I	7562 - 30395	3.1	0.89	-0.05
4389.88	Gd I	7103 - 29877	2.5	0.73	-0.14
4392.06	Gd I	7480 - 30242	4.3	1.2	0.09
4400.76	Gd I	7480 - 30197	1.3	0.38	-0.42
4401.86	Gd I	1719 - 24430	4.2	1.2	0.08
4403.14	Gd I	7947 - 30652	8.9	2.6	0.41
4409.25	Gd I	8498 - 31172	4.3	1.3	0.10
4411.16	Gd I	533 - 23196	1.1	0.32	-0.50
4413.44	Gd I	6976 - 29628	0.35	0.10	-0.99
4414.16	Gd I	8498 - 31147	17.	5.0	0.70
4414.73	Gd I	999 - 23644	1.7	0.49	-0.31
4422.41	Gd I	215 - 22821	2.7	0.78	-0.11
4430.63	Gd I	0 - 22564	1.9	0.56	-0.25
4431.76	Gd I	7947 - 30505	1.4	0.42	-0.37
4452.73	Gd I	12487 - 34938	2.2	0.65	-0.18

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4461.36	Gd I	7427 - 29835	0.45	0.13	-0.87
4473.28	Gd I	215 - 22564	0.12	0.035	-1.46
4476.12	Gd I	0 - 22335	1.4	0.43	-0.36
4485.48	Gd I	533 - 22821	0.052	0.016	-1.81
4486.90	Gd I	1719 - 24000	0.75	0.23	-0.64
4497.13	Gd I	999 - 23229	1.1	0.33	-0.49
4503.79	Gd I	999 - 23196	0.058	0.018	-1.75
4506.21	Gd I	533 - 22718	0.81	0.25	-0.61
4519.66	Gd I	215 - 22335	1.8	0.56	-0.25
4537.81	Gd I	533 - 22564	1.7	0.51	-0.29
4542.03	Gd I	215 - 22226	0.50	0.15	-0.81
4544.23	Gd I	7427 - 29426	0.81	0.25	-0.60
4564.59	Gd I	10884 - 32785	0.88	0.27	-0.56
4572.20	Gd I	6976 - 28842	0.92	0.29	-0.54
4573.81	Gd I	0 - 21858	0.19	0.061	-1.22
4575.91	Gd I	7947 - 29795	3.6	1.1	0.06
4581.29	Gd I	999 - 22821	0.81	0.25	-0.60
4583.07	Gd I	7480 - 29294	5.0	1.6	0.20
4584.26	Gd I	10576 - 32384	2.5	0.79	-0.10
4598.90	Gd I	7103 - 28842	4.4	1.4	0.15
4602.93	Gd I	999 - 22718	0.45	0.14	-0.84
4608.58	Gd I	533 - 22226	0.045	0.014	-1.84
4614.50	Gd I	6786 - 28451	5.0	1.6	0.20
4619.14	Gd I	10222 - 31865	1.6	0.53	-0.28
4624.42	Gd I	6550 - 28169	1.3	0.40	-0.39
4636.64	Gd I	6550 - 28112	3.8	1.2	0.09
4646.00	Gd I	11830 - 33348	6.7	2.2	0.34
4653.54	Gd I	6378 - 27861	3.6	1.2	0.06
4679.18	Gd I	12487 - 33852	7.8	2.6	0.41
4680.04	Gd I	7480 - 28842	2.8	0.93	-0.03
4683.07	Gd I	7103 - 28451	0.64	0.21	-0.68
4683.33	Gd I	7947 - 29294	5.4	1.8	0.25
4688.12	Gd I	533 - 21858	0.21	0.071	-1.15
4691.16	Gd I	6550 - 27861	0.72	0.24	-0.62
4694.33	Gd I	8498 - 29795	10.	3.3	0.52
4697.42	Gd I	6378 - 27660	3.4	1.1	0.05
4709.78	Gd I	999 - 22226	0.35	0.12	-0.93
4728.64	Gd I	533 - 21675	0.13	0.042	-1.37
4735.75	Gd I	6550 - 27660	2.1	0.69	-0.16
4743.65	Gd I	6786 - 27861	3.5	1.2	0.07
4745.82	Gd I	7103 - 28169	0.99	0.34	-0.47
4758.26	Gd I	533 - 21543	0.061	0.021	-1.68
4758.70	Gd I	7103 - 28112	2.9	1.00	-0.00
4760.74	Gd I	1719 - 22718	0.21	0.073	-1.14
4763.82	Gd I	10884 - 31869	3.4	1.2	0.06
4767.24	Gd I	7480 - 28451	4.7	1.6	0.21
4780.99	Gd I	11297 - 32207	1.9	0.64	-0.19
4781.92	Gd I	999 - 21905	0.29	0.100	-1.00
4784.62	Gd I	7947 - 28842	3.4	1.2	0.07
4786.75	Gd I	7562 - 28448	1.1	0.37	-0.43

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4807.45	Gd I	8498 - 29294	2.8	0.96	-0.02
4808.01	Gd I	13926 - 34719	2.6	0.88	-0.05
4816.83	Gd I	11830 - 32585	1.7	0.61	-0.22
4835.26	Gd I	999 - 21675	0.19	0.068	-1.17
4859.22	Gd I	10884 - 31457	1.8	0.64	-0.20
4861.78	Gd I	11297 - 31859	2.0	0.71	-0.15
4862.59	Gd I	10576 - 31136	2.3	0.83	-0.08
4871.50	Gd I	10360 - 30882	2.4	0.86	-0.07
4881.08	Gd I	11297 - 31778	2.3	0.81	-0.09
4881.36	Gd I	12487 - 32967	2.4	0.85	-0.07
4883.19	Gd I	10222 - 30695	1.7	0.60	-0.22
4910.12	Gd I	6976 - 27337	0.57	0.21	-0.69
4915.83	Gd I	7235 - 27572	0.26	0.094	-1.02
4916.60	Gd I	10222 - 30556	0.81	0.29	-0.53
4934.12	Gd I	11830 - 32092	8.1	3.0	0.47
4936.33	Gd I	10884 - 31136	1.9	0.70	-0.16
4938.61	Gd I	12487 - 32730	7.5	2.7	0.44
4950.11	Gd I	10360 - 30556	1.2	0.45	-0.35
4951.58	Gd I	11830 - 32020	0.92	0.34	-0.47
4952.47	Gd I	1719 - 21905	0.18	0.065	-1.19
4958.79	Gd I	11297 - 31457	3.1	1.2	0.06
4969.16	Gd I	10576 - 30695	1.9	0.71	-0.15
4972.61	Gd I	6976 - 27081	0.38	0.14	-0.85
4999.07	Gd I	10884 - 30882	1.6	0.59	-0.23
5011.74	Gd I	11830 - 31778	1.5	0.55	-0.26
5015.04	Gd I	8498 - 28433	7.9	3.0	0.47
5020.37	Gd I	7562 - 27476	0.22	0.082	-1.09
5039.09	Gd I	11297 - 31136	1.7	0.65	-0.19
5103.45	Gd I	7947 - 27536	7.6	3.0	0.47
5136.04	Gd I	7103 - 26568	0.48	0.19	-0.72
5141.50	Gd I	7480 - 26925	0.53	0.21	-0.68
5142.68	Gd I	7427 - 26866	0.52	0.21	-0.68
5155.84	Gd I	7480 - 26870	6.0	2.4	0.38
5158.48	Gd I	7235 - 26615	0.49	0.19	-0.71
5163.70	Gd I	6976 - 26337	0.45	0.18	-0.74
5171.69	Gd I	0 - 19331	0.036	0.014	-1.84
5187.88	Gd I	6550 - 25821	0.28	0.11	-0.95
5197.77	Gd I	7103 - 26337	2.5	1.00	-0.00
5217.48	Gd I	999 - 20160	0.091	0.037	-1.43
5219.40	Gd I	6786 - 25940	1.5	0.62	-0.21
5233.93	Gd I	7235 - 26336	0.78	0.32	-0.49
5246.87	Gd I	15665 - 34719	4.2	1.7	0.24
5251.18	Gd I	8498 - 27536	2.8	1.1	0.06
5252.14	Gd I	11067 - 30101	2.1	0.86	-0.06
5254.75	Gd I	6378 - 25403	0.40	0.17	-0.78
5255.80	Gd I	6550 - 25572	0.69	0.28	-0.55
5263.81	Gd I	533 - 19525	0.029	0.012	-1.92
5268.01	Gd I	7947 - 26925	0.16	0.065	-1.19
5268.78	Gd I	533 - 19507	0.057	0.024	-1.62
5271.79	Gd I	6976 - 25940	0.12	0.049	-1.31

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5272.91	Gd I	6378 - 25338	0.25	0.10	-0.99
5282.48	Gd I	10576 - 29502	0.80	0.34	-0.47
5283.08	Gd I	7947 - 26870	2.0	0.83	-0.08
5298.58	Gd I	10222 - 29090	0.43	0.18	-0.74
5301.67	Gd I	7480 - 26337	1.7	0.72	-0.14
5302.76	Gd I	6550 - 25403	1.0	0.43	-0.37
5306.70	Gd I	6976 - 25815	0.29	0.12	-0.92
5307.30	Gd I	7103 - 25940	1.5	0.65	-0.19
5321.25	Gd I	6550 - 25338	0.20	0.085	-1.07
5321.50	Gd I	6378 - 25165	0.57	0.24	-0.61
5321.78	Gd I	6786 - 25572	1.4	0.59	-0.23
5322.37	Gd I	10222 - 29006	0.42	0.18	-0.75
5322.69	Gd I	10576 - 29359	0.62	0.26	-0.58
5327.32	Gd I	10360 - 29126	1.5	0.62	-0.21
5328.30	Gd I	10222 - 28985	0.84	0.36	-0.45
5333.30	Gd I	10884 - 29628	2.7	1.1	0.06
5337.53	Gd I	10360 - 29090	0.72	0.31	-0.51
5341.17	Gd I	7103 - 25821	0.17	0.074	-1.13
5341.81	Gd I	1719 - 20434	0.038	0.016	-1.79
5343.00	Gd I	11297 - 30007	5.3	2.2	0.35
5345.13	Gd I	6550 - 25254	0.39	0.17	-0.77
5345.68	Gd I	999 - 19701	0.072	0.031	-1.51
5348.67	Gd I	6378 - 25069	0.89	0.38	-0.42
5350.38	Gd I	12487 - 31172	7.3	3.1	0.50
5353.26	Gd I	11830 - 30505	4.8	2.0	0.31
5361.66	Gd I	10360 - 29006	0.71	0.31	-0.51
5365.38	Gd I	10576 - 29209	1.4	0.58	-0.23
5367.70	Gd I	10360 - 28985	0.42	0.18	-0.74
5368.79	Gd I	7947 - 26568	0.21	0.093	-1.03
5369.61	Gd I	10884 - 29502	0.49	0.21	-0.67
5369.92	Gd I	6786 - 25403	0.46	0.20	-0.70
5370.63	Gd I	10222 - 28837	1.9	0.82	-0.09
5384.15	Gd I	10884 - 29451	0.65	0.28	-0.55
5389.50	Gd I	10576 - 29126	1.2	0.51	-0.29
5411.20	Gd I	10884 - 29359	0.40	0.17	-0.76
5413.20	Gd I	7103 - 25572	0.44	0.19	-0.72
5413.39	Gd I	6786 - 25254	0.20	0.087	-1.06
5415.69	Gd I	7480 - 25940	0.48	0.21	-0.67
5421.19	Gd I	1719 - 20160	0.047	0.021	-1.68
5436.30	Gd I	7947 - 26337	0.27	0.12	-0.92
5441.58	Gd I	8499 - 26870	0.20	0.088	-1.06
5453.46	Gd I	11297 - 29628	1.0	0.46	-0.34
5455.31	Gd I	10884 - 29209	0.46	0.20	-0.69
5469.72	Gd I	7103 - 25381	0.21	0.093	-1.03
5475.72	Gd I	6786 - 25044	0.095	0.043	-1.37
5480.23	Gd I	10884 - 29126	0.30	0.14	-0.87
5482.01	Gd I	10884 - 29120	0.30	0.14	-0.87
5493.42	Gd I	7947 - 26146	0.13	0.059	-1.23
5498.75	Gd I	7480 - 25661	0.14	0.064	-1.19
5499.97	Gd I	11830 - 30007	0.68	0.31	-0.51

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5521.75	Gd I	6550 - 24656	0.11	0.049	-1.31
5533.37	Gd I	6976 - 25044	0.096	0.044	-1.36
5548.20	Gd I	12487 - 30505	0.56	0.26	-0.59
5550.21	Gd I	6976 - 24989	0.085	0.039	-1.41
5559.73	Gd I	1719 - 19701	0.021	0.0099	-2.00
5572.53	Gd I	7103 - 25044	0.12	0.056	-1.25
5576.13	Gd I	6786 - 24715	0.15	0.072	-1.14
5586.32	Gd I	7480 - 25376	0.11	0.050	-1.30
5591.85	Gd I	14669 - 32548	2.0	0.94	-0.03
5594.13	Gd I	14036 - 31907	1.2	0.55	-0.26
5614.45	Gd I	1719 - 19525	0.020	0.0097	-2.01
5617.91	Gd I	0 - 17795	0.11	0.054	-1.26
5629.55	Gd I	215 - 17974	0.040	0.019	-1.72
5632.25	Gd I	0 - 17750	0.063	0.030	-1.52
5633.49	Gd I	7103 - 24850	0.14	0.066	-1.18
5643.24	Gd I	215 - 17931	0.16	0.076	-1.12
5653.33	Gd I	7654 - 25338	0.064	0.031	-1.51
5677.45	Gd I	14298 - 31907	1.0	0.49	-0.31
5686.66	Gd I	215 - 17795	0.013	0.0063	-2.20
5692.13	Gd I	7480 - 25044	0.17	0.084	-1.08
5696.22	Gd I	533 - 18084	0.25	0.12	-0.92
5701.35	Gd I	215 - 17750	0.058	0.028	-1.55
5709.42	Gd I	0 - 17510	0.036	0.018	-1.75
5710.32	Gd I	14669 - 32176	1.3	0.63	-0.20
5724.75	Gd I	11830 - 29294	0.66	0.32	-0.49
5735.98	Gd I	7947 - 25376	0.22	0.11	-0.97
5744.66	Gd I	215 - 17618	0.025	0.012	-1.91
5746.36	Gd I	533 - 17931	0.054	0.027	-1.57
5751.88	Gd I	0 - 17381	0.020	0.010	-1.99
5754.17	Gd I	7480 - 24854	0.38	0.19	-0.73
5776.02	Gd I	12487 - 29795	1.3	0.67	-0.17
5791.38	Gd I	533 - 17795	0.14	0.073	-1.14
5802.92	Gd I	533 - 17761	0.033	0.017	-1.78
5807.72	Gd I	6786 - 24000	0.19	0.095	-1.02
5809.22	Gd I	15852 - 33061	2.4	1.2	0.09
5823.97	Gd I	215 - 17381	0.024	0.012	-1.92
5851.63	Gd I	999 - 18084	0.14	0.073	-1.14
5856.22	Gd I	999 - 18070	0.18	0.095	-1.02
5904.56	Gd I	999 - 17931	0.069	0.036	-1.44
5916.77	Gd I	7103 - 24000	0.19	0.10	-1.00
5930.29	Gd I	6786 - 23644	0.28	0.15	-0.84
5936.84	Gd I	6550 - 23390	0.26	0.14	-0.87
5937.71	Gd I	6378 - 23215	0.18	0.097	-1.01
5977.25	Gd I	6378 - 23104	0.24	0.13	-0.89
5988.02	Gd I	15852 - 32548	4.3	2.3	0.36
5999.08	Gd I	6550 - 23215	0.25	0.13	-0.87
6021.13	Gd I	6786 - 23390	0.16	0.089	-1.05
6114.07	Gd I	1719 - 18070	0.30	0.17	-0.78
6292.87	Gd I	999 - 16886	0.016	0.0096	-2.02
6317.19	Gd I	999 - 16825	0.013	0.0079	-2.10

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
6331.35	Gd I	18014 - 33804	2.3	1.4	0.14
6333.75	Gd I	6550 - 22335	0.041	0.025	-1.61
6336.34	Gd I	6786 - 22564	0.044	0.026	-1.58
6351.72	Gd I	17795 - 33535	1.5	0.91	-0.04
6363.23	Gd I	16196 - 31907	0.61	0.37	-0.43
6408.55	Gd I	1719 - 17319	0.013	0.0079	-2.10
6424.52	Gd I	7654 - 23215	0.053	0.033	-1.48
6470.29	Gd I	18084 - 33535	1.1	0.69	-0.16
6538.15	Gd I	16886 - 32176	1.5	0.95	-0.02
6549.25	Gd I	17931 - 33195	1.1	0.73	-0.14
6564.78	Gd I	17319 - 32548	2.4	1.5	0.18
6573.80	Gd I	17750 - 32958	0.64	0.41	-0.38
6591.60	Gd I	1719 - 16886	0.020	0.013	-1.89
6593.42	Gd I	17795 - 32958	0.96	0.62	-0.20
6628.43	Gd I	16825 - 31907	0.40	0.26	-0.58
6640.08	Gd I	1719 - 16775	0.022	0.014	-1.84
6642.76	Gd I	12487 - 27536	0.14	0.092	-1.03
6643.98	Gd I	18014 - 33061	1.9	1.3	0.11
6646.85	Gd I	11297 - 26337	0.099	0.066	-1.18
6653.55	Gd I	18509 - 33535	0.76	0.50	-0.30
6692.86	Gd I	10884 - 25821	0.087	0.058	-1.24
6730.73	Gd I	999 - 15852	0.038	0.026	-1.59
6783.39	Gd I	11830 - 26568	0.14	0.100	-1.00
6814.56	Gd I	7235 - 21905	0.034	0.024	-1.62
6816.49	Gd I	999 - 15665	0.011	0.0073	-2.13
6828.25	Gd I	533 - 15174	0.034	0.023	-1.63
6849.89	Gd I	20160 - 34755	0.92	0.65	-0.19
6916.57	Gd I	215 - 14669	0.026	0.019	-1.72
6926.49	Gd I	10222 - 24656	0.13	0.097	-1.01
6964.33	Gd I	10360 - 24715	0.088	0.064	-1.19
6980.86	Gd I	20434 - 34755	2.8	2.1	0.31
6983.53	Gd I	11830 - 26146	0.074	0.054	-1.27
6991.92	Gd I	0 - 14298	0.017	0.012	-1.92
6993.18	Gd I	10360 - 24656	0.14	0.100	-1.00
7016.60	Gd I	7427 - 21675	0.033	0.024	-1.61
7052.79	Gd I	999 - 15174	0.0029	0.0022	-2.67
7071.00	Gd I	10576 - 24715	0.14	0.10	-0.98
7073.63	Gd I	1719 - 15852	0.0099	0.0074	-2.13
7084.18	Gd I	17795 - 31907	0.30	0.22	-0.65
7093.90	Gd I	18084 - 32176	0.32	0.24	-0.62
7098.11	Gd I	11297 - 25381	0.14	0.10	-0.99
7098.73	Gd I	215 - 14298	0.0037	0.0028	-2.55
7099.44	Gd I	12487 - 26568	0.076	0.057	-1.24
7100.71	Gd I	10576 - 24656	0.055	0.042	-1.38
7122.57	Gd I	0 - 14036	0.0081	0.0062	-2.21
7150.77	Gd I	7562 - 21543	0.018	0.014	-1.85
7158.28	Gd I	10884 - 24850	0.11	0.081	-1.09
7168.37	Gd I	1719 - 15665	0.089	0.068	-1.17
7198.63	Gd I	7562 - 21450	0.018	0.014	-1.85
7228.02	Gd I	10884 - 24715	0.080	0.063	-1.20

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7233.45	Gd I	215 - 14036	0.0058	0.0045	-2.34
7262.66	Gd I	533 - 14298	0.0076	0.0060	-2.22
7291.35	Gd I	215 - 13926	0.0031	0.0025	-2.60
7313.28	Gd I	999 - 14669	0.0070	0.0056	-2.25
7327.07	Gd I	20160 - 33804	0.90	0.73	-0.14
7373.81	Gd I	11297 - 24854	0.12	0.099	-1.01
7376.41	Gd I	11297 - 24850	0.12	0.099	-1.01
7377.77	Gd I	11830 - 25381	0.063	0.052	-1.29
7380.28	Gd I	11830 - 25376	0.13	0.10	-0.99
7430.19	Gd I	1719 - 15174	0.0055	0.0045	-2.34
7441.85	Gd I	0 - 13434	0.0060	0.0050	-2.30
7464.36	Gd I	533 - 13926	0.0096	0.0080	-2.10
7562.97	Gd I	215 - 13434	0.0097	0.0083	-2.08
7566.10	Gd I	11830 - 25044	0.052	0.045	-1.35
7588.20	Gd I	12487 - 25661	0.11	0.095	-1.02
7611.78	Gd I	11297 - 24430	0.078	0.067	-1.17
7621.96	Gd I	10884 - 24000	0.15	0.13	-0.89
7650.32	Gd I	10576 - 23644	0.13	0.12	-0.93
7672.56	Gd I	10360 - 23390	0.15	0.13	-0.89
7676.06	Gd I	11830 - 24854	0.088	0.078	-1.11
7677.16	Gd I	19525 - 32548	0.55	0.49	-0.31
7683.36	Gd I	19165 - 32176	0.50	0.44	-0.36
7694.45	Gd I	10222 - 23215	0.072	0.064	-1.20
7717.66	Gd I	7480 - 20434	0.011	0.0098	-2.01
7733.50	Gd I	999 - 13926	0.018	0.016	-1.79
7749.30	Gd I	533 - 13434	0.0062	0.0056	-2.25
7755.97	Gd I	12487 - 25376	0.10	0.093	-1.03
7834.46	Gd I	10884 - 23644	0.055	0.050	-1.30
7844.87	Gd I	10360 - 23104	0.063	0.058	-1.24
7845.80	Gd I	19165 - 31907	0.66	0.61	-0.22
7856.93	Gd I	6976 - 19701	0.075	0.070	-1.16
7869.72	Gd I	11297 - 24000	0.10	0.094	-1.03
7884.39	Gd I	7480 - 20160	0.010	0.0096	-2.02
7910.08	Gd I	10576 - 23215	0.037	0.035	-1.46
7966.66	Gd I	6976 - 19525	0.0073	0.0069	-2.16
7978.15	Gd I	6976 - 19507	0.012	0.011	-1.96
7993.82	Gd I	10884 - 23390	0.039	0.037	-1.43
8006.26	Gd I	7947 - 20434	0.017	0.016	-1.79
8019.82	Gd I	7235 - 19701	0.014	0.013	-1.87
8048.08	Gd I	7103 - 19525	0.012	0.011	-1.94
8077.59	Gd I	7103 - 19480	0.026	0.026	-1.59
8146.15	Gd I	7235 - 19507	0.037	0.037	-1.43
8185.90	Gd I	7947 - 20160	0.011	0.011	-1.97
8218.08	Gd I	7235 - 19400	0.023	0.023	-1.63
8275.42	Gd I	7427 - 19507	0.021	0.022	-1.67
8349.73	Gd I	7427 - 19400	0.021	0.022	-1.67
8374.76	Gd I	10884 - 22821	0.023	0.024	-1.61
8377.79	Gd I	11297 - 23229	0.026	0.027	-1.56
8398.30	Gd I	7427 - 19331	0.023	0.025	-1.61
8445.47	Gd I	7562 - 19400	0.021	0.022	-1.65

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
8527.88	Gd I	7562 - 19285	0.026	0.029	-1.54
8559.11	Gd I	10884 - 22564	0.026	0.028	-1.55
8561.72	Gd I	7653 - 19331	0.012	0.013	-1.89
8668.63	Gd I	6976 - 18509	0.036	0.040	-1.40
8674.86	Gd I	11297 - 22821	0.028	0.032	-1.50
8752.77	Gd I	11297 - 22718	0.035	0.041	-1.39
8770.36	Gd I	11830 - 23229	0.073	0.084	-1.08
8784.85	Gd I	6550 - 17931	0.019	0.021	-1.67
8795.76	Gd I	11830 - 23196	0.063	0.073	-1.13
8849.14	Gd I	6786 - 18084	0.022	0.025	-1.60
8867.31	Gd I	7235 - 18509	0.030	0.036	-1.45

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2468.22	Gd II	8551 - 49054	19.	1.8	0.25
2471.58	Gd II	8885 - 49332	12.	1.1	0.03
2485.67	Gd II	9329 - 49547	7.6	0.71	-0.15
2487.46	Gd II	9143 - 49332	15.	1.4	0.13
2488.72	Gd II	8885 - 49054	22.	2.1	0.31
2493.29	Gd II	9452 - 49547	12.	1.1	0.06
2496.35	Gd II	9452 - 49498	7.6	0.71	-0.15
2499.04	Gd II	9329 - 49332	8.8	0.83	-0.08
2543.68	Gd II	3444 - 42745	1.1	0.10	-0.98
2586.13	Gd II	3972 - 42628	1.0	0.11	-0.98
2661.50	Gd II	11492 - 49054	5.9	0.63	-0.20
2750.22	Gd II	3427 - 39777	7.5	0.85	-0.07
2764.08	Gd II	2857 - 39025	8.1	0.93	-0.03
2768.51	Gd II	3427 - 39537	0.82	0.095	-1.02
2769.81	Gd II	3444 - 39537	6.6	0.76	-0.12
2770.17	Gd II	3082 - 39170	4.2	0.49	-0.31
2770.98	Gd II	633 - 36711	0.19	0.022	-1.66
2779.14	Gd II	2857 - 38828	0.77	0.089	-1.05
2781.40	Gd II	3082 - 39025	7.8	0.90	-0.05
2791.96	Gd II	3444 - 39251	7.4	0.87	-0.06
2794.66	Gd II	2857 - 38629	1.7	0.19	-0.71
2796.93	Gd II	3427 - 39170	17.	2.0	0.30
2808.38	Gd II	3427 - 39025	1.0	0.12	-0.91
2809.72	Gd II	3444 - 39025	13.	1.6	0.20
2810.93	Gd II	3972 - 39537	3.3	0.40	-0.40
2833.75	Gd II	3972 - 39251	5.8	0.69	-0.16
2837.00	Gd II	3082 - 38320	1.0	0.12	-0.91
2840.23	Gd II	3972 - 39170	10.	1.3	0.10
2841.33	Gd II	3444 - 38629	2.2	0.27	-0.57
2856.52	Gd II	4027 - 39025	1.0	0.13	-0.89
2859.78	Gd II	4213 - 39170	0.35	0.043	-1.37
2862.48	Gd II	4852 - 39777	2.6	0.32	-0.50
2865.06	Gd II	3427 - 38320	0.86	0.11	-0.97
2871.75	Gd II	4213 - 39025	0.74	0.091	-1.04
2881.33	Gd II	4841 - 39537	9.8	1.2	0.09
2882.13	Gd II	4484 - 39170	0.77	0.096	-1.02
2905.31	Gd II	4841 - 39251	9.1	1.2	0.06
2906.26	Gd II	4852 - 39251	0.68	0.086	-1.06
2910.53	Gd II	3972 - 38320	2.6	0.33	-0.48
2913.08	Gd II	4852 - 39170	1.1	0.14	-0.85
2923.32	Gd II	5340 - 39537	2.0	0.25	-0.59
2928.34	Gd II	2857 - 36996	0.36	0.047	-1.33
2947.80	Gd II	3082 - 36996	0.37	0.048	-1.32
2948.01	Gd II	5340 - 39251	1.4	0.18	-0.74
2960.93	Gd II	3082 - 36845	0.71	0.093	-1.03
2965.43	Gd II	4841 - 38553	1.3	0.18	-0.75
2972.74	Gd II	3082 - 36711	0.28	0.038	-1.42
2980.15	Gd II	633 - 34179	2.7	0.36	-0.45
2991.52	Gd II	3427 - 36845	0.42	0.056	-1.25
2993.04	Gd II	3444 - 36845	0.95	0.13	-0.89

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2999.04	Gd II	262 - 33596	4.8	0.64	-0.19
3003.58	Gd II	3427 - 36711	0.69	0.093	-1.03
3009.37	Gd II	3427 - 36647	0.68	0.092	-1.04
3009.65	Gd II	4841 - 38058	0.50	0.069	-1.16
3010.13	Gd II	0 - 33212	7.7	1.0	0.02
3010.90	Gd II	3444 - 36647	0.79	0.11	-0.97
3012.19	Gd II	4841 - 38030	1.8	0.25	-0.60
3027.60	Gd II	1159 - 34179	9.1	1.2	0.10
3028.98	Gd II	4841 - 37846	1.6	0.22	-0.66
3032.84	Gd II	633 - 33596	8.7	1.2	0.08
3034.05	Gd II	262 - 33212	6.1	0.84	-0.08
3040.34	Gd II	4852 - 37734	0.78	0.11	-0.97
3053.57	Gd II	3972 - 36711	2.8	0.39	-0.41
3068.64	Gd II	633 - 33212	3.9	0.56	-0.26
3072.56	Gd II	10092 - 42628	30.	4.2	0.63
3076.92	Gd II	0 - 32491	2.0	0.28	-0.55
3077.08	Gd II	3972 - 36461	1.4	0.20	-0.69
3081.99	Gd II	1159 - 33596	8.8	1.3	0.10
3083.35	Gd II	262 - 32685	0.30	0.043	-1.36
3089.95	Gd II	10392 - 42745	16.	2.2	0.35
3092.06	Gd II	10633 - 42965	8.3	1.2	0.07
3098.64	Gd II	0 - 32263	1.4	0.19	-0.71
3098.90	Gd II	0 - 32260	0.54	0.078	-1.14
3100.50	Gd II	1935 - 34179	17.	2.5	0.40
3101.18	Gd II	10392 - 42628	6.3	0.91	-0.04
3101.91	Gd II	262 - 32491	0.72	0.10	-0.98
3102.55	Gd II	8551 - 40773	19.	2.7	0.43
3108.36	Gd II	10803 - 42965	7.6	1.1	0.04
3113.17	Gd II	10633 - 42745	9.1	1.3	0.12
3118.60	Gd II	10908 - 42965	7.0	1.0	0.01
3119.94	Gd II	262 - 32304	1.5	0.22	-0.66
3120.18	Gd II	8885 - 40925	3.5	0.51	-0.29
3123.99	Gd II	262 - 32263	1.1	0.16	-0.80
3124.25	Gd II	262 - 32260	0.34	0.050	-1.30
3128.56	Gd II	9143 - 41097	4.5	0.67	-0.18
3129.96	Gd II	9452 - 41392	3.6	0.53	-0.28
3130.81	Gd II	9329 - 41260	4.8	0.70	-0.16
3133.09	Gd II	0 - 31908	0.28	0.041	-1.39
3133.85	Gd II	8885 - 40785	15.	2.2	0.35
3135.03	Gd II	262 - 32150	0.60	0.088	-1.06
3142.90	Gd II	9452 - 41260	3.5	0.51	-0.29
3143.13	Gd II	4841 - 36647	2.4	0.35	-0.46
3145.00	Gd II	1159 - 32946	3.3	0.49	-0.31
3145.52	Gd II	9143 - 40925	13.	1.9	0.27
3146.88	Gd II	9329 - 41097	8.3	1.2	0.09
3156.53	Gd II	633 - 32304	3.5	0.52	-0.28
3160.69	Gd II	633 - 32263	0.48	0.072	-1.14
3161.37	Gd II	1935 - 33558	5.0	0.74	-0.13
3171.09	Gd II	1159 - 32685	0.35	0.053	-1.28
3193.17	Gd II	5340 - 36647	1.1	0.17	-0.78

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3206.47	Gd II	18369 - 49547	28.	4.2	0.63
3223.74	Gd II	1935 - 32946	3.0	0.46	-0.33
3226.32	Gd II	8551 - 39537	4.4	0.68	-0.17
3238.62	Gd II	10392 - 41260	4.0	0.63	-0.20
3250.19	Gd II	10633 - 41392	4.7	0.74	-0.13
3259.25	Gd II	10803 - 41476	5.3	0.84	-0.08
3268.34	Gd II	262 - 30850	0.33	0.054	-1.27
3274.18	Gd II	10392 - 40925	4.5	0.73	-0.14
3279.53	Gd II	10908 - 41392	5.2	0.83	-0.08
3281.61	Gd II	10633 - 41097	4.3	0.70	-0.16
3292.21	Gd II	8885 - 39251	9.8	1.6	0.20
3313.73	Gd II	3427 - 33596	1.8	0.29	-0.53
3315.59	Gd II	3444 - 33596	1.1	0.17	-0.76
3320.44	Gd II	9143 - 39251	4.9	0.82	-0.09
3329.34	Gd II	9143 - 39170	3.3	0.55	-0.26
3331.38	Gd II	0 - 30009	2.7	0.45	-0.35
3332.13	Gd II	8551 - 38553	18.	3.0	0.48
3336.18	Gd II	0 - 29966	2.1	0.35	-0.46
3336.98	Gd II	8551 - 38510	1.9	0.32	-0.50
3345.98	Gd II	0 - 29878	1.1	0.19	-0.73
3350.10	Gd II	9329 - 39170	5.1	0.86	-0.06
3350.47	Gd II	1159 - 30997	14.	2.4	0.37
3358.43	Gd II	3444 - 33212	1.3	0.23	-0.64
3358.62	Gd II	262 - 30027	8.6	1.5	0.16
3360.71	Gd II	262 - 30009	1.6	0.26	-0.58
3362.23	Gd II	633 - 30367	12.	2.0	0.30
3365.59	Gd II	262 - 29966	0.38	0.065	-1.19
3367.66	Gd II	10092 - 39777	4.6	0.78	-0.11
3369.62	Gd II	8885 - 38553	3.2	0.55	-0.26
3374.69	Gd II	3972 - 33596	1.2	0.20	-0.70
3379.76	Gd II	10392 - 39971	7.1	1.2	0.09
3380.52	Gd II	9452 - 39025	5.5	0.94	-0.03
3390.88	Gd II	9452 - 38934	2.2	0.38	-0.42
3392.53	Gd II	633 - 30101	2.2	0.38	-0.42
3393.63	Gd II	10633 - 40092	5.1	0.87	-0.06
3395.12	Gd II	10092 - 39537	16.	2.7	0.44
3399.41	Gd II	3082 - 32491	0.79	0.14	-0.86
3399.99	Gd II	2857 - 32260	2.0	0.35	-0.45
3401.07	Gd II	633 - 30027	0.22	0.038	-1.42
3402.07	Gd II	10392 - 39777	17.	2.9	0.47
3403.08	Gd II	9452 - 38828	2.6	0.45	-0.35
3405.04	Gd II	10803 - 40162	3.1	0.54	-0.27
3407.56	Gd II	10633 - 39971	36.	6.3	0.80
3409.30	Gd II	3427 - 32750	1.1	0.19	-0.71
3412.02	Gd II	9329 - 38629	2.5	0.43	-0.37
3413.27	Gd II	10803 - 40092	7.5	1.3	0.11
3416.95	Gd II	3427 - 32685	5.9	1.0	0.01
3417.33	Gd II	10908 - 40162	4.5	0.79	-0.10
3418.73	Gd II	0 - 29242	2.2	0.39	-0.41
3422.47	Gd II	1935 - 31146	19.	3.3	0.52

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3422.75	Gd II	1159 - 30367	0.87	0.15	-0.81
3424.59	Gd II	2857 - 32049	3.0	0.53	-0.28
3425.93	Gd II	3082 - 32263	1.5	0.26	-0.58
3426.34	Gd II	9143 - 38320	2.1	0.36	-0.44
3428.47	Gd II	10092 - 39251	5.9	1.0	0.02
3430.24	Gd II	10633 - 39777	3.4	0.60	-0.22
3432.99	Gd II	2857 - 31977	2.4	0.43	-0.37
3439.21	Gd II	3082 - 32150	6.2	1.1	0.04
3439.78	Gd II	3427 - 32491	3.4	0.60	-0.22
3439.99	Gd II	1935 - 30997	7.3	1.3	0.12
3441.79	Gd II	3444 - 32491	0.44	0.078	-1.11
3449.62	Gd II	262 - 29242	0.64	0.11	-0.94
3450.38	Gd II	3972 - 32946	6.4	1.1	0.06
3451.23	Gd II	3082 - 32049	3.9	0.70	-0.16
3454.14	Gd II	1159 - 30101	1.1	0.20	-0.70
3454.90	Gd II	262 - 29198	1.4	0.26	-0.59
3461.95	Gd II	3427 - 32304	0.84	0.15	-0.82
3463.00	Gd II	1159 - 30027	0.44	0.079	-1.10
3463.98	Gd II	3444 - 32304	11.	1.9	0.28
3466.50	Gd II	5340 - 34179	0.65	0.12	-0.93
3466.95	Gd II	3427 - 32263	1.3	0.23	-0.64
3467.27	Gd II	3427 - 32260	6.4	1.2	0.06
3468.08	Gd II	3082 - 31908	0.51	0.093	-1.03
3468.99	Gd II	3444 - 32263	6.4	1.2	0.06
3469.31	Gd II	3444 - 32260	0.30	0.055	-1.26
3473.22	Gd II	262 - 29045	2.1	0.39	-0.41
3481.28	Gd II	4841 - 33558	12.	2.2	0.34
3481.80	Gd II	3972 - 32685	7.3	1.3	0.12
3482.60	Gd II	3444 - 32150	1.8	0.33	-0.48
3491.95	Gd II	0 - 28629	1.4	0.25	-0.60
3494.40	Gd II	633 - 29242	2.8	0.51	-0.30
3503.21	Gd II	10633 - 39170	2.1	0.39	-0.40
3505.51	Gd II	3972 - 32491	5.7	1.1	0.02
3512.22	Gd II	3444 - 31908	2.8	0.51	-0.29
3512.50	Gd II	10092 - 38553	25.	4.6	0.66
3517.89	Gd II	10092 - 38510	2.2	0.41	-0.38
3524.20	Gd II	262 - 28629	1.4	0.26	-0.59
3528.54	Gd II	3972 - 32304	1.7	0.32	-0.50
3542.77	Gd II	5340 - 33558	3.1	0.58	-0.24
3545.80	Gd II	1159 - 29353	7.5	1.4	0.15
3549.36	Gd II	1935 - 30101	8.4	1.6	0.20
3553.72	Gd II	10803 - 38934	2.3	0.43	-0.36
3557.05	Gd II	4841 - 32946	6.6	1.2	0.10
3558.19	Gd II	8551 - 36647	7.3	1.4	0.14
3558.47	Gd II	4852 - 32946	2.1	0.39	-0.41
3564.05	Gd II	4213 - 32263	0.78	0.15	-0.83
3567.12	Gd II	10803 - 38828	2.7	0.52	-0.28
3567.65	Gd II	4027 - 32049	0.40	0.077	-1.11
3569.57	Gd II	4484 - 32491	0.41	0.079	-1.10
3571.93	Gd II	0 - 27988	0.82	0.16	-0.81

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3574.74	Gd II	10092 - 38058	6.8	1.3	0.11
3576.77	Gd II	4027 - 31977	0.36	0.069	-1.16
3578.36	Gd II	4213 - 32150	1.5	0.29	-0.54
3579.55	Gd II	10392 - 38320	2.2	0.41	-0.38
3580.62	Gd II	10908 - 38828	3.7	0.72	-0.14
3581.91	Gd II	8551 - 36461	13.	2.5	0.39
3584.96	Gd II	1159 - 29045	8.7	1.7	0.22
3587.19	Gd II	633 - 28502	0.20	0.039	-1.41
3590.47	Gd II	4841 - 32685	2.4	0.47	-0.33
3591.44	Gd II	4213 - 32049	0.33	0.064	-1.19
3591.91	Gd II	4852 - 32685	0.57	0.11	-0.95
3592.71	Gd II	8885 - 36711	15.	2.9	0.47
3593.44	Gd II	4484 - 32304	0.79	0.15	-0.81
3600.96	Gd II	8885 - 36647	7.4	1.4	0.16
3602.00	Gd II	10092 - 37846	1.9	0.37	-0.43
3605.66	Gd II	262 - 27988	0.31	0.060	-1.22
3608.75	Gd II	9143 - 36845	12.	2.4	0.38
3610.76	Gd II	10633 - 38320	18.	3.6	0.56
3613.39	Gd II	9329 - 36996	8.2	1.6	0.21
3614.21	Gd II	5897 - 33558	1.6	0.31	-0.51
3617.16	Gd II	10392 - 38030	8.8	1.7	0.24
3625.26	Gd II	8885 - 36461	2.2	0.43	-0.36
3626.32	Gd II	9143 - 36711	2.4	0.46	-0.33
3629.51	Gd II	9452 - 36996	3.9	0.77	-0.11
3634.76	Gd II	9143 - 36647	4.6	0.92	-0.04
3640.18	Gd II	4841 - 32304	1.0	0.21	-0.68
3641.39	Gd II	10392 - 37846	6.5	1.3	0.11
3645.62	Gd II	3427 - 30850	2.3	0.45	-0.34
3646.19	Gd II	1935 - 29353	10.	2.1	0.32
3649.44	Gd II	9452 - 36845	4.3	0.87	-0.06
3650.95	Gd II	9329 - 36711	6.1	1.2	0.09
3654.62	Gd II	633 - 27988	4.5	0.91	-0.04
3656.15	Gd II	1159 - 28502	4.1	0.83	-0.08
3662.26	Gd II	0 - 27298	1.4	0.28	-0.56
3671.20	Gd II	633 - 27865	2.3	0.47	-0.33
3687.74	Gd II	2857 - 29966	6.3	1.3	0.11
3697.73	Gd II	262 - 27298	2.0	0.41	-0.39
3699.73	Gd II	2857 - 29878	2.7	0.55	-0.26
3709.13	Gd II	6605 - 33558	0.35	0.072	-1.14
3712.70	Gd II	3082 - 30009	5.6	1.2	0.06
3716.36	Gd II	262 - 27162	1.3	0.28	-0.55
3722.07	Gd II	13926 - 40785	11.	2.2	0.35
3723.69	Gd II	13926 - 40773	2.7	0.56	-0.25
3730.84	Gd II	3082 - 29878	3.1	0.65	-0.19
3732.45	Gd II	633 - 27418	0.23	0.048	-1.32
3743.47	Gd II	1159 - 27865	5.2	1.1	0.04
3748.88	Gd II	11067 - 37734	2.3	0.48	-0.32
3755.56	Gd II	10092 - 36711	1.1	0.24	-0.61
3758.31	Gd II	3427 - 30027	3.1	0.65	-0.19
3759.00	Gd II	0 - 26595	0.66	0.14	-0.85

Wavelength A	Spectrum A	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3760.71	Gd II	3444 - 30027	1.3	0.28	-0.56
3760.92	Gd II	3427 - 30009	0.61	0.13	-0.89
3763.00	Gd II	1935 - 28502	0.21	0.045	-1.34
3763.33	Gd II	3444 - 30009	0.43	0.092	-1.03
3764.60	Gd II	10092 - 36647	2.3	0.48	-0.32
3767.04	Gd II	3427 - 29966	1.8	0.39	-0.41
3768.39	Gd II	633 - 27162	8.3	1.8	0.25
3769.45	Gd II	3444 - 29966	1.3	0.27	-0.56
3787.56	Gd II	3972 - 30367	2.7	0.57	-0.24
3791.17	Gd II	10092 - 36461	10.	2.2	0.34
3791.72	Gd II	4484 - 30850	0.22	0.048	-1.32
3795.25	Gd II	2857 - 29198	0.14	0.030	-1.52
3796.37	Gd II	262 - 26595	4.2	0.90	-0.04
3798.39	Gd II	10392 - 36711	2.3	0.50	-0.30
3807.65	Gd II	10392 - 36647	2.1	0.47	-0.33
3813.97	Gd II	0 - 26212	2.7	0.59	-0.23
3816.64	Gd II	262 - 26455	0.61	0.13	-0.88
3821.51	Gd II	3082 - 29242	0.11	0.023	-1.63
3822.17	Gd II	4841 - 30997	0.35	0.077	-1.12
3826.05	Gd II	3972 - 30101	0.77	0.17	-0.77
3831.80	Gd II	262 - 26352	0.28	0.062	-1.20
3836.91	Gd II	3972 - 30027	2.1	0.47	-0.33
3839.64	Gd II	3972 - 30009	2.2	0.49	-0.31
3843.80	Gd II	4841 - 30850	0.22	0.050	-1.30
3844.58	Gd II	1159 - 27162	1.4	0.31	-0.51
3845.47	Gd II	4852 - 30850	0.34	0.075	-1.13
3850.69	Gd II	633 - 26595	2.7	0.60	-0.22
3850.97	Gd II	0 - 25960	3.5	0.79	-0.10
3852.45	Gd II	262 - 26212	3.2	0.71	-0.15
3854.18	Gd II	4027 - 29966	0.29	0.064	-1.20
3855.56	Gd II	1935 - 27865	0.53	0.12	-0.92
3867.26	Gd II	4027 - 29878	0.28	0.063	-1.20
3871.54	Gd II	633 - 26455	0.11	0.024	-1.62
3872.62	Gd II	3427 - 29242	0.23	0.053	-1.28
3875.46	Gd II	4213 - 30009	0.45	0.10	-1.00
3881.84	Gd II	3444 - 29198	0.18	0.040	-1.39
3887.16	Gd II	633 - 26352	0.056	0.013	-1.90
3894.70	Gd II	0 - 25669	0.93	0.21	-0.68
3895.23	Gd II	4213 - 29878	0.35	0.079	-1.10
3902.40	Gd II	3427 - 29045	1.2	0.27	-0.56
3913.78	Gd II	12776 - 38320	1.4	0.32	-0.49
3916.51	Gd II	4841 - 30367	5.0	1.2	0.06
3918.24	Gd II	4852 - 30367	0.28	0.063	-1.20
3923.25	Gd II	4484 - 29966	0.94	0.22	-0.66
3952.00	Gd II	1159 - 26455	0.23	0.055	-1.26
3957.67	Gd II	4841 - 30101	2.6	0.61	-0.22
3959.44	Gd II	4852 - 30101	1.6	0.39	-0.41
3968.26	Gd II	1159 - 26352	0.45	0.11	-0.97
3969.29	Gd II	4841 - 30027	0.58	0.14	-0.87
3971.06	Gd II	4852 - 30027	0.30	0.071	-1.15

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3971.75	Gd II	4027 - 29198	0.77	0.18	-0.74
3973.98	Gd II	4852 - 30009	1.3	0.30	-0.52
3983.01	Gd II	5897 - 30997	0.43	0.10	-0.99
3987.21	Gd II	3972 - 29045	0.74	0.18	-0.76
3993.21	Gd II	633 - 25669	0.14	0.032	-1.49
3994.16	Gd II	4213 - 29242	1.1	0.27	-0.57
3997.76	Gd II	8551 - 33558	1.9	0.45	-0.35
4001.26	Gd II	4213 - 29198	0.81	0.19	-0.71
4003.85	Gd II	11492 - 36461	0.86	0.21	-0.69
4013.95	Gd II	3082 - 27989	0.10	0.025	-1.60
4037.33	Gd II	5340 - 30101	3.1	0.76	-0.12
4037.90	Gd II	4484 - 29242	1.2	0.30	-0.53
4045.15	Gd II	4484 - 29198	0.22	0.055	-1.26
4049.43	Gd II	5340 - 30027	2.8	0.69	-0.16
4059.37	Gd II	13926 - 38553	2.6	0.64	-0.19
4063.59	Gd II	4027 - 28629	0.79	0.20	-0.71
4070.29	Gd II	4484 - 29045	1.3	0.31	-0.51
4073.20	Gd II	3444 - 27988	0.80	0.20	-0.70
4073.76	Gd II	6605 - 31146	0.91	0.23	-0.65
4078.44	Gd II	4841 - 29353	2.3	0.59	-0.23
4085.56	Gd II	5897 - 30367	3.7	0.91	-0.04
4094.48	Gd II	4213 - 28629	0.38	0.097	-1.01
4098.61	Gd II	6605 - 30997	7.5	1.9	0.28
4098.90	Gd II	4852 - 29242	0.91	0.23	-0.64
4108.40	Gd II	12662 - 36996	1.2	0.30	-0.52
4115.38	Gd II	12704 - 36996	1.2	0.30	-0.52
4127.72	Gd II	12776 - 36996	0.68	0.17	-0.76
4130.37	Gd II	5897 - 30101	4.9	1.3	0.10
4132.28	Gd II	4852 - 29045	1.8	0.47	-0.33
4140.45	Gd II	4484 - 28629	0.18	0.046	-1.34
4141.02	Gd II	12704 - 36845	0.66	0.17	-0.77
4153.51	Gd II	12776 - 36845	1.6	0.43	-0.37
4154.86	Gd II	8885 - 32946	0.99	0.26	-0.59
4162.73	Gd II	3972 - 27988	0.68	0.18	-0.75
4163.09	Gd II	5340 - 29353	0.52	0.13	-0.87
4167.16	Gd II	3427 - 27418	0.30	0.078	-1.11
4170.11	Gd II	3444 - 27418	0.14	0.036	-1.44
4173.56	Gd II	12892 - 36845	1.8	0.48	-0.32
4184.25	Gd II	3972 - 27865	2.9	0.76	-0.12
4188.10	Gd II	3427 - 27298	0.090	0.024	-1.63
4191.07	Gd II	3444 - 27298	0.79	0.21	-0.68
4197.07	Gd II	12892 - 36711	1.6	0.42	-0.37
4204.86	Gd II	4213 - 27988	0.75	0.20	-0.70
4212.00	Gd II	3427 - 27162	1.3	0.35	-0.46
4215.02	Gd II	3444 - 27162	0.98	0.26	-0.58
4217.20	Gd II	5340 - 29045	1.1	0.30	-0.53
4223.02	Gd II	18955 - 42628	3.4	0.92	-0.04
4225.15	Gd II	4841 - 28502	0.24	0.064	-1.19
4227.14	Gd II	4852 - 28502	0.32	0.085	-1.07
4229.80	Gd II	13076 - 36711	3.2	0.87	-0.06

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4235.07	Gd II	8885 - 32491	0.25	0.066	-1.18
4241.28	Gd II	13076 - 36647	1.4	0.39	-0.41
4246.57	Gd II	9143 - 32685	0.99	0.27	-0.57
4251.73	Gd II	3082 - 26595	1.5	0.41	-0.39
4253.37	Gd II	4484 - 27988	1.1	0.30	-0.52
4268.73	Gd II	8885 - 32304	0.71	0.19	-0.71
4280.49	Gd II	2857 - 26212	0.72	0.20	-0.70
4296.08	Gd II	4027 - 27298	0.58	0.16	-0.80
4296.30	Gd II	13378 - 36647	2.1	0.58	-0.24
4310.98	Gd II	3972 - 27162	0.089	0.025	-1.60
4316.05	Gd II	5340 - 28502	0.78	0.22	-0.66
4316.27	Gd II	9143 - 32304	0.29	0.080	-1.10
4321.11	Gd II	4852 - 27988	0.99	0.28	-0.56
4322.20	Gd II	3082 - 26212	0.10	0.029	-1.54
4324.06	Gd II	9143 - 32263	0.57	0.16	-0.80
4325.57	Gd II	11067 - 34179	19.	5.5	0.74
4326.32	Gd II	17817 - 40925	2.2	0.61	-0.21
4330.61	Gd II	4213 - 27298	0.37	0.10	-0.98
4335.29	Gd II	17725 - 40785	1.8	0.52	-0.29
4341.28	Gd II	3427 - 26455	0.39	0.11	-0.96
4342.18	Gd II	4841 - 27865	1.2	0.33	-0.48
4344.30	Gd II	4852 - 27865	1.3	0.37	-0.43
4347.31	Gd II	10600 - 33596	1.4	0.39	-0.41
4359.15	Gd II	4484 - 27418	0.061	0.017	-1.76
4359.64	Gd II	9329 - 32260	0.14	0.041	-1.39
4360.92	Gd II	3427 - 26352	0.13	0.038	-1.42
4369.77	Gd II	3082 - 25960	0.23	0.065	-1.19
4380.64	Gd II	9329 - 32150	0.60	0.17	-0.76
4382.06	Gd II	4484 - 27298	0.11	0.031	-1.52
4383.12	Gd II	9452 - 32260	0.62	0.18	-0.75
4387.67	Gd II	3427 - 26212	0.15	0.043	-1.37
4390.95	Gd II	3444 - 26212	0.12	0.035	-1.45
4391.44	Gd II	9143 - 31908	0.26	0.075	-1.12
4394.72	Gd II	6605 - 29353	0.053	0.015	-1.82
4400.18	Gd II	9329 - 32049	0.14	0.039	-1.41
4406.67	Gd II	11492 - 34179	2.0	0.58	-0.24
4408.25	Gd II	4484 - 27162	0.27	0.080	-1.10
4419.03	Gd II	3972 - 26595	0.31	0.091	-1.04
4421.24	Gd II	10600 - 33212	0.82	0.24	-0.62
4424.10	Gd II	9452 - 32049	0.18	0.053	-1.27
4426.15	Gd II	3082 - 25669	0.038	0.011	-1.96
4427.61	Gd II	9329 - 31908	0.17	0.051	-1.29
4433.64	Gd II	10633 - 33182	0.25	0.074	-1.13
4438.27	Gd II	5340 - 27865	0.21	0.062	-1.21
4446.49	Gd II	3972 - 26455	0.066	0.020	-1.71
4453.93	Gd II	8551 - 30997	0.12	0.035	-1.45
4463.25	Gd II	10092 - 32491	0.26	0.078	-1.11
4466.55	Gd II	4213 - 26595	0.28	0.082	-1.08
4467.23	Gd II	10803 - 33182	0.44	0.13	-0.88
4471.29	Gd II	10392 - 32750	0.56	0.17	-0.78

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4478.80	Gd II	4841 - 27162	0.23	0.070	-1.16
4481.06	Gd II	4852 - 27162	0.30	0.091	-1.04
4483.33	Gd II	8551 - 30850	0.66	0.20	-0.70
4486.35	Gd II	18641 - 40925	3.4	1.0	0.01
4488.40	Gd II	10908 - 33182	0.38	0.11	-0.94
4498.28	Gd II	3444 - 25669	0.12	0.037	-1.43
4506.33	Gd II	4027 - 26212	0.12	0.035	-1.45
4506.93	Gd II	3427 - 25609	0.038	0.011	-1.94
4509.08	Gd II	10092 - 32263	0.25	0.075	-1.13
4514.50	Gd II	11067 - 33212	0.84	0.26	-0.59
4520.07	Gd II	10633 - 32750	0.34	0.10	-0.98
4521.30	Gd II	4484 - 26595	0.050	0.015	-1.82
4521.94	Gd II	18677 - 40785	3.8	1.2	0.07
4522.82	Gd II	11492 - 33596	2.0	0.62	-0.21
4540.02	Gd II	18753 - 40773	11.	3.4	0.53
4550.95	Gd II	5897 - 27865	0.086	0.027	-1.57
4554.99	Gd II	10803 - 32750	0.23	0.071	-1.15
4558.08	Gd II	4027 - 25960	0.092	0.029	-1.54
4570.98	Gd II	10392 - 32263	0.15	0.047	-1.33
4581.09	Gd II	5340 - 27162	0.095	0.030	-1.53
4582.38	Gd II	10092 - 31908	0.41	0.13	-0.89
4582.53	Gd II	8551 - 30367	0.35	0.11	-0.96
4596.98	Gd II	4213 - 25960	0.17	0.054	-1.27
4597.91	Gd II	4852 - 26595	0.30	0.096	-1.02
4601.05	Gd II	4484 - 26212	0.29	0.092	-1.03
4608.03	Gd II	19402 - 41097	1.8	0.58	-0.24
4639.00	Gd II	8551 - 30101	0.27	0.089	-1.05
4647.64	Gd II	1719 - 23229	0.063	0.021	-1.69
4654.99	Gd II	8551 - 30027	0.22	0.070	-1.15
4664.27	Gd II	17817 - 39251	1.5	0.48	-0.32
4666.45	Gd II	11067 - 32491	0.27	0.089	-1.05
4711.98	Gd II	8885 - 30101	0.14	0.046	-1.33
4728.47	Gd II	8885 - 30027	0.38	0.13	-0.89
4732.60	Gd II	8885 - 30009	0.55	0.18	-0.74
4734.43	Gd II	5340 - 26455	0.040	0.013	-1.87
4755.35	Gd II	18001 - 39025	1.0	0.36	-0.45
4786.91	Gd II	9143 - 30027	0.11	0.038	-1.42
4791.15	Gd II	9143 - 30009	0.11	0.038	-1.42
4801.05	Gd II	9143 - 29966	0.36	0.12	-0.91
4802.58	Gd II	4852 - 25669	0.024	0.0085	-2.07
4803.54	Gd II	11492 - 32304	0.19	0.064	-1.19
4805.82	Gd II	8551 - 29353	0.058	0.020	-1.70
4834.23	Gd II	9328 - 30009	0.22	0.078	-1.11
4865.02	Gd II	9329 - 29878	0.43	0.15	-0.81
4873.34	Gd II	9452 - 29966	0.083	0.030	-1.53
4881.92	Gd II	18151 - 38629	0.80	0.29	-0.54
4894.30	Gd II	9452 - 29878	0.22	0.078	-1.11
4923.58	Gd II	17725 - 38030	1.6	0.60	-0.22
4965.05	Gd II	19402 - 39537	1.1	0.39	-0.41
4968.58	Gd II	17725 - 37846	0.52	0.19	-0.71

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4998.37	Gd II	18319 - 38320	1.5	0.56	-0.25
5010.82	Gd II	8551 - 28502	0.11	0.043	-1.37
5019.36	Gd II	10092 - 30009	0.087	0.033	-1.48
5023.13	Gd II	9143 - 29045	0.11	0.042	-1.38
5031.29	Gd II	13076 - 32946	0.40	0.15	-0.82
5031.56	Gd II	9329 - 29198	0.081	0.031	-1.51
5050.88	Gd II	12892 - 32685	0.37	0.14	-0.85
5062.86	Gd II	9452 - 29198	0.058	0.022	-1.65
5071.02	Gd II	12776 - 32491	0.24	0.091	-1.04
5092.25	Gd II	13926 - 33558	0.72	0.28	-0.55
5096.06	Gd II	8885 - 28502	0.12	0.045	-1.35
5098.38	Gd II	13076 - 32685	0.75	0.29	-0.53
5100.94	Gd II	12892 - 32491	0.30	0.12	-0.94
5108.91	Gd II	13378 - 32946	1.1	0.45	-0.35
5125.56	Gd II	11492 - 30997	0.43	0.17	-0.77
5130.28	Gd II	12776 - 32263	0.34	0.13	-0.88
5140.84	Gd II	12704 - 32150	0.43	0.17	-0.76
5149.38	Gd II	13076 - 32491	0.084	0.033	-1.48
5149.84	Gd II	12892 - 32304	0.17	0.068	-1.17
5156.76	Gd II	12662 - 32049	0.26	0.11	-0.98
5160.90	Gd II	12892 - 32263	0.23	0.090	-1.05
5164.54	Gd II	11492 - 30850	0.19	0.076	-1.12
5176.28	Gd II	8551 - 27865	0.29	0.12	-0.93
5178.10	Gd II	13378 - 32685	0.22	0.089	-1.05
5178.84	Gd II	19947 - 39251	1.6	0.65	-0.19
5179.92	Gd II	11067 - 30367	0.12	0.047	-1.33
5186.92	Gd II	12704 - 31977	0.21	0.084	-1.07
5187.24	Gd II	12776 - 32049	0.27	0.11	-0.97
5191.08	Gd II	12892 - 32150	0.27	0.11	-0.96
5199.21	Gd II	13076 - 32304	0.23	0.093	-1.03
5200.55	Gd II	19947 - 39170	0.99	0.40	-0.39
5210.49	Gd II	13076 - 32263	0.28	0.12	-0.94
5220.30	Gd II	10092 - 29242	0.17	0.069	-1.16
5357.79	Gd II	9329 - 27988	0.070	0.030	-1.52
5372.22	Gd II	11492 - 30101	0.11	0.048	-1.32
5419.88	Gd II	10600 - 29045	0.060	0.026	-1.58
5500.43	Gd II	11067 - 29242	0.089	0.041	-1.39
5545.01	Gd II	10600 - 28629	0.043	0.020	-1.70
5560.69	Gd II	11067 - 29045	0.073	0.034	-1.47
5583.68	Gd II	8551 - 26455	0.059	0.028	-1.56
5586.16	Gd II	10092 - 27988	0.022	0.010	-1.99
5597.21	Gd II	11492 - 29353	0.048	0.023	-1.64
5616.21	Gd II	8551 - 26352	0.029	0.014	-1.86
5621.43	Gd II	18677 - 36461	0.32	0.15	-0.82
5644.84	Gd II	8885 - 26595	0.031	0.015	-1.83
5721.99	Gd II	13378 - 30850	0.084	0.041	-1.39
5733.86	Gd II	11067 - 28502	0.24	0.12	-0.93
5749.41	Gd II	10600 - 27988	0.066	0.033	-1.49
5774.56	Gd II	9143 - 26455	0.020	0.0098	-2.01
5807.05	Gd II	12662 - 29878	0.081	0.041	-1.39

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5815.85	Gd II	12776 - 29966	0.17	0.084	-1.08
5820.99	Gd II	12704 - 29878	0.13	0.066	-1.18
5840.47	Gd II	12892 - 30009	0.17	0.086	-1.06
5845.71	Gd II	12776 - 29878	0.065	0.033	-1.48
5855.24	Gd II	12892 - 29966	0.17	0.086	-1.07
5856.96	Gd II	9143 - 26212	0.046	0.024	-1.62
5860.73	Gd II	8551 - 25609	0.049	0.025	-1.60
5877.26	Gd II	11492 - 28502	0.13	0.069	-1.16
5897.62	Gd II	13076 - 30027	0.14	0.071	-1.15
5904.07	Gd II	13076 - 30009	0.17	0.089	-1.05
5951.60	Gd II	11067 - 27865	0.094	0.050	-1.30
5956.48	Gd II	8885 - 25669	0.051	0.027	-1.57
6004.57	Gd II	13378 - 30027	0.17	0.094	-1.03
6080.65	Gd II	13926 - 30367	0.19	0.11	-0.97
6180.42	Gd II	13927 - 30104	0.18	0.10	-0.98
6305.15	Gd II	10600 - 26455	0.093	0.056	-1.25
6346.65	Gd II	10600 - 26352	0.033	0.020	-1.71
6380.95	Gd II	13378 - 29045	0.098	0.060	-1.22
6480.11	Gd II	13926 - 29353	0.044	0.027	-1.56
6568.00	Gd II	17725 - 32946	0.10	0.067	-1.17
6610.04	Gd II	13378 - 28502	0.030	0.020	-1.71
6634.36	Gd II	10600 - 25669	0.068	0.045	-1.35
6681.23	Gd II	11492 - 26455	0.057	0.038	-1.42
6702.12	Gd II	18641 - 33558	0.11	0.071	-1.15
6704.18	Gd II	13076 - 27988	0.026	0.018	-1.75
6718.14	Gd II	18677 - 33558	0.17	0.11	-0.94
6727.83	Gd II	11492 - 26352	0.028	0.019	-1.73
6752.67	Gd II	18753 - 33558	0.64	0.44	-0.36
6846.60	Gd II	11067 - 25669	0.046	0.033	-1.49
6857.13	Gd II	17725 - 32304	0.26	0.19	-0.73
6900.73	Gd II	17817 - 32304	0.12	0.087	-1.06
6920.62	Gd II	17817 - 32263	0.19	0.14	-0.87
6945.98	Gd II	17870 - 32263	0.15	0.11	-0.96
6959.24	Gd II	18319 - 32685	0.15	0.11	-0.95
6971.66	Gd II	18151 - 32491	0.15	0.11	-0.97
6988.75	Gd II	18641 - 32946	0.11	0.081	-1.09
6996.76	Gd II	17972 - 32260	0.53	0.39	-0.41
7000.75	Gd II	17870 - 32150	0.15	0.11	-0.96
7006.16	Gd II	18677 - 32946	0.46	0.34	-0.47
7017.73	Gd II	18245 - 32491	0.082	0.060	-1.22
7051.00	Gd II	17972 - 32150	0.15	0.11	-0.95
7054.62	Gd II	18319 - 32491	0.15	0.11	-0.96
7058.02	Gd II	18096 - 32260	0.11	0.080	-1.09
7085.52	Gd II	18151 - 32260	0.077	0.058	-1.24
7101.73	Gd II	17972 - 32049	0.036	0.028	-1.56
7116.77	Gd II	18001 - 32049	0.10	0.078	-1.11
7118.86	Gd II	18641 - 32685	0.26	0.20	-0.70
7133.16	Gd II	18245 - 32260	0.093	0.071	-1.15
7141.17	Gd II	18151 - 32150	0.060	0.046	-1.34
7146.13	Gd II	17988 - 31977	0.065	0.050	-1.31

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
7172.26	Gd II	13926 - 27865	0.068	0.052	-1.28
7173.40	Gd II	17972 - 31908	0.042	0.033	-1.48
7189.57	Gd II	18245 - 32150	0.30	0.24	-0.63
7197.08	Gd II	18369 - 32260	0.14	0.11	-0.96
7242.24	Gd II	18245 - 32049	0.067	0.053	-1.28
7252.70	Gd II	13378 - 27162	0.037	0.030	-1.53
7385.97	Gd II	18955 - 32491	0.10	0.084	-1.07
7394.90	Gd II	13076 - 26595	0.029	0.024	-1.62
7505.35	Gd II	12892 - 26212	0.012	0.010	-2.00
7748.37	Gd II	19402 - 32304	0.034	0.031	-1.51
7908.06	Gd II	17725 - 30367	0.030	0.028	-1.55
8089.96	Gd II	19947 - 32304	0.036	0.035	-1.46

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
1954.49	Ge I	557 - 51705	4.1	0.23	-0.63
1961.40	Ge I	7125 - 58091	5.9	0.34	-0.47
1970.26	Ge I	1410 - 52148	5.6	0.33	-0.49
1987.64	Ge I	1410 - 51705	3.0	0.18	-0.75
1998.25	Ge I	1410 - 51437	9.5	0.57	-0.24
2019.05	Ge I	557 - 50069	3.8	0.23	-0.63
2041.69	Ge I	0 - 48962	5.8	0.36	-0.44
2043.76	Ge I	1410 - 50323	5.0	0.31	-0.51
2054.45	Ge I	1410 - 50069	1.5	0.095	-1.02
2057.23	Ge I	7125 - 55718	1.6	0.10	-1.00
2065.20	Ge I	557 - 48962	2.4	0.16	-0.81
2068.65	Ge I	557 - 48882	8.2	0.52	-0.28
2086.00	Ge I	557 - 48480	1.6	0.10	-0.99
2094.23	Ge I	1410 - 49144	9.2	0.61	-0.22
2105.80	Ge I	1410 - 48882	1.2	0.081	-1.09
2124.75	Ge I	7125 - 54175	1.4	0.094	-1.02
2198.70	Ge I	7125 - 52592	9.5	0.69	-0.16
2256.00	Ge I	7125 - 51437	0.83	0.063	-1.20
2314.20	Ge I	7125 - 50323	1.4	0.11	-0.95
2327.90	Ge I	7125 - 50069	2.0	0.17	-0.78
2379.14	Ge I	7125 - 49144	2.6	0.22	-0.65
2417.37	Ge I	7125 - 48480	22.	1.9	0.28
2497.96	Ge I	0 - 40020	2.4	0.22	-0.66
2533.23	Ge I	557 - 40020	1.9	0.18	-0.75
2556.30	Ge I	16367 - 55474	1.9	0.19	-0.72
2589.19	Ge I	1410 - 40020	0.76	0.077	-1.12
2592.54	Ge I	557 - 39118	11.	1.1	0.03
2644.19	Ge I	16367 - 54175	4.2	0.44	-0.36
2651.18	Ge I	1410 - 39118	26.	2.7	0.44
2651.58	Ge I	0 - 37702	8.0	0.84	-0.08
2691.34	Ge I	557 - 37702	7.3	0.80	-0.10
2709.63	Ge I	557 - 37452	12.	1.3	0.11
2740.43	Ge I	16367 - 52847	24.	2.8	0.44
2754.59	Ge I	1410 - 37702	9.8	1.1	0.05
2793.94	Ge I	16367 - 52148	4.0	0.47	-0.33
2829.01	Ge I	16367 - 51705	4.3	0.52	-0.29
3039.06	Ge I	7125 - 40020	24.	3.3	0.52
3067.01	Ge I	16367 - 48962	22.	3.1	0.49
3124.82	Ge I	7125 - 39118	0.51	0.074	-1.13
3269.49	Ge I	7125 - 37702	2.0	0.31	-0.50
4226.57	Ge I	16367 - 40020	3.1	0.83	-0.08
4685.84	Ge I	16367 - 37702	0.15	0.051	-1.30
8789.87	Ge I	37702 - 49076	0.64	0.74	-0.13

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2353.02	Hf I	0 - 42485	0.67	0.056	-1.25
2428.75	Hf I	2357 - 43518	0.81	0.072	-1.14
2444.99	Hf I	4568 - 45455	1.6	0.14	-0.84
2465.67	Hf I	4568 - 45112	1.5	0.13	-0.87
2482.65	Hf I	0 - 40267	0.57	0.053	-1.28
2487.16	Hf I	0 - 40194	0.56	0.052	-1.28
2502.66	Hf I	2357 - 42302	1.4	0.13	-0.89
2517.86	Hf I	0 - 39704	0.66	0.063	-1.20
2559.02	Hf I	2357 - 41422	0.95	0.093	-1.03
2594.12	Hf I	4568 - 43105	0.77	0.078	-1.11
2602.67	Hf I	2357 - 40768	0.69	0.070	-1.16
2602.87	Hf I	0 - 38408	0.18	0.018	-1.75
2608.45	Hf I	0 - 38325	0.75	0.077	-1.12
2609.96	Hf I	4568 - 42871	0.83	0.085	-1.07
2612.59	Hf I	5522 - 43786	0.67	0.069	-1.16
2616.61	Hf I	5639 - 43845	2.7	0.28	-0.55
2623.32	Hf I	8984 - 47092	2.8	0.29	-0.54
2635.57	Hf I	6573 - 44504	1.00	0.10	-0.98
2637.00	Hf I	2357 - 40267	1.8	0.19	-0.72
2642.08	Hf I	2357 - 40194	0.79	0.083	-1.08
2642.75	Hf I	4568 - 42396	3.3	0.35	-0.46
2668.28	Hf I	5639 - 43105	2.3	0.24	-0.61
2682.19	Hf I	6573 - 43845	1.1	0.12	-0.92
2686.36	Hf I	6572 - 43786	0.55	0.060	-1.22
2688.35	Hf I	8984 - 46170	1.1	0.12	-0.92
2696.18	Hf I	2357 - 39435	0.65	0.071	-1.15
2705.61	Hf I	0 - 36949	3.0	0.33	-0.48
2711.83	Hf I	8984 - 45848	4.0	0.44	-0.35
2713.84	Hf I	2357 - 39194	1.2	0.14	-0.87
2718.59	Hf I	0 - 36773	1.1	0.12	-0.92
2726.70	Hf I	5639 - 42302	1.7	0.19	-0.73
2729.10	Hf I	2357 - 38988	0.58	0.065	-1.19
2730.71	Hf I	0 - 36610	0.37	0.042	-1.38
2730.85	Hf I	4568 - 41175	1.8	0.20	-0.71
2737.83	Hf I	5522 - 42036	1.4	0.16	-0.81
2743.64	Hf I	5639 - 42076	3.8	0.43	-0.36
2746.62	Hf I	5639 - 42036	0.69	0.078	-1.11
2758.31	Hf I	10533 - 46776	2.4	0.27	-0.57
2758.78	Hf I	0 - 36237	0.34	0.039	-1.41
2761.63	Hf I	4568 - 40768	6.1	0.70	-0.16
2762.69	Hf I	5639 - 41825	1.1	0.13	-0.88
2766.96	Hf I	5639 - 41769	2.9	0.33	-0.48
2773.02	Hf I	2357 - 38408	1.2	0.14	-0.86
2779.37	Hf I	2357 - 38325	2.7	0.31	-0.50
2783.69	Hf I	6572 - 42485	1.6	0.19	-0.73
2812.32	Hf I	10509 - 46056	1.7	0.20	-0.69
2815.82	Hf I	6573 - 42076	0.90	0.11	-0.97
2817.68	Hf I	8984 - 44464	9.2	1.1	0.04
2818.94	Hf I	6572 - 42036	2.8	0.34	-0.47
2819.74	Hf I	0 - 35454	0.61	0.073	-1.14

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2833.28	Hf I	0 - 35284	0.53	0.064	-1.19
2834.13	Hf I	8984 - 44258	4.0	0.48	-0.32
2841.49	Hf I	5522 - 40704	0.98	0.12	-0.92
2845.83	Hf I	5639 - 40768	5.8	0.70	-0.15
2850.96	Hf I	5639 - 40704	3.7	0.45	-0.35
2860.56	Hf I	0 - 34948	0.49	0.060	-1.22
2866.37	Hf I	0 - 34877	5.8	0.71	-0.15
2867.70	Hf I	8984 - 43845	1.8	0.22	-0.65
2877.16	Hf I	10509 - 45255	2.2	0.28	-0.55
2887.14	Hf I	4568 - 39194	2.0	0.24	-0.61
2887.54	Hf I	6572 - 41194	1.6	0.20	-0.70
2889.62	Hf I	0 - 34596	2.0	0.25	-0.60
2894.84	Hf I	8984 - 43518	0.55	0.070	-1.16
2898.26	Hf I	2357 - 36850	8.5	1.1	0.03
2904.41	Hf I	4568 - 38988	11.	1.4	0.14
2904.75	Hf I	2357 - 36773	4.1	0.52	-0.28
2916.48	Hf I	4568 - 38845	16.	2.1	0.32
2918.58	Hf I	2357 - 36610	2.6	0.33	-0.48
2924.62	Hf I	5522 - 39704	1.9	0.24	-0.61
2929.01	Hf I	6572 - 40704	0.89	0.11	-0.94
2929.90	Hf I	8984 - 43105	12.	1.6	0.21
2940.77	Hf I	0 - 33995	4.2	0.55	-0.26
2944.71	Hf I	0 - 33949	0.34	0.044	-1.35
2950.68	Hf I	2357 - 36237	5.1	0.66	-0.18
2951.90	Hf I	10509 - 44375	1.1	0.14	-0.85
2954.20	Hf I	4568 - 38408	8.0	1.1	0.02
2958.02	Hf I	5639 - 39435	5.4	0.70	-0.15
2964.88	Hf I	2357 - 36075	5.6	0.73	-0.13
2966.93	Hf I	6572 - 40267	7.9	1.0	0.02
2973.37	Hf I	6572 - 40194	1.3	0.18	-0.75
2979.28	Hf I	5639 - 39194	1.4	0.19	-0.72
2980.81	Hf I	0 - 33538	2.1	0.27	-0.56
2982.72	Hf I	10533 - 44049	8.0	1.1	0.03
2984.05	Hf I	8984 - 42485	1.3	0.17	-0.77
3005.56	Hf I	10533 - 43795	28.	3.8	0.58
3016.78	Hf I	0 - 33138	0.93	0.13	-0.90
3017.37	Hf I	6572 - 39704	0.30	0.040	-1.39
3018.31	Hf I	0 - 33122	1.7	0.23	-0.64
3020.53	Hf I	2357 - 35454	3.9	0.53	-0.28
3024.60	Hf I	8984 - 42036	1.7	0.24	-0.63
3049.29	Hf I	8984 - 41769	1.6	0.22	-0.65
3050.76	Hf I	5639 - 38408	5.5	0.77	-0.11
3057.02	Hf I	4568 - 37270	6.0	0.84	-0.07
3063.78	Hf I	5522 - 38152	0.90	0.13	-0.90
3067.41	Hf I	2357 - 34948	2.5	0.35	-0.45
3069.18	Hf I	10532 - 43105	2.6	0.37	-0.43
3072.88	Hf I	0 - 32533	3.2	0.45	-0.35
3074.10	Hf I	2357 - 34877	0.49	0.069	-1.16
3074.79	Hf I	5639 - 38152	1.8	0.26	-0.59
3075.30	Hf I	10509 - 43016	0.77	0.11	-0.96

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3080.84	Hf I	2357 - 34806	1.2	0.17	-0.76
3096.76	Hf I	4568 - 36850	0.99	0.14	-0.84
3119.98	Hf I	4568 - 36610	0.60	0.087	-1.06
3128.76	Hf I	0 - 31952	0.11	0.017	-1.77
3129.58	Hf I	0 - 31944	0.092	0.013	-1.87
3131.81	Hf I	10533 - 42454	18.	2.6	0.42
3137.51	Hf I	10533 - 42396	3.1	0.45	-0.34
3148.41	Hf I	6572 - 38325	1.7	0.26	-0.59
3151.63	Hf I	8984 - 40704	1.8	0.26	-0.58
3152.96	Hf I	14092 - 45799	2.3	0.34	-0.47
3156.63	Hf I	4568 - 36237	1.9	0.29	-0.54
3159.82	Hf I	2357 - 33995	0.62	0.093	-1.03
3163.39	Hf I	10509 - 42112	1.0	0.15	-0.82
3165.73	Hf I	6573 - 38152	0.67	0.10	-1.00
3168.39	Hf I	10509 - 42062	10.	1.5	0.18
3172.94	Hf I	4568 - 36075	3.7	0.56	-0.25
3178.43	Hf I	14542 - 45995	3.1	0.46	-0.33
3181.01	Hf I	5522 - 36949	1.2	0.18	-0.74
3181.15	Hf I	4568 - 35994	0.47	0.072	-1.14
3189.62	Hf I	0 - 31342	0.15	0.023	-1.65
3206.11	Hf I	2357 - 33538	0.64	0.099	-1.00
3210.98	Hf I	5639 - 36773	0.92	0.14	-0.85
3213.72	Hf I	14542 - 45649	5.6	0.87	-0.06
3243.35	Hf I	16767 - 47590	14.	2.3	0.36
3247.66	Hf I	2357 - 33139	0.67	0.11	-0.98
3249.53	Hf I	2357 - 33121	0.41	0.066	-1.18
3254.86	Hf I	14741 - 45455	4.3	0.68	-0.16
3261.90	Hf I	14435 - 45083	2.4	0.39	-0.41
3262.47	Hf I	10533 - 41175	2.1	0.33	-0.48
3265.29	Hf I	15673 - 46290	7.0	1.1	0.05
3267.18	Hf I	5639 - 36237	0.32	0.051	-1.29
3291.05	Hf I	6572 - 36949	0.89	0.14	-0.84
3306.12	Hf I	4568 - 34806	0.65	0.11	-0.97
3309.19	Hf I	8984 - 39194	1.2	0.20	-0.70
3310.27	Hf I	6573 - 36773	1.8	0.30	-0.53
3312.86	Hf I	2357 - 32533	1.1	0.18	-0.75
3316.19	Hf I	17901 - 48048	8.8	1.4	0.16
3331.89	Hf I	10509 - 40514	0.68	0.11	-0.94
3332.73	Hf I	0 - 29997	0.70	0.12	-0.93
3356.78	Hf I	15673 - 45455	7.8	1.3	0.12
3358.91	Hf I	14741 - 44504	11.	1.9	0.27
3360.06	Hf I	0 - 29753	0.13	0.022	-1.65
3366.68	Hf I	14092 - 43786	5.6	0.95	-0.02
3372.21	Hf I	5639 - 35284	0.13	0.022	-1.67
3378.93	Hf I	2357 - 31943	0.25	0.042	-1.37
3386.21	Hf I	16767 - 46290	14.	2.4	0.38
3392.81	Hf I	15673 - 45139	13.	2.3	0.36
3397.26	Hf I	4568 - 33995	0.58	0.100	-1.00
3397.60	Hf I	8984 - 38408	2.0	0.35	-0.46
3400.21	Hf I	0 - 29402	0.12	0.020	-1.70

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3402.51	Hf I	4568 - 33949	0.44	0.076	-1.12
3407.14	Hf I	8984 - 38325	0.75	0.13	-0.88
3412.34	Hf I	14542 - 43838	2.5	0.44	-0.36
3417.34	Hf I	2357 - 31611	0.30	0.052	-1.29
3419.18	Hf I	5639 - 34877	1.3	0.23	-0.64
3427.44	Hf I	8984 - 38152	1.2	0.20	-0.69
3438.43	Hf I	5522 - 34596	0.42	0.075	-1.12
3441.84	Hf I	14741 - 43786	3.9	0.69	-0.16
3452.31	Hf I	5639 - 34596	0.29	0.052	-1.28
3467.60	Hf I	15673 - 44504	7.0	1.3	0.10
3472.40	Hf I	0 - 28790	0.42	0.075	-1.12
3497.49	Hf I	0 - 28584	0.55	0.10	-1.00
3498.98	Hf I	4568 - 33139	0.20	0.036	-1.44
3513.28	Hf I	10532 - 38988	1.6	0.29	-0.53
3521.56	Hf I	17901 - 46290	4.5	0.85	-0.07
3523.02	Hf I	2357 - 30733	1.0	0.19	-0.73
3530.87	Hf I	19293 - 47606	12.	2.2	0.34
3531.23	Hf I	5639 - 33949	0.25	0.047	-1.33
3536.62	Hf I	0 - 28267	0.39	0.073	-1.14
3554.00	Hf I	14542 - 42671	4.6	0.86	-0.06
3564.31	Hf I	0 - 28048	0.074	0.014	-1.85
3567.36	Hf I	6572 - 34596	0.83	0.16	-0.80
3579.90	Hf I	14435 - 42361	4.2	0.81	-0.09
3583.28	Hf I	5639 - 33538	0.25	0.047	-1.32
3599.87	Hf I	16767 - 44537	28.	5.4	0.73
3615.04	Hf I	0 - 27654	0.047	0.0093	-2.03
3616.89	Hf I	2357 - 29997	0.69	0.13	-0.87
3617.68	Hf I	14542 - 42176	2.8	0.56	-0.25
3620.04	Hf I	5522 - 33138	0.19	0.036	-1.44
3635.43	Hf I	5639 - 33138	0.20	0.041	-1.39
3637.59	Hf I	5639 - 33122	0.11	0.022	-1.66
3649.10	Hf I	2357 - 29753	0.26	0.052	-1.29
3650.53	Hf I	19293 - 46678	8.7	1.7	0.24
3651.84	Hf I	4568 - 31943	0.29	0.059	-1.23
3664.60	Hf I	14018 - 41298	1.5	0.30	-0.52
3668.21	Hf I	8984 - 36237	0.45	0.091	-1.04
3675.74	Hf I	15673 - 42871	14.	2.9	0.46
3682.24	Hf I	0 - 27150	0.77	0.16	-0.81
3696.51	Hf I	2357 - 29402	0.18	0.038	-1.42
3704.92	Hf I	18381 - 45365	6.0	1.2	0.09
3717.80	Hf I	2357 - 29247	0.64	0.13	-0.88
3726.49	Hf I	10509 - 37336	0.87	0.18	-0.74
3729.10	Hf I	20960 - 47769	19.	3.9	0.59
3733.79	Hf I	4568 - 31342	0.53	0.11	-0.96
3739.04	Hf I	10533 - 37270	0.74	0.15	-0.81
3743.99	Hf I	18381 - 45083	3.3	0.70	-0.15
3746.80	Hf I	14741 - 41422	7.9	1.7	0.22
3753.22	Hf I	17901 - 44537	6.7	1.4	0.15
3765.05	Hf I	18225 - 44778	5.1	1.1	0.04
3765.56	Hf I	6572 - 33122	0.19	0.041	-1.39

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3768.25	Hf I	10509 - 37039	1.2	0.25	-0.61
3773.12	Hf I	14018 - 40514	0.93	0.20	-0.70
3777.64	Hf I	0 - 26464	0.41	0.088	-1.05
3782.43	Hf I	5522 - 31952	0.049	0.010	-1.98
3785.46	Hf I	4568 - 30977	1.5	0.32	-0.50
3787.37	Hf I	18381 - 44778	1.8	0.39	-0.41
3798.66	Hf I	10532 - 36850	0.55	0.12	-0.92
3800.38	Hf I	0 - 26306	0.24	0.052	-1.28
3811.78	Hf I	2357 - 28584	0.17	0.038	-1.42
3819.38	Hf I	14092 - 40267	1.5	0.32	-0.50
3820.73	Hf I	4568 - 30733	1.3	0.28	-0.55
3829.67	Hf I	16767 - 42871	4.3	0.94	-0.03
3830.02	Hf I	14092 - 40194	4.0	0.88	-0.05
3849.18	Hf I	5639 - 31611	1.0	0.23	-0.64
3858.31	Hf I	2357 - 28267	0.30	0.067	-1.17
3860.91	Hf I	8984 - 34877	0.65	0.14	-0.84
3882.52	Hf I	15673 - 41422	3.7	0.84	-0.08
3889.23	Hf I	10532 - 36237	0.86	0.19	-0.71
3889.33	Hf I	5639 - 31342	0.22	0.049	-1.31
3892.47	Hf I	19791 - 45475	3.9	0.88	-0.05
3899.94	Hf I	0 - 25634	0.13	0.030	-1.52
3906.89	Hf I	14542 - 40130	0.58	0.13	-0.88
3909.18	Hf I	19791 - 45365	4.4	1.0	0.00
3926.42	Hf I	10533 - 35994	0.49	0.11	-0.94
3927.57	Hf I	14741 - 40194	1.9	0.44	-0.35
3931.38	Hf I	4568 - 29997	0.23	0.054	-1.27
3939.04	Hf I	6572 - 31952	0.16	0.037	-1.43
3951.83	Hf I	2357 - 27654	0.16	0.036	-1.44
3968.01	Hf I	0 - 25194	0.030	0.0071	-2.15
3973.48	Hf I	2356 - 27516	0.075	0.018	-1.75
4032.27	Hf I	2357 - 27150	0.061	0.015	-1.83
4044.39	Hf I	16163 - 40882	1.5	0.36	-0.44
4062.84	Hf I	10509 - 35115	0.73	0.18	-0.74
4066.21	Hf I	14542 - 39128	1.4	0.34	-0.47
4083.35	Hf I	10509 - 34992	0.56	0.14	-0.85
4087.96	Hf I	16163 - 40619	0.52	0.13	-0.89
4104.23	Hf I	5639 - 29997	0.087	0.022	-1.66
4106.58	Hf I	10532 - 34877	0.41	0.10	-0.98
4115.90	Hf I	18381 - 42671	0.93	0.24	-0.63
4118.60	Hf I	10532 - 34806	0.34	0.086	-1.07
4118.91	Hf I	14018 - 38289	0.54	0.14	-0.86
4145.76	Hf I	5639 - 29753	0.098	0.025	-1.60
4162.69	Hf I	4568 - 28584	0.059	0.015	-1.81
4174.34	Hf I	2357 - 26306	0.31	0.081	-1.09
4190.95	Hf I	14435 - 38289	1.0	0.27	-0.58
4209.70	Hf I	14542 - 38289	1.6	0.42	-0.38
4228.08	Hf I	0 - 23645	0.022	0.0060	-2.22
4245.16	Hf I	8984 - 32533	0.13	0.035	-1.46
4260.98	Hf I	10533 - 33994	0.42	0.11	-0.95
4263.39	Hf I	0 - 23449	0.026	0.0070	-2.16

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4294.79	Hf I	2357 - 25634	0.074	0.021	-1.69
4296.41	Hf I	5522 - 28790	0.045	0.013	-1.90
4318.14	Hf I	5639 - 28790	0.071	0.020	-1.70
4330.27	Hf I	4568 - 27654	0.066	0.019	-1.73
4349.74	Hf I	24785 - 47769	4.1	1.1	0.06
4352.57	Hf I	8984 - 31952	0.11	0.032	-1.50
4353.34	Hf I	16163 - 39128	0.72	0.21	-0.69
4356.33	Hf I	4568 - 27516	0.10	0.029	-1.54
4356.99	Hf I	5639 - 28584	0.031	0.0088	-2.06
4365.37	Hf I	14435 - 37336	0.44	0.13	-0.90
4417.91	Hf I	5639 - 28267	0.080	0.023	-1.63
4418.25	Hf I	8984 - 31611	0.044	0.013	-1.89
4422.23	Hf I	10532 - 33139	0.068	0.020	-1.70
4438.04	Hf I	5522 - 28048	0.097	0.029	-1.54
4443.07	Hf I	18381 - 40882	1.0	0.30	-0.52
4453.00	Hf I	0 - 22451	0.0056	0.0017	-2.78
4457.34	Hf I	2357 - 24785	0.026	0.0077	-2.11
4461.18	Hf I	5639 - 28048	0.065	0.019	-1.71
4499.65	Hf I	6572 - 28790	0.034	0.010	-1.99
4518.29	Hf I	16163 - 38289	0.40	0.12	-0.92
4540.93	Hf I	5639 - 27654	0.059	0.018	-1.74
4544.02	Hf I	10532 - 32533	0.14	0.043	-1.37
4565.94	Hf I	5639 - 27534	0.11	0.033	-1.48
4598.80	Hf I	0 - 21739	0.042	0.013	-1.88
4608.09	Hf I	6573 - 28267	0.048	0.015	-1.82
4620.86	Hf I	4568 - 26203	0.067	0.021	-1.67
4630.61	Hf I	19293 - 40882	0.84	0.27	-0.57
4655.19	Hf I	6572 - 28048	0.091	0.029	-1.53
4669.24	Hf I	10532 - 31943	0.034	0.011	-1.95
4699.01	Hf I	18011 - 39286	1.2	0.41	-0.39
4708.84	Hf I	22901 - 44132	1.9	0.62	-0.20
4738.58	Hf I	14018 - 35115	0.13	0.043	-1.37
4757.58	Hf I	8984 - 29997	0.030	0.010	-1.99
4766.51	Hf I	14018 - 34992	0.29	0.098	-1.01
4773.72	Hf I	5522 - 26464	0.022	0.0076	-2.12
4774.89	Hf I	22901 - 43838	1.0	0.34	-0.47
4782.74	Hf I	18225 - 39128	1.6	0.55	-0.26
4800.50	Hf I	5638 - 26464	0.090	0.031	-1.51
4818.87	Hf I	18381 - 39128	0.67	0.23	-0.63
4834.19	Hf I	14435 - 35115	0.13	0.045	-1.34
4837.23	Hf I	5639 - 26306	0.022	0.0076	-2.12
4850.61	Hf I	10509 - 31119	0.022	0.0079	-2.10
4858.41	Hf I	6572 - 27150	0.014	0.0049	-2.31
4859.24	Hf I	14542 - 35115	0.43	0.15	-0.81
4863.27	Hf I	14435 - 34992	0.25	0.089	-1.05
4872.94	Hf I	20960 - 41476	0.42	0.15	-0.83
4877.58	Hf I	19293 - 39789	0.98	0.35	-0.46
4915.26	Hf I	19791 - 40130	0.25	0.092	-1.04
4948.94	Hf I	10533 - 30733	0.045	0.017	-1.78
4962.37	Hf I	18143 - 38289	0.17	0.064	-1.19

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4975.25	Hf I	2357 - 22450	0.0100	0.0037	-2.43
5018.20	Hf I	20960 - 40882	1.4	0.52	-0.29
5021.75	Hf I	18381 - 38289	0.11	0.042	-1.38
5047.45	Hf I	8984 - 28790	0.045	0.017	-1.76
5112.13	Hf I	5639 - 25194	0.0028	0.0011	-2.96
5157.96	Hf I	22901 - 42283	0.70	0.28	-0.56
5167.42	Hf I	24785 - 44132	2.1	0.82	-0.08
5170.18	Hf I	19791 - 39128	0.72	0.29	-0.54
5181.86	Hf I	0 - 19293	0.0080	0.0032	-2.49
5186.84	Hf I	22901 - 42176	0.68	0.27	-0.56
5243.99	Hf I	8984 - 28048	0.045	0.018	-1.73
5275.04	Hf I	16163 - 35115	0.17	0.069	-1.16
5286.09	Hf I	23449 - 42361	0.51	0.21	-0.67
5294.87	Hf I	4568 - 23449	0.014	0.0059	-2.23
5307.82	Hf I	23449 - 42283	0.72	0.30	-0.52
5309.68	Hf I	16163 - 34992	0.14	0.058	-1.24
5354.73	Hf I	25462 - 44132	4.3	1.8	0.26
5373.86	Hf I	2357 - 20960	0.0062	0.0027	-2.57
5389.34	Hf I	8984 - 27534	0.014	0.0062	-2.21
5404.47	Hf I	19791 - 38289	0.14	0.062	-1.21
5424.02	Hf I	22451 - 40882	0.44	0.20	-0.71
5438.74	Hf I	0 - 18381	0.0011	0.00048	-3.32
5452.92	Hf I	4568 - 22901	0.0078	0.0035	-2.46
5497.30	Hf I	29753 - 47938	1.8	0.80	-0.09
5510.12	Hf I	0 - 18143	0.00041	0.00019	-3.73
5510.45	Hf I	18381 - 36524	0.073	0.033	-1.48
5538.02	Hf I	21739 - 39791	0.56	0.26	-0.59
5538.26	Hf I	10533 - 28584	0.014	0.0065	-2.19
5550.60	Hf I	0 - 18011	0.0060	0.0028	-2.56
5552.12	Hf I	5639 - 23645	0.029	0.014	-1.87
5575.86	Hf I	26203 - 44132	2.2	1.0	0.02
5600.77	Hf I	23449 - 41298	0.26	0.12	-0.92
5613.27	Hf I	5639 - 23449	0.011	0.0053	-2.28
5614.01	Hf I	21739 - 39546	0.28	0.13	-0.88
5628.27	Hf I	23449 - 41211	0.14	0.067	-1.18
5650.83	Hf I	10509 - 28201	0.0086	0.0041	-2.38
5713.28	Hf I	24785 - 42283	0.62	0.30	-0.52
5719.18	Hf I	8984 - 26464	0.045	0.022	-1.66
5748.72	Hf I	24785 - 42176	0.30	0.15	-0.83
5817.47	Hf I	14435 - 31620	0.023	0.012	-1.93
5845.87	Hf I	14018 - 31119	0.027	0.014	-1.86
5847.77	Hf I	22451 - 39546	0.22	0.11	-0.95
5883.66	Hf I	23645 - 40636	0.35	0.18	-0.74
5926.47	Hf I	23645 - 40514	0.24	0.13	-0.89
5933.69	Hf I	18143 - 34992	0.21	0.11	-0.97
5974.28	Hf I	18381 - 35115	0.27	0.14	-0.84
5974.72	Hf I	19791 - 36524	0.13	0.068	-1.17
5978.66	Hf I	18270 - 34992	0.21	0.11	-0.96
6016.79	Hf I	27516 - 44132	2.1	1.1	0.05
6054.17	Hf I	14542 - 31055	0.028	0.015	-1.82

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
6098.67	Hf I	4568 - 20960	0.0060	0.0034	-2.47
6185.13	Hf I	0 - 16163	0.0014	0.00082	-3.08
6210.70	Hf I	24785 - 40882	0.99	0.57	-0.24
6216.82	Hf I	26203 - 42283	0.76	0.44	-0.36
6238.58	Hf I	2357 - 18381	0.0015	0.00087	-3.06
6299.54	Hf I	26306 - 42176	0.58	0.34	-0.46
6311.85	Hf I	22451 - 38289	0.22	0.13	-0.88
6318.33	Hf I	19293 - 35115	0.068	0.041	-1.39
6338.10	Hf I	10532 - 26306	0.0094	0.0057	-2.24
6380.19	Hf I	15673 - 31342	0.024	0.014	-1.84
6386.23	Hf I	2357 - 18011	0.0018	0.0011	-2.95
6409.52	Hf I	21739 - 37336	0.13	0.079	-1.10
6556.50	Hf I	25634 - 40882	0.30	0.19	-0.72
6587.23	Hf I	16766 - 31943	0.043	0.028	-1.55
6659.40	Hf I	14741 - 29753	0.013	0.0087	-2.06
6713.48	Hf I	16163 - 31055	0.057	0.039	-1.41
6716.00	Hf I	22451 - 37336	0.067	0.046	-1.34
6769.95	Hf I	27516 - 42283	0.46	0.31	-0.50
6789.27	Hf I	4568 - 19293	0.0056	0.0039	-2.41
6818.94	Hf I	8984 - 23645	0.036	0.025	-1.60
6826.56	Hf I	23645 - 38289	0.21	0.15	-0.83
6850.07	Hf I	25194 - 39789	0.27	0.19	-0.71
6858.70	Hf I	16766 - 31342	0.074	0.052	-1.28
6911.40	Hf I	8984 - 23449	0.0092	0.0066	-2.18
6926.19	Hf I	14092 - 28526	0.0087	0.0063	-2.20
6979.59	Hf I	15673 - 29997	0.027	0.019	-1.71
7019.25	Hf I	29247 - 43489	0.53	0.39	-0.40
7035.13	Hf I	16767 - 30977	0.018	0.013	-1.88
7061.90	Hf I	25634 - 39791	0.33	0.25	-0.61
7062.87	Hf I	25634 - 39789	0.42	0.32	-0.50
7063.83	Hf I	5639 - 19791	0.017	0.013	-1.90
7094.40	Hf I	25194 - 39286	0.29	0.22	-0.66
7100.54	Hf I	15673 - 29753	0.025	0.019	-1.72
7119.52	Hf I	17901 - 31943	0.18	0.14	-0.86
7131.81	Hf I	0 - 14018	0.0068	0.0052	-2.29
7237.10	Hf I	4568 - 18381	0.046	0.036	-1.44
7240.87	Hf I	2357 - 16163	0.014	0.011	-1.96
7262.62	Hf I	14435 - 28201	0.0065	0.0051	-2.29
7320.05	Hf I	4568 - 18225	0.0050	0.0040	-2.39
7321.76	Hf I	5639 - 19293	0.0015	0.0012	-2.92
7356.10	Hf I	23449 - 37039	0.079	0.064	-1.19
7365.28	Hf I	15673 - 29247	0.0088	0.0072	-2.14
7390.70	Hf I	14741 - 28267	0.024	0.020	-1.71
7423.69	Hf I	8984 - 22450	0.0013	0.0011	-2.97
7437.56	Hf I	14092 - 27534	0.024	0.020	-1.71
7463.86	Hf I	23645 - 37039	0.18	0.15	-0.81
7484.56	Hf I	22880 - 36237	0.073	0.062	-1.21
7556.37	Hf I	16766 - 29997	0.029	0.025	-1.61
7562.93	Hf I	6572 - 19791	0.0081	0.0069	-2.16
7564.22	Hf I	34806 - 48022	4.5	3.8	0.58

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7576.95	Hf I	18381 - 31576	0.035	0.030	-1.52
7592.96	Hf I	23253 - 36419	0.14	0.12	-0.93
7608.59	Hf I	31943 - 45083	1.8	1.6	0.20
7624.40	Hf I	10533 - 23645	0.12	0.10	-0.99
7645.64	Hf I	17901 - 30977	0.053	0.047	-1.33
7740.17	Hf I	10532 - 23449	0.036	0.032	-1.49
7743.57	Hf I	15673 - 28584	0.011	0.0099	-2.01
7790.90	Hf I	17901 - 30733	0.10	0.092	-1.04
7796.81	Hf I	23253 - 36075	0.082	0.075	-1.12
7814.55	Hf I	14741 - 27534	0.033	0.030	-1.52
7845.35	Hf I	5639 - 18381	0.024	0.022	-1.66
7846.56	Hf I	23253 - 35994	0.081	0.075	-1.13
7920.71	Hf I	5522 - 18143	0.0094	0.0089	-2.05
7938.06	Hf I	15673 - 28267	0.036	0.034	-1.47
7994.73	Hf I	5639 - 18143	0.018	0.017	-1.77
8010.58	Hf I	16766 - 29247	0.011	0.011	-1.98
8056.52	Hf I	14741 - 27150	0.023	0.022	-1.65
8080.32	Hf I	5639 - 18011	0.0017	0.0017	-2.77
8173.89	Hf I	20908 - 33139	0.084	0.084	-1.08
8204.58	Hf I	2357 - 14542	0.0024	0.0024	-2.62
8248.81	Hf I	36237 - 48357	2.3	2.4	0.38
8276.95	Hf I	2357 - 14435	0.00099	0.0010	-2.99
8344.25	Hf I	15673 - 27654	0.027	0.028	-1.55
8380.06	Hf I	28584 - 40514	0.21	0.22	-0.66
8382.98	Hf I	22880 - 34806	0.041	0.043	-1.36
8460.01	Hf I	16767 - 28584	0.048	0.051	-1.29
8546.48	Hf I	6572 - 18270	0.012	0.013	-1.89
8640.06	Hf I	6572 - 18143	0.013	0.014	-1.84
8711.24	Hf I	15673 - 27150	0.041	0.047	-1.33
9004.73	Hf I	14092 - 25194	0.039	0.048	-1.32

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2012.78	Hf II	3051 - 52717	5.0	0.30	-0.52
2028.18	Hf II	13486 - 62775	18.	1.1	0.04
2096.18	Hf II	15084 - 62775	5.7	0.38	-0.42
2210.82	Hf II	36883 - 82101	13.	0.92	-0.04
2254.01	Hf II	3645 - 47996	2.0	0.15	-0.82
2255.15	Hf II	3645 - 47973	0.98	0.075	-1.13
2266.83	Hf II	4905 - 49006	2.1	0.17	-0.78
2277.16	Hf II	0 - 43901	1.6	0.13	-0.90
2321.14	Hf II	4905 - 47973	3.0	0.24	-0.61
2322.47	Hf II	0 - 43044	2.1	0.17	-0.77
2323.25	Hf II	3645 - 46675	3.0	0.24	-0.62
2324.50	Hf II	12071 - 55077	4.6	0.37	-0.43
2324.89	Hf II	4905 - 47904	4.0	0.32	-0.49
2332.97	Hf II	3645 - 46495	2.1	0.17	-0.76
2337.33	Hf II	0 - 42771	0.73	0.059	-1.23
2343.32	Hf II	6344 - 49006	5.1	0.42	-0.38
2347.44	Hf II	6344 - 48931	6.9	0.57	-0.25
2351.22	Hf II	0 - 42518	2.3	0.19	-0.73
2365.98	Hf II	4905 - 47158	1.7	0.14	-0.85
2380.30	Hf II	3645 - 45643	3.6	0.31	-0.51
2381.00	Hf II	14360 - 56346	8.8	0.75	-0.13
2393.18	Hf II	12921 - 54693	15.	1.3	0.11
2393.36	Hf II	4905 - 46675	9.9	0.85	-0.07
2393.83	Hf II	0 - 41761	3.7	0.32	-0.49
2400.78	Hf II	3051 - 44691	1.9	0.17	-0.78
2404.56	Hf II	13486 - 55060	7.9	0.68	-0.17
2405.42	Hf II	6344 - 47904	19.	1.6	0.21
2406.44	Hf II	11952 - 53494	12.	1.0	0.02
2410.14	Hf II	8362 - 49841	20.	1.7	0.24
2413.33	Hf II	12071 - 53494	9.3	0.81	-0.09
2415.96	Hf II	11952 - 53331	5.2	0.46	-0.34
2417.69	Hf II	3051 - 44400	5.2	0.45	-0.35
2425.98	Hf II	13486 - 54693	15.	1.4	0.13
2428.99	Hf II	12071 - 53227	13.	1.1	0.06
2433.57	Hf II	17369 - 58448	25.	2.3	0.35
2434.74	Hf II	17389 - 58448	8.5	0.75	-0.12
2447.25	Hf II	3051 - 43901	7.3	0.66	-0.18
2449.44	Hf II	6344 - 47158	7.0	0.63	-0.20
2452.30	Hf II	11952 - 52717	4.9	0.44	-0.36
2453.34	Hf II	17369 - 58117	25.	2.3	0.35
2460.49	Hf II	3051 - 43681	8.2	0.75	-0.13
2463.97	Hf II	12921 - 53494	11.	0.99	-0.01
2464.19	Hf II	8362 - 48931	31.	2.9	0.46
2465.06	Hf II	15084 - 55639	17.	1.6	0.19
2467.97	Hf II	0 - 40507	1.1	0.099	-1.01
2469.18	Hf II	13486 - 53973	35.	3.2	0.50
2473.92	Hf II	12921 - 53331	15.	1.3	0.13
2481.44	Hf II	17830 - 58117	13.	1.2	0.07
2496.99	Hf II	3645 - 43681	5.3	0.50	-0.30
2500.74	Hf II	15084 - 55060	13.	1.2	0.09

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2512.69	Hf II	4905 - 44691	15.	1.4	0.14
2513.03	Hf II	6344 - 46125	22.	2.1	0.33
2515.48	Hf II	13486 - 53227	20.	1.9	0.28
2516.88	Hf II	3051 - 42771	13.	1.2	0.09
2521.49	Hf II	17830 - 57478	16.	1.6	0.19
2531.19	Hf II	4905 - 44400	7.9	0.76	-0.12
2532.97	Hf II	3051 - 42518	1.1	0.11	-0.98
2537.33	Hf II	3645 - 43044	3.1	0.30	-0.52
2548.20	Hf II	13486 - 52717	15.	1.5	0.17
2551.40	Hf II	17389 - 56572	69.	6.8	0.83
2551.85	Hf II	12921 - 52097	3.5	0.34	-0.47
2559.19	Hf II	12071 - 51134	14.	1.4	0.14
2563.61	Hf II	4905 - 43901	5.1	0.50	-0.30
2570.71	Hf II	15084 - 53973	9.0	0.89	-0.05
2571.67	Hf II	3645 - 42518	12.	1.2	0.09
2573.90	Hf II	12071 - 50910	35.	3.5	0.55
2576.82	Hf II	8362 - 47158	17.	1.7	0.22
2578.14	Hf II	4905 - 43681	5.9	0.58	-0.23
2582.54	Hf II	3051 - 41761	3.6	0.36	-0.44
2591.33	Hf II	0 - 38579	0.58	0.058	-1.24
2599.22	Hf II	15084 - 53546	8.6	0.88	-0.06
2606.37	Hf II	3051 - 41407	4.0	0.41	-0.39
2607.03	Hf II	6344 - 44691	12.	1.2	0.07
2607.24	Hf II	14360 - 52703	7.8	0.79	-0.10
2613.60	Hf II	17389 - 55639	47.	4.8	0.68
2614.29	Hf II	15254 - 53494	12.	1.2	0.07
2622.74	Hf II	3645 - 41761	5.1	0.53	-0.28
2626.95	Hf II	6344 - 44400	1.7	0.18	-0.75
2635.79	Hf II	17711 - 55639	13.	1.3	0.12
2638.71	Hf II	0 - 37886	4.1	0.43	-0.37
2641.41	Hf II	8362 - 46209	45.	4.7	0.67
2647.29	Hf II	8362 - 46125	27.	2.9	0.46
2649.15	Hf II	14360 - 52097	6.1	0.64	-0.20
2651.16	Hf II	17369 - 55077	19.	2.0	0.30
2652.86	Hf II	41407 - 79090	13.	1.4	0.15
2657.50	Hf II	15084 - 52703	9.3	0.98	-0.01
2657.84	Hf II	4905 - 42518	2.3	0.24	-0.61
2661.88	Hf II	6344 - 43901	4.5	0.48	-0.32
2665.97	Hf II	12921 - 50420	9.4	1.00	-0.00
2669.00	Hf II	3051 - 40507	0.66	0.070	-1.15
2671.25	Hf II	13486 - 50910	5.1	0.55	-0.26
2676.63	Hf II	17711 - 55060	4.4	0.47	-0.33
2677.58	Hf II	6344 - 43681	0.36	0.039	-1.41
2678.43	Hf II	17369 - 54693	3.4	0.36	-0.44
2683.35	Hf II	15084 - 52340	41.	4.4	0.64
2685.22	Hf II	17830 - 55060	11.	1.1	0.06
2706.73	Hf II	13486 - 50420	11.	1.3	0.10
2711.99	Hf II	17830 - 54693	8.6	0.94	-0.03
2712.14	Hf II	12071 - 48931	1.8	0.20	-0.70
2712.42	Hf II	4905 - 41761	2.5	0.28	-0.55

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2718.51	Hf II	14360 - 51134	7.5	0.84	-0.08
2732.68	Hf II	17389 - 53973	6.4	0.71	-0.15
2738.76	Hf II	4905 - 41407	7.7	0.87	-0.06
2751.81	Hf II	8362 - 44691	9.8	1.1	0.05
2756.91	Hf II	17711 - 53973	11.	1.3	0.11
2770.46	Hf II	12921 - 49006	4.5	0.52	-0.29
2772.32	Hf II	14360 - 50420	4.9	0.56	-0.25
2773.36	Hf II	6344 - 42391	14.	1.6	0.21
2774.02	Hf II	8362 - 44400	4.5	0.52	-0.28
2775.27	Hf II	11952 - 47973	3.6	0.42	-0.38
2786.30	Hf II	15254 - 51134	5.5	0.64	-0.19
2789.50	Hf II	17389 - 53227	16.	1.9	0.28
2789.73	Hf II	17711 - 53546	25.	2.9	0.46
2808.00	Hf II	4905 - 40507	2.0	0.24	-0.63
2813.86	Hf II	3051 - 38579	1.2	0.14	-0.86
2814.48	Hf II	13486 - 49006	14.	1.7	0.23
2814.76	Hf II	17711 - 53227	15.	1.8	0.25
2816.07	Hf II	17830 - 53330	7.6	0.90	-0.04
2820.22	Hf II	3051 - 38499	6.1	0.73	-0.14
2820.42	Hf II	13486 - 48931	4.5	0.54	-0.27
2822.68	Hf II	6344 - 41761	6.0	0.72	-0.14
2829.32	Hf II	17369 - 52703	13.	1.5	0.18
2849.21	Hf II	12071 - 47158	15.	1.9	0.27
2850.15	Hf II	12921 - 47996	5.0	0.61	-0.22
2851.21	Hf II	6344 - 41407	2.0	0.24	-0.61
2857.65	Hf II	12921 - 47904	3.7	0.45	-0.35
2860.31	Hf II	17389 - 52340	8.1	1.00	-0.00
2861.01	Hf II	0 - 34942	1.4	0.17	-0.77
2861.70	Hf II	3645 - 38579	3.9	0.47	-0.32
2869.82	Hf II	3051 - 37886	0.56	0.069	-1.16
2876.33	Hf II	15084 - 49841	16.	1.9	0.28
2879.11	Hf II	11952 - 46675	2.7	0.34	-0.47
2885.47	Hf II	14360 - 49006	4.7	0.58	-0.23
2898.71	Hf II	13486 - 47973	9.4	1.2	0.08
2909.91	Hf II	0 - 34355	0.22	0.028	-1.55
2917.49	Hf II	17830 - 52097	4.7	0.60	-0.22
2919.59	Hf II	3645 - 37886	1.4	0.18	-0.76
2929.63	Hf II	0 - 34124	0.73	0.094	-1.03
2937.80	Hf II	8362 - 42391	11.	1.4	0.15
2947.13	Hf II	15084 - 49006	4.8	0.62	-0.21
2960.82	Hf II	17369 - 51134	8.2	1.1	0.03
2961.80	Hf II	12921 - 46675	6.1	0.80	-0.09
2967.23	Hf II	11952 - 45643	5.5	0.73	-0.14
2968.81	Hf II	4905 - 38579	3.8	0.50	-0.30
2975.88	Hf II	4905 - 38499	4.6	0.61	-0.21
2977.60	Hf II	12921 - 46495	3.6	0.48	-0.32
3000.10	Hf II	3051 - 36373	0.49	0.066	-1.18
3011.24	Hf II	17711 - 50910	10.	1.4	0.15
3012.90	Hf II	0 - 33181	1.3	0.17	-0.77
3016.94	Hf II	0 - 33136	1.2	0.17	-0.77

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3024.76	Hf II	17369 - 50420	9.6	1.3	0.12
3025.29	Hf II	8362 - 41407	1.7	0.23	-0.63
3031.16	Hf II	4905 - 37886	1.8	0.25	-0.60
3046.08	Hf II	15084 - 47904	7.8	1.1	0.04
3054.52	Hf II	3645 - 36373	0.23	0.033	-1.48
3055.44	Hf II	15254 - 47973	3.3	0.46	-0.33
3064.68	Hf II	12071 - 44691	3.8	0.54	-0.27
3080.66	Hf II	17389 - 49841	17.	2.4	0.37
3092.24	Hf II	12071 - 44400	2.5	0.36	-0.44
3101.40	Hf II	6344 - 38579	1.9	0.27	-0.57
3109.12	Hf II	6344 - 38499	3.9	0.56	-0.25
3110.87	Hf II	14360 - 46495	6.6	0.96	-0.02
3116.95	Hf II	15084 - 47158	4.5	0.65	-0.19
3126.29	Hf II	4905 - 36883	0.15	0.023	-1.65
3133.50	Hf II	41761 - 73665	22.	3.2	0.51
3134.72	Hf II	3051 - 34942	1.7	0.25	-0.60
3139.65	Hf II	6344 - 38186	0.85	0.13	-0.90
3140.76	Hf II	12071 - 43901	2.9	0.43	-0.37
3145.32	Hf II	0 - 31784	0.18	0.027	-1.57
3162.61	Hf II	12071 - 43681	17.	2.5	0.40
3176.86	Hf II	4905 - 36373	1.4	0.20	-0.69
3193.53	Hf II	3051 - 34355	0.62	0.094	-1.03
3194.19	Hf II	3645 - 34942	1.4	0.21	-0.68
3195.61	Hf II	14360 - 45643	2.6	0.40	-0.40
3199.99	Hf II	15254 - 46495	7.3	1.1	0.05
3203.67	Hf II	13486 - 44691	1.4	0.22	-0.66
3217.30	Hf II	3051 - 34124	0.29	0.045	-1.35
3220.61	Hf II	15084 - 46125	8.8	1.4	0.14
3253.70	Hf II	3051 - 33776	1.3	0.21	-0.67
3255.28	Hf II	3645 - 34355	0.47	0.075	-1.13
3273.66	Hf II	6344 - 36883	0.64	0.10	-0.99
3279.98	Hf II	3645 - 34124	0.44	0.072	-1.14
3283.38	Hf II	12071 - 42518	0.79	0.13	-0.89
3310.86	Hf II	13486 - 43681	1.1	0.18	-0.74
3317.99	Hf II	3051 - 33181	0.23	0.038	-1.42
3323.36	Hf II	23146 - 53227	8.8	1.5	0.17
3328.21	Hf II	4905 - 34942	0.28	0.047	-1.33
3352.06	Hf II	8362 - 38186	2.0	0.34	-0.47
3356.09	Hf II	17369 - 47158	6.0	1.0	0.01
3358.30	Hf II	17389 - 47158	4.8	0.81	-0.09
3384.14	Hf II	14360 - 43901	3.9	0.66	-0.18
3384.70	Hf II	3645 - 33181	0.30	0.052	-1.28
3389.83	Hf II	3645 - 33136	1.0	0.18	-0.75
3394.59	Hf II	4905 - 34355	0.43	0.073	-1.13
3394.98	Hf II	17711 - 47158	9.7	1.7	0.23
3399.80	Hf II	0 - 29405	1.1	0.18	-0.74
3407.76	Hf II	12071 - 41407	1.9	0.33	-0.48
3410.17	Hf II	15084 - 44400	7.3	1.3	0.10
3413.74	Hf II	13486 - 42771	1.8	0.31	-0.51
3421.42	Hf II	4905 - 34124	0.077	0.014	-1.87

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3428.37	Hf II	0 – 29160	0.084	0.015	-1.83
3438.24	Hf II	18898 – 47973	21.	3.7	0.57
3462.64	Hf II	4905 – 33776	0.23	0.041	-1.39
3478.99	Hf II	17389 – 46125	11.	1.9	0.28
3479.28	Hf II	3051 – 31784	0.44	0.080	-1.10
3487.57	Hf II	17830 – 46495	2.6	0.48	-0.32
3495.75	Hf II	6344 – 34942	0.56	0.10	-0.99
3495.93	Hf II	15084 – 43681	2.1	0.39	-0.41
3505.23	Hf II	8362 – 36882	4.8	0.89	-0.05
3518.75	Hf II	14360 – 42771	2.7	0.51	-0.29
3535.54	Hf II	4905 – 33181	1.3	0.25	-0.60
3552.70	Hf II	3645 – 31784	0.50	0.094	-1.03
3561.66	Hf II	0 – 28069	0.44	0.083	-1.08
3569.04	Hf II	6344 – 34355	2.1	0.39	-0.40
3597.42	Hf II	15254 – 43044	4.8	0.94	-0.03
3624.00	Hf II	12921 – 40507	1.2	0.23	-0.63
3630.87	Hf II	28105 – 55639	91.	18.	1.25
3644.36	Hf II	6344 – 33776	1.3	0.27	-0.57
3661.05	Hf II	15084 – 42391	2.4	0.48	-0.32
3665.35	Hf II	11952 – 39226	1.5	0.31	-0.51
3698.40	Hf II	17369 – 44400	3.0	0.62	-0.21
3699.72	Hf II	13486 – 40507	2.4	0.50	-0.30
3701.15	Hf II	17389 – 44400	10.	2.1	0.33
3705.40	Hf II	17711 – 44691	4.0	0.81	-0.09
3719.28	Hf II	4905 – 31784	0.56	0.12	-0.93
3737.88	Hf II	18898 – 45643	7.0	1.5	0.16
3744.98	Hf II	23146 – 49841	12.	2.5	0.40
3747.49	Hf II	15084 – 41761	1.2	0.25	-0.61
3762.51	Hf II	31878 – 58448	20.	4.2	0.62
3766.92	Hf II	20135 – 46675	10.	2.2	0.34
3771.36	Hf II	12070 – 38579	0.36	0.077	-1.12
3782.78	Hf II	12070 – 38499	0.41	0.088	-1.05
3793.37	Hf II	3051 – 29405	0.29	0.063	-1.20
3806.07	Hf II	21638 – 47904	11.	2.5	0.39
3817.20	Hf II	17711 – 43901	2.7	0.59	-0.23
3849.52	Hf II	17711 – 43681	3.6	0.80	-0.10
3867.34	Hf II	17830 – 43681	1.8	0.41	-0.39
3872.55	Hf II	12071 – 37886	0.91	0.20	-0.69
3877.10	Hf II	23146 – 48931	14.	3.3	0.51
3880.82	Hf II	3645 – 29405	0.16	0.036	-1.45
3883.77	Hf II	13486 – 39226	0.96	0.22	-0.66
3900.65	Hf II	30942 – 56572	8.8	2.0	0.30
3917.45	Hf II	21638 – 47158	4.9	1.1	0.05
3918.09	Hf II	3645 – 29160	0.24	0.055	-1.26
3923.90	Hf II	12921 – 38399	1.1	0.25	-0.61
3929.54	Hf II	28105 – 53546	22.	5.0	0.70
3935.65	Hf II	17369 – 42771	2.2	0.52	-0.28
3964.95	Hf II	17830 – 43044	1.6	0.37	-0.44
3979.40	Hf II	28105 – 53227	15.	3.5	0.55
4047.96	Hf II	30942 – 55639	25.	6.2	0.79

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4049.45	Hf II	17830 - 42518	1.2	0.29	-0.54
4093.16	Hf II	3645 - 28069	0.16	0.040	-1.39
4113.53	Hf II	12071 - 36373	0.35	0.089	-1.05
4127.80	Hf II	14360 - 38579	0.85	0.22	-0.66
4158.88	Hf II	17369 - 41407	1.0	0.27	-0.58
4162.36	Hf II	17389 - 41407	1.9	0.50	-0.31
4187.66	Hf II	18898 - 42771	1.5	0.40	-0.40
4206.58	Hf II	20135 - 43901	4.2	1.1	0.05
4232.44	Hf II	18898 - 42518	3.1	0.82	-0.09
4245.84	Hf II	20135 - 43681	0.99	0.27	-0.57
4272.85	Hf II	13486 - 36883	0.63	0.17	-0.76
4320.67	Hf II	17369 - 40507	0.83	0.23	-0.64
4334.64	Hf II	23146 - 46209	2.1	0.60	-0.22
4336.66	Hf II	21638 - 44691	6.2	1.7	0.24
4350.51	Hf II	23146 - 46125	7.8	2.2	0.34
4367.90	Hf II	13486 - 36373	0.37	0.11	-0.97
4370.97	Hf II	12071 - 34942	0.40	0.11	-0.94
4417.35	Hf II	15254 - 37886	0.63	0.19	-0.73
4466.40	Hf II	20135 - 42518	0.86	0.26	-0.59
4486.13	Hf II	12071 - 34355	0.11	0.033	-1.49
4573.79	Hf II	17369 - 39226	0.17	0.055	-1.26
4605.77	Hf II	12071 - 33776	0.038	0.012	-1.92
4622.70	Hf II	20135 - 41761	1.1	0.35	-0.46
4664.12	Hf II	12921 - 34355	0.13	0.044	-1.36
4699.72	Hf II	20135 - 41407	0.50	0.16	-0.78
4719.10	Hf II	11952 - 33136	0.056	0.019	-1.72
4731.37	Hf II	17369 - 38499	0.26	0.086	-1.06
4790.72	Hf II	17711 - 38578	0.23	0.078	-1.11
4817.21	Hf II	21638 - 42391	0.56	0.19	-0.71
4934.45	Hf II	12921 - 33181	0.027	0.0100	-2.00
4999.68	Hf II	14360 - 34355	0.024	0.0090	-2.04
5040.82	Hf II	11952 - 31784	0.041	0.016	-1.80
5079.65	Hf II	18898 - 38579	0.16	0.062	-1.21
5128.53	Hf II	17389 - 36883	0.060	0.024	-1.62
5187.75	Hf II	15084 - 34355	0.050	0.020	-1.70
5247.10	Hf II	28105 - 47158	3.3	1.4	0.13
5260.44	Hf II	17369 - 36373	0.072	0.030	-1.53
5264.95	Hf II	18898 - 37886	0.14	0.057	-1.24
5298.06	Hf II	15254 - 34124	0.072	0.030	-1.52
5311.60	Hf II	14360 - 33181	0.064	0.027	-1.57
5324.26	Hf II	14360 - 33136	0.015	0.0062	-2.21
5346.30	Hf II	28458 - 47158	0.58	0.25	-0.61
5391.36	Hf II	17830 - 36373	0.055	0.024	-1.62
5444.07	Hf II	20135 - 38499	0.076	0.034	-1.47
5463.38	Hf II	13486 - 31784	0.025	0.011	-1.94
5524.35	Hf II	15084 - 33181	0.023	0.010	-1.98
5767.18	Hf II	12071 - 29405	0.0062	0.0031	-2.51
5809.50	Hf II	11952 - 29160	0.0052	0.0026	-2.58
5842.23	Hf II	17830 - 34942	0.053	0.027	-1.57
6248.95	Hf II	12071 - 28069	0.020	0.012	-1.92

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
6644.60	Hf II	14360 - 29405	0.024	0.016	-1.80
6647.06	Hf II	23146 - 38186	0.11	0.075	-1.12
6754.61	Hf II	14360 - 29160	0.012	0.0082	-2.08
6980.91	Hf II	15084 - 29405	0.017	0.012	-1.91
7030.33	Hf II	20135 - 34355	0.027	0.020	-1.70
7757.89	Hf II	18898 - 31784	0.011	0.0098	-2.01
8305.91	Hf II	17369 - 29405	0.016	0.016	-1.79

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2536.52	Hg I	0 - 39412	3.5	0.34	-0.47
2752.78	Hg I	37645 - 73961	1.1	0.12	-0.92
2893.60	Hg I	39412 - 73961	1.9	0.23	-0.63
2967.28	Hg I	37645 - 71336	22.	2.9	0.47
3021.50	Hg I	44043 - 77129	4.0	0.54	-0.27
3125.66	Hg I	39412 - 71396	7.8	1.1	0.06
3131.55	Hg I	39412 - 71336	6.2	0.92	-0.04
3131.83	Hg I	39412 - 71333	6.2	0.92	-0.04
3341.48	Hg I	44043 - 73961	1.3	0.22	-0.67
3650.15	Hg I	44043 - 71431	64.	13.	1.11
3654.83	Hg I	44043 - 71396	6.8	1.4	0.14
3662.88	Hg I	44043 - 71336	1.8	0.37	-0.43
3663.28	Hg I	44043 - 71333	5.5	1.1	0.04
4046.56	Hg I	37645 - 62350	36.	8.8	0.94
4077.81	Hg I	39412 - 63928	2.6	0.64	-0.20
4358.35	Hg I	39412 - 62350	86.	24.	1.39
5460.74	Hg I	44043 - 62350	86.	38.	1.58
5769.59	Hg I	54069 - 71396	8.6	4.3	0.63
5790.65	Hg I	54069 - 71333	10.	5.1	0.71

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4040.81	Ho I	0 - 24660	8.0	2.0	0.29
4053.93	Ho I	0 - 24660	24.	5.9	0.77
4103.84	Ho I	0 - 24361	25.	6.3	0.80

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2389.54	In I	0 - 41836	0.17	0.015	-1.83
2460.08	In I	0 - 40637	0.38	0.035	-1.46
2468.02	In I	2213 - 42718	0.35	0.032	-1.50
2521.37	In I	2213 - 41862	0.93	0.089	-1.05
2560.15	In I	0 - 39048	4.7	0.46	-0.34
2601.76	In I	2213 - 40637	1.4	0.14	-0.86
2710.26	In I	2213 - 39098	7.3	0.81	-0.09
2713.94	In I	2213 - 39048	1.4	0.15	-0.82
2753.88	In I	0 - 36302	1.5	0.17	-0.77
2775.37	In I	0 - 36020	0.079	0.0091	-2.04
2836.92	In I	2213 - 37452	0.54	0.065	-1.18
2858.14	In I	0 - 34978	0.045	0.0055	-2.26
2932.63	In I	2213 - 36302	2.5	0.32	-0.50
2957.01	In I	2213 - 36020	0.042	0.0055	-2.26
3039.36	In I	0 - 32892	7.1	0.99	-0.01
3256.09	In I	2213 - 32916	12.	2.0	0.30
3258.56	In I	2213 - 32892	2.9	0.46	-0.34
4104.76	In I	0 - 24373	1.9	0.47	-0.33
4511.31	In I	2213 - 24373	2.2	0.66	-0.18
6847.44	In I	24373 - 38972	0.089	0.063	-1.20
6900.13	In I	24373 - 38861	0.044	0.031	-1.51

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2306.06	In II	0 - 43349	0.032	0.0025	-2.60

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2010.65	Ir I	0 - 49719	2.1	0.13	-0.89
2022.35	Ir I	2835 - 52266	3.2	0.20	-0.71
2033.57	Ir I	0 - 49159	3.8	0.24	-0.62
2052.22	Ir I	6324 - 55036	4.5	0.29	-0.54
2060.64	Ir I	7107 - 55619	4.1	0.26	-0.58
2083.22	Ir I	5785 - 53772	3.4	0.22	-0.65
2085.74	Ir I	7107 - 55036	3.3	0.22	-0.67
2088.82	Ir I	0 - 47858	5.6	0.36	-0.44
2092.63	Ir I	2835 - 50606	9.6	0.63	-0.20
2112.68	Ir I	6324 - 53642	3.4	0.23	-0.64
2119.54	Ir I	0 - 47165	0.74	0.050	-1.30
2125.44	Ir I	7107 - 54141	3.1	0.21	-0.68
2127.52	Ir I	2835 - 49824	1.6	0.11	-0.96
2127.94	Ir I	0 - 46979	2.1	0.14	-0.84
2148.22	Ir I	7107 - 53642	7.0	0.48	-0.32
2150.54	Ir I	4079 - 50564	3.0	0.21	-0.68
2155.81	Ir I	0 - 46372	1.5	0.11	-0.97
2158.05	Ir I	2835 - 49159	8.7	0.61	-0.21
2162.88	Ir I	0 - 46220	1.2	0.083	-1.08
2175.24	Ir I	0 - 45957	2.7	0.19	-0.72
2178.17	Ir I	0 - 45896	1.6	0.11	-0.95
2191.64	Ir I	2835 - 48449	1.0	0.074	-1.13
2220.37	Ir I	2835 - 47858	2.3	0.17	-0.77
2253.38	Ir I	7107 - 51471	10.	0.76	-0.12
2255.10	Ir I	2835 - 47165	4.3	0.33	-0.48
2255.81	Ir I	5785 - 50101	5.8	0.44	-0.35
2258.51	Ir I	9878 - 54141	2.6	0.20	-0.70
2258.86	Ir I	6324 - 50580	6.3	0.48	-0.32
2264.61	Ir I	2835 - 46979	1.9	0.14	-0.84
2266.33	Ir I	6324 - 50434	5.4	0.42	-0.38
2268.90	Ir I	10579 - 54639	9.6	0.74	-0.13
2280.00	Ir I	6324 - 50170	3.7	0.29	-0.54
2281.91	Ir I	9878 - 53687	6.2	0.49	-0.31
2284.60	Ir I	13940 - 57698	4.6	0.36	-0.45
2295.08	Ir I	5785 - 49342	1.9	0.15	-0.82
2298.05	Ir I	11831 - 55333	10.	0.83	-0.08
2299.53	Ir I	7107 - 50580	3.2	0.26	-0.59
2300.50	Ir I	6324 - 49779	5.6	0.44	-0.35
2304.22	Ir I	2835 - 46220	8.2	0.65	-0.19
2305.47	Ir I	5785 - 49146	2.5	0.20	-0.70
2307.27	Ir I	7107 - 50434	1.6	0.13	-0.90
2308.93	Ir I	6324 - 49621	6.1	0.49	-0.31
2315.38	Ir I	0 - 43176	0.65	0.052	-1.28
2321.45	Ir I	7107 - 50170	3.8	0.31	-0.51
2321.58	Ir I	2835 - 45896	1.4	0.11	-0.95
2327.98	Ir I	12218 - 55161	3.7	0.30	-0.52
2333.30	Ir I	5785 - 48629	4.0	0.32	-0.49
2333.84	Ir I	6324 - 49159	6.3	0.51	-0.29
2334.50	Ir I	6324 - 49146	5.0	0.41	-0.39
2343.18	Ir I	5785 - 48449	13.	1.1	0.03

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2343.61	Ir I	5785 - 48441	6.0	0.49	-0.31
2352.62	Ir I	12218 - 54711	2.6	0.21	-0.67
2355.00	Ir I	9878 - 52327	11.	0.90	-0.05
2358.16	Ir I	4079 - 46472	2.4	0.20	-0.70
2360.73	Ir I	9878 - 52224	9.6	0.80	-0.10
2363.04	Ir I	6324 - 48629	27.	2.3	0.36
2372.77	Ir I	0 - 42132	6.9	0.59	-0.23
2377.28	Ir I	7107 - 49159	3.2	0.27	-0.57
2377.98	Ir I	7107 - 49146	3.2	0.27	-0.57
2379.38	Ir I	4079 - 46094	3.4	0.29	-0.53
2381.62	Ir I	6324 - 48299	6.4	0.55	-0.26
2383.17	Ir I	13088 - 55036	7.5	0.64	-0.19
2383.79	Ir I	9878 - 51815	2.0	0.17	-0.76
2386.89	Ir I	6324 - 48207	16.	1.4	0.13
2390.62	Ir I	2835 - 44652	12.	1.0	0.02
2391.18	Ir I	2835 - 44643	14.	1.2	0.09
2401.77	Ir I	13088 - 54711	3.7	0.32	-0.50
2407.59	Ir I	7107 - 48629	4.1	0.35	-0.45
2409.37	Ir I	4079 - 45571	2.4	0.21	-0.68
2410.17	Ir I	13088 - 54566	13.	1.1	0.06
2410.73	Ir I	12218 - 53687	12.	1.0	0.01
2413.31	Ir I	4079 - 45503	4.4	0.39	-0.41
2415.86	Ir I	5785 - 47165	5.0	0.44	-0.36
2418.11	Ir I	7107 - 48449	12.	1.1	0.04
2424.32	Ir I	10579 - 51815	5.2	0.45	-0.34
2424.66	Ir I	9878 - 51108	4.6	0.41	-0.39
2424.89	Ir I	5785 - 47011	3.2	0.29	-0.54
2424.99	Ir I	6324 - 47549	6.5	0.57	-0.24
2425.66	Ir I	6324 - 47537	5.1	0.45	-0.35
2426.78	Ir I	5785 - 46979	0.81	0.071	-1.15
2427.61	Ir I	4079 - 45259	4.9	0.43	-0.36
2431.24	Ir I	0 - 41119	1.7	0.15	-0.83
2431.94	Ir I	4079 - 45186	13.	1.2	0.07
2432.36	Ir I	7107 - 48207	3.8	0.33	-0.48
2432.58	Ir I	13940 - 55036	6.2	0.55	-0.26
2435.14	Ir I	13088 - 54141	15.	1.4	0.14
2436.42	Ir I	13088 - 54119	4.9	0.44	-0.36
2445.34	Ir I	6324 - 47206	4.7	0.42	-0.37
2447.49	Ir I	17779 - 58625	4.2	0.37	-0.43
2447.76	Ir I	6324 - 47165	4.7	0.42	-0.38
2448.23	Ir I	5785 - 46618	3.3	0.30	-0.52
2449.02	Ir I	12952 - 53772	2.7	0.24	-0.62
2452.81	Ir I	2835 - 43592	6.8	0.61	-0.21
2454.12	Ir I	12952 - 53687	5.4	0.48	-0.32
2455.61	Ir I	0 - 40711	4.5	0.40	-0.39
2455.87	Ir I	4079 - 44785	2.4	0.22	-0.67
2457.03	Ir I	5785 - 46472	3.6	0.32	-0.49
2457.23	Ir I	13088 - 53772	14.	1.2	0.09
2462.36	Ir I	13088 - 53687	5.4	0.49	-0.31
2463.03	Ir I	12218 - 52807	4.8	0.44	-0.36

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2464.90	Ir I	11831 - 52388	4.5	0.41	-0.38
2465.09	Ir I	13088 - 53642	8.0	0.73	-0.14
2467.30	Ir I	4079 - 44597	8.7	0.79	-0.10
2475.12	Ir I	0 - 40390	10.	0.93	-0.03
2478.11	Ir I	2835 - 43176	1.4	0.13	-0.89
2479.16	Ir I	13940 - 54264	2.9	0.27	-0.57
2481.18	Ir I	0 - 40291	6.2	0.57	-0.24
2485.38	Ir I	9878 - 50101	4.0	0.37	-0.43
2486.37	Ir I	18547 - 58754	4.3	0.40	-0.40
2486.75	Ir I	13940 - 54141	2.9	0.27	-0.58
2489.20	Ir I	16103 - 56265	3.5	0.33	-0.48
2493.08	Ir I	7107 - 47206	13.	1.2	0.09
2496.27	Ir I	6324 - 46372	3.5	0.33	-0.48
2500.27	Ir I	11831 - 51815	4.3	0.40	-0.40
2502.63	Ir I	9878 - 49824	9.2	0.86	-0.06
2502.98	Ir I	0 - 39940	11.	1.1	0.03
2504.37	Ir I	17779 - 57697	16.	1.5	0.18
2505.74	Ir I	6324 - 46220	2.0	0.19	-0.71
2506.60	Ir I	12506 - 52388	4.6	0.44	-0.36
2507.63	Ir I	10579 - 50445	5.1	0.49	-0.31
2508.35	Ir I	12952 - 52807	4.9	0.46	-0.34
2509.71	Ir I	12218 - 52052	8.8	0.83	-0.08
2511.94	Ir I	12506 - 52304	9.2	0.87	-0.06
2513.71	Ir I	6324 - 46094	3.3	0.31	-0.50
2515.36	Ir I	9878 - 49621	4.4	0.42	-0.37
2525.05	Ir I	10579 - 50170	6.6	0.63	-0.20
2526.77	Ir I	19061 - 58625	4.3	0.41	-0.38
2532.20	Ir I	18547 - 58027	5.2	0.50	-0.30
2532.52	Ir I	5785 - 45259	1.5	0.15	-0.83
2533.13	Ir I	9878 - 49342	34.	3.3	0.51
2534.46	Ir I	2835 - 42279	6.1	0.59	-0.23
2537.22	Ir I	5785 - 45186	7.0	0.68	-0.17
2537.68	Ir I	16103 - 55497	13.	1.3	0.11
2538.88	Ir I	12952 - 52327	2.3	0.22	-0.65
2540.40	Ir I	12952 - 52304	2.3	0.22	-0.65
2541.48	Ir I	11831 - 51166	4.9	0.47	-0.32
2542.02	Ir I	5785 - 45112	6.9	0.67	-0.17
2543.97	Ir I	2835 - 42132	40.	3.9	0.59
2545.54	Ir I	12952 - 52224	8.0	0.78	-0.11
2546.03	Ir I	7107 - 46372	14.	1.3	0.13
2547.20	Ir I	6324 - 45571	1.7	0.16	-0.78
2547.69	Ir I	13088 - 52327	7.0	0.68	-0.17
2551.40	Ir I	12952 - 52134	11.	1.1	0.05
2554.40	Ir I	13088 - 52224	10.	1.0	0.01
2555.35	Ir I	4079 - 43202	1.4	0.14	-0.85
2555.88	Ir I	7107 - 46220	2.8	0.27	-0.56
2563.28	Ir I	5785 - 44785	1.6	0.16	-0.81
2564.18	Ir I	7107 - 46094	15.	1.5	0.17
2569.88	Ir I	12952 - 51852	11.	1.1	0.04
2570.62	Ir I	12218 - 51108	4.9	0.49	-0.31

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2572.07	Ir I	10579 - 49446	2.6	0.25	-0.59
2572.37	Ir I	12952 - 51815	3.8	0.38	-0.42
2572.70	Ir I	5785 - 44643	2.4	0.24	-0.62
2577.26	Ir I	7107 - 45896	11.	1.1	0.05
2578.71	Ir I	16565 - 55333	8.4	0.84	-0.08
2578.91	Ir I	13088 - 51852	3.9	0.38	-0.41
2583.18	Ir I	18547 - 57248	3.6	0.36	-0.44
2592.06	Ir I	0 - 38568	1.4	0.14	-0.84
2599.04	Ir I	7107 - 45571	10.	1.0	0.02
2602.04	Ir I	16565 - 54985	11.	1.2	0.07
2604.55	Ir I	13088 - 51471	9.5	0.96	-0.02
2607.52	Ir I	13088 - 51427	9.4	0.96	-0.02
2608.25	Ir I	6324 - 44652	7.6	0.77	-0.11
2611.30	Ir I	2835 - 41119	7.0	0.71	-0.15
2612.04	Ir I	6324 - 44597	0.77	0.078	-1.11
2614.98	Ir I	0 - 38230	0.36	0.037	-1.43
2615.88	Ir I	16103 - 54320	5.4	0.55	-0.26
2617.78	Ir I	4079 - 42268	1.8	0.19	-0.73
2619.88	Ir I	0 - 38158	0.36	0.037	-1.43
2625.32	Ir I	7107 - 45186	3.1	0.32	-0.49
2625.67	Ir I	16565 - 54639	3.2	0.33	-0.48
2626.76	Ir I	12506 - 50564	4.6	0.47	-0.32
2628.20	Ir I	16103 - 54141	3.8	0.39	-0.41
2629.41	Ir I	13088 - 51108	2.0	0.21	-0.68
2634.17	Ir I	12218 - 50170	29.	3.0	0.48
2635.27	Ir I	4079 - 42014	0.85	0.089	-1.05
2638.97	Ir I	12218 - 50101	1.4	0.14	-0.85
2639.42	Ir I	2835 - 40711	0.89	0.093	-1.03
2639.71	Ir I	0 - 37872	5.6	0.59	-0.23
2640.38	Ir I	10579 - 48441	1.5	0.16	-0.79
2644.19	Ir I	5785 - 43592	1.7	0.18	-0.76
2653.76	Ir I	9878 - 47549	4.0	0.43	-0.37
2653.95	Ir I	16103 - 53772	5.1	0.54	-0.27
2656.81	Ir I	10579 - 48207	2.9	0.31	-0.51
2657.71	Ir I	11831 - 49446	1.2	0.13	-0.89
2661.98	Ir I	2835 - 40390	8.9	0.94	-0.03
2662.63	Ir I	7107 - 44652	5.9	0.63	-0.20
2663.31	Ir I	7107 - 44643	1.4	0.14	-0.84
2664.79	Ir I	0 - 37515	6.1	0.65	-0.19
2668.99	Ir I	2835 - 40291	0.66	0.071	-1.15
2669.46	Ir I	16103 - 53553	5.7	0.61	-0.21
2669.91	Ir I	4079 - 41522	3.6	0.38	-0.42
2671.84	Ir I	5785 - 43201	5.7	0.61	-0.21
2673.61	Ir I	5785 - 43176	3.6	0.39	-0.41
2676.83	Ir I	13088 - 50434	8.2	0.88	-0.05
2679.06	Ir I	11831 - 49146	5.0	0.54	-0.27
2681.10	Ir I	5785 - 43072	0.58	0.063	-1.20
2682.46	Ir I	6324 - 43592	0.34	0.037	-1.44
2684.04	Ir I	10579 - 47825	4.4	0.47	-0.33
2691.06	Ir I	12952 - 50101	3.5	0.38	-0.42

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2692.34	Ir I	4079 - 41210	1.7	0.19	-0.72
2692.88	Ir I	12218 - 49342	1.5	0.16	-0.79
2693.49	Ir I	17779 - 54895	3.4	0.37	-0.44
2694.23	Ir I	2835 - 39940	13.	1.5	0.16
2704.03	Ir I	2835 - 39806	0.47	0.051	-1.29
2704.93	Ir I	10579 - 47537	1.5	0.17	-0.77
2706.88	Ir I	17779 - 54711	3.3	0.36	-0.44
2712.74	Ir I	6324 - 43176	1.8	0.20	-0.70
2720.45	Ir I	6324 - 43072	0.74	0.082	-1.08
2723.76	Ir I	16103 - 52807	3.3	0.37	-0.43
2729.56	Ir I	10579 - 47204	1.4	0.16	-0.79
2730.71	Ir I	11831 - 48441	2.5	0.28	-0.55
2732.67	Ir I	12218 - 48802	3.4	0.38	-0.42
2739.32	Ir I	13940 - 50434	2.3	0.26	-0.58
2740.00	Ir I	7107 - 43592	0.43	0.049	-1.31
2740.18	Ir I	5785 - 42268	0.30	0.034	-1.47
2744.00	Ir I	10579 - 47011	4.6	0.52	-0.29
2747.51	Ir I	19593 - 55979	3.8	0.43	-0.37
2749.32	Ir I	17779 - 54141	3.2	0.36	-0.45
2758.23	Ir I	5785 - 42029	0.67	0.077	-1.12
2759.32	Ir I	12218 - 48449	3.2	0.37	-0.44
2759.91	Ir I	12218 - 48441	2.6	0.29	-0.53
2767.65	Ir I	16103 - 52224	2.5	0.29	-0.54
2771.61	Ir I	7107 - 43176	0.93	0.11	-0.97
2772.46	Ir I	13088 - 49146	18.	2.1	0.31
2774.58	Ir I	16103 - 52134	2.5	0.29	-0.54
2775.55	Ir I	9878 - 45896	6.0	0.70	-0.16
2777.43	Ir I	11831 - 47825	3.4	0.39	-0.41
2781.29	Ir I	6324 - 42268	4.6	0.53	-0.27
2785.22	Ir I	10579 - 46472	9.7	1.1	0.05
2796.46	Ir I	16103 - 51852	7.2	0.84	-0.08
2797.35	Ir I	5785 - 41522	3.9	0.46	-0.33
2797.70	Ir I	2835 - 38568	5.1	0.60	-0.22
2798.18	Ir I	4079 - 39806	1.7	0.20	-0.70
2799.74	Ir I	16681 - 52388	3.9	0.46	-0.34
2800.82	Ir I	9878 - 45571	9.3	1.1	0.04
2812.80	Ir I	13088 - 48629	2.0	0.24	-0.62
2823.18	Ir I	0 - 35411	0.89	0.11	-0.97
2824.45	Ir I	2835 - 38230	3.5	0.42	-0.37
2830.17	Ir I	2835 - 38158	0.19	0.023	-1.63
2830.51	Ir I	12218 - 47538	2.2	0.26	-0.59
2831.36	Ir I	9878 - 45186	0.84	0.10	-1.00
2835.66	Ir I	12952 - 48206	5.0	0.61	-0.22
2836.40	Ir I	4079 - 39324	3.2	0.39	-0.41
2837.33	Ir I	9878 - 45112	3.3	0.40	-0.40
2839.16	Ir I	13088 - 48299	51.	6.2	0.79
2840.22	Ir I	6324 - 41522	6.0	0.73	-0.14
2842.28	Ir I	7107 - 42279	1.5	0.18	-0.74
2849.72	Ir I	0 - 35081	4.6	0.56	-0.25
2855.82	Ir I	18547 - 53553	4.6	0.56	-0.25

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2860.66	Ir I	12218 - 47165	1.5	0.18	-0.74
2863.84	Ir I	9878 - 44786	2.0	0.25	-0.60
2866.69	Ir I	12952 - 47825	2.3	0.29	-0.54
2867.63	Ir I	16565 - 51427	2.9	0.35	-0.45
2869.70	Ir I	10579 - 45415	1.8	0.22	-0.65
2875.60	Ir I	9878 - 44643	6.8	0.85	-0.07
2875.98	Ir I	12218 - 46979	13.	1.7	0.22
2877.68	Ir I	5785 - 40525	1.5	0.19	-0.72
2879.41	Ir I	9878 - 44597	2.4	0.30	-0.52
2881.16	Ir I	12506 - 47204	2.0	0.25	-0.60
2882.64	Ir I	2835 - 37515	2.0	0.25	-0.61
2897.15	Ir I	5785 - 40291	3.5	0.44	-0.36
2899.63	Ir I	16103 - 50580	6.1	0.77	-0.11
2900.39	Ir I	19593 - 54061	4.1	0.52	-0.28
2901.95	Ir I	13088 - 47538	10.	1.3	0.12
2904.80	Ir I	7107 - 41522	1.9	0.25	-0.61
2905.64	Ir I	4079 - 38485	0.13	0.017	-1.78
2907.24	Ir I	6324 - 40711	1.2	0.15	-0.81
2909.56	Ir I	13940 - 48299	3.3	0.42	-0.38
2916.36	Ir I	4079 - 38358	1.3	0.17	-0.77
2918.57	Ir I	12218 - 46472	7.2	0.92	-0.03
2924.79	Ir I	0 - 34180	4.2	0.53	-0.27
2930.63	Ir I	12506 - 46618	2.7	0.34	-0.46
2934.64	Ir I	6324 - 40390	6.8	0.87	-0.06
2936.68	Ir I	4079 - 38121	2.6	0.33	-0.48
2938.47	Ir I	5785 - 39806	1.1	0.15	-0.83
2939.27	Ir I	7107 - 41119	1.3	0.17	-0.78
2940.54	Ir I	16103 - 50101	9.5	1.2	0.09
2941.08	Ir I	10579 - 44570	0.73	0.095	-1.02
2943.15	Ir I	6324 - 40291	15.	1.9	0.28
2946.97	Ir I	13088 - 47011	8.4	1.1	0.04
2949.76	Ir I	13088 - 46979	7.3	0.96	-0.02
2951.22	Ir I	0 - 33874	1.0	0.13	-0.87
2962.99	Ir I	11831 - 45571	3.6	0.47	-0.32
2965.20	Ir I	9878 - 43592	0.66	0.086	-1.06
2968.49	Ir I	12218 - 45896	0.90	0.12	-0.93
2974.10	Ir I	4079 - 37693	0.071	0.0094	-2.03
2974.95	Ir I	16565 - 50170	15.	1.9	0.29
2980.65	Ir I	5785 - 39324	1.8	0.24	-0.62
2985.80	Ir I	6324 - 39806	0.71	0.095	-1.02
2990.62	Ir I	11831 - 45259	4.2	0.57	-0.25
2996.08	Ir I	4079 - 37446	0.73	0.099	-1.00
2997.19	Ir I	11831 - 45186	1.5	0.20	-0.70
2997.41	Ir I	12218 - 45571	4.3	0.58	-0.24
3002.25	Ir I	9878 - 43176	2.7	0.36	-0.44
3003.63	Ir I	7107 - 40390	3.4	0.46	-0.34
3005.21	Ir I	13940 - 47206	3.2	0.43	-0.37
3009.90	Ir I	16565 - 49779	2.7	0.37	-0.43
3011.69	Ir I	9878 - 43072	2.0	0.27	-0.57
3016.43	Ir I	12952 - 46094	3.6	0.49	-0.31

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3017.31	Ir I	13088 - 46221	8.2	1.1	0.05
3019.23	Ir I	26307 - 59419	27.	3.7	0.57
3020.01	Ir I	26307 - 59410	16.	2.2	0.35
3022.41	Ir I	26307 - 59384	16.	2.2	0.35
3025.82	Ir I	13940 - 46979	4.0	0.55	-0.26
3029.36	Ir I	6324 - 39324	1.6	0.22	-0.66
3032.41	Ir I	12218 - 45186	1.5	0.21	-0.68
3033.62	Ir I	11831 - 44786	0.80	0.11	-0.95
3037.75	Ir I	12506 - 45415	2.2	0.31	-0.51
3039.26	Ir I	12218 - 45112	7.1	0.98	-0.01
3040.47	Ir I	18547 - 51427	4.9	0.68	-0.17
3047.16	Ir I	13088 - 45896	8.1	1.1	0.05
3049.44	Ir I	5785 - 38568	1.0	0.14	-0.84
3052.16	Ir I	19061 - 51815	3.9	0.54	-0.26
3053.60	Ir I	11831 - 44570	1.5	0.21	-0.67
3057.28	Ir I	7107 - 39806	1.5	0.20	-0.69
3061.41	Ir I	17779 - 50434	5.2	0.73	-0.13
3064.51	Ir I	10579 - 43201	0.69	0.098	-1.01
3068.89	Ir I	2835 - 35411	3.1	0.44	-0.36
3069.09	Ir I	5785 - 38358	0.84	0.12	-0.93
3069.71	Ir I	12218 - 44785	5.2	0.73	-0.14
3076.69	Ir I	10579 - 43072	2.9	0.40	-0.39
3083.22	Ir I	12218 - 44643	8.4	1.2	0.08
3086.44	Ir I	9878 - 42268	3.2	0.46	-0.34
3088.04	Ir I	5785 - 38158	1.6	0.23	-0.64
3094.01	Ir I	4079 - 36390	0.18	0.026	-1.59
3100.29	Ir I	2835 - 35081	0.89	0.13	-0.89
3100.45	Ir I	6324 - 38568	2.4	0.34	-0.47
3114.05	Ir I	16103 - 48206	4.1	0.60	-0.22
3114.55	Ir I	13088 - 45186	2.8	0.40	-0.39
3120.76	Ir I	6324 - 38358	1.5	0.22	-0.65
3121.78	Ir I	13088 - 45112	6.1	0.88	-0.05
3122.38	Ir I	13940 - 45957	3.5	0.51	-0.30
3128.39	Ir I	13940 - 45896	2.6	0.39	-0.41
3133.09	Ir I	5785 - 37693	0.26	0.039	-1.41
3133.32	Ir I	6324 - 38230	15.	2.2	0.34
3140.41	Ir I	12952 - 44786	1.9	0.29	-0.54
3145.07	Ir I	28452 - 60239	21.	3.1	0.49
3150.61	Ir I	5785 - 37515	0.68	0.10	-0.99
3154.55	Ir I	12952 - 44643	1.9	0.28	-0.55
3154.74	Ir I	10579 - 42268	2.6	0.39	-0.41
3159.15	Ir I	12952 - 44597	5.0	0.75	-0.12
3168.18	Ir I	13088 - 44643	3.8	0.57	-0.25
3168.88	Ir I	6324 - 37872	1.9	0.29	-0.54
3177.58	Ir I	7107 - 38568	1.8	0.27	-0.58
3180.35	Ir I	16103 - 47538	10.	1.6	0.19
3198.92	Ir I	7107 - 38358	1.7	0.25	-0.59
3212.12	Ir I	7107 - 38230	2.7	0.41	-0.38
3213.55	Ir I	19061 - 50170	7.3	1.1	0.06
3218.46	Ir I	16103 - 47165	3.9	0.61	-0.22

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3219.51	Ir I	7107 - 38158	1.6	0.25	-0.61
3220.78	Ir I	2835 - 33874	6.6	1.0	0.01
3221.28	Ir I	28452 - 59487	29.	4.5	0.65
3229.28	Ir I	12218 - 43176	5.4	0.85	-0.07
3230.76	Ir I	10579 - 41522	1.1	0.18	-0.75
3232.00	Ir I	28452 - 59384	17.	2.7	0.43
3241.52	Ir I	4079 - 34920	0.82	0.13	-0.89
3254.40	Ir I	19061 - 49779	7.9	1.3	0.10
3262.01	Ir I	9878 - 40525	1.7	0.28	-0.56
3266.44	Ir I	5785 - 36390	1.0	0.16	-0.78
3277.28	Ir I	13088 - 43592	3.3	0.53	-0.27
3287.06	Ir I	9878 - 40291	0.49	0.080	-1.10
3287.59	Ir I	7107 - 37515	0.37	0.061	-1.22
3310.52	Ir I	11831 - 42029	2.2	0.35	-0.45
3312.13	Ir I	11831 - 42014	1.1	0.18	-0.75
3322.60	Ir I	13088 - 43176	3.7	0.62	-0.21
3322.87	Ir I	19060 - 49147	7.2	1.2	0.07
3334.16	Ir I	13088 - 43072	2.4	0.39	-0.40
3338.37	Ir I	10579 - 40525	0.53	0.089	-1.05
3368.48	Ir I	2835 - 32513	0.51	0.087	-1.06
3419.42	Ir I	13940 - 43176	1.2	0.20	-0.69
3437.02	Ir I	6324 - 35411	1.4	0.25	-0.60
3437.50	Ir I	16103 - 45186	3.4	0.60	-0.22
3448.97	Ir I	4079 - 33065	0.45	0.080	-1.10
3476.46	Ir I	6324 - 35081	0.16	0.029	-1.54
3477.77	Ir I	10579 - 39325	0.40	0.072	-1.14
3484.48	Ir I	9878 - 38568	0.43	0.078	-1.11
3513.64	Ir I	0 - 28452	0.99	0.18	-0.74
3515.95	Ir I	7107 - 35540	0.50	0.093	-1.03
3522.03	Ir I	4079 - 32464	0.39	0.072	-1.14
3557.17	Ir I	16681 - 44785	5.0	0.95	-0.02
3558.99	Ir I	5785 - 33874	0.46	0.088	-1.06
3568.00	Ir I	12506 - 40525	0.57	0.11	-0.96
3573.72	Ir I	7107 - 35081	2.5	0.47	-0.33
3594.39	Ir I	7107 - 34920	0.63	0.12	-0.91
3609.77	Ir I	2835 - 30530	0.13	0.025	-1.61
3617.21	Ir I	9878 - 37515	0.78	0.15	-0.81
3625.71	Ir I	12952 - 40525	0.77	0.15	-0.82
3626.29	Ir I	9878 - 37446	0.65	0.13	-0.89
3628.67	Ir I	6324 - 33874	0.96	0.19	-0.72
3636.20	Ir I	11831 - 39324	1.5	0.30	-0.52
3661.71	Ir I	13088 - 40390	2.8	0.57	-0.25
3664.62	Ir I	5785 - 33065	0.36	0.072	-1.14
3674.98	Ir I	13088 - 40291	2.9	0.59	-0.23
3687.08	Ir I	10579 - 37693	0.88	0.18	-0.75
3698.10	Ir I	19060 - 46094	3.9	0.80	-0.10
3725.38	Ir I	19060 - 45896	6.3	1.3	0.12
3738.53	Ir I	6324 - 33065	0.17	0.036	-1.45
3747.20	Ir I	5785 - 32464	0.56	0.12	-0.93
3750.40	Ir I	32831 - 59487	14.	2.8	0.45

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3753.32	Ir I	16565 - 43201	0.85	0.18	-0.75
3768.68	Ir I	11831 - 38358	0.38	0.081	-1.09
3770.73	Ir I	9878 - 36390	0.16	0.033	-1.48
3793.79	Ir I	13940 - 40291	1.1	0.24	-0.61
3794.06	Ir I	12218 - 38568	0.20	0.044	-1.36
3800.12	Ir I	0 - 26308	0.59	0.13	-0.90
3817.24	Ir I	6324 - 32513	0.25	0.056	-1.26
3865.64	Ir I	11831 - 37693	0.83	0.19	-0.73
3902.51	Ir I	2835 - 28452	0.17	0.039	-1.41
3902.66	Ir I	12952 - 38568	0.60	0.14	-0.87
3915.38	Ir I	9878 - 35411	1.2	0.28	-0.55
3934.84	Ir I	7107 - 32513	0.48	0.11	-0.95
3946.27	Ir I	16681 - 42014	2.1	0.48	-0.31
3951.95	Ir I	12218 - 37515	0.31	0.074	-1.13
3952.62	Ir I	17779 - 43072	0.75	0.18	-0.75
3962.78	Ir I	12218 - 37446	0.15	0.036	-1.44
3966.09	Ir I	12952 - 38158	0.22	0.051	-1.29
3976.31	Ir I	13088 - 38230	3.6	0.85	-0.07
3992.12	Ir I	9878 - 34920	1.1	0.26	-0.58
4020.03	Ir I	26307 - 51176	31.	7.5	0.88
4033.76	Ir I	13088 - 37872	1.9	0.47	-0.33
4040.08	Ir I	5785 - 30530	0.090	0.022	-1.66
4069.92	Ir I	12952 - 37515	1.9	0.46	-0.34
4070.68	Ir I	11831 - 36390	0.54	0.13	-0.87
4092.61	Ir I	13088 - 37515	0.51	0.13	-0.89
4115.78	Ir I	13940 - 38230	0.86	0.22	-0.66
4127.92	Ir I	13940 - 38158	0.14	0.036	-1.44
4155.70	Ir I	28452 - 52509	5.8	1.5	0.18
4166.04	Ir I	9878 - 33874	0.027	0.0071	-2.15
4172.56	Ir I	16565 - 40525	1.1	0.29	-0.54
4182.47	Ir I	32513 - 56416	12.	3.2	0.50
4183.21	Ir I	38230 - 62128	6.9	1.8	0.26
4185.66	Ir I	12506 - 36390	0.069	0.018	-1.74
4197.54	Ir I	11831 - 35648	0.070	0.019	-1.73
4217.76	Ir I	16103 - 39806	0.27	0.073	-1.14
4220.80	Ir I	26365 - 50050	1.9	0.50	-0.30
4259.11	Ir I	2835 - 26308	0.016	0.0045	-2.35
4265.30	Ir I	12952 - 36390	0.11	0.029	-1.54
4268.10	Ir I	7107 - 30530	0.19	0.052	-1.29
4286.62	Ir I	12218 - 35540	0.070	0.019	-1.72
4301.60	Ir I	16565 - 39806	0.75	0.21	-0.68
4310.59	Ir I	12218 - 35411	0.16	0.045	-1.34
4311.50	Ir I	9878 - 33065	0.34	0.093	-1.03
4351.30	Ir I	18547 - 41522	0.31	0.087	-1.06
4352.56	Ir I	19061 - 42029	0.35	0.10	-1.00
4392.59	Ir I	16565 - 39325	0.17	0.048	-1.32
4399.47	Ir I	16565 - 39289	1.5	0.43	-0.37
4403.78	Ir I	12218 - 34920	0.17	0.049	-1.31
4426.27	Ir I	9878 - 32464	0.15	0.043	-1.37
4450.18	Ir I	16103 - 38568	0.11	0.032	-1.49

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4478.48	Ir I	13088 - 35411	0.17	0.051	-1.29
4495.35	Ir I	33065 - 55304	5.3	1.6	0.20
4496.03	Ir I	34180 - 56416	3.9	1.2	0.07
4545.68	Ir I	13088 - 35081	0.16	0.048	-1.32
4548.48	Ir I	30530 - 52509	7.5	2.3	0.37
4550.78	Ir I	12952 - 34920	0.035	0.011	-1.97
4568.09	Ir I	10579 - 32464	0.050	0.016	-1.81
4570.02	Ir I	23310 - 45186	0.90	0.28	-0.55
4604.48	Ir I	35081 - 56793	6.8	2.2	0.34
4616.39	Ir I	12218 - 33874	0.13	0.042	-1.38
4656.18	Ir I	13940 - 35411	0.073	0.024	-1.62
4668.99	Ir I	16103 - 37515	0.085	0.028	-1.56
4708.88	Ir I	19060 - 40291	0.23	0.078	-1.11
4728.86	Ir I	13940 - 35081	0.14	0.045	-1.34
4731.86	Ir I	16565 - 37693	0.11	0.038	-1.42
4756.46	Ir I	33874 - 54893	7.4	2.5	0.40
4757.96	Ir I	16681 - 37693	0.068	0.023	-1.63
4778.16	Ir I	12952 - 33874	0.12	0.040	-1.40
4795.67	Ir I	12218 - 33065	0.047	0.016	-1.79
4807.14	Ir I	19593 - 40390	0.12	0.043	-1.37
4809.47	Ir I	13088 - 33874	0.039	0.014	-1.87
4840.77	Ir I	9878 - 30530	0.0077	0.0027	-2.57
4845.38	Ir I	11831 - 32464	0.021	0.0075	-2.13
4938.09	Ir I	12218 - 32464	0.068	0.025	-1.61
4970.48	Ir I	12952 - 33065	0.040	0.015	-1.83
4999.74	Ir I	32513 - 52509	4.7	1.8	0.25
5002.74	Ir I	6324 - 26308	0.0048	0.0018	-2.74
5009.17	Ir I	12506 - 32464	0.019	0.0072	-2.14
5014.98	Ir I	13940 - 33874	0.051	0.019	-1.72
5046.06	Ir I	35081 - 54893	4.4	1.7	0.23
5123.66	Ir I	12952 - 32464	0.035	0.014	-1.86
5177.95	Ir I	16103 - 35411	0.052	0.021	-1.68
5238.92	Ir I	16565 - 35648	0.063	0.026	-1.58
5340.74	Ir I	23310 - 42029	0.22	0.093	-1.03
5364.32	Ir I	19593 - 38230	0.22	0.097	-1.01
5449.50	Ir I	32831 - 51176	13.	5.6	0.75
5454.50	Ir I	34180 - 52509	6.4	2.9	0.46
5469.40	Ir I	19593 - 37872	0.041	0.019	-1.73
5620.04	Ir I	37515 - 55304	2.9	1.4	0.14
5625.55	Ir I	16103 - 33874	0.080	0.038	-1.42
5828.55	Ir I	38230 - 55382	3.1	1.6	0.19
5882.30	Ir I	34180 - 51176	1.8	0.94	-0.03
5887.36	Ir I	23310 - 40291	0.088	0.046	-1.34
5894.06	Ir I	16103 - 33065	0.057	0.030	-1.53
6026.10	Ir I	13940 - 30530	0.0057	0.0031	-2.51
6067.83	Ir I	39940 - 56416	4.4	2.4	0.38
6110.67	Ir I	16103 - 32464	0.027	0.015	-1.82
6288.28	Ir I	16565 - 32464	0.017	0.010	-1.99
6334.44	Ir I	16681 - 32464	0.010	0.0063	-2.20
6624.73	Ir I	40291 - 55382	1.7	1.1	0.06

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6686.08	Ir I	39940 - 54893	5.0	3.4	0.53
6830.01	Ir I	37872 - 52509	1.9	1.3	0.13
6929.88	Ir I	16103 - 30530	0.0088	0.0063	-2.20
7183.71	Ir I	18547 - 32464	0.014	0.011	-1.97
7834.32	Ir I	42132 - 54893	4.9	4.5	0.65

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4044.14	K I	0 - 24720	0.95	0.23	-0.63
4047.20	K I	0 - 24701	0.48	0.12	-0.93
5782.60	K I	12985 - 30274	0.20	0.10	-0.99
5801.96	K I	13043 - 30274	0.29	0.14	-0.84
6911.30	K I	12985 - 27451	0.28	0.20	-0.70
6938.98	K I	13043 - 27451	0.55	0.40	-0.40
7664.91	K I	0 - 13043	1.6	1.4	0.15
7698.98	K I	0 - 12985	0.78	0.70	-0.16

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2725.58	La I	1053 - 37732	6.6	0.74	-0.13
3215.81	La I	1053 - 32141	1.3	0.21	-0.68
3342.23	La I	1053 - 30965	2.6	0.44	-0.36
3461.18	La I	1053 - 29937	1.4	0.25	-0.60
3514.07	La I	1053 - 29502	0.84	0.16	-0.81
3574.43	La I	0 - 27969	2.6	0.49	-0.31
3613.08	La I	0 - 27669	0.77	0.15	-0.82
3636.67	La I	1053 - 28543	0.44	0.088	-1.06
3641.53	La I	1053 - 28506	2.2	0.43	-0.36
3649.53	La I	0 - 27393	0.88	0.18	-0.75
3672.02	La I	0 - 27225	0.15	0.031	-1.51
3704.54	La I	1053 - 28040	1.4	0.28	-0.55
3898.60	La I	0 - 25643	0.26	0.059	-1.23
3902.58	La I	0 - 25617	0.18	0.041	-1.38
3927.56	La I	0 - 25454	0.80	0.18	-0.73
3953.68	La I	1053 - 26339	0.26	0.060	-1.22
4015.39	La I	1053 - 25950	1.1	0.26	-0.59
4037.21	La I	0 - 24763	0.59	0.14	-0.84
4060.33	La I	4122 - 28743	2.9	0.71	-0.15
4064.79	La I	3495 - 28089	1.7	0.43	-0.37
4065.58	La I	1053 - 25643	0.33	0.081	-1.09
4079.18	La I	0 - 24508	0.48	0.12	-0.93
4089.61	La I	3010 - 27455	1.6	0.41	-0.39
4104.87	La I	2668 - 27023	0.89	0.23	-0.65
4109.80	La I	1053 - 25378	0.26	0.065	-1.19
4137.04	La I	1053 - 25218	0.54	0.14	-0.86
4157.52	La I	0 - 24046	0.14	0.037	-1.43
4160.26	La I	1053 - 25083	0.48	0.12	-0.91
4172.32	La I	3495 - 27455	0.47	0.12	-0.92
4177.48	La I	1053 - 24984	0.32	0.085	-1.07
4187.32	La I	0 - 23875	0.95	0.25	-0.60
4262.34	La I	1053 - 24508	0.21	0.056	-1.25
4280.27	La I	1053 - 24410	1.2	0.33	-0.48
4340.73	La I	8446 - 31477	1.2	0.34	-0.47
4354.80	La I	9184 - 32141	2.2	0.62	-0.21
4389.87	La I	9719 - 32493	2.4	0.70	-0.15
4402.65	La I	9044 - 31752	1.7	0.48	-0.32
4423.90	La I	9920 - 32518	6.6	1.9	0.29
4452.15	La I	9961 - 32411	4.0	1.2	0.08
4468.97	La I	3010 - 25380	0.22	0.067	-1.18
4486.06	La I	7490 - 29776	0.77	0.23	-0.63
4493.11	La I	1053 - 23303	0.12	0.038	-1.42
4494.71	La I	2668 - 24910	0.20	0.059	-1.23
4500.22	La I	7680 - 29895	1.8	0.55	-0.26
4541.79	La I	7490 - 29502	0.54	0.17	-0.78
4549.50	La I	3010 - 24984	0.40	0.13	-0.90
4567.91	La I	3495 - 25380	0.91	0.28	-0.55
4570.02	La I	4122 - 25997	1.4	0.42	-0.37
4602.05	La I	8052 - 29776	0.59	0.19	-0.73
4615.07	La I	7231 - 28893	0.31	0.099	-1.01

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4646.34	La I	9961 - 31477	1.3	0.42	-0.38
4648.65	La I	2668 - 24174	0.29	0.093	-1.03
4650.33	La I	3010 - 24508	0.14	0.044	-1.36
4652.08	La I	3495 - 24984	0.21	0.067	-1.17
4660.70	La I	8052 - 29502	0.56	0.18	-0.74
4702.64	La I	4122 - 25380	0.18	0.058	-1.24
4708.19	La I	9184 - 30417	0.73	0.24	-0.62
4750.41	La I	9920 - 30965	1.1	0.39	-0.41
4766.89	La I	0 - 20972	0.24	0.081	-1.09
4770.43	La I	7012 - 27969	0.37	0.13	-0.90
4800.00	La I	9961 - 30788	0.69	0.24	-0.63
4800.25	La I	7680 - 28506	0.29	0.100	-1.00
4817.17	La I	9184 - 29937	0.54	0.19	-0.73
4839.52	La I	7012 - 27669	0.69	0.24	-0.62
4850.82	La I	1053 - 21663	0.13	0.045	-1.35
4854.95	La I	9184 - 29776	0.42	0.15	-0.83
4870.56	La I	8446 - 28972	0.42	0.15	-0.83
4878.86	La I	8052 - 28543	0.74	0.26	-0.58
4887.61	La I	8052 - 28506	0.29	0.11	-0.98
4901.87	La I	1053 - 21448	0.10	0.036	-1.44
4905.13	La I	7012 - 27393	0.22	0.078	-1.11
4945.85	La I	7012 - 27225	0.21	0.076	-1.12
4949.77	La I	0 - 20197	0.40	0.15	-0.83
4977.95	La I	0 - 20083	0.035	0.013	-1.89
4993.88	La I	0 - 20019	0.068	0.026	-1.59
5001.79	La I	8052 - 28040	0.53	0.20	-0.70
5046.88	La I	3495 - 23303	0.38	0.15	-0.83
5050.57	La I	3010 - 22804	0.49	0.19	-0.73
5056.46	La I	2668 - 22439	0.36	0.14	-0.86
5067.90	La I	3495 - 23221	0.12	0.046	-1.34
5106.23	La I	2668 - 22247	0.39	0.15	-0.81
5120.88	La I	8446 - 27969	0.46	0.18	-0.74
5145.42	La I	3010 - 22439	0.95	0.38	-0.42
5158.69	La I	0 - 19379	0.26	0.10	-0.98
5167.79	La I	4122 - 23467	0.22	0.090	-1.05
5177.31	La I	3495 - 22804	1.4	0.55	-0.26
5179.12	La I	8446 - 27749	0.23	0.091	-1.04
5183.92	La I	1053 - 20338	0.11	0.044	-1.36
5211.86	La I	4122 - 23303	2.0	0.81	-0.09
5234.27	La I	4122 - 23221	1.4	0.58	-0.24
5239.55	La I	8052 - 27133	0.27	0.11	-0.96
5253.46	La I	1053 - 20083	0.38	0.16	-0.80
5271.19	La I	1053 - 20019	0.40	0.17	-0.77
5276.42	La I	8446 - 27393	0.46	0.19	-0.71
5304.02	La I	7490 - 26339	0.30	0.13	-0.89
5320.16	La I	3495 - 22286	0.033	0.014	-1.85
5323.57	La I	8446 - 27225	0.28	0.12	-0.93
5357.86	La I	7680 - 26339	0.70	0.30	-0.52
5365.89	La I	7012 - 25643	0.11	0.050	-1.30
5380.01	La I	9961 - 28543	0.26	0.11	-0.95

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5415.68	La I	7490 - 25950	0.16	0.070	-1.16
5429.86	La I	7231 - 25643	0.22	0.096	-1.02
5437.54	La I	7231 - 25617	0.12	0.051	-1.29
5455.15	La I	1053 - 19379	0.47	0.21	-0.67
5466.92	La I	8052 - 26339	0.089	0.040	-1.40
5491.07	La I	7012 - 25218	0.13	0.059	-1.23
5501.34	La I	0 - 18172	0.32	0.15	-0.84
5502.25	La I	9920 - 28089	0.29	0.13	-0.88
5502.67	La I	3495 - 21663	0.034	0.015	-1.82
5503.81	La I	4122 - 22286	0.20	0.091	-1.04
5506.00	La I	0 - 18157	0.036	0.016	-1.79
5515.28	La I	7490 - 25617	0.22	0.10	-1.00
5517.34	La I	9920 - 28040	0.73	0.33	-0.48
5529.87	La I	9961 - 28040	0.20	0.093	-1.03
5541.26	La I	9184 - 27225	0.58	0.27	-0.57
5544.91	La I	9719 - 27749	0.24	0.11	-0.95
5565.44	La I	7680 - 25643	0.30	0.14	-0.86
5565.72	La I	3010 - 20972	0.060	0.028	-1.56
5568.46	La I	3495 - 21448	0.14	0.064	-1.20
5570.38	La I	0 - 17947	0.010	0.0048	-2.32
5588.34	La I	3495 - 21384	0.13	0.063	-1.20
5631.22	La I	3010 - 20763	0.23	0.11	-0.96
5632.03	La I	7012 - 24763	0.29	0.14	-0.85
5639.31	La I	7490 - 25218	0.20	0.096	-1.02
5648.25	La I	9920 - 27620	2.4	1.1	0.06
5656.54	La I	9719 - 27393	0.15	0.071	-1.15
5657.72	La I	2668 - 20338	0.17	0.081	-1.09
5696.19	La I	1053 - 18604	0.073	0.036	-1.45
5699.39	La I	4122 - 21663	0.025	0.012	-1.92
5710.85	La I	9719 - 27225	0.096	0.047	-1.33
5714.02	La I	7012 - 24508	0.17	0.082	-1.09
5714.55	La I	9961 - 27455	0.13	0.062	-1.20
5720.02	La I	3495 - 20972	0.072	0.035	-1.45
5734.95	La I	9961 - 27393	0.38	0.19	-0.73
5740.66	La I	2668 - 20083	0.22	0.11	-0.96
5742.94	La I	7231 - 24639	0.081	0.040	-1.40
5744.41	La I	7680 - 25083	0.79	0.39	-0.41
5761.84	La I	2668 - 20019	0.19	0.094	-1.03
5769.34	La I	3010 - 20338	0.48	0.24	-0.62
5769.99	La I	8052 - 25378	0.43	0.21	-0.67
5789.24	La I	3495 - 20763	0.47	0.24	-0.63
5791.34	La I	4122 - 21384	0.79	0.40	-0.40
5821.99	La I	9961 - 27132	1.3	0.66	-0.18
5823.83	La I	8052 - 25218	0.28	0.14	-0.85
5827.56	La I	9184 - 26339	0.17	0.087	-1.06
5829.72	La I	7490 - 24639	0.35	0.18	-0.75
5839.79	La I	1053 - 18172	0.011	0.0058	-2.23
5845.03	La I	1053 - 18157	0.017	0.0087	-2.06
5848.38	La I	13260 - 30354	1.5	0.76	-0.12
5852.27	La I	7680 - 24763	0.15	0.078	-1.11

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5855.58	La I	3010 - 20083	0.098	0.050	-1.30
5869.95	La I	8052 - 25083	0.080	0.042	-1.38
5874.73	La I	7490 - 24508	0.20	0.10	-0.99
5877.63	La I	3010 - 20019	0.026	0.013	-1.87
5894.85	La I	7680 - 24639	0.30	0.15	-0.81
5900.75	La I	7231 - 24174	0.042	0.022	-1.66
5904.30	La I	8052 - 24984	0.079	0.041	-1.39
5917.63	La I	1053 - 17947	0.032	0.017	-1.78
5928.49	La I	7012 - 23875	0.077	0.041	-1.39
5930.62	La I	1053 - 17910	0.22	0.11	-0.94
5935.24	La I	3495 - 20338	0.089	0.047	-1.33
5940.83	La I	7680 - 24508	0.058	0.031	-1.51
5960.59	La I	8446 - 25218	0.14	0.075	-1.12
5962.60	La I	9184 - 25950	0.10	0.056	-1.25
5975.75	La I	7680 - 24410	0.079	0.042	-1.37
5982.35	La I	2668 - 19379	0.027	0.015	-1.83
5992.36	La I	7490 - 24174	0.064	0.034	-1.47
6007.36	La I	4122 - 20763	0.10	0.055	-1.26
6017.16	La I	13260 - 29875	0.32	0.17	-0.76
6038.59	La I	7490 - 24046	0.21	0.11	-0.95
6068.68	La I	7231 - 23705	0.16	0.091	-1.04
6072.05	La I	8446 - 24910	0.066	0.037	-1.44
6084.89	La I	16857 - 33287	0.84	0.47	-0.33
6107.27	La I	3010 - 19379	0.017	0.0094	-2.03
6108.48	La I	7680 - 24046	0.31	0.17	-0.76
6111.72	La I	8052 - 24410	0.20	0.11	-0.95
6127.05	La I	8446 - 24763	0.13	0.072	-1.14
6134.39	La I	7231 - 23528	0.18	0.10	-0.99
6145.30	La I	15020 - 31288	0.40	0.23	-0.64
6165.70	La I	7490 - 23705	0.29	0.16	-0.79
6218.20	La I	9920 - 25997	0.092	0.053	-1.27
6233.51	La I	7490 - 23528	0.11	0.067	-1.17
6234.86	La I	9184 - 25218	0.19	0.11	-0.97
6236.74	La I	7231 - 23261	0.043	0.025	-1.60
6238.59	La I	7680 - 23705	0.068	0.039	-1.40
6249.93	La I	4122 - 20117	0.97	0.57	-0.25
6266.02	La I	9920 - 25875	0.63	0.37	-0.43
6287.74	La I	9184 - 25083	0.10	0.060	-1.22
6288.56	La I	9719 - 25617	0.10	0.059	-1.23
6293.57	La I	3495 - 19379	0.072	0.043	-1.37
6318.26	La I	8052 - 23875	0.062	0.037	-1.43
6325.91	La I	1053 - 16857	0.056	0.034	-1.47
6360.22	La I	9044 - 24763	0.17	0.10	-1.00
6394.23	La I	3495 - 19129	0.46	0.28	-0.55
6410.99	La I	3010 - 18604	0.19	0.12	-0.93
6448.11	La I	2668 - 18172	0.017	0.010	-1.98
6450.34	La I	9719 - 25218	0.077	0.048	-1.32
6454.52	La I	2668 - 18157	0.073	0.046	-1.34
6455.99	La I	1053 - 16538	0.12	0.075	-1.12
6468.44	La I	9184 - 24639	0.065	0.041	-1.39

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6485.55	La I	8052 - 23467	0.085	0.053	-1.27
6506.23	La I	14096 - 29461	0.20	0.13	-0.89
6543.16	La I	2668 - 17947	0.10	0.064	-1.19
6565.44	La I	1053 - 16280	0.012	0.0075	-2.13
6578.51	La I	0 - 15197	0.039	0.025	-1.60
6582.19	La I	16099 - 31288	0.35	0.23	-0.65
6593.46	La I	3010 - 18172	0.038	0.024	-1.61
6600.17	La I	3010 - 18157	0.027	0.017	-1.76
6608.26	La I	9961 - 25090	0.26	0.17	-0.76
6616.59	La I	3495 - 18604	0.049	0.032	-1.50
6644.41	La I	1053 - 16099	0.014	0.0090	-2.05
6645.16	La I	16243 - 31288	0.61	0.41	-0.39
6650.81	La I	0 - 15032	0.020	0.013	-1.88
6661.40	La I	4122 - 19129	0.099	0.066	-1.18
6692.87	La I	3010 - 17947	0.036	0.024	-1.62
6709.50	La I	3010 - 17910	0.15	0.10	-0.99
6748.13	La I	8446 - 23261	0.14	0.094	-1.02
6753.04	La I	0 - 14804	0.015	0.010	-1.99
6796.73	La I	0 - 14709	0.0017	0.0012	-2.92
6823.78	La I	7012 - 21663	0.12	0.083	-1.08
6917.24	La I	3495 - 17947	0.019	0.014	-1.86
6918.30	La I	1053 - 15504	0.0043	0.0031	-2.51
6925.24	La I	7012 - 21448	0.17	0.12	-0.91
6935.01	La I	3495 - 17910	0.042	0.030	-1.52
7023.67	La I	8052 - 22286	0.26	0.19	-0.72
7032.05	La I	9044 - 23261	0.12	0.089	-1.05
7045.96	La I	2668 - 16857	0.078	0.058	-1.24
7068.37	La I	1053 - 15197	0.023	0.017	-1.76
7149.77	La I	7680 - 21663	0.031	0.024	-1.62
7158.08	La I	1053 - 15020	0.014	0.011	-1.96
7161.25	La I	7012 - 20972	0.13	0.099	-1.01
7219.91	La I	3010 - 16857	0.016	0.012	-1.90
7270.09	La I	7012 - 20763	0.061	0.049	-1.31
7270.30	La I	1053 - 14804	0.0032	0.0026	-2.59
7320.91	La I	1053 - 14709	0.0031	0.0025	-2.60
7334.18	La I	0 - 13631	0.017	0.014	-1.86
7345.34	La I	8052 - 21663	0.19	0.16	-0.81
7382.73	La I	9719 - 23261	0.18	0.14	-0.84
7463.08	La I	8052 - 21448	0.15	0.13	-0.89
7498.83	La I	8052 - 21384	0.15	0.13	-0.90
7533.59	La I	3010 - 16280	0.020	0.017	-1.77
7539.23	La I	0 - 13260	0.011	0.0097	-2.01
7664.34	La I	3495 - 16538	0.015	0.013	-1.88
7841.80	La I	3495 - 16243	0.0095	0.0088	-2.06
7964.83	La I	2668 - 15220	0.017	0.017	-1.78
8001.89	La I	3010 - 15504	0.018	0.017	-1.77
8051.39	La I	4122 - 16538	0.028	0.027	-1.57
8086.05	La I	2668 - 15031	0.028	0.028	-1.56
8203.38	La I	3010 - 15197	0.0031	0.0031	-2.50
8247.44	La I	4122 - 16243	0.036	0.036	-1.44

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
8316.04	La I	3010 - 15031	0.0050	0.0052	-2.29
8324.69	La I	3495 - 15504	0.042	0.043	-1.36
8346.53	La I	4122 - 16099	0.061	0.064	-1.19
8379.80	La I	19129 - 31060	0.41	0.44	-0.36
8467.62	La I	20117 - 31924	0.53	0.57	-0.24
8476.48	La I	3010 - 14804	0.0095	0.010	-1.99
8507.37	La I	8446 - 20197	0.029	0.032	-1.50
8513.57	La I	9920 - 21663	0.044	0.048	-1.32
8543.46	La I	9961 - 21663	0.060	0.065	-1.19
8545.44	La I	3010 - 14709	0.022	0.024	-1.62
8590.94	La I	8446 - 20083	0.022	0.024	-1.62
8624.22	La I	7012 - 18604	0.011	0.012	-1.91
8638.47	La I	8446 - 20019	0.033	0.037	-1.43
8672.11	La I	9920 - 21448	0.064	0.072	-1.14
8674.43	La I	3495 - 15020	0.017	0.019	-1.71
8720.41	La I	9920 - 21384	0.042	0.048	-1.32
8748.38	La I	2668 - 14096	0.0094	0.011	-1.97
8825.82	La I	8052 - 19379	0.071	0.083	-1.08
8839.63	La I	3495 - 14804	0.0079	0.0092	-2.03

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
2187.87	La II	0 - 45692	0.46	0.033	-1.48
2256.76	La II	1394 - 45692	3.2	0.24	-0.61
2317.82	La II	18895 - 62026	6.6	0.54	-0.27
2319.44	La II	2592 - 45692	1.6	0.13	-0.88
2328.75	La II	16599 - 59528	5.9	0.48	-0.32
2438.01	La II	18895 - 59900	5.6	0.50	-0.30
2471.90	La II	5250 - 45692	2.6	0.24	-0.62
2472.44	La II	17826 - 58259	9.6	0.88	-0.06
2479.85	La II	19215 - 59528	10.	0.96	-0.02
2487.59	La II	17212 - 57400	18.	1.7	0.22
2533.14	La II	6227 - 45692	1.8	0.17	-0.76
2560.37	La II	19215 - 58259	13.	1.3	0.11
2580.82	La II	15699 - 54435	3.8	0.38	-0.42
2582.56	La II	14148 - 52858	3.9	0.39	-0.40
2596.09	La II	16599 - 55107	10.	1.0	0.02
2610.34	La II	7395 - 45692	21.	2.2	0.34
2672.91	La II	18580 - 55982	17.	1.8	0.27
2695.47	La II	19750 - 56838	22.	2.4	0.38
2791.51	La II	22106 - 57919	21.	2.5	0.39
2798.56	La II	22537 - 58259	22.	2.5	0.41
2808.39	La II	10095 - 45692	24.	2.8	0.45
2838.45	La II	19215 - 54435	3.1	0.38	-0.42
2840.51	La II	29498 - 64693	9.0	1.1	0.04
2855.90	La II	24523 - 59528	20.	2.4	0.39
2862.98	La II	20403 - 55321	8.7	1.1	0.03
2880.65	La II	20403 - 55107	28.	3.5	0.55
2885.14	La II	21332 - 55982	46.	5.8	0.76
2893.07	La II	22283 - 56838	60.	7.6	0.88
2950.50	La II	28526 - 62408	57.	7.5	0.87
3104.59	La II	0 - 32201	0.29	0.042	-1.37
3108.46	La II	0 - 32161	0.097	0.014	-1.85
3142.76	La II	1394 - 33204	0.30	0.044	-1.36
3193.02	La II	1895 - 33204	0.17	0.025	-1.59
3245.13	La II	1394 - 32201	0.89	0.14	-0.85
3249.35	La II	1394 - 32161	0.46	0.072	-1.14
3265.67	La II	2592 - 33204	1.3	0.20	-0.69
3303.11	La II	1895 - 32161	1.4	0.23	-0.64
3337.49	La II	3250 - 33204	3.5	0.58	-0.23
3344.56	La II	1895 - 31786	1.4	0.24	-0.63
3376.33	La II	2592 - 32201	0.37	0.064	-1.20
3380.91	La II	2592 - 32161	2.6	0.45	-0.35
3452.18	La II	1394 - 30353	0.15	0.026	-1.59
3453.17	La II	3250 - 32201	0.33	0.058	-1.23
3510.00	La II	1016 - 29498	0.064	0.012	-1.92
3512.93	La II	1895 - 30353	0.082	0.015	-1.82
3550.82	La II	0 - 28155	0.027	0.0051	-2.30
3557.26	La II	1394 - 29498	0.059	0.011	-1.95
3601.06	La II	2592 - 30353	0.076	0.015	-1.83
3612.34	La II	24463 - 52138	22.	4.4	0.64
3628.83	La II	1016 - 28565	0.19	0.038	-1.42

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
3637.15	La II	5718 - 33204	0.27	0.053	-1.28
3645.42	La II	0 - 27424	0.45	0.089	-1.05
3650.18	La II	0 - 27388	0.17	0.034	-1.47
3662.08	La II	1016 - 28315	0.096	0.019	-1.71
3701.81	La II	28315 - 55321	15.	3.1	0.49
3705.82	La II	6227 - 33204	0.74	0.15	-0.82
3713.54	La II	1394 - 28315	0.32	0.066	-1.18
3714.87	La II	5250 - 32161	0.23	0.048	-1.32
3715.53	La II	2592 - 29498	0.22	0.045	-1.34
3725.05	La II	0 - 26838	0.036	0.0074	-2.13
3735.85	La II	1394 - 28155	0.019	0.0039	-2.41
3759.08	La II	1971 - 28565	1.5	0.31	-0.50
3773.12	La II	26838 - 53333	27.	5.9	0.77
3780.67	La II	5718 - 32161	0.21	0.044	-1.36
3784.81	La II	0 - 26414	0.023	0.0050	-2.30
3790.83	La II	1016 - 27388	1.7	0.36	-0.44
3794.78	La II	1971 - 28315	2.3	0.50	-0.30
3808.79	La II	3250 - 29498	0.056	0.012	-1.91
3835.08	La II	5718 - 31786	0.26	0.056	-1.25
3840.72	La II	1394 - 27424	0.24	0.052	-1.28
3846.00	La II	1394 - 27388	0.047	0.010	-1.98
3849.02	La II	0 - 25973	0.42	0.093	-1.03
3854.91	La II	6227 - 32161	0.19	0.043	-1.36
3864.49	La II	28565 - 54435	28.	6.4	0.80
3871.64	La II	1016 - 26838	1.1	0.26	-0.59
3886.37	La II	2592 - 28315	0.87	0.20	-0.71
3910.81	La II	2592 - 28155	0.020	0.0045	-2.35
3916.05	La II	1895 - 27424	0.52	0.12	-0.92
3921.54	La II	1895 - 27388	0.44	0.10	-1.00
3929.22	La II	1394 - 26838	0.75	0.17	-0.76
3936.22	La II	1016 - 26414	0.054	0.013	-1.90
3949.10	La II	3250 - 28565	5.0	1.2	0.07
3988.52	La II	3250 - 28315	2.3	0.55	-0.26
3995.75	La II	1394 - 26414	1.1	0.26	-0.58
4023.59	La II	14376 - 39222	1.0	0.25	-0.60
4025.88	La II	2592 - 27424	0.10	0.025	-1.60
4031.69	La II	2592 - 27388	1.1	0.28	-0.56
4036.59	La II	7395 - 32161	0.063	0.015	-1.81
4042.91	La II	7473 - 32201	4.8	1.2	0.07
4050.08	La II	15774 - 40458	5.2	1.3	0.11
4067.39	La II	1394 - 25973	0.23	0.058	-1.23
4076.71	La II	0 - 24523	0.020	0.0050	-2.30
4077.35	La II	1895 - 26414	0.88	0.22	-0.66
4086.72	La II	0 - 24463	1.00	0.25	-0.60
4099.54	La II	14148 - 38534	2.7	0.68	-0.17
4123.23	La II	2592 - 26838	1.6	0.40	-0.40
4141.74	La II	3250 - 27388	0.23	0.059	-1.23
4151.97	La II	1895 - 25973	0.31	0.080	-1.10
4152.78	La II	14148 - 38221	2.0	0.51	-0.29
4192.36	La II	14375 - 38221	2.5	0.67	-0.18

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4196.55	La II	2592 - 26414	0.48	0.13	-0.89
4204.04	La II	5718 - 29498	0.19	0.049	-1.31
4217.56	La II	15699 - 39403	3.8	1.0	0.01
4230.95	La II	15774 - 39403	2.5	0.68	-0.17
4238.38	La II	3250 - 26838	0.59	0.16	-0.80
4249.99	La II	15699 - 39222	1.7	0.46	-0.34
4263.59	La II	15774 - 39222	3.9	1.1	0.03
4269.50	La II	14375 - 37791	3.9	1.1	0.03
4275.64	La II	2592 - 25973	0.070	0.019	-1.72
4286.97	La II	15699 - 39019	6.9	1.9	0.28
4296.05	La II	6227 - 29498	0.47	0.13	-0.88
4300.44	La II	0 - 23247	0.016	0.0045	-2.35
4315.90	La II	3250 - 26414	0.017	0.0046	-2.33
4322.51	La II	1394 - 24523	0.086	0.024	-1.62
4333.74	La II	1394 - 24463	0.88	0.25	-0.60
4334.96	La II	14148 - 37210	0.14	0.040	-1.40
4354.40	La II	7395 - 30353	0.56	0.16	-0.80
4364.67	La II	5250 - 28155	0.060	0.017	-1.76
4378.10	La II	14375 - 37210	0.78	0.22	-0.65
4383.44	La II	14148 - 36955	1.8	0.53	-0.27
4385.20	La II	14375 - 37173	0.70	0.20	-0.69
4411.21	La II	28565 - 51229	13.	3.9	0.59
4419.16	La II	16599 - 39222	1.0	0.30	-0.53
4427.55	La II	14375 - 36955	1.7	0.51	-0.29
4429.90	La II	1895 - 24463	0.39	0.12	-0.94
4435.85	La II	0 - 22537	0.0057	0.0017	-2.77
4455.80	La II	5718 - 28155	0.056	0.017	-1.78
4522.37	La II	10095 - 32201	1.5	0.46	-0.33
4525.31	La II	15699 - 37791	1.5	0.45	-0.35
4526.12	La II	6227 - 28315	0.25	0.077	-1.11
4558.46	La II	2592 - 24523	0.082	0.026	-1.59
4559.29	La II	6227 - 28155	0.063	0.020	-1.71
4574.88	La II	1394 - 23247	0.058	0.018	-1.74
4580.06	La II	5718 - 27546	0.097	0.031	-1.52
4605.78	La II	5718 - 27424	0.066	0.021	-1.68
4613.39	La II	5718 - 27388	0.17	0.054	-1.27
4619.88	La II	14148 - 35788	1.8	0.58	-0.24
4636.43	La II	18895 - 40458	0.66	0.21	-0.67
4645.28	La II	1016 - 22537	0.012	0.0039	-2.41
4647.51	La II	15699 - 37210	0.45	0.15	-0.84
4655.50	La II	15699 - 37173	3.6	1.2	0.07
4662.51	La II	0 - 21442	0.028	0.0092	-2.04
4663.76	La II	15774 - 37210	1.5	0.49	-0.31
4668.91	La II	14375 - 35788	0.91	0.30	-0.53
4671.83	La II	15774 - 37173	1.0	0.34	-0.47
4691.18	La II	1394 - 22705	0.010	0.0033	-2.48
4692.50	La II	14148 - 35453	0.92	0.31	-0.52
4699.63	La II	3250 - 24523	0.017	0.0056	-2.25
4703.28	La II	15699 - 36955	0.85	0.28	-0.55
4712.93	La II	3250 - 24463	0.013	0.0042	-2.38

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4716.44	La II	6227 – 27424	0.072	0.024	-1.62
4717.59	La II	16599 – 37791	0.27	0.090	-1.05
4719.94	La II	15774 – 36955	0.85	0.28	-0.55
4724.43	La II	6227 – 27388	0.014	0.0048	-2.32
4728.42	La II	1394 – 22537	0.024	0.0082	-2.09
4740.28	La II	1016 – 22106	0.048	0.016	-1.79
4743.09	La II	14375 – 35453	1.6	0.54	-0.27
4748.73	La II	7473 – 28526	0.19	0.063	-1.20
4796.69	La II	7473 – 28315	0.016	0.0054	-2.26
4804.04	La II	1895 – 22705	0.018	0.0063	-2.20
4809.01	La II	1895 – 22684	0.018	0.0063	-2.20
4824.06	La II	5250 – 25973	0.059	0.021	-1.69
4826.88	La II	1394 – 22106	0.0022	0.00077	-3.11
4840.01	La II	2592 – 23247	0.0061	0.0021	-2.67
4850.58	La II	6227 – 26838	0.017	0.0059	-2.23
4860.91	La II	1971 – 22537	0.035	0.012	-1.91
4899.92	La II	0 – 20403	0.045	0.016	-1.79
4920.98	La II	1016 – 21332	0.072	0.026	-1.58
4921.79	La II	1971 – 22283	0.094	0.034	-1.46
4934.83	La II	10095 – 30353	0.13	0.046	-1.33
4935.62	La II	5718 – 25973	0.0067	0.0024	-2.61
4946.47	La II	1895 – 22106	0.0090	0.0033	-2.48
4952.07	La II	19215 – 39403	0.74	0.27	-0.56
4970.39	La II	2592 – 22705	0.035	0.013	-1.89
4986.83	La II	1394 – 21442	0.026	0.0099	-2.01
4991.28	La II	7395 – 27424	0.056	0.021	-1.68
4996.82	La II	19215 – 39222	0.36	0.13	-0.87
4999.47	La II	3250 – 23247	0.087	0.032	-1.49
5002.13	La II	18236 – 38221	0.27	0.10	-1.00
5048.04	La II	19215 – 39019	0.27	0.10	-0.98
5062.92	La II	6227 – 25973	0.012	0.0046	-2.33
5080.21	La II	15774 – 35453	0.13	0.048	-1.31
5114.56	La II	1895 – 21442	0.035	0.014	-1.86
5122.99	La II	2592 – 22106	0.042	0.017	-1.78
5156.74	La II	1016 – 20403	0.010	0.0041	-2.39
5157.43	La II	17826 – 37210	1.2	0.47	-0.33
5163.62	La II	1971 – 21332	0.0085	0.0034	-2.47
5172.91	La II	18895 – 38221	0.22	0.089	-1.05
5173.84	La II	32201 – 51524	20.	7.9	0.90
5183.42	La II	3250 – 22537	0.087	0.035	-1.46
5188.22	La II	19750 – 39019	2.8	1.1	0.05
5204.15	La II	18580 – 37791	1.3	0.52	-0.28
5226.21	La II	17826 – 36955	0.20	0.081	-1.09
5259.39	La II	1394 – 20403	0.0059	0.0025	-2.61
5279.13	La II	18236 – 37173	0.17	0.071	-1.15
5290.84	La II	0 – 18895	0.0054	0.0023	-2.65
5301.98	La II	3250 – 22106	0.034	0.014	-1.85
5302.62	La II	16599 – 35453	0.57	0.24	-0.62
5303.55	La II	2592 – 21442	0.014	0.0059	-2.23
5340.67	La II	18236 – 36955	0.64	0.28	-0.56

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5377.09	La II	18580 - 37173	0.86	0.37	-0.43
5380.99	La II	7395 - 25973	0.040	0.017	-1.76
5381.92	La II	17212 - 35788	0.35	0.15	-0.82
5458.69	La II	18895 - 37210	0.22	0.099	-1.01
5464.38	La II	6227 - 24523	0.0086	0.0039	-2.41
5480.73	La II	17212 - 35453	0.11	0.049	-1.31
5482.27	La II	0 - 18236	0.0021	0.00095	-3.02
5493.45	La II	1016 - 19215	0.0017	0.00075	-3.12
5535.67	La II	10095 - 28155	0.049	0.022	-1.65
5566.94	La II	19215 - 37173	0.16	0.075	-1.13
5671.55	La II	17826 - 35453	0.22	0.11	-0.97
5703.33	La II	5718 - 23247	0.0063	0.0031	-2.51
5712.40	La II	1394 - 18895	0.0026	0.0013	-2.89
5727.29	La II	5250 - 22705	0.0031	0.0015	-2.82
5769.07	La II	10095 - 27424	0.071	0.035	-1.45
5797.58	La II	1971 - 19215	0.0099	0.0050	-2.30
5805.78	La II	1016 - 18236	0.0053	0.0027	-2.57
5808.32	La II	0 - 17212	0.0013	0.00068	-3.17
5848.95	La II	21442 - 38534	0.14	0.070	-1.15
5863.71	La II	7473 - 24523	0.016	0.0082	-2.09
5874.00	La II	6227 - 23247	0.0030	0.0015	-2.82
5880.64	La II	1895 - 18895	0.0027	0.0014	-2.85
5901.96	La II	22283 - 39222	0.20	0.11	-0.98
5927.71	La II	22537 - 39403	0.21	0.11	-0.95
5936.22	La II	1394 - 18236	0.0018	0.00096	-3.02
5948.30	La II	20403 - 37210	0.13	0.071	-1.15
5971.09	La II	10095 - 26838	0.0052	0.0028	-2.56
5973.53	La II	22283 - 39019	0.56	0.30	-0.52
6067.14	La II	6227 - 22705	0.0016	0.00090	-3.04
6100.38	La II	5718 - 22106	0.0042	0.0023	-2.63
6126.09	La II	10095 - 26414	0.028	0.016	-1.80
6129.56	La II	6227 - 22537	0.0095	0.0053	-2.27
6146.53	La II	1971 - 18236	0.00066	0.00037	-3.43
6172.73	La II	1016 - 17212	0.00090	0.00051	-3.29
6188.09	La II	23247 - 39403	0.37	0.21	-0.67
6203.51	La II	22106 - 38221	0.16	0.092	-1.03
6262.30	La II	3250 - 19215	0.013	0.0074	-2.13
6273.76	La II	24523 - 40458	0.25	0.15	-0.82
6296.09	La II	10095 - 25973	0.060	0.036	-1.45
6305.46	La II	1971 - 17826	0.00070	0.00042	-3.38
6310.92	La II	21332 - 37173	0.25	0.15	-0.82
6320.39	La II	1394 - 17212	0.0044	0.0026	-2.58
6358.13	La II	5718 - 21442	0.0030	0.0018	-2.74
6390.48	La II	2592 - 18236	0.0064	0.0039	-2.41
6399.05	La II	21332 - 36955	0.39	0.24	-0.63
6446.61	La II	22283 - 37791	0.31	0.19	-0.72
6498.19	La II	20403 - 35788	0.21	0.13	-0.87
6526.99	La II	1895 - 17212	0.0030	0.0019	-2.71
6529.73	La II	7395 - 22705	0.0014	0.00090	-3.04
6570.96	La II	6227 - 21442	0.00075	0.00048	-3.32

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6636.53	La II	7473 - 22537	0.0014	0.00090	-3.04
6642.79	La II	20403 - 35453	0.13	0.087	-1.06
6671.40	La II	3250 - 18236	0.0015	0.0010	-2.99
6714.09	La II	22283 - 37173	0.17	0.12	-0.93
6718.68	La II	24523 - 39403	0.12	0.082	-1.09
6732.78	La II	22106 - 36955	0.061	0.041	-1.38
6774.26	La II	1016 - 15774	0.0022	0.0015	-2.82
6808.86	La II	1016 - 15699	0.00054	0.00037	-3.43
6813.66	La II	22537 - 37210	0.13	0.092	-1.04
6834.05	La II	1971 - 16599	0.00095	0.00067	-3.18
6837.90	La II	2592 - 17212	0.00079	0.00056	-3.25
6859.03	La II	3250 - 17826	0.00033	0.00023	-3.63
6952.51	La II	1394 - 15774	0.00016	0.00012	-3.94
6954.52	La II	0 - 14375	0.00021	0.00015	-3.82
6958.10	La II	10095 - 24463	0.0093	0.0067	-2.17
7066.23	La II	0 - 14148	0.0016	0.0012	-2.94
7116.80	La II	7395 - 21442	0.0013	0.0010	-2.99
7282.34	La II	1971 - 15699	0.0023	0.0018	-2.74
7483.50	La II	1016 - 14375	0.00087	0.00073	-3.14
7612.94	La II	1016 - 14148	0.00020	0.00017	-3.76
8514.65	La II	7473 - 19215	0.00069	0.00075	-3.13

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10⁸/sec		
2741.20	Li I	0 - 36470	0.41	0.046	-1.34
3232.61	Li I	0 - 30925	0.34	0.053	-1.27
4602.86	Li I	14904 - 36623	1.9	0.59	-0.23
4971.99	Li I	14904 - 35012	0.78	0.29	-0.54
6103.64	Li I	14904 - 31283	13.	7.5	0.87
6707.84	Li I	0 - 14904	1.2	0.80	-0.10
8126.52	Li I	14904 - 27206	0.85	0.84	-0.08

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2685.08	Lu I	4136 - 41368	2.8	0.31	-0.52
2728.95	Lu I	0 - 36633	0.64	0.071	-1.15
2765.74	Lu I	4136 - 40282	2.8	0.32	-0.49
2845.13	Lu I	1994 - 37131	0.52	0.064	-1.20
2903.05	Lu I	0 - 34436	0.23	0.029	-1.54
2949.73	Lu I	7476 - 41368	1.5	0.19	-0.72
2989.27	Lu I	0 - 33443	1.1	0.14	-0.85
3080.11	Lu I	0 - 32457	0.18	0.026	-1.59
3081.47	Lu I	1994 - 34436	4.1	0.58	-0.23
3171.36	Lu I	0 - 31523	0.76	0.12	-0.94
3278.97	Lu I	0 - 30489	0.93	0.15	-0.83
3281.74	Lu I	1994 - 32457	3.2	0.52	-0.28
3312.11	Lu I	0 - 30184	1.4	0.23	-0.64
3359.56	Lu I	1994 - 31751	2.7	0.46	-0.34
3376.50	Lu I	0 - 29608	1.2	0.21	-0.68
3385.50	Lu I	1994 - 31523	0.32	0.055	-1.26
3508.42	Lu I	1994 - 30489	0.43	0.079	-1.10
3567.84	Lu I	0 - 28020	0.64	0.12	-0.91
3596.34	Lu I	7476 - 35275	0.36	0.069	-1.16
3636.25	Lu I	0 - 27493	0.11	0.022	-1.66
3647.77	Lu I	4136 - 31542	1.3	0.26	-0.58
3756.70	Lu I	4136 - 30748	0.047	0.0099	-2.00
3756.79	Lu I	4136 - 30747	0.047	0.0099	-2.00
3841.18	Lu I	1994 - 28020	0.54	0.12	-0.92
3874.61	Lu I	4136 - 29938	0.017	0.0038	-2.42
3968.46	Lu I	0 - 25192	0.057	0.014	-1.87
4054.45	Lu I	4136 - 28793	0.23	0.056	-1.25
4112.67	Lu I	0 - 24308	0.0092	0.0023	-2.63
4124.73	Lu I	7476 - 31714	2.4	0.61	-0.21
4154.08	Lu I	7476 - 31542	0.34	0.089	-1.05
4295.97	Lu I	7476 - 30748	0.20	0.056	-1.25
4309.57	Lu I	1994 - 25192	0.020	0.0055	-2.26
4420.96	Lu I	21462 - 44076	1.8	0.54	-0.27
4450.81	Lu I	7476 - 29938	0.098	0.029	-1.54
4498.85	Lu I	0 - 22222	0.0034	0.0010	-2.99
4518.57	Lu I	0 - 22125	0.19	0.057	-1.24
4605.39	Lu I	18851 - 40559	0.81	0.26	-0.59
4658.02	Lu I	0 - 21462	0.047	0.015	-1.82
4716.70	Lu I	0 - 21195	0.0013	0.00044	-3.36
4815.05	Lu I	0 - 20762	0.0032	0.0011	-2.96
4904.88	Lu I	4136 - 24518	0.047	0.017	-1.77
4942.34	Lu I	1994 - 22222	0.0099	0.0036	-2.44
5001.14	Lu I	4136 - 24126	0.075	0.028	-1.55
5057.60	Lu I	17427 - 37194	0.22	0.083	-1.08
5134.05	Lu I	17427 - 36900	0.48	0.19	-0.72
5135.09	Lu I	1994 - 21462	0.12	0.049	-1.31
5196.61	Lu I	18505 - 37743	0.78	0.31	-0.50
5206.47	Lu I	1994 - 21195	0.0039	0.0016	-2.80
5304.40	Lu I	20433 - 39279	0.28	0.12	-0.92
5349.12	Lu I	18505 - 37194	0.32	0.14	-0.86

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
5402.57	Lu I	0 – 18505	0.010	0.0046	-2.34
5421.90	Lu I	1994 – 20433	0.0049	0.0022	-2.67
5453.57	Lu I	4136 – 22468	0.0022	0.00098	-3.01
5736.55	Lu I	0 – 17427	0.0091	0.0045	-2.35
5775.40	Lu I	20433 – 37743	0.29	0.14	-0.84
5860.79	Lu I	22222 – 39279	0.31	0.16	-0.79
5866.30	Lu I	7476 – 24518	0.0011	0.00058	-3.24
5997.13	Lu I	22609 – 39279	1.1	0.60	-0.23
6004.52	Lu I	7476 – 24125	0.15	0.083	-1.08
6041.66	Lu I	21195 – 37743	0.18	0.099	-1.01
6055.03	Lu I	1994 – 18505	0.010	0.0055	-2.26
6140.71	Lu I	21462 – 37743	0.061	0.035	-1.46
6248.80	Lu I	21195 – 37194	0.075	0.044	-1.36
6345.35	Lu I	23524 – 39279	0.58	0.35	-0.45
6354.85	Lu I	21462 – 37194	0.087	0.052	-1.28
6365.79	Lu I	21195 – 36900	0.040	0.024	-1.61
6441.14	Lu I	22222 – 37743	0.12	0.076	-1.12
6477.67	Lu I	1994 – 17427	0.00053	0.00034	-3.47
6677.14	Lu I	22222 – 37194	0.17	0.11	-0.94
6735.76	Lu I	20433 – 35275	0.040	0.027	-1.56
6793.77	Lu I	4136 – 18851	0.0013	0.00091	-3.04
7031.24	Lu I	23524 – 37743	0.28	0.21	-0.68
7096.34	Lu I	25192 – 39279	0.27	0.21	-0.69
7237.98	Lu I	21462 – 35275	0.090	0.071	-1.15
7441.52	Lu I	24308 – 37743	0.15	0.12	-0.91
7640.08	Lu I	24109 – 37194	0.078	0.068	-1.16
7758.30	Lu I	24308 – 37194	0.079	0.072	-1.14
7815.90	Lu I	24109 – 36900	0.074	0.067	-1.17
8382.08	Lu I	7476 – 19403	0.0014	0.0015	-2.83
8508.08	Lu I	23524 – 35275	0.21	0.23	-0.64
8610.98	Lu I	22222 – 33832	0.17	0.19	-0.72

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2195.54	Lu II	0 - 45532	0.22	0.016	-1.79
2276.94	Lu II	27264 - 71169	0.40	0.031	-1.51
2297.41	Lu II	28503 - 72017	1.0	0.081	-1.09
2392.19	Lu II	17332 - 59122	15.	1.3	0.12
2399.14	Lu II	32453 - 74122	2.2	0.19	-0.72
2419.21	Lu II	38223 - 79547	1.8	0.16	-0.80
2430.26	Lu II	32453 - 73588	1.5	0.14	-0.86
2459.64	Lu II	12435 - 53079	1.7	0.15	-0.82
2469.27	Lu II	28503 - 68989	2.5	0.23	-0.64
2481.72	Lu II	32453 - 72736	0.71	0.066	-1.18
2536.95	Lu II	11796 - 51202	3.7	0.35	-0.45
2546.87	Lu II	32453 - 71705	1.4	0.13	-0.88
2561.80	Lu II	12435 - 51458	0.34	0.034	-1.47
2571.23	Lu II	14199 - 53079	12.	1.2	0.08
2578.79	Lu II	12435 - 51202	17.	1.7	0.24
2582.13	Lu II	32453 - 71169	2.7	0.27	-0.56
2613.40	Lu II	11796 - 50049	13.	1.4	0.14
2615.42	Lu II	0 - 38223	5.8	0.60	-0.22
2619.26	Lu II	11796 - 49963	13.	1.4	0.13
2657.80	Lu II	12435 - 50049	20.	2.2	0.33
2701.71	Lu II	14199 - 51202	39.	4.3	0.63
2738.17	Lu II	27264 - 63774	2.0	0.23	-0.65
2754.17	Lu II	12435 - 48733	22.	2.5	0.39
2796.63	Lu II	17332 - 53079	34.	4.0	0.60
2834.35	Lu II	28503 - 63774	7.5	0.90	-0.04
2847.51	Lu II	11796 - 46904	12.	1.5	0.18
2894.84	Lu II	14199 - 48733	40.	5.0	0.70
2900.30	Lu II	12435 - 46904	19.	2.4	0.38
2911.39	Lu II	14199 - 48537	55.	7.0	0.85
2951.69	Lu II	17332 - 51202	12.	1.6	0.20
2963.32	Lu II	11796 - 45532	12.	1.6	0.20
2969.82	Lu II	11796 - 45458	6.8	0.90	-0.05
3020.54	Lu II	12435 - 45532	8.8	1.2	0.08
3027.29	Lu II	12435 - 45458	0.35	0.047	-1.32
3056.72	Lu II	14199 - 46904	9.3	1.3	0.11
3077.60	Lu II	12435 - 44919	19.	2.7	0.43
3183.73	Lu II	17332 - 48733	0.63	0.096	-1.02
3191.80	Lu II	32453 - 63774	7.0	1.1	0.03
3198.12	Lu II	14199 - 45458	3.6	0.56	-0.25
3254.31	Lu II	14199 - 44919	11.	1.8	0.25
3397.07	Lu II	11796 - 41225	3.5	0.61	-0.22
3472.48	Lu II	12435 - 41225	4.2	0.76	-0.12
3507.39	Lu II	0 - 28503	0.20	0.037	-1.43
3554.43	Lu II	17332 - 45458	14.	2.7	0.43
3623.99	Lu II	17332 - 44919	2.9	0.57	-0.25
3876.65	Lu II	12435 - 38223	0.39	0.089	-1.05
4184.25	Lu II	17332 - 41225	3.1	0.81	-0.09
4341.98	Lu II	36098 - 59122	1.5	0.43	-0.36
4785.42	Lu II	17332 - 38223	0.12	0.043	-1.37
4839.62	Lu II	11796 - 32453	0.0088	0.0031	-2.51

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4865.36	Lu II	38575 - 59122	0.91	0.32	-0.49
4994.13	Lu II	12435 - 32453	0.13	0.048	-1.32
5476.69	Lu II	14199 - 32453	0.36	0.16	-0.79
5664.89	Lu II	30889 - 48537	0.14	0.069	-1.16
5713.49	Lu II	29407 - 46904	0.15	0.073	-1.14
5983.90	Lu II	11796 - 28503	0.043	0.023	-1.64
6159.94	Lu II	32504 - 48733	2.6	1.5	0.18
6199.66	Lu II	29407 - 45532	1.3	0.73	-0.14
6221.87	Lu II	12435 - 28503	0.13	0.078	-1.11
6228.14	Lu II	29407 - 45458	0.27	0.15	-0.81
6235.36	Lu II	32504 - 48537	1.4	0.81	-0.09
6242.34	Lu II	30889 - 46904	1.9	1.1	0.04
6444.89	Lu II	29407 - 44919	0.079	0.049	-1.31
6463.12	Lu II	11796 - 27264	0.052	0.032	-1.49
6611.28	Lu II	17332 - 32453	0.0072	0.0047	-2.33
6619.15	Lu II	36098 - 51202	0.34	0.22	-0.65
6826.59	Lu II	36557 - 51202	0.49	0.34	-0.46
6943.96	Lu II	35652 - 50049	0.41	0.30	-0.52
7125.84	Lu II	30889 - 44919	0.70	0.53	-0.27
7165.94	Lu II	36098 - 50049	0.43	0.33	-0.48
7409.70	Lu II	36557 - 50049	0.25	0.21	-0.68
7456.96	Lu II	36557 - 49963	0.44	0.36	-0.44
8459.19	Lu II	29407 - 41225	0.22	0.24	-0.63

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
2776.69	Mg I	21870 – 57874	8.2	0.95	-0.02
2778.29	Mg I	21850 – 57833	6.9	0.80	-0.10
2779.83	Mg I	21911 – 57874	20.	2.3	0.36
2781.42	Mg I	21870 – 57813	6.9	0.80	-0.10
2782.97	Mg I	21911 – 57833	7.8	0.91	-0.04
2852.13	Mg I	0 – 35051	9.4	1.1	0.06
2942.11	Mg I	21911 – 55892	0.39	0.051	-1.29
3096.90	Mg I	21911 – 54192	2.4	0.35	-0.46
3332.15	Mg I	21870 – 51872	0.83	0.14	-0.86
3336.68	Mg I	21911 – 51872	1.2	0.21	-0.68
3829.35	Mg I	21850 – 47957	11.	2.4	0.38
3832.31	Mg I	21870 – 47957	23.	5.1	0.71
3838.26	Mg I	21911 – 47957	39.	8.6	0.93
4703.02	Mg I	35051 – 56308	2.3	0.75	-0.12
5167.34	Mg I	21850 – 41197	1.2	0.48	-0.32
5172.70	Mg I	21870 – 41197	3.5	1.4	0.15
5183.62	Mg I	21911 – 41197	6.4	2.6	0.41
5528.46	Mg I	35051 – 53135	1.6	0.75	-0.13
8806.79	Mg I	35051 – 46403	1.7	2.0	0.30

Wavelength Å	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2790.79	Mg II	35669 - 71491	22.	2.6	0.42
2795.53	Mg II	0 - 35761	9.0	1.1	0.03
2798.06	Mg II	35761 - 71490	28.	3.3	0.51
2802.70	Mg II	0 - 35669	5.3	0.62	-0.20
2928.75	Mg II	35669 - 69805	2.8	0.36	-0.44
2936.54	Mg II	35761 - 69805	5.3	0.69	-0.16

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
1995.40	Mn I	0 - 50099	2.1	0.12	-0.91
1998.86	Mn I	0 - 50013	3.0	0.18	-0.74
2003.82	Mn I	0 - 49888	4.0	0.24	-0.62
2092.13	Mn I	0 - 47782	0.67	0.044	-1.35
2208.81	Mn I	0 - 45259	0.24	0.017	-1.76
2213.85	Mn I	0 - 45156	0.46	0.034	-1.47
2221.83	Mn I	0 - 44994	0.67	0.049	-1.31
2533.06	Mn I	25266 - 64732	12.	1.2	0.07
2572.76	Mn I	18532 - 57389	64.	6.4	0.80
2575.51	Mn I	18402 - 57218	53.	5.3	0.72
2584.31	Mn I	18705 - 57389	75.	7.5	0.88
2592.94	Mn I	18532 - 57086	34.	3.4	0.53
2595.76	Mn I	18705 - 57218	34.	3.4	0.54
2622.90	Mn I	25281 - 63395	27.	2.8	0.45
2624.04	Mn I	25266 - 63363	29.	3.0	0.47
2626.64	Mn I	18402 - 56462	12.	1.3	0.10
2630.26	Mn I	25281 - 63289	6.1	0.63	-0.20
2630.57	Mn I	25285 - 63289	12.	1.3	0.10
2667.00	Mn I	18705 - 56190	6.0	0.64	-0.19
2676.33	Mn I	23549 - 60903	5.6	0.60	-0.22
2692.66	Mn I	25266 - 62393	17.	1.8	0.25
2738.86	Mn I	30354 - 66855	7.1	0.80	-0.10
2760.93	Mn I	17052 - 53261	4.6	0.52	-0.28
2771.44	Mn I	17052 - 53124	3.0	0.35	-0.46
2776.23	Mn I	17282 - 53291	3.1	0.36	-0.45
2780.00	Mn I	23297 - 59257	5.3	0.61	-0.21
2789.20	Mn I	17282 - 53124	5.3	0.62	-0.21
2790.36	Mn I	17282 - 53109	6.0	0.71	-0.15
2791.08	Mn I	17052 - 52870	5.9	0.69	-0.16
2794.82	Mn I	0 - 35770	8.3	0.97	-0.01
2798.27	Mn I	0 - 35726	6.7	0.78	-0.11
2799.84	Mn I	17052 - 52758	20.	2.4	0.38
2801.06	Mn I	0 - 35690	4.9	0.57	-0.24
2804.10	Mn I	17452 - 53103	6.8	0.81	-0.09
2806.14	Mn I	25266 - 60891	12.	1.4	0.14
2808.02	Mn I	17282 - 52884	5.2	0.61	-0.21
2809.11	Mn I	17282 - 52870	10.	1.2	0.09
2812.84	Mn I	17568 - 53109	6.1	0.72	-0.14
2813.47	Mn I	17568 - 53101	6.9	0.81	-0.09
2817.97	Mn I	17282 - 52758	8.0	0.96	-0.02
2818.77	Mn I	17637 - 53103	3.8	0.45	-0.34
2821.45	Mn I	17452 - 52884	5.2	0.62	-0.21
2822.55	Mn I	17452 - 52870	5.2	0.62	-0.21
2830.79	Mn I	17568 - 52884	7.5	0.90	-0.05
2836.31	Mn I	17637 - 52884	2.6	0.32	-0.50
2882.90	Mn I	17452 - 52129	3.4	0.43	-0.37
2907.22	Mn I	25266 - 59653	7.1	0.89	-0.05
2914.60	Mn I	18402 - 52702	13.	1.7	0.24
2925.57	Mn I	18532 - 52703	18.	2.3	0.36
2928.68	Mn I	25281 - 59416	4.9	0.63	-0.20

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2934.02	Mn I	25288 - 59361	4.9	0.63	-0.20
2940.39	Mn I	18705 - 52705	24.	3.1	0.50
2941.04	Mn I	25266 - 59257	11.	1.4	0.16
3007.66	Mn I	25281 - 58520	6.8	0.92	-0.04
3011.16	Mn I	25286 - 58486	6.8	0.92	-0.03
3011.38	Mn I	25288 - 58486	6.8	0.92	-0.03
3014.67	Mn I	25266 - 58427	6.8	0.92	-0.04
3016.45	Mn I	25286 - 58427	11.	1.5	0.17
3022.75	Mn I	25266 - 58339	12.	1.7	0.22
3040.60	Mn I	25281 - 58160	16.	2.2	0.35
3042.73	Mn I	25281 - 58137	4.7	0.65	-0.19
3043.36	Mn I	25288 - 58137	15.	2.0	0.31
3044.57	Mn I	17052 - 49888	21.	2.9	0.47
3045.59	Mn I	25286 - 58110	20.	2.8	0.45
3047.04	Mn I	25266 - 58075	35.	4.8	0.58
3048.86	Mn I	25286 - 58075	6.7	0.93	-0.03
3054.36	Mn I	17282 - 50012	17.	2.3	0.36
3062.12	Mn I	17452 - 50099	9.5	1.3	0.12
3066.02	Mn I	17282 - 49888	11.	1.6	0.20
3070.27	Mn I	17452 - 50012	11.	1.6	0.21
3073.13	Mn I	17569 - 50099	11.	1.5	0.17
3079.63	Mn I	17637 - 50099	7.4	1.1	0.02
3081.33	Mn I	17569 - 50012	4.2	0.59	-0.23
3082.05	Mn I	17452 - 49888	1.8	0.25	-0.59
3097.06	Mn I	27248 - 59527	9.0	1.3	0.11
3110.68	Mn I	27201 - 59339	8.9	1.3	0.11
3148.18	Mn I	18403 - 50158	4.9	0.73	-0.14
3161.04	Mn I	18532 - 50158	7.7	1.2	0.06
3178.50	Mn I	18705 - 50158	12.	1.8	0.26
3212.88	Mn I	17052 - 48168	13.	2.0	0.30
3216.95	Mn I	0 - 31076	0.032	0.0049	-2.31
3228.09	Mn I	17052 - 48021	59.	9.1	0.96
3230.72	Mn I	17282 - 48226	18.	2.8	0.44
3236.78	Mn I	17282 - 48168	49.	7.7	0.89
3243.78	Mn I	17452 - 48271	19.	3.1	0.49
3248.52	Mn I	17452 - 48226	39.	6.1	0.79
3251.14	Mn I	17569 - 48318	6.3	1.00	-0.00
3252.95	Mn I	17569 - 48301	19.	3.0	0.48
3254.04	Mn I	17052 - 47774	3.5	0.55	-0.26
3256.14	Mn I	17569 - 48271	19.	3.0	0.47
3258.41	Mn I	17637 - 48318	13.	2.1	0.33
3260.23	Mn I	17637 - 48301	11.	1.8	0.24
3264.71	Mn I	17282 - 47904	10.	1.6	0.21
3296.88	Mn I	17452 - 47774	3.5	0.58	-0.24
3298.22	Mn I	27201 - 57512	14.	2.3	0.35
3320.69	Mn I	17282 - 47388	3.3	0.54	-0.27
3330.67	Mn I	17452 - 47467	3.7	0.61	-0.22
3531.85	Mn I	18402 - 46708	16.	3.0	0.48
3532.12	Mn I	18402 - 46706	50.	9.3	0.97
3547.80	Mn I	18532 - 46710	59.	11.	1.04

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3548.03	Mn I	18532 - 46708	50.	9.4	0.97
3548.20	Mn I	18532 - 46707	18.	3.3	0.52
3569.49	Mn I	18705 - 46713	101.	19.	1.28
3569.80	Mn I	18705 - 46710	33.	6.2	0.79
3577.88	Mn I	17052 - 44994	39.	7.6	0.88
3586.54	Mn I	17282 - 45156	21.	4.0	0.60
3595.12	Mn I	17452 - 45259	8.5	1.7	0.22
3607.54	Mn I	17282 - 44994	12.	2.3	0.36
3608.49	Mn I	17452 - 45156	12.	2.4	0.38
3610.30	Mn I	17569 - 45259	11.	2.1	0.32
3619.28	Mn I	17637 - 45259	8.6	1.7	0.23
3623.79	Mn I	17569 - 45156	6.5	1.3	0.10
3629.74	Mn I	17452 - 44994	4.0	0.79	-0.10
3660.40	Mn I	37420 - 64732	36.	7.2	0.85
3670.52	Mn I	17052 - 44289	1.7	0.33	-0.48
3676.96	Mn I	37631 - 64820	25.	5.0	0.70
3682.09	Mn I	37737 - 64888	18.	3.7	0.56
3693.67	Mn I	34139 - 61205	62.	13.	1.11
3696.57	Mn I	23297 - 50341	13.	2.7	0.43
3701.73	Mn I	17282 - 44289	1.2	0.25	-0.60
3706.08	Mn I	34251 - 61226	47.	9.7	0.99
3718.93	Mn I	34344 - 61226	29.	6.1	0.79
3728.89	Mn I	23549 - 50359	4.0	0.84	-0.08
3731.93	Mn I	41404 - 68192	37.	7.8	0.89
3790.22	Mn I	17052 - 43429	3.7	0.79	-0.10
3799.26	Mn I	17282 - 43596	0.77	0.17	-0.78
3800.55	Mn I	31001 - 57306	19.	4.1	0.61
3801.91	Mn I	25266 - 51561	5.0	1.1	0.03
3806.72	Mn I	17052 - 43314	43.	9.3	0.97
3809.59	Mn I	17282 - 43524	10.	2.2	0.34
3810.69	Mn I	25281 - 51516	5.0	1.1	0.03
3816.75	Mn I	17452 - 43644	1.3	0.29	-0.54
3823.51	Mn I	17282 - 43429	30.	6.5	0.81
3823.89	Mn I	17452 - 43596	5.7	1.2	0.10
3829.68	Mn I	17568 - 43673	2.0	0.44	-0.36
3833.86	Mn I	17568 - 43644	4.7	1.0	0.02
3834.36	Mn I	17452 - 43524	13.	2.8	0.45
3839.78	Mn I	17637 - 43673	3.4	0.76	-0.12
3841.08	Mn I	17568 - 43596	6.5	1.4	0.16
3843.98	Mn I	17637 - 43644	3.4	0.76	-0.12
3918.32	Mn I	34139 - 59653	9.5	2.2	0.34
3926.47	Mn I	31001 - 56462	14.	3.2	0.50
3952.84	Mn I	33825 - 59117	9.3	2.2	0.34
3975.89	Mn I	34845 - 59990	7.9	1.9	0.27
3977.08	Mn I	34463 - 59600	9.6	2.3	0.36
3982.58	Mn I	25281 - 50383	7.2	1.7	0.23
3985.24	Mn I	25288 - 50373	7.9	1.9	0.27
3986.83	Mn I	25266 - 50341	10.	2.4	0.38
3987.10	Mn I	25286 - 50359	7.9	1.9	0.27
4018.10	Mn I	17052 - 41933	9.3	2.3	0.35

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4026.44	Mn I	25266 - 50095	7.6	1.8	0.27
4030.76	Mn I	0 - 24802	1.4	0.33	-0.48
4033.07	Mn I	0 - 24788	0.95	0.23	-0.64
4034.49	Mn I	0 - 24779	0.54	0.13	-0.88
4035.73	Mn I	17282 - 42054	9.7	2.4	0.37
4038.73	Mn I	30354 - 55108	5.5	1.3	0.13
4041.36	Mn I	17052 - 41790	34.	8.4	0.93
4045.13	Mn I	34939 - 59653	31.	7.7	0.89
4048.76	Mn I	17452 - 42144	7.3	1.8	0.25
4049.00	Mn I	35041 - 59732	12.	2.9	0.46
4052.47	Mn I	35115 - 59784	9.9	2.4	0.39
4055.21	Mn I	35165 - 59818	22.	5.4	0.73
4055.54	Mn I	17282 - 41933	12.	3.0	0.47
4057.95	Mn I	24779 - 49415	9.8	2.4	0.39
4058.93	Mn I	17569 - 42199	7.4	1.8	0.26
4059.39	Mn I	24788 - 49415	6.8	1.7	0.22
4061.74	Mn I	24802 - 49415	34.	8.4	0.92
4063.53	Mn I	17452 - 42054	4.9	1.2	0.08
4065.08	Mn I	34251 - 58843	11.	2.8	0.45
4068.00	Mn I	17569 - 42144	0.55	0.14	-0.87
4070.28	Mn I	17637 - 42199	2.0	0.51	-0.30
4079.24	Mn I	17282 - 41790	4.5	1.1	0.06
4079.42	Mn I	17637 - 42144	5.0	1.3	0.10
4082.94	Mn I	17569 - 42054	7.1	1.8	0.25
4083.63	Mn I	17452 - 41933	6.9	1.7	0.24
4089.94	Mn I	34423 - 58867	9.5	2.4	0.38
4105.36	Mn I	34939 - 59290	7.8	2.0	0.29
4110.90	Mn I	34939 - 59257	29.	7.4	0.87
4131.12	Mn I	34139 - 58339	20.	5.2	0.72
4135.04	Mn I	34251 - 58427	17.	4.3	0.63
4141.06	Mn I	34344 - 58486	11.	2.9	0.46
4147.53	Mn I	27202 - 51306	3.5	0.90	-0.05
4148.80	Mn I	34423 - 58520	11.	2.9	0.46
4176.60	Mn I	34139 - 58075	20.	5.3	0.72
4189.99	Mn I	34251 - 58110	17.	4.4	0.64
4201.76	Mn I	34344 - 58136	9.2	2.4	0.39
4211.75	Mn I	34423 - 58160	9.3	2.5	0.39
4235.14	Mn I	23549 - 47155	11.	3.0	0.47
4235.29	Mn I	23297 - 46901	14.	3.8	0.58
4239.72	Mn I	23720 - 47299	5.7	1.5	0.19
4257.66	Mn I	23819 - 47299	9.0	2.4	0.39
4265.92	Mn I	23720 - 47155	8.7	2.4	0.37
4281.10	Mn I	23549 - 46901	7.4	2.0	0.31
4284.08	Mn I	23819 - 47155	2.0	0.55	-0.26
4312.55	Mn I	23720 - 46901	1.9	0.52	-0.28
4374.95	Mn I	27248 - 50099	2.6	0.76	-0.12
4381.70	Mn I	38670 - 61485	8.2	2.4	0.37
4411.88	Mn I	38009 - 60668	9.1	2.6	0.42
4414.88	Mn I	23297 - 45941	7.5	2.2	0.34
4419.78	Mn I	38120 - 60739	9.1	2.7	0.43

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4436.35	Mn I	23549 - 46084	5.0	1.5	0.17
4451.59	Mn I	23297 - 45754	17.	4.9	0.69
4453.00	Mn I	23720 - 46170	3.8	1.1	0.06
4455.01	Mn I	24779 - 47220	4.2	1.2	0.10
4455.32	Mn I	24779 - 47218	5.0	1.5	0.17
4455.82	Mn I	24779 - 47216	3.3	1.00	-0.00
4457.04	Mn I	24788 - 47218	1.7	0.50	-0.30
4457.55	Mn I	24788 - 47216	6.7	2.0	0.30
4458.26	Mn I	24788 - 47212	8.4	2.5	0.40
4460.38	Mn I	24802 - 47216	1.7	0.50	-0.30
4461.08	Mn I	24802 - 47212	4.6	1.4	0.14
4462.02	Mn I	24802 - 47207	16.	4.7	0.68
4464.68	Mn I	23549 - 45941	6.4	1.9	0.28
4470.14	Mn I	23720 - 46084	4.7	1.4	0.15
4472.79	Mn I	23819 - 46170	3.2	0.96	-0.02
4490.08	Mn I	23819 -- 46084	4.1	1.2	0.09
4498.90	Mn I	23720 -- 45941	5.3	1.6	0.21
4502.22	Mn I	23549 -- 45754	5.0	1.5	0.18
4605.36	Mn I	38120 -- 59828	14.	4.3	0.63
4626.54	Mn I	38009 -- 59617	13.	4.3	0.64
4671.69	Mn I	23297 - 44696	0.54	0.18	-0.75
4701.16	Mn I	23549 - 44815	0.89	0.30	-0.53
4709.72	Mn I	23297 - 44524	2.7	0.89	-0.05
4727.48	Mn I	23549 - 44696	3.0	1.0	0.01
4739.11	Mn I	23720 - 44815	2.3	0.76	-0.12
4754.04	Mn I	18403 - 39431	4.0	1.3	0.13
4761.53	Mn I	23819 - 44815	3.2	1.1	0.03
4762.38	Mn I	23297 - 44289	12.	4.0	0.60
4765.86	Mn I	23720 - 44696	5.3	1.8	0.25
4766.43	Mn I	23549 - 44524	8.4	2.8	0.45
4783.42	Mn I	18532 - 39431	3.7	1.3	0.11
4823.52	Mn I	18705 - 39431	4.0	1.4	0.15
4844.32	Mn I	31001 - 51638	2.1	0.75	-0.12
4965.88	Mn I	23297 - 43429	0.48	0.18	-0.75
5004.91	Mn I	23549 - 43524	0.26	0.099	-1.00
5074.79	Mn I	27202 - 46901	1.1	0.43	-0.37
5117.94	Mn I	25281 - 44815	1.2	0.48	-0.32
5150.89	Mn I	25288 - 44696	0.95	0.38	-0.42
5196.59	Mn I	25286 - 44524	0.91	0.37	-0.43
5255.32	Mn I	25266 - 44289	1.5	0.63	-0.20
5341.06	Mn I	17052 - 35770	0.26	0.11	-0.96
5349.88	Mn I	43314 - 62001	4.7	2.0	0.30
5377.63	Mn I	31001 - 49591	6.7	2.9	0.47
5394.67	Mn I	0 - 18532	0.0012	0.00054	-3.27
5399.49	Mn I	31076 - 49591	3.4	1.5	0.17
5407.42	Mn I	17282 - 35770	0.16	0.070	-1.15
5413.69	Mn I	31125 - 49591	2.5	1.1	0.05
5420.36	Mn I	17282 - 35726	0.14	0.061	-1.21
5432.55	Mn I	0 - 18402	0.00045	0.00020	-3.70
5457.47	Mn I	17452 - 35770	0.020	0.0090	-2.04

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5470.64	Mn I	17452 - 35726	0.10	0.045	-1.35
5481.40	Mn I	17452 - 35690	0.070	0.031	-1.50
5505.87	Mn I	17568 - 35726	0.050	0.023	-1.64
5516.77	Mn I	17568 - 35690	0.080	0.037	-1.44
5537.76	Mn I	17637 - 35690	0.070	0.032	-1.49
5551.98	Mn I	44289 - 62295	5.5	2.6	0.41
5567.76	Mn I	44523 - 62479	2.2	1.0	0.01
5573.01	Mn I	35165 - 53103	0.91	0.42	-0.37
5573.68	Mn I	35165 - 53101	1.1	0.49	-0.31
5738.29	Mn I	34139 - 51561	0.75	0.37	-0.43
5780.19	Mn I	34251 - 51546	0.76	0.38	-0.42
5816.84	Mn I	34344 - 51531	0.76	0.39	-0.41
6013.50	Mn I	24779 - 41404	1.3	0.71	-0.15
6016.64	Mn I	24788 - 41404	1.9	1.0	0.00
6021.80	Mn I	24802 - 41404	2.6	1.4	0.16
6384.67	Mn I	30426 - 46084	0.27	0.16	-0.78
6440.97	Mn I	30420 - 45941	0.59	0.37	-0.44
6491.71	Mn I	30354 - 45754	0.81	0.51	-0.29
6942.52	Mn I	41789 - 56190	3.1	2.3	0.36
6989.96	Mn I	42054 - 56356	2.7	2.0	0.29
7069.84	Mn I	37420 - 51561	1.9	1.4	0.14
7184.25	Mn I	37631 - 51546	1.6	1.2	0.08
7247.82	Mn I	37737 - 51531	1.3	0.99	-0.00
7283.82	Mn I	35690 - 49415	2.2	1.8	0.24
7302.89	Mn I	35726 - 49415	3.3	2.7	0.42
7326.51	Mn I	35770 - 49415	4.4	3.6	0.55
7680.20	Mn I	44289 - 57306	3.2	2.8	0.45
7712.42	Mn I	44524 - 57486	2.6	2.3	0.36
7764.72	Mn I	43314 - 56190	2.3	2.1	0.33
8670.92	Mn I	35690 - 47220	0.65	0.74	-0.13
8672.06	Mn I	35690 - 47218	0.81	0.92	-0.04
8673.97	Mn I	35690 - 47216	0.65	0.74	-0.13
8701.05	Mn I	35726 - 47216	0.82	0.93	-0.03
8703.76	Mn I	35726 - 47212	1.1	1.3	0.11
8740.93	Mn I	35770 - 47207	2.0	2.3	0.37

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2543.45	Mn II	27589 - 66894	24.	2.4	0.37
2556.57	Mn II	27583 - 66686	39.	3.8	0.58
2558.59	Mn II	27571 - 66643	49.	4.8	0.68
2563.65	Mn II	27547 - 66542	73.	7.2	0.86
2576.10	Mn II	0 - 38807	80.	7.9	0.90
2589.71	Mn II	32788 - 71390	32.	3.3	0.51
2593.73	Mn II	0 - 38543	50.	5.0	0.70
2598.90	Mn II	29951 - 68417	62.	6.2	0.80
2603.72	Mn II	29889 - 68284	31.	3.1	0.50
2605.69	Mn II	0 - 38366	33.	3.3	0.52
2610.20	Mn II	27547 - 65847	116.	12.	1.07
2624.80	Mn II	27571 - 65658	24.	2.5	0.40
2625.58	Mn II	27583 - 65658	126.	13.	1.11
2632.35	Mn II	27588 - 65566	116.	12.	1.08
2638.17	Mn II	27589 - 65483	77.	8.1	0.91
2639.84	Mn II	32788 - 70657	54.	5.7	0.75
2650.99	Mn II	32788 - 70497	19.	2.0	0.30
2655.91	Mn II	32857 - 70497	44.	4.6	0.66
2672.59	Mn II	29889 - 67295	72.	7.7	0.89
2673.37	Mn II	32836 - 70231	38.	4.1	0.61
2674.43	Mn II	33147 - 70527	39.	4.1	0.62
2680.34	Mn II	33248 - 70546	33.	3.6	0.55
2684.55	Mn II	33278 - 70518	39.	4.2	0.62
2685.94	Mn II	30523 - 67744	37.	4.0	0.60
2693.19	Mn II	29889 - 67009	18.	2.0	0.29
2695.36	Mn II	29919 - 67009	36.	3.9	0.59
2698.97	Mn II	29889 - 66929	18.	2.0	0.29
2701.00	Mn II	29889 - 66901	57.	6.2	0.79
2701.70	Mn II	27547 - 64550	96.	11.	1.02
2705.74	Mn II	27571 - 64519	77.	8.5	0.93
2707.53	Mn II	27571 - 64494	48.	5.3	0.72
2708.45	Mn II	27583 - 64494	67.	7.4	0.87
2709.96	Mn II	27583 - 64473	29.	3.2	0.50
2710.33	Mn II	27588 - 64473	48.	5.3	0.73
2711.58	Mn II	27588 - 64456	67.	7.4	0.87
2815.02	Mn II	35004 - 70518	46.	5.5	0.74
2879.49	Mn II	33147 - 67866	56.	7.0	0.84
2886.68	Mn II	33278 - 67910	51.	6.4	0.80
2889.58	Mn II	33248 - 67846	113.	14.	1.15
2892.39	Mn II	33248 - 67812	40.	5.0	0.70
2900.16	Mn II	36274 - 70745	60.	7.6	0.88
2933.06	Mn II	9473 - 43557	40.	5.2	0.72
2939.30	Mn II	9473 - 43485	54.	7.0	0.84
2949.20	Mn II	9473 - 43370	66.	8.6	0.94
3031.06	Mn II	34762 - 67744	41.	5.7	0.76
3441.99	Mn II	14326 - 43370	35.	6.3	0.80
3460.33	Mn II	14594 - 43485	18.	3.3	0.52
3474.04	Mn II	14594 - 43370	18.	3.2	0.51
3482.91	Mn II	14781 - 43485	15.	2.7	0.43
3488.68	Mn II	14901 - 43557	9.6	1.8	0.24

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3495.84	Mn II	14960 - 43557	7.6	1.4	0.14
3496.81	Mn II	14781 - 43370	2.6	0.48	-0.32
3497.54	Mn II	14901 - 43485	5.4	0.99	-0.00

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2325.94	Mo I	12346 - 55328	4.5	0.36	-0.44
2352.61	Mo I	12346 - 54839	3.8	0.31	-0.50
2355.22	Mo I	11143 - 53589	3.3	0.27	-0.56
2364.37	Mo I	11454 - 53736	3.4	0.28	-0.55
2372.27	Mo I	11454 - 53595	6.6	0.56	-0.25
2380.41	Mo I	11859 - 53855	5.9	0.50	-0.30
2383.52	Mo I	11859 - 53800	8.8	0.75	-0.13
2408.39	Mo I	12346 - 53855	3.0	0.26	-0.59
2415.33	Mo I	12346 - 53736	5.9	0.52	-0.29
2430.43	Mo I	12346 - 53479	6.7	0.59	-0.23
2471.97	Mo I	10768 - 51210	14.	1.2	0.09
2481.81	Mo I	10768 - 51049	6.3	0.58	-0.24
2509.56	Mo I	12346 - 52182	5.0	0.47	-0.32
2515.66	Mo I	12346 - 52085	2.5	0.24	-0.63
2517.46	Mo I	11454 - 51165	4.3	0.41	-0.39
2524.81	Mo I	11454 - 51049	8.5	0.81	-0.09
2536.85	Mo I	12346 - 51753	7.1	0.69	-0.16
2540.45	Mo I	11859 - 51210	10.	0.99	-0.00
2543.35	Mo I	11859 - 51165	5.8	0.56	-0.25
2548.22	Mo I	10768 - 49999	25.	2.4	0.39
2550.85	Mo I	11859 - 51049	10.	0.98	-0.01
2567.05	Mo I	10768 - 49712	18.	1.8	0.26
2572.34	Mo I	12346 - 51210	30.	2.9	0.47
2575.77	Mo I	11858 - 50670	3.4	0.34	-0.47
2578.77	Mo I	11858 - 50625	8.1	0.81	-0.09
2582.16	Mo I	10768 - 49484	18.	1.8	0.25
2591.98	Mo I	11143 - 49712	5.2	0.52	-0.28
2595.40	Mo I	10966 - 49484	7.2	0.73	-0.14
2596.77	Mo I	21343 - 59841	8.9	0.90	-0.05
2597.22	Mo I	10768 - 49259	2.1	0.21	-0.67
2599.64	Mo I	12346 - 50802	4.2	0.43	-0.37
2603.32	Mo I	10768 - 49169	1.8	0.19	-0.73
2607.37	Mo I	11143 - 49484	18.	1.8	0.26
2608.86	Mo I	20930 - 59250	6.9	0.70	-0.15
2611.20	Mo I	20951 - 59236	41.	4.2	0.62
2613.08	Mo I	11454 - 49712	21.	2.1	0.33
2615.39	Mo I	10966 - 49190	8.4	0.86	-0.06
2616.78	Mo I	11143 - 49346	27.	2.8	0.45
2621.07	Mo I	11859 - 49999	11.	1.1	0.06
2627.55	Mo I	11143 - 49190	21.	2.2	0.34
2628.74	Mo I	11454 - 49484	11.	1.2	0.07
2628.97	Mo I	11143 - 49169	5.3	0.55	-0.26
2629.85	Mo I	11454 - 49468	31.	3.2	0.50
2631.50	Mo I	10966 - 48956	4.0	0.42	-0.38
2635.57	Mo I	11859 - 49790	5.4	0.56	-0.25
2638.30	Mo I	11454 - 49346	18.	1.8	0.26
2640.99	Mo I	11859 - 49712	31.	3.2	0.50
2643.81	Mo I	11143 - 48956	2.5	0.27	-0.57
2647.25	Mo I	10768 - 48532	1.9	0.20	-0.71
2649.25	Mo I	11454 - 49190	2.1	0.22	-0.65

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2649.46	Mo I	11859 - 49591	46.	4.9	0.69
2650.68	Mo I	11454 - 49169	2.7	0.28	-0.55
2655.03	Mo I	12346 - 49999	44.	4.6	0.66
2655.93	Mo I	10768 - 48409	2.3	0.24	-0.62
2656.49	Mo I	11143 - 48775	2.5	0.26	-0.58
2658.11	Mo I	11859 - 49468	20.	2.2	0.33
2665.10	Mo I	11859 - 49370	7.8	0.83	-0.08
2666.75	Mo I	11859 - 49346	3.3	0.35	-0.45
2670.32	Mo I	10768 - 48206	3.5	0.37	-0.43
2678.67	Mo I	11454 - 48775	2.0	0.21	-0.67
2679.85	Mo I	12346 - 49651	77.	8.3	0.92
2682.62	Mo I	11143 - 48409	1.8	0.20	-0.70
2688.64	Mo I	21343 - 58526	10.	1.1	0.04
2693.04	Mo I	12346 - 49468	2.0	0.22	-0.66
2696.07	Mo I	10768 - 47848	3.3	0.36	-0.45
2697.81	Mo I	10966 - 48022	4.7	0.51	-0.29
2700.21	Mo I	12346 - 49370	4.5	0.49	-0.31
2701.03	Mo I	11858 - 48870	8.7	0.95	-0.02
2705.24	Mo I	11454 - 48409	2.8	0.31	-0.51
2706.12	Mo I	11143 - 48085	5.2	0.57	-0.24
2710.74	Mo I	11143 - 48022	3.4	0.38	-0.42
2715.17	Mo I	10768 - 47588	2.3	0.26	-0.59
2720.17	Mo I	11454 - 48206	4.5	0.50	-0.31
2724.41	Mo I	16784 - 53479	15.	1.7	0.22
2725.15	Mo I	11143 - 47827	9.0	1.0	0.00
2725.95	Mo I	11859 - 48532	2.9	0.32	-0.49
2726.65	Mo I	21154 - 57818	5.7	0.64	-0.20
2728.70	Mo I	11143 - 47779	4.5	0.50	-0.30
2729.13	Mo I	11454 - 48085	3.1	0.34	-0.47
2733.39	Mo I	11454 - 48028	14.	1.5	0.19
2735.65	Mo I	16784 - 53327	3.7	0.42	-0.38
2735.88	Mo I	11858 - 48399	1.4	0.16	-0.80
2736.42	Mo I	18356 - 54889	4.4	0.50	-0.30
2743.07	Mo I	11143 - 47588	12.	1.3	0.12
2743.71	Mo I	10966 - 47402	4.5	0.51	-0.29
2745.09	Mo I	10768 - 47186	3.6	0.40	-0.40
2745.38	Mo I	16784 - 53198	5.2	0.59	-0.23
2748.49	Mo I	11454 - 47827	2.9	0.33	-0.48
2751.47	Mo I	11859 - 48192	18.	2.0	0.31
2754.29	Mo I	10768 - 47064	1.4	0.16	-0.80
2755.37	Mo I	10966 - 47248	1.5	0.17	-0.78
2759.58	Mo I	11859 - 48085	1.5	0.18	-0.75
2761.53	Mo I	12346 - 48547	12.	1.3	0.13
2762.70	Mo I	12346 - 48532	3.9	0.45	-0.35
2763.03	Mo I	11143 - 47324	3.0	0.34	-0.47
2763.93	Mo I	11859 - 48028	2.2	0.25	-0.60
2766.26	Mo I	11143 - 47282	5.1	0.59	-0.23
2766.72	Mo I	11454 - 47588	2.0	0.23	-0.64
2767.22	Mo I	10768 - 46895	1.3	0.15	-0.81
2771.36	Mo I	10966 - 47039	1.2	0.14	-0.85

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2777.74	Mo I	11858 - 47848	6.7	0.78	-0.11
2779.48	Mo I	11143 - 47110	3.2	0.37	-0.43
2787.83	Mo I	12346 - 48206	10.	1.2	0.07
2788.94	Mo I	12346 - 48192	4.1	0.48	-0.32
2790.01	Mo I	16748 - 52579	2.9	0.34	-0.46
2790.31	Mo I	11454 - 47282	4.4	0.52	-0.29
2792.96	Mo I	11454 - 47248	3.7	0.43	-0.37
2796.78	Mo I	24096 - 59841	7.6	0.90	-0.05
2797.93	Mo I	11454 - 47184	11.	1.3	0.11
2801.47	Mo I	10768 - 46453	8.4	0.99	-0.00
2807.36	Mo I	11454 - 47064	1.4	0.17	-0.78
2808.37	Mo I	11454 - 47052	3.2	0.37	-0.43
2809.96	Mo I	11143 - 46720	1.3	0.15	-0.81
2810.43	Mo I	18229 - 53800	3.5	0.41	-0.39
2815.54	Mo I	18229 - 53736	4.6	0.54	-0.26
2815.91	Mo I	11454 - 46956	3.1	0.37	-0.43
2818.30	Mo I	11454 - 46926	1.7	0.20	-0.69
2822.43	Mo I	11454 - 46874	1.4	0.16	-0.79
2822.86	Mo I	18229 - 53644	3.4	0.41	-0.39
2825.67	Mo I	18356 - 53736	6.9	0.83	-0.08
2826.54	Mo I	24823 - 60191	59.	7.1	0.85
2826.75	Mo I	18229 - 53595	6.8	0.81	-0.09
2828.79	Mo I	24096 - 59437	9.4	1.1	0.05
2829.79	Mo I	11858 - 47186	1.8	0.22	-0.66
2829.94	Mo I	11858 - 47184	3.3	0.40	-0.40
2835.91	Mo I	11858 - 47110	0.90	0.11	-0.96
2836.03	Mo I	16641 - 51891	1.1	0.13	-0.88
2837.90	Mo I	21154 - 56381	9.1	1.1	0.04
2839.58	Mo I	11858 - 47064	2.5	0.30	-0.52
2844.39	Mo I	24466 - 59612	54.	6.5	0.81
2850.79	Mo I	11859 - 46926	2.8	0.34	-0.47
2851.18	Mo I	12346 - 47409	1.6	0.19	-0.72
2853.58	Mo I	16641 - 51675	4.4	0.54	-0.27
2854.87	Mo I	24823 - 59841	9.7	1.2	0.08
2859.57	Mo I	20948 - 55908	8.8	1.1	0.03
2864.31	Mo I	24096 - 58998	37.	4.6	0.66
2864.66	Mo I	11859 - 46756	6.0	0.74	-0.13
2869.56	Mo I	12346 - 47184	3.3	0.41	-0.38
2870.18	Mo I	12346 - 47177	1.3	0.16	-0.79
2870.90	Mo I	21154 - 55976	5.2	0.64	-0.19
2873.64	Mo I	24823 - 59612	9.7	1.2	0.08
2876.54	Mo I	21154 - 55908	8.8	1.1	0.04
2878.38	Mo I	11858 - 46590	1.6	0.20	-0.70
2882.54	Mo I	20158 - 54839	6.6	0.83	-0.08
2885.74	Mo I	25549 - 60192	16.	2.0	0.30
2886.61	Mo I	21343 - 55976	16.	2.0	0.31
2887.62	Mo I	10768 - 45389	0.79	0.098	-1.01
2889.84	Mo I	11858 - 46453	1.6	0.19	-0.71
2893.23	Mo I	25639 - 60192	16.	2.0	0.31
2896.44	Mo I	12346 - 46861	1.2	0.15	-0.82

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2898.65	Mo I	20350 - 54839	13.	1.7	0.23
2905.27	Mo I	12346 - 46756	6.8	0.86	-0.07
2906.06	Mo I	20130 - 54531	10.	1.3	0.12
2907.78	Mo I	11454 - 45835	0.90	0.11	-0.94
2908.16	Mo I	21154 - 55530	4.3	0.55	-0.26
2913.52	Mo I	10768 - 45081	1.9	0.24	-0.62
2915.26	Mo I	25549 - 59841	12.	1.5	0.18
2915.38	Mo I	20281 - 54572	9.1	1.2	0.07
2916.10	Mo I	11143 - 45425	1.4	0.18	-0.76
2919.20	Mo I	11143 - 45389	0.68	0.087	-1.06
2919.38	Mo I	12346 - 46590	2.3	0.29	-0.54
2931.08	Mo I	12346 - 46453	1.9	0.24	-0.61
2934.84	Mo I	25549 - 59612	16.	2.0	0.31
2936.50	Mo I	21343 - 55387	14.	1.8	0.27
2940.98	Mo I	20350 - 54343	7.7	1.00	-0.00
2942.85	Mo I	11454 - 45425	1.6	0.21	-0.68
2944.21	Mo I	0 - 33955	0.16	0.021	-1.67
2945.43	Mo I	20948 - 54889	14.	1.8	0.25
2945.66	Mo I	11143 - 45080	3.8	0.49	-0.31
2946.01	Mo I	11454 - 45389	5.5	0.72	-0.15
2953.56	Mo I	16784 - 50631	4.6	0.61	-0.22
2959.48	Mo I	20158 - 53938	12.	1.6	0.21
2959.80	Mo I	11859 - 45635	2.5	0.32	-0.49
2972.96	Mo I	11454 - 45081	2.1	0.28	-0.55
2977.27	Mo I	20158 - 53736	7.3	0.97	-0.01
2978.28	Mo I	11859 - 45425	5.1	0.68	-0.16
2981.52	Mo I	11858 - 45389	3.5	0.46	-0.33
2983.04	Mo I	19970 - 53483	7.1	0.94	-0.03
2983.81	Mo I	20350 - 53855	9.8	1.3	0.12
2985.16	Mo I	12346 - 45836	1.6	0.21	-0.68
2985.84	Mo I	25517 - 58999	12.	1.6	0.19
2987.92	Mo I	20130 - 53588	17.	2.2	0.35
2988.23	Mo I	20281 - 53736	12.	1.6	0.21
2988.68	Mo I	20350 - 53800	25.	3.3	0.52
2989.80	Mo I	20158 - 53595	29.	3.8	0.59
3000.23	Mo I	20158 - 53479	7.1	0.96	-0.02
3002.21	Mo I	0 - 33299	0.19	0.025	-1.60
3010.26	Mo I	12346 - 45556	1.5	0.20	-0.70
3013.39	Mo I	18229 - 51405	14.	1.9	0.29
3016.78	Mo I	21154 - 54292	13.	1.8	0.25
3025.00	Mo I	18356 - 51405	29.	3.9	0.60
3035.33	Mo I	18229 - 51165	5.2	0.72	-0.14
3036.31	Mo I	18480 - 51405	12.	1.6	0.21
3039.82	Mo I	25639 - 58526	11.	1.6	0.20
3041.70	Mo I	16784 - 49650	25.	3.5	0.55
3046.80	Mo I	16784 - 49596	13.	1.8	0.24
3047.31	Mo I	16785 - 49591	17.	2.4	0.38
3055.32	Mo I	16748 - 49468	17.	2.4	0.37
3061.59	Mo I	16693 - 49346	13.	1.8	0.25
3064.28	Mo I	16784 - 49408	64.	9.1	0.96

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3068.00	Mo I	16785 - 49370	8.3	1.2	0.07
3070.90	Mo I	16748 - 49302	20.	2.9	0.46
3071.44	Mo I	16641 - 49190	6.8	0.96	-0.02
3074.37	Mo I	16784 - 49302	63.	9.0	0.95
3079.88	Mo I	23515 - 55975	30.	4.3	0.63
3080.41	Mo I	16693 - 49147	16.	2.3	0.36
3081.16	Mo I	18480 - 50926	4.2	0.60	-0.22
3085.62	Mo I	16748 - 49147	62.	8.8	0.94
3089.12	Mo I	16784 - 49147	8.0	1.1	0.06
3089.71	Mo I	16641 - 48997	7.8	1.1	0.05
3094.66	Mo I	16693 - 48997	42.	6.0	0.78
3099.93	Mo I	16748 - 48999	8.4	1.2	0.08
3100.88	Mo I	23668 - 55908	22.	3.2	0.50
3112.12	Mo I	0 - 32123	0.98	0.14	-0.85
3117.54	Mo I	24823 - 56891	12.	1.8	0.25
3132.59	Mo I	0 - 31913	9.8	1.4	0.16
3135.89	Mo I	24096 - 55976	11.	1.7	0.22
3136.46	Mo I	16748 - 48622	6.8	1.00	-0.00
3136.75	Mo I	23516 - 55387	9.1	1.4	0.13
3147.35	Mo I	16784 - 48547	16.	2.3	0.36
3156.51	Mo I	11858 - 43530	1.0	0.15	-0.82
3158.16	Mo I	0 - 31655	3.8	0.57	-0.24
3163.90	Mo I	16641 - 48238	6.3	0.94	-0.03
3164.53	Mo I	11454 - 43046	1.9	0.29	-0.54
3170.35	Mo I	0 - 31533	5.4	0.82	-0.09
3172.37	Mo I	16693 - 48206	2.6	0.39	-0.41
3177.90	Mo I	16748 - 48206	6.3	0.95	-0.02
3183.03	Mo I	16785 - 48192	24.	3.6	0.56
3184.57	Mo I	16693 - 48085	7.6	1.2	0.06
3185.10	Mo I	11858 - 43246	6.2	0.95	-0.02
3185.71	Mo I	16641 - 48022	11.	1.7	0.23
3188.09	Mo I	23668 - 55026	12.	1.8	0.26
3188.40	Mo I	23534 - 54889	12.	1.8	0.25
3191.52	Mo I	21343 - 52667	14.	2.1	0.32
3192.80	Mo I	21154 - 52465	13.	2.0	0.31
3193.97	Mo I	0 - 31300	4.4	0.68	-0.17
3194.87	Mo I	24096 - 55387	12.	1.9	0.28
3195.96	Mo I	16748 - 48028	18.	2.8	0.44
3198.85	Mo I	12346 - 43598	2.3	0.35	-0.46
3200.21	Mo I	18229 - 49468	5.4	0.84	-0.08
3200.89	Mo I	18480 - 49712	5.7	0.88	-0.06
3205.22	Mo I	10966 - 42156	4.2	0.65	-0.19
3205.54	Mo I	11858 - 43046	1.9	0.30	-0.53
3205.88	Mo I	12346 - 43530	16.	2.5	0.40
3208.83	Mo I	0 - 31155	1.7	0.26	-0.58
3210.97	Mo I	16693 - 47827	15.	2.2	0.35
3213.32	Mo I	11858 - 42970	1.0	0.16	-0.81
3214.44	Mo I	16748 - 47848	7.3	1.1	0.05
3215.07	Mo I	11143 - 42237	7.2	1.1	0.05
3220.86	Mo I	10768 - 41807	0.73	0.11	-0.94

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3221.74	Mo I	18229 - 49259	29.	4.5	0.65
3223.49	Mo I	11143 - 42156	0.81	0.13	-0.90
3228.22	Mo I	11454 - 42422	12.	1.9	0.27
3229.79	Mo I	12346 - 43299	10.	1.6	0.21
3233.14	Mo I	16784 - 47705	66.	10.	1.02
3235.38	Mo I	12346 - 43246	3.3	0.52	-0.29
3237.08	Mo I	20281 - 51165	111.	17.	1.24
3237.98	Mo I	16784 - 47659	6.6	1.0	0.01
3240.49	Mo I	12346 - 43197	3.3	0.51	-0.29
3244.47	Mo I	18356 - 49169	3.9	0.62	-0.21
3245.92	Mo I	27727 - 58526	16.	2.6	0.41
3249.92	Mo I	16641 - 47402	3.5	0.56	-0.25
3256.21	Mo I	11454 - 42156	12.	1.9	0.29
3259.16	Mo I	24466 - 55140	22.	3.4	0.54
3260.48	Mo I	16748 - 47409	3.6	0.57	-0.25
3262.63	Mo I	16641 - 47282	16.	2.6	0.42
3263.83	Mo I	10768 - 41398	1.2	0.18	-0.73
3264.40	Mo I	16785 - 47409	27.	4.3	0.63
3270.90	Mo I	11859 - 42422	11.	1.8	0.25
3279.44	Mo I	16692 - 47177	3.4	0.55	-0.26
3285.02	Mo I	10966 - 41398	0.25	0.040	-1.40
3285.36	Mo I	16748 - 47177	1.7	0.28	-0.56
3287.38	Mo I	16641 - 47052	3.3	0.53	-0.27
3289.02	Mo I	11454 - 41850	13.	2.1	0.33
3289.84	Mo I	16784 - 47172	10.	1.7	0.22
3290.82	Mo I	11858 - 42237	13.	2.1	0.31
3294.85	Mo I	11143 - 41484	1.4	0.22	-0.65
3296.40	Mo I	11858 - 42186	1.4	0.22	-0.66
3303.34	Mo I	16693 - 46956	5.3	0.86	-0.07
3304.22	Mo I	11143 - 41398	1.8	0.30	-0.52
3305.56	Mo I	10768 - 41012	3.0	0.49	-0.31
3305.90	Mo I	21619 - 51859	17.	2.8	0.44
3307.12	Mo I	11859 - 42088	4.1	0.67	-0.18
3310.77	Mo I	10768 - 40964	1.5	0.24	-0.61
3312.33	Mo I	16693 - 46874	4.8	0.78	-0.11
3319.59	Mo I	16693 - 46808	6.3	1.0	0.02
3319.79	Mo I	16641 - 46755	6.2	1.0	0.01
3323.95	Mo I	12346 - 42422	9.0	1.5	0.17
3325.67	Mo I	10768 - 40829	3.2	0.53	-0.27
3327.30	Mo I	10966 - 41012	3.4	0.56	-0.25
3331.40	Mo I	16748 - 46756	3.1	0.52	-0.29
3336.51	Mo I	18229 - 48192	8.7	1.5	0.16
3340.17	Mo I	10768 - 40698	2.1	0.35	-0.46
3344.75	Mo I	11143 - 41032	12.	2.0	0.31
3347.02	Mo I	11143 - 41012	3.0	0.51	-0.29
3349.19	Mo I	18356 - 48206	4.4	0.74	-0.13
3350.30	Mo I	12346 - 42186	1.7	0.28	-0.55
3354.99	Mo I	10768 - 40566	1.1	0.18	-0.74
3358.12	Mo I	11454 - 41224	16.	2.7	0.44
3361.37	Mo I	12346 - 42088	3.3	0.56	-0.25

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3362.37	Mo I	10966 - 40698	1.1	0.19	-0.72
3363.78	Mo I	10768 - 40488	7.9	1.3	0.13
3369.25	Mo I	18356 - 48028	4.3	0.72	-0.14
3375.22	Mo I	18229 - 47848	4.1	0.70	-0.16
3375.65	Mo I	21619 - 51234	7.8	1.3	0.12
3378.20	Mo I	11143 - 40736	1.1	0.19	-0.71
3378.46	Mo I	25549 - 55140	26.	4.4	0.64
3379.97	Mo I	11454 - 41032	9.2	1.6	0.20
3382.29	Mo I	11454 - 41012	0.61	0.11	-0.98
3382.48	Mo I	11143 - 40699	2.8	0.48	-0.32
3384.62	Mo I	11859 - 41396	20.	3.5	0.55
3385.88	Mo I	26636 - 56162	14.	2.4	0.39
3387.75	Mo I	11454 - 40964	0.91	0.16	-0.81
3389.80	Mo I	18356 - 47848	10.	1.8	0.25
3392.17	Mo I	21154 - 50625	11.	1.8	0.26
3393.65	Mo I	21343 - 50802	18.	3.2	0.50
3397.69	Mo I	11143 - 40566	1.4	0.23	-0.63
3402.81	Mo I	27766 - 57144	31.	5.4	0.73
3403.35	Mo I	11454 - 40829	0.59	0.10	-0.99
3404.34	Mo I	11859 - 41224	6.5	1.1	0.06
3405.20	Mo I	18229 - 47588	3.9	0.68	-0.17
3418.52	Mo I	11454 - 40698	2.1	0.37	-0.43
3418.96	Mo I	20350 - 49591	4.5	0.78	-0.11
3420.04	Mo I	18356 - 47588	16.	2.7	0.44
3421.25	Mo I	10768 - 39989	1.4	0.24	-0.61
3422.31	Mo I	20158 - 49370	23.	4.0	0.60
3424.60	Mo I	10768 - 39960	1.4	0.24	-0.61
3424.76	Mo I	16748 - 45939	3.7	0.66	-0.18
3425.19	Mo I	20281 - 49468	8.7	1.5	0.19
3425.48	Mo I	16784 - 45969	5.0	0.88	-0.05
3426.00	Mo I	18229 - 47409	7.5	1.3	0.12
3426.79	Mo I	11859 - 41032	1.6	0.27	-0.56
3427.90	Mo I	27727 - 56891	19.	3.4	0.53
3432.87	Mo I	16748 - 45870	3.7	0.65	-0.19
3434.04	Mo I	11454 - 40566	0.82	0.15	-0.84
3434.79	Mo I	11859 - 40964	3.7	0.65	-0.19
3435.45	Mo I	25639 - 54739	63.	11.	1.04
3437.22	Mo I	16785 - 45870	24.	4.3	0.64
3438.87	Mo I	10966 - 40037	1.9	0.34	-0.47
3441.44	Mo I	12346 - 41396	2.8	0.49	-0.31
3442.66	Mo I	20130 - 49169	5.5	0.98	-0.01
3443.26	Mo I	11454 - 40488	2.2	0.38	-0.42
3445.04	Mo I	20350 - 49370	8.6	1.5	0.19
3445.26	Mo I	16693 - 45710	7.0	1.3	0.10
3447.12	Mo I	12346 - 41348	34.	6.1	0.79
3449.07	Mo I	11859 - 40844	6.0	1.1	0.03
3449.85	Mo I	20281 - 49259	8.4	1.5	0.18
3452.60	Mo I	18229 - 47184	14.	2.6	0.41
3454.22	Mo I	16693 - 45635	3.7	0.67	-0.17
3456.15	Mo I	18356 - 47282	11.	2.0	0.29

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3456.39	Mo I	0 – 28924	0.31	0.056	-1.26
3458.15	Mo I	20281 – 49190	5.6	1.00	-0.00
3459.92	Mo I	11143 – 40037	1.2	0.21	-0.67
3460.23	Mo I	18356 – 47248	7.3	1.3	0.12
3460.78	Mo I	16748 – 45635	2.3	0.41	-0.38
3466.83	Mo I	0 – 28836	0.10	0.018	-1.74
3466.97	Mo I	18229 – 47064	3.5	0.63	-0.20
3467.85	Mo I	18356 – 47184	14.	2.6	0.41
3469.22	Mo I	16641 – 45458	11.	2.0	0.30
3469.63	Mo I	24823 – 53637	11.	2.0	0.30
3470.92	Mo I	18480 – 47282	11.	2.0	0.30
3473.22	Mo I	16641 – 45425	2.2	0.40	-0.40
3475.03	Mo I	18480 – 47248	11.	2.0	0.30
3479.43	Mo I	16693 – 45425	6.0	1.1	0.04
3480.09	Mo I	18229 – 46956	5.5	1.0	0.00
3481.79	Mo I	20158 – 48870	8.5	1.6	0.19
3482.40	Mo I	11859 – 40566	1.7	0.30	-0.52
3483.67	Mo I	18229 – 46926	5.1	0.92	-0.03
3483.84	Mo I	18356 – 47052	10.	1.9	0.28
3485.93	Mo I	11143 – 39821	1.7	0.31	-0.51
3491.77	Mo I	18480 – 47110	7.1	1.3	0.11
3493.34	Mo I	12346 – 40964	1.2	0.23	-0.64
3504.41	Mo I	18229 – 46756	41.	7.5	0.88
3505.32	Mo I	20350 – 48870	20.	3.7	0.56
3508.12	Mo I	12346 – 40844	5.3	0.98	-0.01
3510.78	Mo I	28241 – 56717	25.	4.6	0.67
3513.70	Mo I	18356 – 46808	5.4	1.00	-0.00
3517.56	Mo I	25517 – 53938	23.	4.4	0.64
3518.22	Mo I	18480 – 46895	6.8	1.3	0.10
3521.41	Mo I	20158 – 48547	37.	6.9	0.84
3524.23	Mo I	11454 – 39821	0.74	0.14	-0.86
3524.65	Mo I	25821 – 54184	36.	6.8	0.83
3524.98	Mo I	18229 – 46590	12.	2.2	0.34
3542.17	Mo I	18229 – 46452	15.	2.9	0.46
3554.20	Mo I	20281 – 48409	7.3	1.4	0.14
3555.43	Mo I	20281 – 48399	4.9	0.92	-0.03
3558.10	Mo I	18356 – 46453	25.	4.7	0.67
3563.14	Mo I	11859 – 39916	3.0	0.56	-0.25
3563.76	Mo I	19970 – 48022	4.5	0.86	-0.07
3566.05	Mo I	20158 – 48192	22.	4.2	0.63
3570.65	Mo I	25639 – 53637	43.	8.2	0.92
3573.88	Mo I	18480 – 46452	15.	2.9	0.47
3580.54	Mo I	28241 – 56162	26.	5.0	0.70
3581.89	Mo I	16785 – 44695	39.	7.5	0.87
3586.86	Mo I	25456 – 52327	9.7	1.9	0.27
3588.95	Mo I	20350 – 48206	7.7	1.5	0.17
3590.74	Mo I	20350 – 48192	15.	2.8	0.45
3592.02	Mo I	16693 – 44525	1.8	0.34	-0.47
3595.55	Mo I	20281 – 48085	7.5	1.4	0.16
3595.71	Mo I	20608 – 48411	4.9	0.96	-0.02

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3598.88	Mo I	25549 - 53327	36.	7.0	0.85
3600.28	Mo I	16693 - 44461	2.6	0.50	-0.30
3602.94	Mo I	20281 - 48028	19.	3.8	0.58
3604.07	Mo I	25997 - 53736	12.	2.3	0.36
3608.37	Mo I	11454 - 39160	1.3	0.25	-0.61
3612.00	Mo I	20350 - 48028	9.7	1.9	0.28
3612.45	Mo I	20948 - 48622	8.4	1.6	0.22
3613.37	Mo I	11454 - 39122	0.82	0.16	-0.80
3613.64	Mo I	21154 - 48819	8.8	1.7	0.24
3615.15	Mo I	26639 - 54292	13.	2.5	0.39
3615.74	Mo I	20130 - 47779	4.3	0.85	-0.07
3616.84	Mo I	18229 - 45870	2.9	0.57	-0.24
3624.46	Mo I	16748 - 44330	36.	7.0	0.85
3626.18	Mo I	12346 - 39916	2.5	0.50	-0.30
3628.35	Mo I	20158 - 47711	4.3	0.84	-0.07
3628.66	Mo I	16641 - 44192	2.6	0.52	-0.29
3629.31	Mo I	25639 - 53184	4.1	0.82	-0.09
3635.43	Mo I	16693 - 44192	26.	5.2	0.72
3637.52	Mo I	11143 - 38626	0.34	0.067	-1.18
3638.20	Mo I	18356 - 45835	6.4	1.3	0.11
3640.62	Mo I	20951 - 48411	11.	2.1	0.32
3640.99	Mo I	20130 - 47588	6.2	1.2	0.09
3642.20	Mo I	20951 - 48399	5.6	1.1	0.05
3648.61	Mo I	16641 - 44041	1.7	0.35	-0.46
3651.35	Mo I	11143 - 38522	0.70	0.14	-0.86
3657.35	Mo I	16641 - 43975	9.5	1.9	0.28
3660.92	Mo I	26336 - 53644	13.	2.7	0.43
3661.78	Mo I	11858 - 39160	1.1	0.22	-0.66
3662.99	Mo I	25906 - 53198	24.	4.8	0.68
3663.30	Mo I	20948 - 48238	10.	2.1	0.32
3664.30	Mo I	16693 - 43975	1.7	0.35	-0.46
3664.81	Mo I	18356 - 45635	18.	3.7	0.57
3666.72	Mo I	16748 - 44012	6.2	1.2	0.10
3666.94	Mo I	11858 - 39122	0.58	0.12	-0.93
3668.00	Mo I	20951 - 48206	4.2	0.85	-0.07
3668.49	Mo I	20158 - 47409	4.0	0.81	-0.09
3669.34	Mo I	21154 - 48399	15.	3.0	0.48
3670.42	Mo I	20350 - 47588	2.1	0.42	-0.37
3672.82	Mo I	26636 - 53855	99.	20.	1.30
3675.36	Mo I	25997 - 53198	14.	2.8	0.45
3675.98	Mo I	18229 - 45425	0.72	0.15	-0.83
3676.24	Mo I	20130 - 47324	4.9	1.00	-0.00
3680.60	Mo I	16784 - 43946	27.	5.4	0.73
3681.55	Mo I	20930 - 48085	5.9	1.2	0.08
3686.11	Mo I	20281 - 47402	2.0	0.41	-0.39
3688.97	Mo I	25906 - 53006	11.	2.2	0.35
3690.59	Mo I	20951 - 48039	15.	3.1	0.49
3692.08	Mo I	18480 - 45556	0.75	0.15	-0.81
3693.38	Mo I	11454 - 38522	0.75	0.15	-0.82
3694.94	Mo I	16641 - 43698	29.	5.8	0.77

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3696.04	Mo I	29982 - 57030	21.	4.3	0.63
3698.53	Mo I	20281 - 47311	3.0	0.61	-0.22
3700.01	Mo I	20158 - 47177	3.8	0.79	-0.10
3702.03	Mo I	16693 - 43698	4.3	0.88	-0.05
3702.55	Mo I	20281 - 47282	9.8	2.0	0.31
3705.41	Mo I	20130 - 47110	2.8	0.58	-0.23
3707.17	Mo I	20281 - 47248	4.4	0.90	-0.04
3708.56	Mo I	23668 - 50625	8.7	1.8	0.26
3710.14	Mo I	18480 - 45425	1.7	0.36	-0.44
3711.51	Mo I	10966 - 37902	0.10	0.022	-1.66
3712.95	Mo I	19970 - 46895	4.0	0.83	-0.08
3713.47	Mo I	20130 - 47052	4.2	0.87	-0.06
3714.55	Mo I	21619 - 48532	5.2	1.1	0.03
3715.65	Mo I	16693 - 43598	4.2	0.87	-0.06
3716.87	Mo I	20281 - 47177	4.3	0.90	-0.05
3718.48	Mo I	26759 - 53644	9.0	1.9	0.27
3720.25	Mo I	25707 - 52579	10.	2.2	0.34
3725.56	Mo I	20350 - 47184	9.7	2.0	0.30
3726.22	Mo I	20281 - 47110	7.1	1.5	0.17
3728.30	Mo I	23668 - 50482	17.	3.6	0.55
3730.56	Mo I	20158 - 46956	1.4	0.29	-0.54
3733.03	Mo I	21619 - 48399	8.3	1.7	0.24
3733.40	Mo I	21343 - 48121	5.4	1.1	0.05
3734.37	Mo I	20281 - 47052	4.2	0.88	-0.05
3735.62	Mo I	25906 - 52667	12.	2.5	0.40
3735.91	Mo I	20350 - 47110	4.8	0.99	-0.00
3736.17	Mo I	20281 - 47039	1.4	0.29	-0.53
3737.91	Mo I	16784 - 43530	3.4	0.72	-0.14
3740.76	Mo I	18356 - 45081	0.80	0.17	-0.77
3742.28	Mo I	20350 - 47064	12.	2.6	0.41
3743.81	Mo I	20158 - 46861	2.7	0.56	-0.25
3744.10	Mo I	20350 - 47052	1.4	0.30	-0.53
3745.48	Mo I	18229 - 44921	2.6	0.54	-0.27
3748.49	Mo I	26636 - 53306	23.	4.9	0.69
3751.20	Mo I	20158 - 46808	6.2	1.3	0.12
3755.10	Mo I	25821 - 52444	19.	4.1	0.61
3755.54	Mo I	21619 - 48238	2.2	0.46	-0.34
3755.84	Mo I	23516 - 50134	3.2	0.67	-0.18
3758.52	Mo I	20158 - 46756	8.8	1.9	0.27
3759.60	Mo I	26636 - 53227	5.0	1.1	0.03
3760.88	Mo I	25997 - 52579	13.	2.8	0.45
3761.76	Mo I	20350 - 46926	4.6	0.97	-0.01
3762.09	Mo I	21619 - 48192	3.7	0.78	-0.11
3763.35	Mo I	11859 - 38423	0.66	0.14	-0.86
3764.44	Mo I	21154 - 47711	3.3	0.70	-0.15
3765.22	Mo I	16748 - 43299	1.6	0.35	-0.46
3767.73	Mo I	21343 - 47877	2.0	0.43	-0.37
3768.62	Mo I	20281 - 46808	3.1	0.66	-0.18
3768.74	Mo I	27766 - 54292	11.	2.4	0.39
3770.00	Mo I	27774 - 54292	11.	2.4	0.39

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3770.45	Mo I	16784 - 43299	6.5	1.4	0.14
3771.95	Mo I	16693 - 43197	3.2	0.67	-0.17
3772.82	Mo I	16748 - 43246	2.6	0.55	-0.26
3775.65	Mo I	19970 - 46448	1.4	0.30	-0.52
3776.10	Mo I	25707 - 52182	4.4	0.94	-0.03
3776.55	Mo I	20930 - 47402	1.8	0.39	-0.41
3777.72	Mo I	28241 - 54704	12.	2.6	0.41
3779.77	Mo I	16748 - 43197	3.8	0.81	-0.09
3781.59	Mo I	11143 - 37579	1.3	0.28	-0.55
3782.19	Mo I	20158 - 46590	3.0	0.63	-0.20
3785.03	Mo I	16785 - 43197	1.6	0.34	-0.47
3785.51	Mo I	26336 - 52747	8.2	1.8	0.24
3788.26	Mo I	26189 - 52579	13.	2.9	0.46
3793.62	Mo I	16693 - 43046	1.8	0.39	-0.40
3794.43	Mo I	23516 - 49864	8.7	1.9	0.27
3796.04	Mo I	24466 - 50802	6.1	1.3	0.12
3797.30	Mo I	10966 - 37293	0.84	0.18	-0.74
3798.25	Mo I	0 - 26321	4.4	0.94	-0.03
3801.84	Mo I	20158 - 46453	13.	2.8	0.45
3804.52	Mo I	16693 - 42970	1.5	0.32	-0.49
3805.93	Mo I	25821 - 52088	12.	2.7	0.43
3807.65	Mo I	21154 - 47409	3.1	0.68	-0.17
3811.39	Mo I	21619 - 47848	5.8	1.3	0.10
3812.47	Mo I	16748 - 42970	1.5	0.33	-0.49
3818.66	Mo I	20930 - 47110	3.4	0.74	-0.13
3819.87	Mo I	20281 - 46452	5.3	1.2	0.07
3822.98	Mo I	11143 - 37293	0.55	0.12	-0.92
3825.32	Mo I	23516 - 49651	5.9	1.3	0.11
3826.70	Mo I	11454 - 37579	1.6	0.36	-0.44
3827.16	Mo I	23668 - 49790	7.8	1.7	0.23
3828.87	Mo I	11859 - 37968	3.3	0.73	-0.14
3830.82	Mo I	25795 - 51891	8.6	1.9	0.27
3831.07	Mo I	27384 - 53479	5.3	1.2	0.07
3831.76	Mo I	16693 - 42783	0.50	0.11	-0.96
3832.11	Mo I	25997 - 52085	18.	3.9	0.59
3833.75	Mo I	12346 - 38423	6.7	1.5	0.17
3834.97	Mo I	25517 - 51585	4.7	1.0	0.01
3835.31	Mo I	21343 - 47409	3.7	0.81	-0.09
3843.90	Mo I	20948 - 46956	2.8	0.63	-0.20
3845.95	Mo I	16748 - 42742	1.6	0.35	-0.46
3847.25	Mo I	11143 - 37128	1.0	0.23	-0.63
3848.30	Mo I	24823 - 50802	19.	4.1	0.62
3851.99	Mo I	25906 - 51859	8.6	1.9	0.28
3864.11	Mo I	0 - 25872	3.4	0.77	-0.12
3866.69	Mo I	25821 - 51675	4.2	0.94	-0.03
3869.08	Mo I	11454 - 37293	1.7	0.38	-0.42
3886.82	Mo I	11859 - 37579	1.8	0.42	-0.38
3888.18	Mo I	20158 - 45870	2.4	0.55	-0.26
3888.88	Mo I	21154 - 46861	3.3	0.74	-0.13
3890.71	Mo I	26189 - 51884	4.3	0.99	-0.01

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3893.32	Mo I	20158 - 45836	1.2	0.27	-0.56
3896.38	Mo I	20281 - 45938	1.2	0.28	-0.55
3896.85	Mo I	21154 - 46808	1.6	0.37	-0.44
3901.77	Mo I	12346 - 37968	1.3	0.31	-0.51
3902.96	Mo I	0 - 25614	2.1	0.47	-0.33
3908.25	Mo I	20130 - 45710	4.3	0.99	-0.00
3911.09	Mo I	16784 - 42345	0.90	0.21	-0.68
3911.94	Mo I	26336 - 51891	4.4	1.0	0.00
3913.36	Mo I	26636 - 52182	9.1	2.1	0.32
3915.44	Mo I	22876 - 48409	6.7	1.5	0.19
3916.92	Mo I	22876 - 48399	4.7	1.1	0.03
3917.54	Mo I	20350 - 45870	4.9	1.1	0.05
3917.78	Mo I	20930 - 46448	2.9	0.68	-0.17
3922.32	Mo I	19970 - 45458	2.2	0.50	-0.30
3923.75	Mo I	23668 - 49147	8.6	2.0	0.30
3928.79	Mo I	21619 - 47064	3.0	0.69	-0.16
3931.40	Mo I	20281 - 45710	1.0	0.23	-0.63
3935.02	Mo I	23516 - 48922	2.6	0.61	-0.21
3943.04	Mo I	20281 - 45635	7.2	1.7	0.23
3943.51	Mo I	20951 - 46302	1.4	0.33	-0.48
3945.25	Mo I	16748 - 42088	0.85	0.20	-0.70
3947.17	Mo I	20130 - 45458	1.1	0.26	-0.59
3950.99	Mo I	16784 - 42088	0.85	0.20	-0.70
3953.93	Mo I	20350 - 45635	3.6	0.85	-0.07
3955.49	Mo I	30113 - 55387	12.	2.7	0.43
3958.60	Mo I	24096 - 49351	2.9	0.68	-0.17
3963.53	Mo I	26636 - 51859	3.8	0.89	-0.05
3963.99	Mo I	26639 - 51859	3.8	0.89	-0.05
3965.76	Mo I	16641 - 41850	0.40	0.094	-1.03
3968.75	Mo I	21619 - 46808	3.3	0.77	-0.11
3973.77	Mo I	29982 - 55140	26.	6.2	0.80
3973.93	Mo I	16693 - 41850	1.3	0.30	-0.53
3975.96	Mo I	20281 - 45425	1.9	0.44	-0.35
3979.22	Mo I	27342 - 52465	4.8	1.1	0.06
3980.20	Mo I	26759 - 51876	8.9	2.1	0.32
3982.05	Mo I	23516 - 48622	5.0	1.2	0.08
3982.60	Mo I	16748 - 41850	0.40	0.095	-1.02
3986.20	Mo I	25517 - 50596	13.	3.2	0.51
3991.39	Mo I	25549 - 50596	3.6	0.87	-0.06
3991.85	Mo I	20930 - 45974	1.3	0.31	-0.51
3993.93	Mo I	23516 - 48547	2.5	0.59	-0.23
3998.29	Mo I	22244 - 47248	1.8	0.44	-0.36
4000.39	Mo I	20948 - 45938	2.2	0.52	-0.28
4000.50	Mo I	26415 - 51405	13.	3.1	0.50
4006.05	Mo I	26321 - 51276	8.2	2.0	0.29
4008.05	Mo I	24466 - 49408	2.5	0.61	-0.22
4009.37	Mo I	24466 - 49400	9.2	2.2	0.35
4011.97	Mo I	25872 - 50791	6.5	1.6	0.19
4017.38	Mo I	24466 - 49351	3.3	0.81	-0.09
4021.02	Mo I	29842 - 54704	22.	5.3	0.72

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
4024.09	Mo I	16641 - 41484	1.7	0.40	-0.39
4028.65	Mo I	21154 - 45969	2.2	0.54	-0.27
4032.50	Mo I	16693 - 41484	0.42	0.10	-0.99
4033.63	Mo I	21154 - 45938	1.5	0.36	-0.45
4037.30	Mo I	20948 - 45710	1.4	0.34	-0.47
4037.78	Mo I	20951 - 45710	2.8	0.67	-0.17
4038.08	Mo I	16641 -- 41398	1.2	0.30	-0.52
4041.12	Mo I	27727 - 52465	4.2	1.0	0.01
4042.87	Mo I	25549 - 50277	12.	2.9	0.47
4050.09	Mo I	20951 -- 45635	1.0	0.25	-0.60
4056.01	Mo I	16748 - 41396	2.7	0.66	-0.18
4056.32	Mo I	26759 - 51405	8.4	2.1	0.32
4057.58	Mo I	25639 - 50277	4.0	0.99	-0.01
4059.61	Mo I	21343 - 45969	6.7	1.7	0.22
4062.08	Mo I	16785 - 41396	13.	3.3	0.52
4066.37	Mo I	24823 - 49408	6.8	1.7	0.23
4069.88	Mo I	16784 - 41348	22.	5.5	0.74
4075.25	Mo I	16693 - 41224	1.8	0.44	-0.36
4076.19	Mo I	24096 - 48622	13.	3.3	0.52
4084.38	Mo I	16748 - 41224	8.8	2.2	0.34
4086.02	Mo I	20948 - 45415	4.5	1.1	0.05
4096.81	Mo I	21154 - 45556	5.7	1.4	0.16
4098.18	Mo I	20130 - 44525	1.2	0.31	-0.50
4098.74	Mo I	16641 - 41032	1.3	0.33	-0.48
4102.15	Mo I	16641 - 41012	2.2	0.56	-0.25
4105.08	Mo I	24466 - 48819	11.	2.7	0.43
4105.53	Mo I	21619 - 45969	1.9	0.48	-0.32
4107.47	Mo I	16693 - 41032	6.5	1.7	0.22
4118.96	Mo I	16693 - 40964	0.83	0.21	-0.68
4123.65	Mo I	20281 - 44525	3.3	0.83	-0.08
4124.54	Mo I	24823 - 49062	11.	2.7	0.43
4128.28	Mo I	16748 - 40964	1.3	0.33	-0.48
4128.83	Mo I	21343 - 45556	2.4	0.60	-0.22
4131.92	Mo I	25456 - 49651	15.	4.0	0.60
4132.23	Mo I	18229 - 42422	0.97	0.25	-0.60
4148.94	Mo I	16748 - 40844	2.0	0.51	-0.29
4151.88	Mo I	25517 - 49596	6.3	1.6	0.21
4155.28	Mo I	16785 - 40844	2.2	0.56	-0.25
4155.58	Mo I	16641 - 40698	1.5	0.38	-0.42
4156.79	Mo I	22876 - 46926	2.0	0.52	-0.28
4157.40	Mo I	25549 - 49596	17.	4.5	0.65
4162.68	Mo I	25549 - 49565	15.	4.0	0.60
4164.08	Mo I	18229 - 42237	0.53	0.14	-0.86
4166.28	Mo I	24823 - 48819	3.1	0.81	-0.09
4169.82	Mo I	23516 - 47492	4.7	1.2	0.08
4177.26	Mo I	22876 - 46808	6.9	1.8	0.26
4178.27	Mo I	25639 - 49565	17.	4.5	0.65
4181.05	Mo I	20130 - 44041	1.8	0.47	-0.33
4184.39	Mo I	25517 - 49408	3.5	0.92	-0.03
4185.82	Mo I	25517 - 49400	40.	11.	1.03

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4186.28	Mo I	18356 - 42237	0.67	0.18	-0.75
4190.00	Mo I	25549 - 49408	7.9	2.1	0.32
4194.56	Mo I	25517 - 49351	21.	5.5	0.74
4200.57	Mo I	18356 - 42156	0.66	0.17	-0.76
4201.32	Mo I	16693 - 40488	0.41	0.11	-0.96
4205.81	Mo I	25639 - 49408	8.0	2.1	0.32
4211.02	Mo I	16748 - 40488	0.41	0.11	-0.96
4219.40	Mo I	18480 - 42173	0.53	0.14	-0.85
4222.41	Mo I	18480 - 42156	0.46	0.12	-0.91
4232.59	Mo I	16748 - 40367	11.	3.0	0.48
4233.49	Mo I	24096 - 47711	2.5	0.67	-0.18
4235.03	Mo I	21154 - 44760	0.97	0.26	-0.59
4237.16	Mo I	20930 - 44525	2.1	0.56	-0.25
4239.07	Mo I	16784 - 40367	0.72	0.19	-0.71
4240.08	Mo I	18229 - 41807	1.6	0.42	-0.38
4240.28	Mo I	24823 - 48400	9.4	2.5	0.41
4240.83	Mo I	20951 - 44525	4.7	1.3	0.10
4242.80	Mo I	24096 - 47659	2.2	0.58	-0.24
4246.02	Mo I	25517 - 49062	15.	4.1	0.61
4251.87	Mo I	28241 - 51753	21.	5.8	0.76
4254.96	Mo I	26639 - 50134	13.	3.6	0.56
4260.36	Mo I	26336 - 49801	8.7	2.4	0.37
4260.66	Mo I	25906 - 49370	3.6	0.97	-0.01
4266.18	Mo I	20608 - 44041	2.0	0.56	-0.25
4268.08	Mo I	25639 - 49062	5.9	1.6	0.20
4269.28	Mo I	21343 - 44760	7.2	2.0	0.30
4272.06	Mo I	26189 - 49591	2.8	0.76	-0.12
4273.07	Mo I	16641 - 40037	0.88	0.24	-0.62
4276.91	Mo I	16693 - 40068	6.3	1.7	0.24
4277.24	Mo I	12346 - 35719	2.4	0.66	-0.18
4287.08	Mo I	16641 - 39960	0.79	0.22	-0.66
4288.64	Mo I	11859 - 35169	2.4	0.67	-0.17
4289.42	Mo I	21154 - 44461	3.3	0.92	-0.04
4290.18	Mo I	25517 - 48819	3.2	0.89	-0.05
4291.20	Mo I	26415 - 49712	3.8	1.1	0.02
4292.13	Mo I	11143 - 34435	0.99	0.27	-0.56
4293.21	Mo I	11454 - 34740	1.4	0.39	-0.41
4293.88	Mo I	10966 - 34248	0.49	0.14	-0.87
4296.16	Mo I	25549 - 48819	3.2	0.89	-0.05
4296.62	Mo I	16693 - 39960	0.22	0.060	-1.22
4298.90	Mo I	18229 - 41484	0.33	0.092	-1.03
4304.92	Mo I	16693 - 39916	0.29	0.080	-1.10
4310.39	Mo I	24466 - 47659	5.0	1.4	0.14
4312.80	Mo I	16641 - 39821	0.28	0.078	-1.11
4312.97	Mo I	20350 - 43530	0.79	0.22	-0.65
4321.97	Mo I	16785 - 39916	0.50	0.14	-0.85
4326.14	Mo I	16641 - 39750	5.5	1.5	0.19
4326.74	Mo I	11143 - 34248	0.35	0.098	-1.01
4329.63	Mo I	20951 - 44041	0.69	0.19	-0.71
4332.51	Mo I	27727 - 50802	4.7	1.3	0.12

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
4334.81	Mo I	26284 - 49346	9.9	2.8	0.45
4338.71	Mo I	18356 - 41398	0.44	0.12	-0.91
4339.82	Mo I	27767 - 50802	4.7	1.3	0.12
4340.75	Mo I	26759 - 49790	7.8	2.2	0.35
4341.42	Mo I	20948 - 43975	2.7	0.77	-0.11
4344.66	Mo I	26336 - 49346	2.7	0.77	-0.12
4350.34	Mo I	11454 - 34435	0.34	0.096	-1.02
4353.31	Mo I	20281 - 43246	1.3	0.37	-0.43
4357.34	Mo I	24466 - 47409	2.4	0.68	-0.17
4359.62	Mo I	26415 - 49346	2.7	0.77	-0.11
4362.02	Mo I	18480 - 41398	0.44	0.13	-0.90
4362.71	Mo I	11858 - 34774	0.068	0.019	-1.71
4364.47	Mo I	26284 - 49190	7.0	2.0	0.30
4366.54	Mo I	20350 - 43246	1.3	0.37	-0.43
4369.04	Mo I	11859 - 34740	0.37	0.11	-0.97
4373.32	Mo I	24096 - 46956	1.9	0.54	-0.27
4374.89	Mo I	25549 - 48400	3.0	0.86	-0.07
4375.01	Mo I	27774 - 50625	8.0	2.3	0.36
4380.29	Mo I	12346 - 35169	0.27	0.077	-1.11
4380.59	Mo I	16641 - 39463	0.22	0.065	-1.19
4381.64	Mo I	16784 - 39600	12.	3.5	0.54
4382.41	Mo I	20158 - 42970	1.2	0.35	-0.46
4385.89	Mo I	11454 - 34248	0.037	0.011	-1.97
4391.54	Mo I	24096 - 46861	3.7	1.1	0.03
4392.12	Mo I	25639 - 48400	5.3	1.5	0.18
4394.32	Mo I	27384 - 50134	5.3	1.5	0.18
4394.47	Mo I	20948 - 43697	1.1	0.31	-0.51
4396.66	Mo I	16784 - 39522	0.85	0.25	-0.61
4397.29	Mo I	18229 - 40964	1.4	0.40	-0.40
4402.49	Mo I	27774 - 50482	3.9	1.1	0.06
4402.90	Mo I	24466 - 47172	4.0	1.2	0.06
4404.55	Mo I	16748 - 39445	0.19	0.056	-1.25
4406.87	Mo I	29982 - 52667	5.5	1.6	0.20
4409.95	Mo I	24823 - 47493	4.3	1.3	0.10
4411.57	Mo I	16784 - 39445	15.	4.5	0.65
4412.77	Mo I	18356 - 41012	1.00	0.29	-0.54
4422.06	Mo I	18356 - 40964	0.35	0.10	-0.99
4423.62	Mo I	18229 - 40829	1.9	0.56	-0.25
4426.67	Mo I	20158 - 42742	2.6	0.77	-0.12
4434.95	Mo I	16748 - 39290	5.9	1.7	0.24
4436.89	Mo I	18480 - 41012	1.0	0.30	-0.53
4438.96	Mo I	27342 - 49864	6.1	1.8	0.26
4442.20	Mo I	16784 - 39290	1.2	0.35	-0.46
4443.07	Mo I	11454 - 33955	0.14	0.041	-1.39
4446.43	Mo I	29982 - 52465	12.	3.7	0.56
4447.23	Mo I	27384 - 49864	2.0	0.60	-0.22
4449.74	Mo I	16693 - 39160	1.9	0.57	-0.25
4452.56	Mo I	23516 - 45969	1.2	0.36	-0.44
4455.30	Mo I	27363 - 49801	2.0	0.60	-0.22
4457.36	Mo I	16693 - 39122	2.7	0.81	-0.09

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4458.65	Mo I	23516 - 45938	1.2	0.36	-0.44
4460.62	Mo I	16748 - 39160	0.36	0.11	-0.97
4464.77	Mo I	20350 - 42742	0.99	0.30	-0.53
4468.28	Mo I	16748 - 39122	1.1	0.32	-0.50
4471.66	Mo I	21619 - 43975	1.2	0.35	-0.46
4472.04	Mo I	28241 - 50596	5.8	1.7	0.24
4473.18	Mo I	18480 - 40829	1.2	0.35	-0.46
4474.56	Mo I	16641 - 38983	3.4	1.0	0.01
4475.62	Mo I	18229 - 40566	0.80	0.24	-0.62
4484.97	Mo I	16693 - 38983	0.80	0.24	-0.62
4487.05	Mo I	22244 - 44525	2.2	0.66	-0.18
4489.00	Mo I	23668 - 45938	1.2	0.37	-0.43
4490.19	Mo I	20158 - 42422	0.91	0.27	-0.56
4491.28	Mo I	18229 - 40488	1.9	0.58	-0.23
4491.66	Mo I	33904 - 56162	7.0	2.1	0.33
4499.44	Mo I	18480 - 40698	0.47	0.14	-0.85
4501.29	Mo I	18356 - 40566	0.45	0.14	-0.86
4504.90	Mo I	25997 - 48189	8.1	2.5	0.39
4506.67	Mo I	26636 - 48819	4.2	1.3	0.11
4512.15	Mo I	11143 - 33299	0.15	0.046	-1.34
4515.18	Mo I	20281 - 42422	1.2	0.37	-0.43
4517.13	Mo I	18356 - 40488	1.9	0.59	-0.23
4517.41	Mo I	10768 - 32899	0.052	0.016	-1.80
4518.44	Mo I	20158 - 42282	0.29	0.090	-1.05
4522.19	Mo I	20130 - 42237	0.72	0.22	-0.65
4524.34	Mo I	11859 - 33955	0.31	0.094	-1.02
4526.37	Mo I	18480 - 40566	0.72	0.22	-0.65
4528.62	Mo I	27093 - 49169	2.7	0.84	-0.08
4529.40	Mo I	20350 - 42422	1.7	0.52	-0.29
4535.38	Mo I	20130 - 42173	0.57	0.18	-0.76
4536.80	Mo I	28241 - 50277	42.	13.	1.12
4553.32	Mo I	21343 - 43299	0.98	0.31	-0.52
4553.80	Mo I	25456 - 47409	1.6	0.48	-0.31
4558.11	Mo I	10966 - 32899	0.10	0.033	-1.49
4558.74	Mo I	20158 - 42088	0.35	0.11	-0.96
4560.13	Mo I	23534 - 45458	2.9	0.90	-0.04
4567.68	Mo I	20350 - 42237	1.2	0.37	-0.44
4569.02	Mo I	23668 - 45548	0.74	0.23	-0.63
4570.13	Mo I	20281 - 42156	0.71	0.22	-0.65
4574.48	Mo I	25639 - 47493	2.6	0.80	-0.10
4576.50	Mo I	11454 - 33299	0.24	0.074	-1.13
4577.78	Mo I	18229 - 40068	0.20	0.062	-1.21
4582.35	Mo I	31510 - 53327	4.4	1.4	0.15
4582.50	Mo I	21154 - 42970	0.45	0.14	-0.85
4586.06	Mo I	25906 - 47705	1.7	0.53	-0.28
4586.57	Mo I	22244 - 44041	0.61	0.19	-0.72
4592.21	Mo I	26639 - 48409	3.1	1.00	-0.00
4595.16	Mo I	11143 - 32899	0.14	0.043	-1.36
4597.88	Mo I	30113 - 51856	3.6	1.2	0.06
4598.25	Mo I	27867 - 49608	2.0	0.64	-0.20

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4599.16	Mo I	20350 - 42088	0.56	0.18	-0.75
4608.71	Mo I	20158 - 41850	0.33	0.11	-0.98
4609.88	Mo I	18229 - 39916	2.1	0.68	-0.17
4611.15	Mo I	18356 - 40037	0.32	0.10	-1.00
4616.62	Mo I	25517 - 47172	1.5	0.48	-0.32
4617.95	Mo I	22876 - 44525	0.70	0.23	-0.65
4621.38	Mo I	18356 - 39989	0.63	0.20	-0.70
4623.46	Mo I	25549 - 47172	1.5	0.48	-0.32
4624.24	Mo I	29171 - 50790	3.1	1.00	-0.00
4626.47	Mo I	12346 - 33955	0.51	0.17	-0.78
4627.48	Mo I	18356 - 39960	0.62	0.20	-0.70
4630.02	Mo I	18229 - 39821	0.30	0.096	-1.02
4633.10	Mo I	28274 - 49852	3.7	1.2	0.08
4642.70	Mo I	25639 - 47172	1.5	0.48	-0.31
4647.81	Mo I	18480 - 39989	0.47	0.15	-0.81
4649.12	Mo I	25906 - 47409	1.6	0.52	-0.29
4651.05	Mo I	29781 - 51276	6.8	2.2	0.34
4661.93	Mo I	11454 - 32899	0.064	0.021	-1.68
4662.76	Mo I	11859 - 33299	0.20	0.066	-1.18
4671.90	Mo I	21343 - 42742	1.7	0.56	-0.25
4683.83	Mo I	25517 - 46861	1.4	0.46	-0.34
4685.81	Mo I	27727 - 49062	2.3	0.76	-0.12
4686.10	Mo I	28274 - 49608	2.0	0.67	-0.17
4688.22	Mo I	28241 - 49565	10.	3.3	0.52
4690.86	Mo I	25549 - 46861	1.7	0.56	-0.26
4696.51	Mo I	20951 - 42237	0.38	0.12	-0.91
4700.49	Mo I	28837 - 50105	4.5	1.5	0.17
4706.06	Mo I	23516 - 44760	1.8	0.61	-0.21
4707.26	Mo I	20158 - 41396	5.9	2.0	0.30
4708.22	Mo I	18229 - 39463	0.83	0.27	-0.56
4714.51	Mo I	20951 - 42156	0.37	0.12	-0.91
4717.92	Mo I	20158 - 41348	2.0	0.67	-0.18
4718.88	Mo I	28667 - 49852	3.2	1.1	0.03
4723.06	Mo I	32688 - 53855	3.9	1.3	0.12
4725.34	Mo I	27766 - 48922	1.4	0.48	-0.32
4729.14	Mo I	20948 - 42088	1.2	0.39	-0.41
4731.44	Mo I	21154 - 42283	8.4	2.8	0.45
4750.39	Mo I	20350 - 41396	0.96	0.32	-0.49
4758.50	Mo I	29781 - 50790	4.5	1.5	0.18
4760.19	Mo I	21343 - 42345	9.4	3.2	0.51
4764.42	Mo I	18480 - 39463	0.42	0.14	-0.85
4773.44	Mo I	20281 - 41224	0.69	0.24	-0.63
4774.22	Mo I	21343 - 42283	0.46	0.16	-0.80
4775.66	Mo I	21154 - 42088	0.73	0.25	-0.60
4776.34	Mo I	18229 - 39160	0.77	0.26	-0.58
4782.94	Mo I	20130 - 41032	0.44	0.15	-0.83
4785.12	Mo I	18229 - 39122	0.44	0.15	-0.82
4786.46	Mo I	10768 - 31655	0.023	0.0080	-2.10
4788.18	Mo I	18480 - 39358	0.11	0.037	-1.43
4792.74	Mo I	20948 - 41807	0.68	0.23	-0.63

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4793.41	Mo I	20951 - 41807	0.68	0.23	-0.63
4793.82	Mo I	27384 - 48238	1.3	0.44	-0.36
4796.52	Mo I	21343 - 42186	1.2	0.42	-0.38
4804.91	Mo I	20158 - 40964	0.15	0.052	-1.28
4805.58	Mo I	18356 - 39160	0.16	0.056	-1.25
4808.09	Mo I	23668 - 44461	0.72	0.25	-0.60
4811.06	Mo I	30496 - 51276	9.8	3.4	0.53
4814.47	Mo I	10768 - 31533	0.011	0.0037	-2.44
4817.70	Mo I	20281 - 41032	0.22	0.076	-1.12
4819.25	Mo I	21343 - 42088	4.7	1.6	0.22
4822.42	Mo I	20281 - 41012	0.15	0.053	-1.27
4830.51	Mo I	21154 - 41850	4.4	1.6	0.19
4832.92	Mo I	20158 - 40844	0.31	0.11	-0.96
4833.96	Mo I	20350 - 41032	0.22	0.077	-1.11
4838.11	Mo I	24096 - 44760	0.38	0.13	-0.88
4845.17	Mo I	27766 - 48399	1.3	0.47	-0.33
4858.22	Mo I	28241 - 48819	3.2	1.1	0.05
4868.00	Mo I	20948 - 41484	3.5	1.3	0.10
4869.20	Mo I	10768 - 31300	0.028	0.010	-1.99
4878.37	Mo I	20350 - 40844	0.19	0.068	-1.17
4886.47	Mo I	23516 - 43975	0.51	0.18	-0.74
4889.22	Mo I	20951 - 41398	0.20	0.071	-1.15
4897.26	Mo I	25456 - 45870	0.70	0.25	-0.60
4903.81	Mo I	10768 - 31155	0.034	0.012	-1.91
4907.43	Mo I	31485 - 51856	3.1	1.1	0.05
4909.19	Mo I	24096 - 44461	0.47	0.17	-0.77
4924.78	Mo I	30502 - 50802	1.9	0.68	-0.17
4926.19	Mo I	24466 - 44760	0.80	0.29	-0.53
4926.43	Mo I	18229 - 38522	0.14	0.050	-1.30
4933.10	Mo I	12346 - 32612	0.052	0.019	-1.72
4941.66	Mo I	25906 - 46136	2.4	0.89	-0.05
4950.62	Mo I	18229 - 38423	0.38	0.14	-0.86
4957.54	Mo I	18356 - 38522	0.50	0.18	-0.73
4964.19	Mo I	25997 - 46136	0.79	0.29	-0.54
4964.41	Mo I	20350 - 40488	0.24	0.090	-1.05
4973.36	Mo I	20930 - 41032	0.16	0.059	-1.23
4979.12	Mo I	10768 - 30847	0.083	0.031	-1.51
4985.56	Mo I	21343 - 41395	0.20	0.075	-1.13
4995.32	Mo I	23516 - 43530	0.32	0.12	-0.92
4999.91	Mo I	24466 - 44461	2.1	0.79	-0.10
5010.81	Mo I	26639 - 46590	0.67	0.25	-0.60
5014.60	Mo I	24823 - 44760	3.6	1.4	0.13
5016.78	Mo I	27384 - 47311	1.1	0.40	-0.39
5019.85	Mo I	25795 - 45710	0.51	0.19	-0.71
5029.00	Mo I	24096 - 43975	1.3	0.50	-0.30
5030.78	Mo I	25997 - 45870	1.8	0.68	-0.17
5038.91	Mo I	25795 - 45635	0.59	0.22	-0.65
5046.52	Mo I	21154 - 40964	0.18	0.069	-1.16
5047.71	Mo I	20930 - 40736	0.63	0.24	-0.62
5055.00	Mo I	12346 - 32123	0.028	0.011	-1.97

Wavelength Å	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5058.01	Mo I	27727 - 47492	1.4	0.54	-0.27
5059.88	Mo I	20157 - 39916	1.0	0.39	-0.41
5062.52	Mo I	20951 - 40699	0.21	0.081	-1.09
5064.64	Mo I	18229 - 37968	0.087	0.034	-1.47
5079.87	Mo I	26189 - 45870	0.91	0.35	-0.46
5080.02	Mo I	20281 - 39960	0.51	0.20	-0.70
5081.26	Mo I	11859 - 31533	0.016	0.0061	-2.21
5090.97	Mo I	25997 - 45635	1.1	0.41	-0.38
5091.34	Mo I	20930 - 40566	0.20	0.079	-1.10
5095.89	Mo I	20948 - 40566	0.25	0.099	-1.00
5096.65	Mo I	20951 - 40566	0.61	0.24	-0.62
5097.52	Mo I	18356 - 37968	0.39	0.15	-0.82
5098.03	Mo I	20350 - 39960	0.17	0.067	-1.17
5109.71	Mo I	20350 - 39916	0.68	0.27	-0.58
5114.97	Mo I	18356 - 37902	0.24	0.094	-1.02
5116.97	Mo I	20951 - 40488	0.20	0.078	-1.11
5123.83	Mo I	27415 - 46926	1.1	0.44	-0.36
5145.38	Mo I	20608 - 40037	0.80	0.32	-0.50
5147.39	Mo I	18480 - 37902	0.34	0.13	-0.87
5163.19	Mo I	31913 - 51276	7.5	3.0	0.48
5167.76	Mo I	21619 - 40964	0.69	0.28	-0.56
5171.08	Mo I	25614 - 44947	3.6	1.4	0.15
5172.94	Mo I	25614 - 44941	5.0	2.0	0.30
5174.18	Mo I	25614 - 44936	3.5	1.4	0.15
5191.44	Mo I	31533 - 50790	3.5	1.4	0.15
5200.17	Mo I	21619 - 40844	0.79	0.32	-0.50
5200.74	Mo I	18356 - 37579	0.13	0.054	-1.26
5210.44	Mo I	12346 - 31533	0.013	0.0053	-2.28
5211.86	Mo I	20281 - 39463	0.23	0.093	-1.03
5219.40	Mo I	22244 - 41398	0.66	0.27	-0.57
5231.06	Mo I	27342 - 46453	2.3	0.92	-0.03
5232.36	Mo I	20930 - 40037	0.14	0.059	-1.23
5234.26	Mo I	18480 - 37579	0.27	0.11	-0.96
5238.20	Mo I	25872 - 44957	10.	4.2	0.62
5240.88	Mo I	25872 - 44947	5.0	2.1	0.32
5242.81	Mo I	25872 - 44941	2.5	1.0	0.02
5245.51	Mo I	20930 - 39989	0.53	0.22	-0.66
5259.04	Mo I	20951 - 39961	0.80	0.33	-0.48
5260.17	Mo I	30847 - 49852	1.2	0.50	-0.30
5261.14	Mo I	20158 - 39160	0.28	0.12	-0.93
5271.80	Mo I	20158 - 39122	0.14	0.058	-1.23
5276.28	Mo I	21619 - 40566	0.21	0.088	-1.06
5279.65	Mo I	16784 - 35719	0.11	0.045	-1.35
5280.86	Mo I	22876 - 41807	1.9	0.81	-0.09
5283.84	Mo I	26636 - 45556	0.52	0.22	-0.66
5292.08	Mo I	16828 - 35719	0.094	0.040	-1.40
5293.46	Mo I	18480 - 37366	0.086	0.036	-1.44
5295.47	Mo I	20281 - 39160	0.25	0.10	-0.98
5302.35	Mo I	25906 - 44760	0.35	0.15	-0.84
5306.26	Mo I	20281 - 39122	0.085	0.036	-1.45

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5313.89	Mo I	18480 - 37293	0.15	0.062	-1.20
5315.04	Mo I	20350 - 39160	0.14	0.060	-1.22
5319.89	Mo I	31485 - 50277	1.6	0.67	-0.18
5324.47	Mo I	26639 - 45415	0.50	0.21	-0.67
5327.06	Mo I	23516 - 42283	0.35	0.15	-0.83
5334.79	Mo I	23668 - 42408	0.18	0.076	-1.12
5337.20	Mo I	24466 - 43197	0.22	0.096	-1.02
5352.35	Mo I	27774 - 46453	0.69	0.30	-0.53
5354.88	Mo I	23516 - 42186	0.84	0.36	-0.44
5355.51	Mo I	32123 - 50790	2.9	1.2	0.09
5356.48	Mo I	32612 - 51276	6.2	2.7	0.43
5360.56	Mo I	26321 - 44970	13.	5.4	0.73
5364.28	Mo I	26321 - 44957	2.6	1.1	0.05
5367.11	Mo I	26321 - 44947	0.74	0.32	-0.50
5372.40	Mo I	22876 - 41484	0.28	0.12	-0.92
5388.69	Mo I	31300 - 49852	2.0	0.86	-0.07
5394.52	Mo I	20930 - 39463	0.32	0.14	-0.86
5397.38	Mo I	22876 - 41398	0.27	0.12	-0.92
5400.47	Mo I	20951 - 39463	0.24	0.10	-0.98
5405.79	Mo I	27342 - 45836	0.95	0.42	-0.38
5406.39	Mo I	22244 - 40736	0.23	0.099	-1.00
5417.38	Mo I	22244 - 40699	0.28	0.12	-0.91
5426.89	Mo I	16748 - 35169	0.033	0.015	-1.84
5427.55	Mo I	23668 - 42088	0.12	0.051	-1.29
5431.02	Mo I	20951 - 39359	0.077	0.034	-1.47
5435.68	Mo I	20130 - 38522	0.21	0.095	-1.02
5437.75	Mo I	16785 - 35169	0.095	0.042	-1.38
5450.51	Mo I	21619 - 39961	0.23	0.10	-0.99
5453.03	Mo I	23516 - 41850	0.14	0.063	-1.20
5456.46	Mo I	22244 - 40566	0.22	0.097	-1.01
5460.53	Mo I	31300 - 49608	1.9	0.85	-0.07
5473.37	Mo I	20157 - 38423	0.048	0.021	-1.67
5488.67	Mo I	27342 - 45556	0.36	0.16	-0.79
5490.28	Mo I	20951 - 39160	0.15	0.067	-1.18
5492.17	Mo I	21619 - 39821	0.11	0.048	-1.32
5493.80	Mo I	31655 - 49852	2.0	0.91	-0.04
5496.94	Mo I	24096 - 42283	0.14	0.065	-1.19
5498.49	Mo I	23668 - 41850	0.25	0.11	-0.94
5501.54	Mo I	20350 - 38522	0.18	0.084	-1.08
5501.87	Mo I	20951 - 39122	0.10	0.046	-1.33
5506.49	Mo I	10768 - 28924	2.0	0.90	-0.05
5511.49	Mo I	23668 - 41807	0.11	0.050	-1.30
5520.04	Mo I	31485 - 49596	1.7	0.77	-0.11
5520.64	Mo I	27727 - 45836	0.78	0.36	-0.45
5526.52	Mo I	24096 - 42186	0.44	0.20	-0.70
5526.97	Mo I	22876 - 40964	0.31	0.14	-0.85
5533.05	Mo I	10768 - 28837	1.3	0.59	-0.23
5539.41	Mo I	16692 - 34740	0.053	0.025	-1.61
5541.65	Mo I	25906 - 43946	0.23	0.11	-0.98
5543.12	Mo I	20948 - 38983	0.21	0.098	-1.01

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
5544.49	Mo I	27384 - 45415	1.1	0.50	-0.30
5552.19	Mo I	21154 - 39160	0.045	0.021	-1.68
5556.28	Mo I	16748 - 34740	0.075	0.035	-1.46
5556.72	Mo I	24096 - 42088	0.27	0.13	-0.90
5564.05	Mo I	21154 - 39121	0.089	0.041	-1.39
5568.62	Mo I	22876 - 40829	0.30	0.14	-0.86
5569.48	Mo I	23534 - 41484	0.23	0.11	-0.97
5570.45	Mo I	10768 - 28715	0.59	0.27	-0.56
5575.19	Mo I	19970 - 37902	0.10	0.049	-1.31
5591.58	Mo I	24466 - 42345	0.22	0.10	-0.98
5596.32	Mo I	23534 - 41398	0.085	0.040	-1.40
5598.47	Mo I	34810 - 52667	1.00	0.47	-0.33
5601.05	Mo I	33904 - 51753	1.6	0.74	-0.13
5602.76	Mo I	25456 - 43299	0.60	0.28	-0.55
5608.62	Mo I	26636 - 44461	0.47	0.22	-0.65
5609.23	Mo I	26189 - 44012	0.41	0.20	-0.71
5610.93	Mo I	24466 - 42283	1.1	0.51	-0.29
5613.07	Mo I	20158 - 37968	0.075	0.036	-1.45
5618.45	Mo I	16641 - 34435	0.024	0.011	-1.95
5618.77	Mo I	22244 - 40037	0.058	0.027	-1.56
5619.38	Mo I	27766 - 45556	0.64	0.30	-0.52
5632.47	Mo I	10966 - 28715	0.079	0.038	-1.42
5634.86	Mo I	16693 - 34435	0.060	0.028	-1.55
5650.13	Mo I	11143 - 28837	0.058	0.028	-1.56
5651.87	Mo I	30160 - 47848	0.60	0.29	-0.54
5664.34	Mo I	29842 - 47492	0.55	0.27	-0.57
5667.30	Mo I	27774 - 45415	0.36	0.17	-0.77
5672.07	Mo I	35042 - 52667	1.2	0.58	-0.23
5673.63	Mo I	20281 - 37902	0.075	0.036	-1.44
5674.47	Mo I	20350 - 37968	0.19	0.092	-1.04
5677.89	Mo I	16641 - 34248	0.048	0.023	-1.64
5682.89	Mo I	20930 - 38522	0.13	0.062	-1.21
5687.64	Mo I	22244 - 39821	0.055	0.027	-1.57
5689.14	Mo I	11143 - 28715	0.11	0.055	-1.26
5694.39	Mo I	23668 - 41224	0.082	0.040	-1.40
5696.03	Mo I	30160 - 47711	0.67	0.33	-0.49
5698.27	Mo I	29642 - 47186	0.52	0.25	-0.60
5699.28	Mo I	21619 - 39160	0.11	0.052	-1.28
5702.11	Mo I	25997 - 43530	0.18	0.090	-1.05
5705.72	Mo I	24823 - 42345	0.94	0.46	-0.34
5711.80	Mo I	21619 - 39122	0.11	0.052	-1.28
5722.74	Mo I	11454 - 28924	0.056	0.027	-1.56
5723.11	Mo I	29642 - 47110	0.51	0.25	-0.60
5728.77	Mo I	25795 - 43246	0.34	0.17	-0.78
5729.45	Mo I	20130 - 37579	0.079	0.039	-1.41
5729.87	Mo I	23516 - 40964	0.12	0.057	-1.25
5734.06	Mo I	12346 - 29781	0.0055	0.0027	-2.57
5739.66	Mo I	27342 - 44760	0.26	0.13	-0.89
5741.71	Mo I	31510 - 48922	0.99	0.49	-0.31
5747.67	Mo I	25906 - 43299	0.25	0.12	-0.91

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5751.40	Mo I	11454 - 28837	0.16	0.079	-1.10
5769.75	Mo I	23517 - 40844	0.075	0.037	-1.43
5771.05	Mo I	19970 - 37293	0.027	0.014	-1.86
5774.55	Mo I	11858 - 29171	0.0065	0.0032	-2.49
5778.19	Mo I	25997 - 43299	0.15	0.075	-1.13
5779.36	Mo I	20281 - 37579	0.12	0.062	-1.21
5780.11	Mo I	23668 - 40964	0.077	0.039	-1.41
5783.33	Mo I	25456 - 42742	0.30	0.15	-0.82
5791.85	Mo I	11454 - 28715	0.13	0.066	-1.18
5795.77	Mo I	34740 - 51990	2.6	1.3	0.12
5800.46	Mo I	20130 - 37366	0.075	0.038	-1.42
5802.67	Mo I	20350 - 37579	0.100	0.050	-1.30
5803.98	Mo I	25821 - 43046	0.12	0.059	-1.23
5806.19	Mo I	22244 - 39463	0.051	0.026	-1.59
5806.69	Mo I	26759 - 43975	0.30	0.15	-0.81
5808.23	Mo I	11454 - 28667	0.0024	0.0012	-2.91
5809.03	Mo I	34435 - 51644	0.89	0.45	-0.34
5813.86	Mo I	39521 - 56717	1.9	0.97	-0.01
5815.74	Mo I	29982 - 47172	0.45	0.23	-0.64
5820.69	Mo I	23668 - 40844	0.075	0.038	-1.42
5825.20	Mo I	20130 - 37293	0.065	0.033	-1.48
5835.59	Mo I	11143 - 28274	0.0051	0.0026	-2.59
5839.99	Mo I	27342 - 44461	0.42	0.21	-0.67
5848.86	Mo I	28715 - 45806	0.61	0.32	-0.50
5849.73	Mo I	28715 - 45805	1.8	0.92	-0.04
5851.52	Mo I	28715 - 45800	1.5	0.79	-0.10
5858.27	Mo I	11859 - 28924	0.14	0.072	-1.14
5861.38	Mo I	26189 - 43246	0.30	0.15	-0.81
5868.76	Mo I	25707 - 42742	0.17	0.089	-1.05
5869.33	Mo I	27727 - 44760	1.1	0.59	-0.23
5876.59	Mo I	20281 - 37293	0.075	0.039	-1.41
5881.53	Mo I	20130 - 37128	0.027	0.014	-1.86
5882.72	Mo I	27766 - 44760	0.23	0.12	-0.92
5888.33	Mo I	11859 - 28837	0.21	0.11	-0.95
5891.56	Mo I	28837 - 45806	0.36	0.19	-0.73
5892.29	Mo I	25456 - 42422	0.28	0.14	-0.84
5893.38	Mo I	28837 - 45800	1.5	0.80	-0.09
5901.47	Mo I	18229 - 35169	0.064	0.034	-1.47
5912.12	Mo I	26336 - 43246	0.13	0.066	-1.18
5923.79	Mo I	28924 - 45800	0.31	0.16	-0.79
5926.36	Mo I	28924 - 45793	1.3	0.68	-0.17
5928.88	Mo I	28924 - 45786	5.2	2.7	0.43
5937.91	Mo I	25906 - 42742	0.22	0.12	-0.94
5968.48	Mo I	27774 - 44525	0.18	0.097	-1.01
5974.26	Mo I	27727 - 44461	0.32	0.17	-0.76
5982.93	Mo I	26336 - 43046	0.24	0.13	-0.89
5988.17	Mo I	27767 - 44461	0.90	0.48	-0.32
5989.47	Mo I	33904 - 50596	1.6	0.84	-0.08
5991.35	Mo I	27774 - 44461	0.22	0.12	-0.94
6025.49	Mo I	27384 - 43976	0.63	0.34	-0.47

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
6027.27	Mo I	22876 - 39463	0.088	0.048	-1.32
6030.66	Mo I	12346 - 28924	0.36	0.20	-0.71
6047.83	Mo I	25707 - 42237	0.23	0.13	-0.90
6054.81	Mo I	18229 - 34740	0.028	0.015	-1.81
6079.58	Mo I	23516 - 39960	0.12	0.068	-1.17
6081.27	Mo I	25906 - 42345	0.12	0.067	-1.18
6101.87	Mo I	18356 - 34740	0.059	0.033	-1.48
6197.66	Mo I	32688 - 48819	0.69	0.40	-0.40
6217.89	Mo I	18356 - 34435	0.026	0.015	-1.81
6264.27	Mo I	33904 - 49864	0.86	0.51	-0.30
6265.88	Mo I	18480 - 34435	0.022	0.013	-1.88
6290.74	Mo I	18356 - 34248	0.019	0.011	-1.95
6301.75	Mo I	24096 - 39961	0.085	0.051	-1.30
6323.54	Mo I	30160 - 45969	0.41	0.24	-0.61
6357.22	Mo I	18229 - 33955	0.049	0.030	-1.53
6389.11	Mo I	26636 - 42283	0.21	0.13	-0.90
6409.11	Mo I	18356 - 33955	0.032	0.020	-1.71
6424.37	Mo I	20158 - 35719	0.20	0.12	-0.92
6446.34	Mo I	25456 - 40964	0.17	0.11	-0.97
6471.20	Mo I	23534 - 38983	0.099	0.062	-1.21
6473.99	Mo I	25906 - 41348	0.19	0.12	-0.92
6493.13	Mo I	30160 - 45556	0.32	0.20	-0.70
6519.84	Mo I	30502 - 45836	0.81	0.51	-0.29
6590.90	Mo I	26639 - 41807	0.075	0.049	-1.31
6611.20	Mo I	25707 - 40829	0.13	0.084	-1.08
6619.13	Mo I	10768 - 25872	0.029	0.019	-1.72
6624.57	Mo I	26759 - 41850	0.11	0.075	-1.13
6637.16	Mo I	26336 - 41398	0.050	0.033	-1.48
6650.38	Mo I	25456 - 40488	0.52	0.34	-0.46
6659.68	Mo I	20158 - 35169	0.029	0.019	-1.71
6678.89	Mo I	25872 - 40840	0.043	0.029	-1.54
6687.87	Mo I	26450 - 41398	0.067	0.045	-1.34
6690.47	Mo I	18356 - 33299	0.024	0.016	-1.79
6691.08	Mo I	27342 - 42283	0.065	0.044	-1.36
6728.04	Mo I	25707 - 40566	0.094	0.064	-1.20
6733.98	Mo I	10768 - 25614	0.016	0.011	-1.97
6746.08	Mo I	18480 - 33299	0.028	0.019	-1.72
6746.27	Mo I	20350 - 35169	0.12	0.080	-1.10
6753.97	Mo I	27384 - 42186	0.53	0.36	-0.44
6763.50	Mo I	25707 - 40488	0.13	0.091	-1.04
6764.92	Mo I	29982 - 44760	0.13	0.091	-1.04
6787.98	Mo I	26284 - 41012	0.092	0.064	-1.20
6788.94	Mo I	26759 - 41484	0.11	0.073	-1.14
6799.88	Mo I	26759 - 41398	0.14	0.095	-1.02
6802.62	Mo I	26336 - 41032	0.12	0.086	-1.07
6812.03	Mo I	26336 - 41012	0.12	0.086	-1.07
6825.63	Mo I	30113 - 44760	0.44	0.31	-0.51
6828.87	Mo I	26759 - 41398	0.24	0.17	-0.77
6838.88	Mo I	27727 - 42345	0.68	0.47	-0.32
6848.92	Mo I	26415 - 41012	0.19	0.13	-0.88

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6886.28	Mo I	27766 - 42283	0.36	0.25	-0.60
6892.36	Mo I	25456 - 39960	0.14	0.099	-1.00
6898.01	Mo I	31300 - 45793	0.48	0.34	-0.46
6898.98	Mo I	25997 - 40488	0.11	0.077	-1.11
6908.20	Mo I	11143 - 25614	0.0020	0.0015	-2.84
6914.01	Mo I	20281 - 28924	0.013	0.0093	-2.03
6931.40	Mo I	20350 - 34774	0.019	0.014	-1.87
6934.10	Mo I	11454 - 25872	0.0022	0.0016	-2.80
6946.75	Mo I	27093 - 41484	0.072	0.052	-1.28
6947.39	Mo I	20350 - 34740	0.021	0.016	-1.81
6953.78	Mo I	26189 - 40566	0.083	0.060	-1.22
6960.64	Mo I	26336 - 40698	0.12	0.084	-1.08
6961.48	Mo I	25707 - 40068	0.072	0.053	-1.28
6978.71	Mo I	26639 - 40964	0.19	0.14	-0.86
6980.37	Mo I	27766 - 42088	0.13	0.094	-1.03
6984.67	Mo I	27774 - 42087	0.11	0.078	-1.11
6988.94	Mo I	20130 - 34435	0.049	0.036	-1.44
6991.69	Mo I	26189 - 40488	0.096	0.070	-1.15
6999.13	Mo I	26415 - 40699	0.13	0.096	-1.02
6999.88	Mo I	25707 - 39989	0.071	0.052	-1.28
7001.60	Mo I	19970 - 34284	0.028	0.021	-1.68
7016.44	Mo I	26450 - 40698	0.12	0.086	-1.07
7025.32	Mo I	26336 - 40566	0.084	0.062	-1.21
7037.98	Mo I	26639 - 40844	0.30	0.23	-0.65
7045.29	Mo I	26639 - 40829	0.12	0.090	-1.04
7060.21	Mo I	11454 - 25614	0.0041	0.0031	-2.51
7063.34	Mo I	20281 - 34435	0.030	0.022	-1.65
7081.22	Mo I	20130 - 34248	0.029	0.021	-1.67
7102.65	Mo I	27774 - 41850	0.16	0.12	-0.91
7109.87	Mo I	25614 - 39675	1.1	0.84	-0.08
7122.65	Mo I	27363 - 41398	0.13	0.096	-1.02
7134.08	Mo I	11858 - 25872	0.0056	0.0043	-2.37
7240.46	Mo I	26759 - 40566	0.10	0.080	-1.10
7242.50	Mo I	25872 - 39675	1.6	1.2	0.09
7245.85	Mo I	20158 - 33950	0.078	0.062	-1.21
7267.62	Mo I	11858 - 25614	0.0043	0.0034	-2.47
7281.53	Mo I	25906 - 39635	0.067	0.053	-1.27
7322.25	Mo I	26336 - 39989	0.087	0.070	-1.16
7333.71	Mo I	26189 - 39821	0.083	0.067	-1.17
7348.49	Mo I	20350 - 33955	0.027	0.022	-1.66
7360.38	Mo I	25707 - 39290	0.051	0.042	-1.38
7361.65	Mo I	27384 - 40964	0.20	0.16	-0.80
7391.36	Mo I	12346 - 25872	0.0082	0.0067	-2.17
7434.10	Mo I	25997 - 39445	0.097	0.081	-1.09
7447.34	Mo I	31533 - 44957	0.62	0.51	-0.29
7452.85	Mo I	25707 - 39122	0.12	0.099	-1.00
7475.43	Mo I	27363 - 40736	0.094	0.079	-1.10
7485.74	Mo I	26320 - 39675	1.5	1.3	0.10
7501.62	Mo I	25795 - 39122	0.050	0.042	-1.38
7504.47	Mo I	26639 - 39960	0.15	0.13	-0.89

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
7571.53	Mo I	27363 - 40566	0.091	0.078	-1.11
7572.64	Mo I	26759 - 39960	0.13	0.11	-0.96
7579.58	Mo I	27774 - 40964	0.10	0.087	-1.06
7591.66	Mo I	20130 - 33299	0.012	0.010	-2.00
7595.16	Mo I	25997 - 39160	0.10	0.088	-1.05
7601.84	Mo I	27415 - 40566	0.15	0.13	-0.88
7649.52	Mo I	27774 - 40844	0.099	0.087	-1.06
7653.26	Mo I	26759 - 39821	0.062	0.054	-1.26
7656.76	Mo I	31913 - 44970	0.85	0.74	-0.13
7679.49	Mo I	20281 - 33299	0.024	0.021	-1.68
7709.54	Mo I	25456 - 38423	0.067	0.060	-1.22
7720.77	Mo I	20350 - 33299	0.050	0.044	-1.35
7723.63	Mo I	27093 - 40037	0.11	0.095	-1.02
7732.49	Mo I	19970 - 32899	0.014	0.013	-1.90
7752.34	Mo I	27093 - 39989	0.053	0.047	-1.32
7829.65	Mo I	20130 - 32899	0.029	0.026	-1.58
7854.45	Mo I	27093 - 39821	0.18	0.16	-0.78
7887.74	Mo I	27363 - 40037	0.095	0.089	-1.05
7917.62	Mo I	27363 - 39989	0.067	0.063	-1.20
7923.15	Mo I	20281 - 32899	0.018	0.017	-1.77
7968.85	Mo I	27415 - 39960	0.11	0.10	-0.99
7984.35	Mo I	26639 - 39160	0.043	0.041	-1.39
7986.60	Mo I	25906 - 38423	0.12	0.12	-0.93
8027.32	Mo I	20158 - 32612	0.010	0.0098	-2.01
8058.22	Mo I	45786 - 58193	2.0	1.9	0.28
8104.67	Mo I	39521 - 51856	1.3	1.3	0.10
8153.45	Mo I	25707 - 37968	0.063	0.062	-1.21
8192.60	Mo I	23516 - 35719	0.017	0.017	-1.78
8245.06	Mo I	28715 - 40840	0.36	0.36	-0.44
8328.44	Mo I	28836 - 40840	0.63	0.65	-0.18
8351.15	Mo I	25997 - 37968	0.064	0.067	-1.17
8389.32	Mo I	28924 - 40840	0.72	0.76	-0.12
8483.39	Mo I	25795 - 37579	0.29	0.31	-0.50

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2015.11	Mo II	0 - 49609	11.	0.68	-0.17
2020.30	Mo II	0 - 49481	24.	1.5	0.17
2038.44	Mo II	0 - 49041	13.	0.84	-0.08
2045.98	Mo II	0 - 48861	13.	0.82	-0.09
2081.68	Mo II	0 - 48022	4.2	0.27	-0.57
2089.52	Mo II	15199 - 63041	12.	0.77	-0.12
2092.50	Mo II	15331 - 63105	12.	0.77	-0.11
2093.11	Mo II	15447 - 63207	21.	1.4	0.14
2100.84	Mo II	15428 - 63012	16.	1.1	0.04
2104.29	Mo II	15447 - 62954	9.4	0.62	-0.21
2108.02	Mo II	23248 - 70670	10.	0.67	-0.17
2269.69	Mo II	15447 - 59492	15.	1.2	0.06
2304.25	Mo II	27627 - 71011	13.	1.0	0.00
2306.97	Mo II	15427 - 58761	8.3	0.66	-0.18
2332.12	Mo II	15330 - 58197	8.1	0.66	-0.18
2341.59	Mo II	15199 - 57892	14.	1.1	0.06
2355.42	Mo II	15699 - 58141	7.1	0.59	-0.23
2366.09	Mo II	15890 - 58141	5.1	0.43	-0.37
2389.20	Mo II	23853 - 65695	20.	1.8	0.24
2403.61	Mo II	23833 - 65425	29.	2.5	0.40
2404.66	Mo II	24509 - 66082	18.	1.6	0.19
2412.84	Mo II	22444 - 63877	9.8	0.85	-0.07
2413.01	Mo II	15890 - 57320	20.	1.7	0.23
2417.96	Mo II	16796 - 58141	15.	1.3	0.11
2419.01	Mo II	23934 - 65261	18.	1.5	0.19
2420.18	Mo II	24138 - 65444	21.	1.8	0.26
2424.00	Mo II	23833 - 65075	20.	1.8	0.25
2435.96	Mo II	22864 - 63904	20.	1.8	0.24
2440.28	Mo II	17174 - 58141	15.	1.3	0.12
2461.81	Mo II	24836 - 65444	15.	1.4	0.13
2466.68	Mo II	22864 - 63392	17.	1.5	0.19
2466.97	Mo II	16796 - 57320	12.	1.1	0.04
2468.78	Mo II	23833 - 64326	17.	1.6	0.20
2470.04	Mo II	23853 - 64326	12.	1.1	0.03
2477.57	Mo II	26041 - 66391	28.	2.6	0.41
2482.57	Mo II	23934 - 64203	23.	2.1	0.33
2484.75	Mo II	23934 - 64168	14.	1.3	0.13
2496.24	Mo II	22444 - 62492	8.2	0.77	-0.12
2498.28	Mo II	15691 - 55706	19.	1.8	0.26
2500.44	Mo II	22444 - 62425	14.	1.3	0.11
2502.84	Mo II	12900 - 52843	10.	0.96	-0.02
2511.80	Mo II	12417 - 52217	7.1	0.67	-0.17
2515.08	Mo II	22980 - 62728	22.	2.1	0.32
2527.14	Mo II	24836 - 64395	27.	2.6	0.41
2530.34	Mo II	24659 - 64168	18.	1.7	0.23
2532.31	Mo II	22864 - 62342	25.	2.4	0.38
2538.46	Mo II	13461 - 52843	71.	6.9	0.84
2539.44	Mo II	24509 - 63877	18.	1.7	0.23
2542.67	Mo II	12900 - 52217	50.	4.9	0.69
2543.61	Mo II	22444 - 61746	13.	1.3	0.12

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2555.42	Mo II	23833 - 62954	23.	2.2	0.35
2556.75	Mo II	23853 - 62954	14.	1.4	0.15
2558.88	Mo II	24836 - 63904	30.	2.9	0.46
2562.08	Mo II	27725 - 66744	26.	2.5	0.41
2564.34	Mo II	25342 - 64326	33.	3.3	0.51
2566.26	Mo II	12417 - 51373	5.3	0.53	-0.28
2571.45	Mo II	26406 - 65282	7.8	0.77	-0.11
2574.42	Mo II	12900 - 51732	6.8	0.67	-0.17
2576.56	Mo II	24138 - 62937	14.	1.4	0.16
2578.36	Mo II	26488 - 65261	16.	1.6	0.19
2585.95	Mo II	23833 - 62492	11.	1.1	0.06
2588.78	Mo II	23934 - 62551	23.	2.3	0.36
2591.77	Mo II	23853 - 62425	14.	1.4	0.15
2593.70	Mo II	12034 - 50577	30.	3.1	0.49
2597.38	Mo II	23853 - 62342	14.	1.4	0.15
2602.80	Mo II	11783 - 50192	28.	2.9	0.46
2605.08	Mo II	26739 - 65115	16.	1.6	0.20
2605.93	Mo II	17344 - 55706	9.2	0.94	-0.03
2619.34	Mo II	11783 - 49949	7.7	0.79	-0.10
2636.67	Mo II	12034 - 49949	36.	3.8	0.58
2638.76	Mo II	12417 - 50302	83.	8.6	0.94
2644.35	Mo II	12900 - 50706	74.	7.8	0.89
2646.49	Mo II	12417 - 50192	42.	4.4	0.64
2653.35	Mo II	12900 - 50577	58.	6.1	0.79
2660.58	Mo II	12034 - 49609	65.	6.9	0.84
2671.83	Mo II	15427 - 52843	9.6	1.0	0.01
2672.84	Mo II	12900 - 50302	84.	9.0	0.95
2673.27	Mo II	15447 - 52843	44.	4.7	0.67
2681.36	Mo II	23833 - 61116	33.	3.6	0.55
2683.23	Mo II	11783 - 49041	59.	6.4	0.80
2684.14	Mo II	13461 - 50706	110.	12.	1.08
2687.99	Mo II	12417 - 49609	58.	6.3	0.80
2692.61	Mo II	27725 - 64852	13.	1.4	0.15
2695.22	Mo II	23833 - 60925	19.	2.1	0.32
2696.83	Mo II	33601 - 70671	15.	1.6	0.21
2699.41	Mo II	22444 - 59478	18.	1.9	0.29
2701.42	Mo II	12034 - 49041	45.	4.9	0.69
2701.87	Mo II	26041 - 63041	12.	1.3	0.12
2704.93	Mo II	33045 - 70004	15.	1.6	0.21
2710.19	Mo II	15330 - 52217	6.4	0.70	-0.15
2711.49	Mo II	23833 - 60702	11.	1.2	0.08
2712.35	Mo II	33146 - 70004	22.	2.4	0.39
2713.51	Mo II	13461 - 50302	23.	2.5	0.40
2717.35	Mo II	15428 - 52217	46.	5.1	0.71
2726.97	Mo II	26069 - 62728	33.	3.7	0.57
2729.68	Mo II	12417 - 49041	13.	1.4	0.15
2730.20	Mo II	26488 - 63105	31.	3.4	0.53
2732.88	Mo II	12900 - 49481	34.	3.9	0.59
2736.96	Mo II	15691 - 52217	26.	2.9	0.46
2737.88	Mo II	35406 - 71920	38.	4.3	0.63

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2738.60	Mo II	27627 - 64130	19.	2.2	0.33
2741.32	Mo II	26739 - 63207	15.	1.7	0.24
2741.62	Mo II	24509 - 60973	20.	2.2	0.34
2746.30	Mo II	15330 - 51732	43.	4.9	0.69
2758.63	Mo II	11783 - 48022	4.9	0.56	-0.25
2760.53	Mo II	26739 - 62954	7.7	0.88	-0.06
2763.62	Mo II	15199 - 51373	32.	3.7	0.57
2769.76	Mo II	27114 - 63207	94.	11.	1.03
2773.78	Mo II	15691 - 51732	24.	2.8	0.45
2774.39	Mo II	15699 - 51732	29.	3.4	0.53
2775.40	Mo II	13461 - 49481	183.	21.	1.33
2777.86	Mo II	12034 - 48022	4.9	0.57	-0.24
2780.04	Mo II	12900 - 48861	81.	9.4	0.97
2784.99	Mo II	16947 - 52843	71.	8.3	0.92
2791.54	Mo II	30019 - 65831	17.	2.0	0.30
2807.76	Mo II	12417 - 48022	31.	3.7	0.57
2812.58	Mo II	23934 - 59478	9.2	1.1	0.04
2814.67	Mo II	28877 - 64395	9.9	1.2	0.07
2816.15	Mo II	13461 - 48960	168.	20.	1.30
2817.44	Mo II	15890 - 51373	33.	3.9	0.59
2822.03	Mo II	11783 - 47208	3.1	0.37	-0.43
2827.74	Mo II	27627 - 62980	32.	3.8	0.58
2831.44	Mo II	33601 - 68909	19.	2.3	0.35
2832.07	Mo II	24836 - 60135	11.	1.3	0.12
2834.39	Mo II	16947 - 52217	13.	1.6	0.21
2835.33	Mo II	15447 - 50706	11.	1.3	0.11
2842.15	Mo II	12034 - 47208	10.	1.3	0.10
2843.73	Mo II	33895 - 69050	11.	1.4	0.14
2848.23	Mo II	12900 - 47999	138.	17.	1.23
2853.23	Mo II	27114 - 62152	142.	17.	1.24
2856.00	Mo II	27724 - 62728	19.	2.3	0.36
2863.20	Mo II	24138 - 59053	7.9	0.97	-0.02
2863.81	Mo II	26739 - 61648	139.	17.	1.23
2865.62	Mo II	15691 - 50577	5.2	0.64	-0.19
2866.69	Mo II	17344 - 52217	38.	4.7	0.67
2868.11	Mo II	26069 - 60924	15.	1.8	0.26
2868.32	Mo II	26604 - 61457	15.	1.8	0.27
2871.51	Mo II	12417 - 47232	116.	14.	1.16
2872.88	Mo II	27628 - 62425	34.	4.3	0.63
2879.05	Mo II	30391 - 65115	97.	12.	1.08
2888.15	Mo II	33146 - 67760	30.	3.7	0.57
2890.99	Mo II	12034 - 46614	73.	9.2	0.96
2891.28	Mo II	16796 - 51373	14.	1.8	0.26
2892.81	Mo II	17174 - 51732	30.	3.8	0.58
2894.45	Mo II	13461 - 47999	77.	9.6	0.98
2897.63	Mo II	15691 - 50192	17.	2.1	0.33
2900.80	Mo II	29034 - 63498	30.	3.8	0.57
2903.07	Mo II	26488 - 60924	106.	13.	1.13
2907.12	Mo II	17344 - 51732	13.	1.6	0.21
2909.12	Mo II	11783 - 46148	30.	3.9	0.59

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
2911.92	Mo II	12900 - 47232	75.	9.6	0.98
2913.81	Mo II	28989 - 63298	23.	2.9	0.47
2918.83	Mo II	15699 - 49949	14.	1.8	0.26
2923.39	Mo II	12417 - 46614	74.	9.5	0.98
2924.32	Mo II	26041 - 60227	49.	6.3	0.80
2927.54	Mo II	30019 - 64168	27.	3.5	0.55
2930.06	Mo II	28883 - 63002	20.	2.5	0.40
2930.50	Mo II	12034 - 46148	57.	7.4	0.87
2930.77	Mo II	30019 - 64130	24.	3.1	0.49
2934.30	Mo II	11783 - 45853	37.	4.7	0.67
2935.20	Mo II	15890 - 49949	7.7	0.99	-0.00
2938.30	Mo II	28989 - 63012	16.	2.1	0.33
2940.10	Mo II	27114 - 61116	36.	4.7	0.67
2941.22	Mo II	30213 - 64203	48.	6.2	0.80
2944.82	Mo II	35099 - 69047	74.	9.7	0.99
2946.69	Mo II	30213 - 64140	62.	8.1	0.91
2947.28	Mo II	29034 - 62954	39.	5.1	0.71
2955.84	Mo II	26406 - 60227	35.	4.6	0.66
2956.06	Mo II	12034 - 45853	11.	1.4	0.16
2956.90	Mo II	35099 - 68909	35.	4.6	0.66
2960.24	Mo II	13461 - 47232	6.5	0.86	-0.07
2963.79	Mo II	12417 - 46148	13.	1.7	0.24
2964.96	Mo II	28877 - 62595	20.	2.6	0.41
2965.27	Mo II	12900 - 46614	12.	1.6	0.21
2971.91	Mo II	26041 - 59680	25.	3.4	0.53
2972.61	Mo II	16947 - 50577	35.	4.6	0.66
2975.40	Mo II	29699 - 63298	34.	4.5	0.65
2992.84	Mo II	17174 - 50577	13.	1.8	0.25
2993.52	Mo II	16796 - 50192	6.1	0.82	-0.08
3004.46	Mo II	26406 - 59680	14.	1.9	0.29
3027.77	Mo II	17174 - 50192	12.	1.7	0.23
3060.78	Mo II	16947 - 49609	12.	1.7	0.23
3065.04	Mo II	38054 - 70670	134.	19.	1.28
3077.66	Mo II	35406 - 67889	44.	6.2	0.79
3087.62	Mo II	27114 - 59492	99.	14.	1.15
3092.07	Mo II	15691 - 48022	16.	2.4	0.37
3122.00	Mo II	26740 - 58761	101.	15.	1.17
3138.72	Mo II	26041 - 57892	37.	5.5	0.74
3152.82	Mo II	26488 - 58197	76.	11.	1.06
3155.64	Mo II	29022 - 60702	22.	3.3	0.52
3172.03	Mo II	17344 - 48860	10.	1.5	0.18
3172.74	Mo II	15699 - 47208	12.	1.8	0.24
3187.59	Mo II	23853 - 55216	32.	4.9	0.69
3201.50	Mo II	16796 - 48022	3.5	0.55	-0.26
3240.71	Mo II	17174 - 48022	5.7	0.90	-0.04
3292.31	Mo II	25342 - 55706	56.	9.1	0.96
3313.62	Mo II	28884 - 59053	39.	6.5	0.81
3320.90	Mo II	25112 - 55216	54.	8.9	0.95
3346.40	Mo II	25342 - 55216	27.	4.5	0.66
3395.36	Mo II	36289 - 65732	67.	12.	1.06

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3446.08	Mo II	23833 - 52843	28.	5.0	0.70
3635.14	Mo II	25342 - 52843	6.5	1.3	0.11
3684.22	Mo II	36741 - 63877	21.	4.3	0.64
3688.31	Mo II	25112 - 52217	12.	2.5	0.39
3692.64	Mo II	24659 - 51732	32.	6.6	0.82
3941.48	Mo II	25342 - 50706	8.8	2.1	0.31

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3302.32	Na I	0 - 30273	0.65	0.11	-0.97
3302.99	Na I	0 - 30267	0.33	0.053	-1.27
5149.09	Na I	16956 - 36373	0.19	0.075	-1.12
5153.64	Na I	16973 - 36373	0.38	0.15	-0.82
5682.66	Na I	16956 - 34549	0.88	0.42	-0.37
5688.22	Na I	16973 - 34549	1.8	0.85	-0.07
5889.95	Na I	0 - 16973	1.8	0.95	-0.02
5895.92	Na I	0 - 16956	0.90	0.47	-0.33
6154.23	Na I	16956 - 33201	0.28	0.16	-0.80
6160.76	Na I	16973 - 33201	0.56	0.32	-0.50
8183.27	Na I	16956 - 29173	4.4	4.4	0.64
8194.81	Na I	16973 - 29173	8.7	8.8	0.94

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2436.33	Nb I	2154 - 43187	1.9	0.17	-0.76
2462.89	Nb I	2805 - 43396	5.0	0.45	-0.34
2466.73	Nb I	2805 - 43333	2.4	0.22	-0.65
2469.08	Nb I	2154 - 42643	3.4	0.31	-0.51
2504.65	Nb I	2805 - 42719	7.0	0.65	-0.18
2524.99	Nb I	1143 - 40735	1.0	0.096	-1.02
2558.94	Nb I	1143 - 40210	2.5	0.24	-0.62
2565.41	Nb I	1587 - 40555	4.6	0.46	-0.34
2567.51	Nb I	1143 - 40079	2.2	0.22	-0.66
2569.03	Nb I	9329 - 48242	29.	2.9	0.46
2570.78	Nb I	1587 - 40474	0.95	0.094	-1.03
2571.05	Nb I	1587 - 40470	0.95	0.094	-1.03
2572.10	Nb I	1143 - 40010	2.2	0.21	-0.67
2576.60	Nb I	2154 - 40953	2.2	0.22	-0.66
2578.20	Nb I	1587 - 40362	1.8	0.18	-0.74
2578.74	Nb I	2154 - 40921	7.8	0.77	-0.41
2583.11	Nb I	8827 - 47528	15.	1.5	0.18
2583.22	Nb I	2154 - 40854	1.7	0.17	-0.77
2592.20	Nb I	2805 - 41371	12.	1.2	0.08
2597.14	Nb I	1587 - 40079	1.4	0.14	-0.86
2601.84	Nb I	1587 - 40010	1.0	0.10	-0.99
2603.31	Nb I	2154 - 40555	0.79	0.080	-1.10
2608.84	Nb I	2154 - 40474	0.96	0.098	-1.01
2610.28	Nb I	1587 - 39886	2.1	0.22	-0.66
2612.38	Nb I	2154 - 40422	2.1	0.21	-0.67
2616.48	Nb I	2154 - 40362	3.6	0.36	-0.44
2622.00	Nb I	8827 - 46954	2.4	0.25	-0.60
2623.51	Nb I	1143 - 39248	2.7	0.28	-0.55
2627.44	Nb I	2805 - 40854	4.1	0.42	-0.37
2628.49	Nb I	1587 - 39620	2.9	0.30	-0.52
2634.71	Nb I	1587 - 39530	0.89	0.093	-1.03
2640.92	Nb I	2154 - 40009	2.4	0.25	-0.60
2647.50	Nb I	1143 - 38903	6.3	0.66	-0.18
2649.52	Nb I	2154 - 39886	6.0	0.63	-0.20
2652.94	Nb I	8827 - 46510	5.5	0.58	-0.24
2653.38	Nb I	2805 - 40482	2.7	0.29	-0.54
2654.45	Nb I	1587 - 39248	6.9	0.73	-0.14
2655.70	Nb I	8827 - 46471	6.5	0.69	-0.16
2656.98	Nb I	9329 - 46954	12.	1.3	0.12
2657.62	Nb I	2805 - 40422	4.6	0.49	-0.31
2661.86	Nb I	2805 - 40362	1.1	0.12	-0.92
2668.29	Nb I	2154 - 39620	2.9	0.31	-0.50
2679.01	Nb I	1587 - 38903	1.8	0.19	-0.72
2682.13	Nb I	2154 - 39427	0.59	0.064	-1.20
2687.15	Nb I	2805 - 40009	3.3	0.36	-0.45
2695.04	Nb I	2154 - 39248	2.0	0.21	-0.67
2696.05	Nb I	2805 - 39886	1.0	0.11	-0.96
2714.20	Nb I	2805 - 39638	0.47	0.052	-1.28
2715.50	Nb I	2805 - 39620	0.63	0.070	-1.16
2715.69	Nb I	1143 - 37955	0.39	0.044	-1.36

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2716.10	Nb I	1587 - 38393	1.1	0.12	-0.91
2720.02	Nb I	5965 - 42719	1.5	0.17	-0.78
2722.31	Nb I	1143 - 37865	0.38	0.043	-1.37
2723.98	Nb I	2154 - 38854	1.1	0.13	-0.89
2726.08	Nb I	1143 - 37815	0.76	0.085	-1.07
2728.08	Nb I	1587 - 38232	0.53	0.060	-1.22
2729.83	Nb I	2805 - 39427	0.60	0.067	-1.17
2741.15	Nb I	8827 - 45297	4.7	0.53	-0.27
2746.91	Nb I	1143 - 37537	2.7	0.30	-0.52
2748.85	Nb I	1587 - 37955	3.0	0.34	-0.47
2755.29	Nb I	8827 - 45110	11.	1.2	0.08
2755.64	Nb I	1587 - 37865	1.2	0.13	-0.88
2758.61	Nb I	2154 - 38393	4.7	0.54	-0.27
2763.38	Nb I	2805 - 38982	1.6	0.18	-0.74
2766.18	Nb I	12102 - 48242	4.3	0.50	-0.30
2773.20	Nb I	2805 - 38854	6.0	0.69	-0.16
2779.36	Nb I	1143 - 37112	0.63	0.074	-1.13
2782.36	Nb I	9329 - 45259	16.	1.8	0.26
2795.86	Nb I	1587 - 37344	0.26	0.030	-1.52
2799.36	Nb I	2154 - 37866	0.49	0.058	-1.24
2800.32	Nb I	1587 - 37287	0.50	0.059	-1.23
2802.07	Nb I	2154 - 37832	0.29	0.035	-1.46
2808.05	Nb I	1587 - 37188	0.49	0.058	-1.24
2811.63	Nb I	11525 - 47081	8.1	0.96	-0.02
2821.92	Nb I	2805 - 38232	0.33	0.040	-1.40
2825.18	Nb I	2154 - 37540	1.0	0.12	-0.92
2826.48	Nb I	2154 - 37524	0.91	0.11	-0.96
2840.94	Nb I	2154 - 37344	1.4	0.17	-0.78
2842.02	Nb I	5298 - 40474	0.73	0.089	-1.05
2851.45	Nb I	10238 - 45297	13.	1.6	0.20
2851.98	Nb I	12102 - 47155	18.	2.2	0.34
2854.17	Nb I	2805 - 37832	1.00	0.12	-0.91
2857.29	Nb I	5965 - 40953	1.7	0.21	-0.68
2859.96	Nb I	2805 - 37761	1.4	0.17	-0.77
2866.67	Nb I	1143 - 36016	0.36	0.044	-1.35
2874.57	Nb I	1143 - 35920	0.82	0.10	-0.99
2879.49	Nb I	2805 - 37524	0.65	0.080	-1.09
2884.97	Nb I	12503 - 47155	14.	1.8	0.24
2889.90	Nb I	1587 - 36180	0.32	0.040	-1.40
2903.65	Nb I	1587 - 36016	0.85	0.11	-0.97
2938.07	Nb I	2154 - 36180	0.90	0.12	-0.93
2955.45	Nb I	10238 - 44063	3.0	0.39	-0.41
2959.97	Nb I	2154 - 35928	0.18	0.024	-1.62
2963.68	Nb I	4998 - 38730	0.80	0.11	-0.98
2965.48	Nb I	4998 - 38710	1.6	0.21	-0.68
2981.64	Nb I	2805 - 36334	0.68	0.091	-1.04
2983.14	Nb I	1143 - 34655	0.26	0.034	-1.47
2987.29	Nb I	5298 - 38763	1.8	0.24	-0.63
2988.69	Nb I	9439 - 42889	4.4	0.58	-0.23
3005.14	Nb I	1587 - 34854	0.23	0.031	-1.51

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3020.67	Nb I	5298 - 38393	0.99	0.14	-0.87
3039.68	Nb I	5965 - 38854	1.1	0.16	-0.80
3048.10	Nb I	5965 - 38763	2.5	0.35	-0.46
3053.09	Nb I	5965 - 38710	1.8	0.25	-0.60
3061.11	Nb I	9329 - 41987	1.4	0.19	-0.71
3061.24	Nb I	5298 - 37955	0.44	0.062	-1.21
3072.41	Nb I	4998 - 37537	0.49	0.070	-1.15
3096.50	Nb I	1587 - 33872	0.28	0.041	-1.39
3111.45	Nb I	1587 - 33717	0.61	0.089	-1.05
3116.36	Nb I	10238 - 42317	3.5	0.51	-0.30
3122.65	Nb I	2154 - 34169	0.31	0.045	-1.34
3133.08	Nb I	8827 - 40735	2.2	0.33	-0.48
3136.97	Nb I	1143 - 33011	0.25	0.037	-1.43
3151.87	Nb I	2154 - 33872	0.61	0.091	-1.04
3172.51	Nb I	1143 - 32654	0.13	0.019	-1.71
3186.54	Nb I	4998 - 36371	0.66	0.10	-0.99
3187.49	Nb I	2805 - 34169	0.95	0.15	-0.84
3200.53	Nb I	2154 - 33390	0.26	0.039	-1.41
3210.29	Nb I	9329 - 40470	2.1	0.33	-0.48
3217.29	Nb I	5298 - 36371	0.82	0.13	-0.90
3217.86	Nb I	1587 - 32654	0.21	0.032	-1.49
3246.78	Nb I	1143 - 31934	0.11	0.017	-1.77
3249.52	Nb I	1143 - 31908	0.41	0.064	-1.19
3251.62	Nb I	2154 - 32899	0.25	0.040	-1.39
3260.14	Nb I	1143 - 31808	0.19	0.030	-1.52
3264.59	Nb I	2805 - 33428	0.63	0.10	-1.00
3267.05	Nb I	8827 - 39427	1.6	0.26	-0.59
3270.76	Nb I	1143 - 31708	0.24	0.039	-1.41
3272.07	Nb I	1587 - 32140	0.55	0.089	-1.05
3277.67	Nb I	1587 - 32088	0.43	0.069	-1.16
3285.66	Nb I	1587 - 32013	0.62	0.10	-1.00
3287.59	Nb I	1143 - 31551	0.47	0.076	-1.12
3287.92	Nb I	5965 - 36371	1.4	0.23	-0.63
3296.01	Nb I	2805 - 33136	1.2	0.19	-0.72
3299.61	Nb I	2154 - 32452	0.48	0.079	-1.10
3304.83	Nb I	13146 - 43396	7.8	1.3	0.11
3308.05	Nb I	1587 - 31808	0.30	0.049	-1.31
3310.47	Nb I	2805 - 33004	0.42	0.068	-1.17
3311.34	Nb I	12982 - 43173	5.2	0.86	-0.07
3312.60	Nb I	2154 - 32333	1.2	0.19	-0.71
3315.22	Nb I	8827 - 38982	3.9	0.63	-0.20
3318.98	Nb I	1587 - 31708	0.50	0.082	-1.09
3319.26	Nb I	2805 - 32924	0.41	0.067	-1.17
3326.62	Nb I	9329 - 39381	5.2	0.87	-0.06
3329.36	Nb I	8827 - 38854	3.1	0.52	-0.29
3332.16	Nb I	2154 - 32156	0.31	0.051	-1.29
3341.97	Nb I	1143 - 31057	2.6	0.43	-0.36
3343.71	Nb I	1587 - 31485	2.9	0.49	-0.31
3346.93	Nb I	4998 - 34868	0.76	0.13	-0.89
3349.06	Nb I	2154 - 32005	4.5	0.76	-0.12

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3349.52	Nb I	11525 - 41371	16.	2.7	0.43
3352.59	Nb I	2154 - 31973	0.11	0.019	-1.72
3354.74	Nb I	2805 - 32605	1.1	0.18	-0.74
3357.04	Nb I	2154 - 31934	0.33	0.056	-1.25
3358.42	Nb I	2805 - 32573	5.3	0.90	-0.04
3366.96	Nb I	9329 - 39021	6.6	1.1	0.05
3367.38	Nb I	8705 - 38393	1.4	0.23	-0.63
3369.83	Nb I	9043 - 38710	1.2	0.21	-0.69
3371.33	Nb I	2154 - 31808	0.43	0.074	-1.13
3372.09	Nb I	2805 - 32452	0.21	0.035	-1.45
3374.92	Nb I	8827 - 38449	5.9	1.0	0.00
3376.34	Nb I	12137 - 41746	2.9	0.49	-0.31
3376.73	Nb I	11248 - 40854	2.8	0.47	-0.32
3380.05	Nb I	2805 - 32382	0.20	0.035	-1.46
3380.41	Nb I	1143 - 30716	0.51	0.087	-1.06
3380.86	Nb I	5298 - 34868	0.82	0.14	-0.85
3383.80	Nb I	8411 - 37955	1.2	0.21	-0.68
3384.66	Nb I	12018 - 41555	3.4	0.58	-0.24
3387.75	Nb I	5298 - 34808	0.51	0.087	-1.06
3390.63	Nb I	9498 - 38982	1.6	0.28	-0.55
3391.33	Nb I	12137 - 41615	1.7	0.30	-0.53
3392.34	Nb I	1587 - 31057	0.74	0.13	-0.90
3395.93	Nb I	1587 - 31026	0.35	0.060	-1.22
3399.40	Nb I	2805 - 32214	0.34	0.059	-1.23
3405.41	Nb I	9498 - 38854	4.5	0.77	-0.11
3406.13	Nb I	9043 - 38393	2.2	0.39	-0.41
3408.38	Nb I	2154 - 31485	0.64	0.11	-0.95
3409.91	Nb I	11044 - 40362	2.2	0.38	-0.42
3414.07	Nb I	2805 - 32088	0.26	0.045	-1.34
3415.97	Nb I	9498 - 38763	3.4	0.60	-0.22
3417.86	Nb I	8705 - 37955	1.4	0.24	-0.62
3423.76	Nb I	2805 - 32005	0.51	0.090	-1.05
3425.85	Nb I	13012 - 42194	6.6	1.2	0.06
3427.45	Nb I	2805 - 31973	0.64	0.11	-0.95
3428.79	Nb I	10923 - 40079	1.1	0.20	-0.70
3429.04	Nb I	5965 - 35120	0.89	0.16	-0.80
3432.42	Nb I	8411 - 37537	0.55	0.098	-1.01
3433.09	Nb I	9329 - 38449	1.3	0.23	-0.64
3442.65	Nb I	8827 - 37866	0.97	0.17	-0.76
3442.79	Nb I	12102 - 41140	1.2	0.22	-0.66
3445.68	Nb I	12358 - 41371	3.6	0.64	-0.19
3456.54	Nb I	9329 - 38251	1.2	0.22	-0.66
3457.79	Nb I	9043 - 37955	1.4	0.25	-0.61
3458.95	Nb I	5965 - 34868	0.47	0.085	-1.07
3459.70	Nb I	9498 - 38393	1.6	0.28	-0.55
3462.65	Nb I	2154 - 31026	0.11	0.019	-1.72
3463.81	Nb I	13012 - 41874	7.6	1.4	0.13
3465.86	Nb I	1143 - 29987	0.29	0.053	-1.28
3467.47	Nb I	8705 - 37537	1.2	0.22	-0.65
3469.44	Nb I	9329 - 38144	2.0	0.36	-0.44

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3471.19	Nb I	16919 - 45719	13.	2.4	0.39
3473.02	Nb I	13146 - 41931	6.6	1.2	0.07
3475.58	Nb I	12982 - 41746	2.2	0.40	-0.40
3478.69	Nb I	5965 - 34704	1.7	0.31	-0.51
3481.05	Nb I	4998 - 33717	0.23	0.042	-1.38
3485.93	Nb I	13515 - 42194	2.5	0.46	-0.34
3491.03	Nb I	1143 - 29779	0.35	0.064	-1.19
3491.48	Nb I	1143 - 29776	0.076	0.014	-1.86
3496.03	Nb I	12358 - 40953	2.7	0.49	-0.31
3497.81	Nb I	392 - 28973	0.24	0.044	-1.35
3498.63	Nb I	5298 - 33872	2.4	0.44	-0.36
3503.20	Nb I	9329 - 37866	1.5	0.27	-0.56
3505.81	Nb I	9439 - 37955	0.76	0.14	-0.85
3507.96	Nb I	154 - 28653	0.51	0.094	-1.03
3511.19	Nb I	10238 - 38710	1.6	0.29	-0.54
3516.20	Nb I	9329 - 37761	0.72	0.13	-0.87
3516.86	Nb I	9439 - 37865	1.2	0.23	-0.64
3520.06	Nb I	1587 - 29987	0.32	0.060	-1.22
3525.23	Nb I	13012 - 41371	3.3	0.62	-0.20
3533.66	Nb I	154 - 28445	0.11	0.020	-1.71
3534.12	Nb I	5965 - 34253	0.27	0.051	-1.30
3535.30	Nb I	· 0 - 28278	2.0	0.38	-0.43
3537.48	Nb I	392 - 28653	1.4	0.26	-0.58
3539.65	Nb I	9043 - 37287	1.3	0.24	-0.62
3541.90	Nb I	13146 - 41371	4.0	0.76	-0.12
3542.56	Nb I	2805 - 31026	0.11	0.021	-1.69
3542.98	Nb I	1143 - 29360	0.12	0.024	-1.63
3544.02	Nb I	· 0 - 28208	0.49	0.093	-1.03
3544.65	Nb I	5965 - 34169	1.3	0.25	-0.60
3548.13	Nb I	1587 - 29763	0.15	0.029	-1.54
3549.26	Nb I	13405 - 41572	2.1	0.40	-0.39
3550.45	Nb I	392 - 28549	0.33	0.062	-1.21
3554.52	Nb I	2154 - 30279	0.44	0.084	-1.08
3554.66	Nb I	154 - 28278	1.0	0.19	-0.72
3559.12	Nb I	4998 - 33087	0.20	0.037	-1.43
3563.50	Nb I	154 - 28208	0.62	0.12	-0.93
3563.62	Nb I	392 - 28445	0.66	0.13	-0.90
3568.72	Nb I	4998 - 33011	0.38	0.073	-1.13
3569.47	Nb I	2154 - 30162	0.32	0.060	-1.22
3575.13	Nb I	12018 - 39981	1.4	0.26	-0.58
3575.85	Nb I	695 - 28653	1.7	0.32	-0.49
3577.72	Nb I	10238 - 38180	3.3	0.64	-0.20
3580.27	Nb I	1050 - 28973	6.2	1.2	0.07
3582.36	Nb I	5965 - 33872	0.41	0.079	-1.10
3584.97	Nb I	392 - 28278	0.51	0.098	-1.01
3589.11	Nb I	695 - 28549	0.82	0.16	-0.80
3589.36	Nb I	2805 - 30658	1.00	0.19	-0.72
3593.97	Nb I	392 - 28208	0.50	0.097	-1.01
3597.26	Nb I	12288 - 40079	1.4	0.28	-0.56
3598.35	Nb I	0 - 27783	0.044	0.0086	-2.06

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3599.28	Nb I	13146 - 40921	5.4	1.1	0.02
3599.63	Nb I	1587 - 29360	0.21	0.040	-1.39
3602.56	Nb I	695 - 28445	0.54	0.10	-0.98
3604.08	Nb I	695 - 28434	0.053	0.010	-1.98
3615.50	Nb I	12358 - 40009	4.2	0.83	-0.08
3617.71	Nb I	17476 - 45110	11.	2.1	0.33
3618.44	Nb I	154 - 27783	0.045	0.0088	-2.06
3618.90	Nb I	4998 - 32623	0.32	0.063	-1.20
3621.03	Nb I	2154 - 29763	0.31	0.061	-1.21
3625.17	Nb I	10238 - 37815	2.1	0.42	-0.37
3625.71	Nb I	12982 - 40555	4.6	0.92	-0.04
3630.62	Nb I	12102 - 39638	3.8	0.75	-0.12
3633.00	Nb I	12692 - 40210	3.0	0.59	-0.23
3633.71	Nb I	154 - 27666	0.13	0.026	-1.59
3634.44	Nb I	8827 - 36334	1.0	0.20	-0.70
3635.32	Nb I	12503 - 40003	2.8	0.56	-0.25
3636.96	Nb I	12358 - 39846	2.7	0.53	-0.27
3637.54	Nb I	12137 - 39620	2.5	0.50	-0.30
3638.79	Nb I	2805 - 30279	0.18	0.036	-1.44
3639.33	Nb I	13012 - 40482	6.5	1.3	0.11
3640.64	Nb I	154 - 27614	0.13	0.026	-1.59
3643.34	Nb I	12982 - 40422	2.6	0.53	-0.28
3643.72	Nb I	15282 - 42719	5.1	1.0	0.00
3644.94	Nb I	9439 - 36867	1.2	0.23	-0.63
3647.31	Nb I	13012 - 40422	1.6	0.32	-0.50
3649.85	Nb I	392 - 27783	0.37	0.075	-1.13
3650.81	Nb I	1050 - 28434	0.27	0.054	-1.27
3655.98	Nb I	154 - 27499	0.083	0.017	-1.78
3657.11	Nb I	13146 - 40482	3.2	0.65	-0.19
3660.37	Nb I	2805 - 30117	1.0	0.20	-0.69
3661.68	Nb I	10238 - 37540	0.71	0.14	-0.85
3662.05	Nb I	1143 - 28442	0.091	0.018	-1.74
3664.70	Nb I	695 - 27975	0.79	0.16	-0.80
3666.53	Nb I	11248 - 38514	0.93	0.19	-0.73
3667.00	Nb I	12358 - 39620	1.1	0.21	-0.67
3667.66	Nb I	10923 - 38180	0.85	0.17	-0.77
3668.62	Nb I	4998 - 32249	0.37	0.075	-1.12
3669.01	Nb I	5298 - 32546	0.69	0.14	-0.85
3669.74	Nb I	12288 - 39530	2.3	0.46	-0.34
3671.37	Nb I	12018 - 39248	0.77	0.15	-0.81
3672.44	Nb I	392 - 27614	0.043	0.0087	-2.06
3673.23	Nb I	13146 - 40362	0.79	0.16	-0.80
3674.78	Nb I	392 - 27597	0.21	0.044	-1.36
3676.31	Nb I	12692 - 39886	2.3	0.47	-0.33
3677.08	Nb I	11044 - 38232	1.4	0.29	-0.53
3677.78	Nb I	9329 - 36511	1.1	0.22	-0.67
3678.72	Nb I	15467 - 42643	1.5	0.30	-0.52
3686.56	Nb I	2154 - 29272	0.10	0.021	-1.67
3687.44	Nb I	12137 - 39248	0.58	0.12	-0.93
3688.70	Nb I	695 - 27797	0.091	0.019	-1.73

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3689.04	Nb I	11044 - 38144	1.3	0.26	-0.59
3693.37	Nb I	4998 - 32066	0.41	0.083	-1.08
3694.67	Nb I	11525 - 38583	2.6	0.52	-0.28
3697.39	Nb I	5965 - 33004	0.43	0.088	-1.05
3697.85	Nb I	392 - 27427	1.1	0.23	-0.65
3703.16	Nb I	13012 - 40008	3.1	0.64	-0.19
3703.91	Nb I	13012 - 40003	3.1	0.64	-0.19
3704.14	Nb I	11525 - 38514	2.4	0.48	-0.31
3707.80	Nb I	1587 - 28549	0.066	0.014	-1.86
3710.45	Nb I	10923 - 37866	0.92	0.19	-0.72
3711.34	Nb I	0 - 26937	0.20	0.042	-1.37
3711.78	Nb I	5965 - 32899	0.16	0.033	-1.48
3713.01	Nb I	1050 - 27975	2.7	0.57	-0.25
3713.82	Nb I	695 - 27614	0.15	0.030	-1.52
3716.21	Nb I	695 - 27597	0.065	0.014	-1.87
3716.99	Nb I	11248 - 38144	7.1	1.5	0.17
3717.54	Nb I	10923 - 37815	1.8	0.38	-0.43
3721.52	Nb I	12982 - 39846	1.6	0.33	-0.48
3722.32	Nb I	13146 - 40003	2.4	0.50	-0.30
3725.22	Nb I	9498 - 36334	0.60	0.12	-0.90
3726.24	Nb I	154 - 26983	1.7	0.36	-0.45
3727.23	Nb I	11044 - 37866	1.8	0.38	-0.42
3732.03	Nb I	11044 - 37832	1.3	0.27	-0.56
3733.32	Nb I	18332 - 45110	7.1	1.5	0.17
3733.62	Nb I	1143 - 27919	0.056	0.012	-1.93
3738.42	Nb I	10238 - 36979	2.9	0.60	-0.22
3739.80	Nb I	695 - 27427	1.9	0.41	-0.39
3741.78	Nb I	0 - 26718	0.16	0.033	-1.48
3742.39	Nb I	0 - 26713	1.0	0.22	-0.67
3744.00	Nb I	10923 - 37625	2.5	0.52	-0.28
3748.55	Nb I	8827 - 35496	1.2	0.26	-0.59
3750.63	Nb I	1143 - 27797	0.054	0.011	-1.94
3753.18	Nb I	695 - 27332	0.18	0.037	-1.43
3755.28	Nb I	1587 - 28208	0.035	0.0074	-2.13
3755.77	Nb I	11248 - 37866	2.9	0.62	-0.21
3759.55	Nb I	392 - 26983	0.086	0.018	-1.74
3760.64	Nb I	11248 - 37832	0.53	0.11	-0.95
3761.13	Nb I	11044 - 37625	2.2	0.47	-0.32
3763.49	Nb I	154 - 26718	0.31	0.067	-1.17
3764.12	Nb I	154 - 26713	0.092	0.019	-1.71
3765.08	Nb I	0 - 26552	0.20	0.042	-1.38
3766.13	Nb I	392 - 26937	0.16	0.034	-1.47
3769.15	Nb I	1143 - 27666	0.13	0.029	-1.54
3769.98	Nb I	12503 - 39021	2.6	0.55	-0.26
3770.71	Nb I	11248 - 37761	1.0	0.22	-0.66
3771.85	Nb I	392 - 26897	0.33	0.071	-1.15
3773.15	Nb I	11044 - 37540	1.3	0.29	-0.54
3774.44	Nb I	5965 - 32452	0.20	0.043	-1.36
3775.45	Nb I	11044 - 37524	1.7	0.36	-0.44
3776.60	Nb I	1143 - 27614	0.030	0.0063	-2.20

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3777.28	Nb I	2805 - 29272	0.059	0.013	-1.90
3777.67	Nb I	15282 - 41746	2.4	0.51	-0.29
3781.01	Nb I	392 - 26832	0.53	0.11	-0.94
3783.84	Nb I	10923 - 37344	1.6	0.35	-0.46
3786.22	Nb I	2805 - 29209	0.16	0.035	-1.46
3787.06	Nb I	154 - 26552	0.99	0.21	-0.67
3787.48	Nb I	2154 - 28549	0.068	0.015	-1.84
3789.50	Nb I	2154 - 28535	0.067	0.015	-1.84
3790.15	Nb I	1050 - 27427	0.99	0.21	-0.67
3791.21	Nb I	1050 - 27420	2.5	0.55	-0.26
3794.47	Nb I	12102 - 38449	1.4	0.31	-0.51
3796.44	Nb I	15282 - 41615	4.2	0.92	-0.04
3796.59	Nb I	1587 - 27919	0.089	0.019	-1.71
3796.85	Nb I	13515 - 39846	2.6	0.56	-0.25
3798.12	Nb I	392 - 26713	1.6	0.35	-0.46
3800.94	Nb I	9329 - 35631	1.3	0.28	-0.55
3801.30	Nb I	11044 - 37344	3.2	0.70	-0.15
3802.92	Nb I	695 - 26983	1.7	0.38	-0.42
3803.88	Nb I	1050 - 27332	0.48	0.10	-0.98
3804.74	Nb I	11248 - 37524	6.7	1.5	0.16
3806.20	Nb I	10923 - 37188	2.0	0.43	-0.36
3806.63	Nb I	14211 - 40474	1.7	0.37	-0.44
3810.49	Nb I	11525 - 37761	9.1	2.0	0.30
3811.03	Nb I	154 - 26386	0.29	0.063	-1.20
3815.51	Nb I	695 - 26897	0.34	0.073	-1.13
3816.34	Nb I	1587 - 27783	0.055	0.012	-1.92
3819.15	Nb I	4998 - 31175	0.45	0.098	-1.01
3821.19	Nb I	8705 - 34868	0.20	0.044	-1.35
3824.88	Nb I	695 - 26832	0.42	0.092	-1.03
3827.01	Nb I	13515 - 39638	2.5	0.54	-0.27
3830.00	Nb I	8705 - 34808	0.20	0.044	-1.36
3833.26	Nb I	12503 - 38583	0.58	0.13	-0.89
3835.18	Nb I	0 - 26067	0.17	0.039	-1.41
3836.45	Nb I	9439 - 35497	1.8	0.40	-0.40
3837.08	Nb I	14899 - 40953	2.3	0.50	-0.30
3841.81	Nb I	13405 - 39427	3.8	0.84	-0.08
3842.71	Nb I	9329 - 35345	0.93	0.21	-0.68
3843.93	Nb I	5965 - 31973	0.090	0.020	-1.70
3844.08	Nb I	11248 - 37254	0.80	0.18	-0.75
3845.90	Nb I	392 - 26386	0.12	0.026	-1.58
3853.38	Nb I	10923 - 36867	1.1	0.25	-0.60
3854.70	Nb I	11044 - 36979	0.37	0.083	-1.08
3855.15	Nb I	11044 - 36976	0.74	0.17	-0.78
3855.45	Nb I	0 - 25930	0.033	0.0073	-2.13
3858.95	Nb I	154 - 26061	0.15	0.033	-1.49
3860.86	Nb I	12358 - 38251	0.53	0.12	-0.92
3862.93	Nb I	0 - 25880	0.065	0.015	-1.84
3863.38	Nb I	5298 - 31175	0.74	0.17	-0.78
3867.92	Nb I	1050 - 26897	0.17	0.039	-1.41
3871.19	Nb I	9043 - 34868	0.41	0.092	-1.03

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3875.42	Nb I	12018 - 37815	0.47	0.11	-0.97
3875.76	Nb I	1143 - 26937	0.11	0.025	-1.59
3876.96	Nb I	12358 - 38144	2.1	0.47	-0.33
3877.56	Nb I	1050 - 26832	0.34	0.076	-1.12
3878.82	Nb I	392 - 26166	0.45	0.10	-0.99
3883.14	Nb I	695 - 26440	0.38	0.086	-1.06
3885.44	Nb I	11525 - 37254	13.	2.9	0.46
3885.68	Nb I	11248 - 36976	7.5	1.7	0.23
3886.07	Nb I	154 - 25880	0.10	0.023	-1.63
3889.80	Nb I	2154 - 27855	0.024	0.0056	-2.26
3891.30	Nb I	695 - 26386	0.32	0.073	-1.13
3893.73	Nb I	392 - 26067	0.025	0.0056	-2.25
3894.03	Nb I	11044 - 36717	0.50	0.11	-0.95
3894.70	Nb I	392 - 26061	0.020	0.0045	-2.35
3895.90	Nb I	9439 - 35100	1.1	0.26	-0.59
3898.56	Nb I	2154 - 27797	0.088	0.020	-1.70
3899.25	Nb I	15282 - 40921	2.3	0.52	-0.28
3904.18	Nb I	12018 - 37625	1.5	0.35	-0.45
3906.91	Nb I	8827 - 34416	0.47	0.11	-0.97
3908.59	Nb I	13405 - 38982	0.76	0.17	-0.76
3908.97	Nb I	1143 - 26718	0.13	0.030	-1.52
3909.60	Nb I	13012 - 38583	1.2	0.27	-0.57
3913.01	Nb I	11318 - 36867	1.4	0.31	-0.51
3914.70	Nb I	10923 - 36460	6.5	1.5	0.18
3919.00	Nb I	9329 - 34838	0.41	0.095	-1.02
3919.16	Nb I	12358 - 37866	0.97	0.22	-0.65
3920.20	Nb I	13012 - 38514	9.1	2.1	0.32
3922.35	Nb I	12137 - 37625	1.4	0.33	-0.48
3924.49	Nb I	12358 - 37832	0.96	0.22	-0.65
3925.00	Nb I	695 - 26166	0.092	0.021	-1.67
3926.61	Nb I	2154 - 27614	0.054	0.012	-1.90
3929.29	Nb I	2154 - 27597	0.100	0.023	-1.64
3931.46	Nb I	9439 - 34868	0.21	0.048	-1.32
3934.14	Nb I	10923 - 36334	0.32	0.073	-1.13
3934.41	Nb I	1143 - 26552	0.057	0.013	-1.88
3935.45	Nb I	12137 - 37540	1.1	0.27	-0.58
3936.45	Nb I	1587 - 26983	0.039	0.0090	-2.05
3937.44	Nb I	1050 - 26440	0.39	0.090	-1.04
3937.96	Nb I	12137 - 37524	1.3	0.29	-0.53
3941.27	Nb I	695 - 26061	0.090	0.021	-1.68
3943.67	Nb I	1587 - 26937	0.34	0.080	-1.09
3947.53	Nb I	12018 - 37344	1.2	0.28	-0.55
3949.33	Nb I	9439 - 34753	0.41	0.095	-1.02
3949.94	Nb I	1587 - 26897	0.038	0.0089	-2.05
3953.08	Nb I	11044 - 36334	0.91	0.21	-0.67
3955.68	Nb I	2154 - 27427	0.081	0.019	-1.72
3959.36	Nb I	12982 - 38232	1.1	0.26	-0.59
3960.98	Nb I	13012 - 38251	0.55	0.13	-0.89
3964.66	Nb I	9439 - 34655	0.20	0.047	-1.33
3965.69	Nb I	5965 - 31175	0.55	0.13	-0.89

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3966.09	Nb I	12137 - 37344	11.	2.7	0.43
3970.65	Nb I	2154 - 27332	0.050	0.012	-1.92
3971.85	Nb I	12018 - 37188	2.5	0.60	-0.22
3972.52	Nb I	12358 - 37524	2.3	0.54	-0.27
3973.62	Nb I	16829 - 41987	4.9	1.2	0.07
3976.67	Nb I	15282 - 40422	3.8	0.89	-0.05
3977.94	Nb I	13012 - 38144	1.7	0.40	-0.40
3978.75	Nb I	1587 - 26713	0.066	0.016	-1.80
3979.37	Nb I	12692 - 37815	0.97	0.23	-0.64
3980.48	Nb I	1050 - 26166	0.021	0.0049	-2.31
3982.06	Nb I	13146 - 38251	0.55	0.13	-0.88
3984.81	Nb I	15467 - 40555	0.90	0.21	-0.67
3985.18	Nb I	11248 - 36334	0.55	0.13	-0.88
3988.16	Nb I	16829 - 41896	4.8	1.2	0.06
3990.67	Nb I	12137 - 37188	0.35	0.083	-1.08
3994.43	Nb I	11248 - 36276	0.27	0.065	-1.19
3999.18	Nb I	13146 - 38144	2.3	0.55	-0.26
4001.13	Nb I	12358 - 37344	0.98	0.23	-0.63
4008.28	Nb I	10238 - 35179	0.93	0.22	-0.65
4009.71	Nb I	12692 - 37625	1.9	0.45	-0.35
4012.06	Nb I	1143 - 26061	0.036	0.0086	-2.07
4013.27	Nb I	16919 - 41829	8.7	2.1	0.32
4014.93	Nb I	12288 - 37188	0.35	0.085	-1.07
4017.56	Nb I	12982 - 37866	1.7	0.41	-0.38
4022.39	Nb I	13012 - 37866	0.43	0.10	-0.99
4023.14	Nb I	12982 - 37832	2.3	0.55	-0.26
4027.31	Nb I	12288 - 37112	0.81	0.20	-0.71
4027.98	Nb I	13012 - 37832	0.99	0.24	-0.62
4032.52	Nb I	2805 - 27597	0.86	0.21	-0.68
4033.20	Nb I	1143 - 25930	0.015	0.0036	-2.44
4035.10	Nb I	13405 - 38180	1.1	0.27	-0.57
4035.93	Nb I	15439 - 40210	1.9	0.47	-0.33
4039.10	Nb I	11525 - 36276	0.82	0.20	-0.70
4039.53	Nb I	13012 - 37761	3.6	0.88	-0.05
4040.47	Nb I	2154 - 26897	0.045	0.011	-1.96
4042.57	Nb I	12137 - 36867	0.97	0.24	-0.62
4043.16	Nb I	15282 - 40009	2.4	0.58	-0.24
4044.10	Nb I	13146 - 37866	2.4	0.60	-0.22
4044.71	Nb I	13515 - 38232	2.1	0.51	-0.30
4049.76	Nb I	13146 - 37832	2.6	0.63	-0.20
4051.52	Nb I	9329 - 34004	0.87	0.21	-0.67
4056.94	Nb I	12982 - 37625	0.47	0.12	-0.94
4057.27	Nb I	15439 - 40079	0.80	0.20	-0.70
4058.94	Nb I	1050 - 25680	7.8	1.9	0.29
4059.51	Nb I	10126 - 34753	1.3	0.32	-0.49
4060.31	Nb I	2805 - 27427	0.091	0.022	-1.65
4060.79	Nb I	154 - 24773	0.13	0.032	-1.50
4061.26	Nb I	10238 - 34854	0.25	0.061	-1.22
4061.54	Nb I	2805 - 27420	0.11	0.026	-1.58
4064.81	Nb I	12692 - 37287	1.1	0.27	-0.57

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4066.12	Nb I	11044 - 35631	0.69	0.17	-0.77
4067.16	Nb I	12137 - 36717	1.9	0.46	-0.33
4068.26	Nb I	10923 - 35496	1.6	0.40	-0.40
4070.96	Nb I	12982 - 37540	1.8	0.46	-0.34
4073.51	Nb I	15439 - 39981	2.4	0.59	-0.23
4076.09	Nb I	2805 - 27332	0.044	0.011	-1.96
4077.09	Nb I	15461 - 39981	2.1	0.52	-0.28
4078.35	Nb I	392 - 24905	0.019	0.0046	-2.33
4078.60	Nb I	13012 - 37524	0.52	0.13	-0.88
4079.73	Nb I	695 - 25200	4.9	1.2	0.08
4083.78	Nb I	1587 - 26067	0.021	0.0052	-2.29
4084.18	Nb I	5298 - 29776	0.13	0.033	-1.48
4084.86	Nb I	1587 - 26061	0.14	0.036	-1.44
4086.63	Nb I	9439 - 33902	0.42	0.11	-0.97
4087.05	Nb I	13405 - 37865	0.58	0.14	-0.84
4090.16	Nb I	12018 - 36460	1.4	0.34	-0.47
4095.56	Nb I	13405 - 37815	0.71	0.18	-0.75
4097.64	Nb I	17476 - 41874	1.8	0.45	-0.35
4098.22	Nb I	13146 - 37540	0.66	0.17	-0.78
4099.07	Nb I	154 - 24543	0.061	0.015	-1.81
4100.40	Nb I	392 - 24773	0.17	0.042	-1.38
4100.92	Nb I	392 - 24770	2.5	0.64	-0.20
4106.18	Nb I	9043 - 33390	0.33	0.083	-1.08
4106.78	Nb I	1587 - 25930	0.018	0.0044	-2.35
4109.88	Nb I	5298 - 29623	0.057	0.014	-1.84
4112.13	Nb I	16829 - 41140	5.1	1.3	0.11
4113.35	Nb I	12982 - 37287	0.62	0.16	-0.81
4113.94	Nb I	11044 - 35345	1.3	0.33	-0.49
4116.90	Nb I	0 - 24283	0.10	0.026	-1.59
4122.81	Nb I	11248 - 35496	0.90	0.23	-0.64
4123.81	Nb I	154 - 24397	1.8	0.46	-0.34
4125.25	Nb I	10923 - 35157	0.54	0.14	-0.86
4125.58	Nb I	2154 - 26386	0.029	0.0073	-2.14
4127.45	Nb I	16919 - 41140	3.3	0.84	-0.07
4129.43	Nb I	695 - 24905	0.26	0.067	-1.17
4131.53	Nb I	12137 - 36334	0.85	0.22	-0.66
4134.59	Nb I	11318 - 35497	1.3	0.35	-0.46
4135.42	Nb I	12692 - 36867	0.88	0.23	-0.65
4137.10	Nb I	0 - 24165	0.74	0.19	-0.72
4137.59	Nb I	12018 - 36180	0.73	0.19	-0.73
4138.30	Nb I	18036 - 42194	2.5	0.64	-0.20
4139.44	Nb I	392 - 24543	0.16	0.040	-1.39
4139.71	Nb I	1050 - 25200	1.1	0.30	-0.53
4142.24	Nb I	11044 - 35179	0.34	0.088	-1.05
4143.21	Nb I	154 - 24283	0.11	0.029	-1.53
4146.00	Nb I	11044 - 35157	0.34	0.088	-1.06
4147.19	Nb I	11525 - 35631	1.3	0.34	-0.47
4148.74	Nb I	8827 - 32924	0.33	0.084	-1.07
4152.04	Nb I	695 - 24773	0.044	0.011	-1.95
4152.58	Nb I	695 - 24770	1.7	0.43	-0.36

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4158.01	Nb I	12137 - 36180	1.6	0.43	-0.37
4160.80	Nb I	2805 - 26832	0.033	0.0085	-2.07
4161.25	Nb I	13515 - 37540	1.1	0.28	-0.56
4162.81	Nb I	10238 - 34253	0.27	0.069	-1.16
4163.47	Nb I	2154 - 26166	0.49	0.13	-0.90
4163.66	Nb I	154 - 24165	1.4	0.37	-0.43
4164.66	Nb I	392 - 24397	1.4	0.36	-0.44
4165.85	Nb I	12018 - 36016	0.79	0.20	-0.69
4168.13	Nb I	0 - 23985	1.1	0.28	-0.56
4169.57	Nb I	12358 - 36334	1.7	0.45	-0.35
4173.95	Nb I	18036 - 41987	5.7	1.5	0.17
4174.34	Nb I	8705 - 32654	0.31	0.080	-1.10
4177.44	Nb I	10238 - 34169	0.26	0.068	-1.17
4179.76	Nb I	12358 - 36276	0.85	0.22	-0.65
4181.34	Nb I	11248 - 35157	0.62	0.16	-0.79
4184.44	Nb I	392 - 24283	0.10	0.027	-1.57
4186.10	Nb I	13405 - 37287	1.0	0.26	-0.58
4189.99	Nb I	18036 - 41896	2.8	0.73	-0.14
4190.65	Nb I	9043 - 32899	0.33	0.086	-1.06
4190.88	Nb I	1050 - 24905	0.46	0.12	-0.92
4192.07	Nb I	695 - 24543	0.31	0.082	-1.09
4193.83	Nb I	8411 - 32249	0.18	0.048	-1.32
4195.09	Nb I	154 - 23985	0.27	0.070	-1.15
4195.66	Nb I	8827 - 32654	4.8	1.3	0.10
4196.95	Nb I	11525 - 35345	0.36	0.096	-1.02
4197.61	Nb I	16919 - 40735	1.7	0.44	-0.36
4198.51	Nb I	695 - 24507	0.11	0.029	-1.54
4198.85	Nb I	11044 - 34854	0.51	0.13	-0.87
4200.99	Nb I	5965 - 29763	0.053	0.014	-1.85
4201.52	Nb I	11044 - 34838	2.3	0.60	-0.22
4203.41	Nb I	13405 - 37188	0.86	0.23	-0.64
4204.32	Nb I	8827 - 32605	0.24	0.062	-1.20
4205.31	Nb I	392 - 24165	0.28	0.074	-1.13
4206.13	Nb I	12692 - 36460	0.90	0.24	-0.62
4208.16	Nb I	154 - 23911	0.046	0.012	-1.91
4212.04	Nb I	12982 - 36717	0.97	0.26	-0.59
4212.53	Nb I	10923 - 34655	0.54	0.14	-0.84
4213.26	Nb I	12288 - 36016	0.79	0.21	-0.67
4213.46	Nb I	16829 - 40555	1.3	0.34	-0.47
4214.73	Nb I	1050 - 24770	0.13	0.036	-1.45
4217.94	Nb I	695 - 24397	0.15	0.039	-1.41
4222.68	Nb I	9329 - 33004	0.15	0.040	-1.39
4226.22	Nb I	8411 - 32066	0.23	0.062	-1.21
4227.51	Nb I	9438 - 33087	0.16	0.042	-1.38
4229.15	Nb I	9498 - 33136	1.7	0.46	-0.33
4229.83	Nb I	2805 - 26440	0.11	0.029	-1.54
4230.32	Nb I	12288 - 35920	1.1	0.30	-0.52
4231.95	Nb I	392 - 24015	0.054	0.015	-1.84
4237.81	Nb I	11248 - 34838	0.51	0.14	-0.86
4241.45	Nb I	9329 - 32899	0.33	0.090	-1.05

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4242.63	Nb I	18332 - 41896	5.6	1.5	0.18
4246.30	Nb I	8705 - 32249	0.40	0.11	-0.97
4248.66	Nb I	154 - 23684	0.0082	0.0022	-2.65
4249.46	Nb I	0 - 23526	0.034	0.0093	-2.03
4252.97	Nb I	9498 - 33004	0.65	0.18	-0.75
4253.70	Nb I	9043 - 32546	0.50	0.14	-0.87
4254.69	Nb I	8411 - 31908	0.36	0.099	-1.01
4255.44	Nb I	10923 - 34416	1.5	0.40	-0.40
4258.91	Nb I	9329 - 32802	0.32	0.088	-1.05
4261.71	Nb I	9043 - 32501	0.30	0.081	-1.09
4262.05	Nb I	1050 - 24507	0.28	0.076	-1.12
4266.02	Nb I	8705 - 32140	1.3	0.36	-0.44
4268.67	Nb I	154 - 23574	0.024	0.0066	-2.18
4270.69	Nb I	9043 - 32452	0.98	0.27	-0.57
4272.97	Nb I	10923 - 34319	0.19	0.053	-1.27
4273.36	Nb I	12102 - 35496	0.23	0.064	-1.20
4274.69	Nb I	8827 - 32214	0.25	0.067	-1.17
4277.50	Nb I	154 - 23526	0.034	0.0094	-2.03
4279.50	Nb I	8705 - 32066	0.24	0.065	-1.19
4279.71	Nb I	12137 - 35496	0.31	0.085	-1.07
4280.60	Nb I	5298 - 28653	0.19	0.053	-1.28
4286.22	Nb I	12692 - 36016	0.72	0.20	-0.70
4286.99	Nb I	695 - 24015	0.13	0.035	-1.45
4289.44	Nb I	5965 - 29272	0.27	0.074	-1.13
4291.19	Nb I	8411 - 31708	0.40	0.11	-0.96
4292.04	Nb I	392 - 23684	0.022	0.0061	-2.21
4292.48	Nb I	9043 - 32333	0.48	0.13	-0.88
4295.62	Nb I	12358 - 35631	0.89	0.25	-0.61
4299.60	Nb I	5298 - 28549	0.66	0.18	-0.74
4300.99	Nb I	5965 - 29209	0.79	0.22	-0.66
4303.88	Nb I	8705 - 31934	0.086	0.024	-1.62
4306.28	Nb I	9439 - 32654	0.28	0.078	-1.11
4308.12	Nb I	9043 - 32249	0.12	0.035	-1.46
4308.69	Nb I	8705 - 31908	0.23	0.063	-1.20
4309.56	Nb I	12982 - 36180	1.1	0.32	-0.50
4311.27	Nb I	13146 - 36334	4.0	1.1	0.04
4311.70	Nb I	1587 - 24773	0.027	0.0074	-2.13
4312.45	Nb I	392 - 23574	0.032	0.0090	-2.04
4313.88	Nb I	16829 - 40003	1.1	0.31	-0.51
4316.48	Nb I	12018 - 35179	0.29	0.080	-1.10
4318.01	Nb I	10238 - 33390	0.17	0.048	-1.32
4323.47	Nb I	9329 - 32452	0.099	0.028	-1.55
4326.33	Nb I	9498 - 32605	1.2	0.35	-0.46
4327.38	Nb I	8705 - 31808	0.33	0.093	-1.03
4328.43	Nb I	9043 - 32140	0.30	0.085	-1.07
4329.73	Nb I	154 - 23244	0.020	0.0056	-2.25
4331.37	Nb I	4998 - 28079	0.39	0.11	-0.96
4337.56	Nb I	9498 - 32546	0.10	0.029	-1.54
4338.70	Nb I	12137 - 35179	0.22	0.061	-1.22
4342.82	Nb I	12137 - 35157	1.0	0.28	-0.55

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4345.32	Nb I	0 – 23007	0.023	0.0066	-2.18
4346.12	Nb I	8705 – 31708	0.11	0.031	-1.51
4347.31	Nb I	13515 – 36511	0.42	0.12	-0.93
4348.65	Nb I	695 – 23684	0.039	0.011	-1.95
4349.03	Nb I	12358 – 35345	0.83	0.24	-0.63
4350.30	Nb I	8827 – 31808	0.11	0.032	-1.50
4351.57	Nb I	8827 – 31801	0.83	0.24	-0.63
4353.27	Nb I	1050 – 24015	0.019	0.0053	-2.28
4354.19	Nb I	11044 – 34004	0.16	0.044	-1.36
4356.85	Nb I	12982 – 35928	0.27	0.076	-1.12
4359.85	Nb I	9043 – 31973	0.20	0.058	-1.23
4361.65	Nb I	4998 – 27919	0.033	0.0093	-2.03
4368.43	Nb I	9329 – 32214	0.69	0.20	-0.70
4369.62	Nb I	695 – 23574	0.0068	0.0020	-2.71
4370.36	Nb I	2805 – 25680	0.030	0.0085	-2.07
4374.78	Nb I	391 – 23244	0.0100	0.0029	-2.54
4375.25	Nb I	10238 – 33087	0.12	0.035	-1.46
4377.96	Nb I	12018 – 34854	0.93	0.27	-0.57
4379.52	Nb I	9329 – 32156	0.22	0.062	-1.21
4381.13	Nb I	13515 – 36334	0.40	0.12	-0.94
4382.49	Nb I	12288 – 35100	0.18	0.051	-1.29
4382.84	Nb I	1587 – 24397	0.012	0.0035	-2.46
4384.86	Nb I	12358 – 35157	0.50	0.15	-0.84
4387.74	Nb I	4998 – 27783	0.063	0.018	-1.74
4388.36	Nb I	5298 – 28079	0.13	0.037	-1.43
4392.69	Nb I	9329 – 32088	0.52	0.15	-0.83
4397.04	Nb I	12102 – 34838	0.46	0.13	-0.87
4400.35	Nb I	16919 – 39638	0.90	0.26	-0.58
4400.83	Nb I	12137 – 34854	0.40	0.12	-0.94
4406.55	Nb I	5965 – 28653	0.041	0.012	-1.93
4410.21	Nb I	4998 – 27666	0.30	0.087	-1.06
4411.52	Nb I	10238 – 32899	0.38	0.11	-0.95
4412.18	Nb I	8827 – 31485	0.064	0.019	-1.73
4414.88	Nb I	9043 – 31688	0.082	0.024	-1.62
4416.41	Nb I	12018 – 34655	0.16	0.046	-1.34
4419.44	Nb I	5298 – 27919	0.19	0.055	-1.26
4419.83	Nb I	2154 – 24773	0.023	0.0068	-2.17
4420.45	Nb I	2154 – 24770	0.023	0.0068	-2.17
4420.64	Nb I	392 – 23007	0.024	0.0069	-2.16
4423.87	Nb I	16829 – 39427	0.73	0.21	-0.67
4426.68	Nb I	5965 – 28549	0.11	0.033	-1.48
4429.44	Nb I	5965 – 28535	0.11	0.033	-1.48
4437.90	Nb I	17476 – 40003	0.72	0.21	-0.67
4440.43	Nb I	12982 – 35496	0.16	0.048	-1.32
4441.81	Nb I	9498 – 32005	0.18	0.053	-1.27
4445.85	Nb I	1050 – 23537	0.017	0.0049	-2.31
4446.17	Nb I	13146 – 35631	0.67	0.20	-0.70
4447.18	Nb I	5965 – 28445	0.33	0.098	-1.01
4456.80	Nb I	1143 – 23574	0.042	0.012	-1.90
4457.42	Nb I	1587 – 24015	0.047	0.014	-1.85

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4458.12	Nb I	13405 - 35829	0.53	0.16	-0.80
4460.42	Nb I	13515 - 35928	0.82	0.24	-0.61
4464.15	Nb I	2805 - 25200	0.040	0.012	-1.92
4465.92	Nb I	10238 - 32623	0.090	0.027	-1.57
4466.42	Nb I	1143 - 23526	0.0069	0.0021	-2.68
4469.32	Nb I	5298 - 27666	0.044	0.013	-1.88
4469.71	Nb I	12288 - 34655	0.89	0.27	-0.57
4471.29	Nb I	9329 - 31688	0.39	0.12	-0.94
4472.53	Nb I	2154 - 24507	0.051	0.015	-1.81
4481.44	Nb I	10238 - 32546	0.11	0.032	-1.50
4494.57	Nb I	5965 - 28208	0.052	0.016	-1.80
4497.25	Nb I	8827 - 31057	0.047	0.014	-1.85
4499.80	Nb I	12102 - 34319	0.47	0.14	-0.85
4503.04	Nb I	5298 - 27499	0.14	0.042	-1.38
4503.42	Nb I	13146 - 35345	0.20	0.059	-1.23
4508.41	Nb I	12982 - 35157	0.37	0.11	-0.95
4511.09	Nb I	17476 - 39638	2.1	0.64	-0.19
4512.13	Nb I	9329 - 31485	0.053	0.016	-1.79
4523.41	Nb I	1143 - 23244	0.14	0.044	-1.36
4524.12	Nb I	1587 - 23684	0.023	0.0072	-2.14
4529.42	Nb I	11318 - 33390	0.11	0.035	-1.46
4542.80	Nb I	0 - 22007	0.0073	0.0023	-2.64
4546.82	Nb I	1587 - 23574	0.14	0.044	-1.35
4547.85	Nb I	9043 - 31026	0.058	0.018	-1.74
4553.84	Nb I	5965 - 27919	0.088	0.027	-1.57
4556.84	Nb I	4998 - 26937	0.030	0.0092	-2.04
4564.53	Nb I	12102 - 34004	2.1	0.64	-0.19
4570.95	Nb I	12982 - 34854	0.17	0.054	-1.27
4573.08	Nb I	2154 - 24015	0.24	0.076	-1.12
4574.33	Nb I	11044 - 32899	0.080	0.025	-1.60
4574.84	Nb I	154 - 22007	0.015	0.0046	-2.33
4575.37	Nb I	10238 - 32088	0.13	0.040	-1.40
4581.62	Nb I	12503 - 34323	3.0	0.94	-0.03
4582.29	Nb I	5965 - 27783	0.075	0.024	-1.62
4599.48	Nb I	9439 - 31175	0.062	0.020	-1.71
4600.21	Nb I	12503 - 34235	0.58	0.19	-0.73
4602.86	Nb I	4998 - 26718	0.014	0.0045	-2.35
4606.77	Nb I	2805 - 24507	0.45	0.14	-0.84
4608.58	Nb I	13146 - 34838	0.17	0.055	-1.26
4610.69	Nb I	10923 - 32605	0.074	0.024	-1.63
4612.12	Nb I	11248 - 32924	0.12	0.039	-1.41
4616.17	Nb I	1587 - 23244	0.047	0.015	-1.82
4630.11	Nb I	11525 - 33116	1.5	0.47	-0.33
4638.10	Nb I	11248 - 32802	0.20	0.063	-1.20
4643.31	Nb I	2154 - 23684	0.0060	0.0019	-2.71
4643.68	Nb I	11044 - 32573	0.18	0.060	-1.22
4646.95	Nb I	18332 - 39846	1.1	0.37	-0.43
4648.95	Nb I	1143 - 22647	0.076	0.025	-1.61
4658.18	Nb I	5965 - 27427	0.022	0.0070	-2.15
4663.83	Nb I	1587 - 23023	0.085	0.028	-1.56

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4665.33	Nb I	12288 - 33717	0.10	0.033	-1.48
4666.24	Nb I	11248 - 32672	0.99	0.32	-0.49
4667.22	Nb I	2154 - 23574	0.053	0.017	-1.76
4669.87	Nb I	11044 - 32452	0.090	0.029	-1.53
4672.09	Nb I	2805 - 24203	0.15	0.050	-1.30
4673.59	Nb I	18036 - 39427	0.64	0.21	-0.68
4675.37	Nb I	2154 - 23537	0.12	0.038	-1.42
4678.48	Nb I	8411 - 29779	0.14	0.044	-1.35
4682.66	Nb I	16672 - 38021	0.35	0.11	-0.94
4685.14	Nb I	11044 - 32382	0.85	0.28	-0.56
4694.51	Nb I	16981 - 38277	0.93	0.31	-0.51
4695.47	Nb I	10923 - 32214	0.17	0.056	-1.25
4697.47	Nb I	8705 - 29987	0.13	0.042	-1.38
4708.29	Nb I	10923 - 32156	0.66	0.22	-0.66
4713.05	Nb I	8411 - 29623	0.041	0.014	-1.87
4713.50	Nb I	2805 - 24015	0.037	0.012	-1.91
4715.83	Nb I	16672 - 37871	0.83	0.28	-0.56
4723.80	Nb I	17937 - 39101	0.95	0.32	-0.50
4727.33	Nb I	11525 - 32672	0.15	0.052	-1.29
4730.31	Nb I	11248 - 32382	0.18	0.060	-1.22
4733.48	Nb I	392 - 21512	0.0099	0.0033	-2.48
4733.89	Nb I	9043 - 30162	0.15	0.051	-1.29
4735.33	Nb I	11044 - 32156	0.13	0.045	-1.35
4736.49	Nb I	17476 - 38583	1.0	0.34	-0.46
4740.61	Nb I	5298 - 26386	0.033	0.011	-1.96
4743.84	Nb I	8705 - 29779	0.086	0.029	-1.54
4744.62	Nb I	12358 - 33428	0.29	0.097	-1.01
4749.70	Nb I	11525 - 32573	0.64	0.22	-0.66
4751.42	Nb I	16981 - 38021	0.88	0.30	-0.53
4755.32	Nb I	13146 - 34169	0.12	0.040	-1.40
4766.81	Nb I	17304 - 38277	0.95	0.32	-0.49
4771.85	Nb I	9329 - 30279	0.050	0.017	-1.77
4773.25	Nb I	9043 - 29987	0.11	0.037	-1.43
4777.62	Nb I	12503 - 33428	0.077	0.026	-1.58
4785.70	Nb I	12982 - 33872	0.11	0.038	-1.42
4802.45	Nb I	695 - 21512	0.0034	0.0012	-2.93
4807.06	Nb I	12102 - 32899	0.13	0.043	-1.36
4809.37	Nb I	12137 - 32924	0.17	0.058	-1.23
4810.60	Nb I	9498 - 30279	0.12	0.042	-1.38
4816.38	Nb I	11248 - 32005	0.26	0.091	-1.04
4829.30	Nb I	17937 - 38638	0.85	0.30	-0.53
4833.37	Nb I	154 - 20838	0.0070	0.0025	-2.61
4837.62	Nb I	18435 - 39101	0.48	0.17	-0.77
4837.99	Nb I	9498 - 30162	0.039	0.014	-1.86
4842.15	Nb I	12358 - 33004	0.17	0.061	-1.21
4845.17	Nb I	12503 - 33136	0.18	0.063	-1.20
4848.37	Nb I	9498 - 30117	0.15	0.054	-1.27
4868.99	Nb I	18876 - 39409	1.6	0.57	-0.25
4890.75	Nb I	11044 - 31485	0.20	0.072	-1.14
4892.50	Nb I	12018 - 32452	0.15	0.054	-1.27

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4895.58	Nb I	5965 - 26386	0.014	0.0049	-2.31
4900.79	Nb I	12102 - 32501	0.19	0.069	-1.16
4904.53	Nb I	0 - 20384	0.0062	0.0023	-2.65
4910.95	Nb I	13515 - 33872	0.34	0.12	-0.91
4928.98	Nb I	13146 - 33428	0.12	0.045	-1.34
4941.52	Nb I	12102 - 32333	0.051	0.019	-1.73
4953.13	Nb I	9439 - 29623	0.024	0.0088	-2.05
4965.37	Nb I	10923 - 31057	0.10	0.038	-1.42
4967.78	Nb I	13012 - 33136	0.28	0.10	-0.99
4971.93	Nb I	0 - 20107	0.0029	0.0011	-2.96
4973.14	Nb I	12503 - 32605	0.20	0.074	-1.13
4975.14	Nb I	12358 - 32452	0.095	0.035	-1.45
4988.97	Nb I	695 - 20734	0.013	0.0047	-2.33
4997.88	Nb I	12137 - 32140	0.12	0.046	-1.34
5000.95	Nb I	13146 - 33136	0.19	0.070	-1.16
5002.25	Nb I	12102 - 32088	0.10	0.039	-1.41
5013.27	Nb I	12982 - 32924	0.088	0.033	-1.48
5017.75	Nb I	392 - 20316	0.014	0.0052	-2.28
5019.51	Nb I	12982 - 32899	0.087	0.033	-1.48
5026.36	Nb I	12018 - 31908	0.23	0.088	-1.06
5030.13	Nb I	13515 - 33390	0.10	0.038	-1.42
5039.04	Nb I	154 - 19994	0.012	0.0044	-2.36
5047.96	Nb I	14899 - 34704	0.15	0.056	-1.25
5058.01	Nb I	0 - 19765	0.0087	0.0033	-2.48
5059.35	Nb I	12692 - 32452	0.12	0.045	-1.35
5065.25	Nb I	695 - 20432	0.0079	0.0030	-2.52
5077.40	Nb I	12018 - 31708	0.063	0.024	-1.61
5078.96	Nb I	1050 - 20734	0.051	0.020	-1.70
5094.41	Nb I	0 - 19624	0.0021	0.00082	-3.09
5095.30	Nb I	695 - 20316	0.025	0.0099	-2.00
5100.16	Nb I	392 - 19994	0.0093	0.0036	-2.44
5120.30	Nb I	392 - 19917	0.0092	0.0036	-2.44
5121.80	Nb I	12982 - 32501	0.16	0.063	-1.20
5127.66	Nb I	10126 - 29623	0.071	0.028	-1.55
5133.34	Nb I	5298 - 24773	0.0090	0.0036	-2.45
5134.75	Nb I	154 - 19624	0.011	0.0042	-2.38
5140.58	Nb I	12692 - 32140	0.13	0.050	-1.30
5147.54	Nb I	15282 - 34704	0.26	0.10	-0.98
5150.64	Nb I	11248 - 30658	0.043	0.017	-1.77
5152.63	Nb I	9043 - 28445	0.045	0.018	-1.75
5160.33	Nb I	392 - 19765	0.013	0.0053	-2.28
5164.38	Nb I	2154 - 21512	0.022	0.0087	-2.06
5180.31	Nb I	695 - 19994	0.013	0.0052	-2.28
5186.98	Nb I	154 - 19428	0.0050	0.0020	-2.69
5189.20	Nb I	1050 - 20316	0.012	0.0047	-2.33
5193.08	Nb I	1587 - 20838	0.012	0.0049	-2.31
5195.84	Nb I	1143 - 20384	0.0093	0.0038	-2.43
5203.22	Nb I	8705 - 27919	0.033	0.014	-1.87
5205.13	Nb I	9329 - 28535	0.021	0.0086	-2.07
5219.10	Nb I	9498 - 28653	0.055	0.022	-1.65

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5225.16	Nb I	11525 - 30658	0.072	0.030	-1.53
5232.81	Nb I	9329 - 28434	0.090	0.037	-1.43
5237.43	Nb I	8411 - 27499	0.040	0.016	-1.79
5240.39	Nb I	8705 - 27783	0.015	0.0062	-2.21
5251.62	Nb I	0 - 19037	0.0064	0.0027	-2.58
5253.03	Nb I	11248 - 30279	0.076	0.032	-1.50
5253.93	Nb I	8827 - 27855	0.044	0.018	-1.74
5269.92	Nb I	8827 - 27797	0.027	0.011	-1.95
5271.53	Nb I	1143 - 20107	0.016	0.0067	-2.17
5272.48	Nb I	8705 - 27666	0.013	0.0052	-2.28
5276.20	Nb I	9498 - 28445	0.078	0.033	-1.48
5279.43	Nb I	9498 - 28434	0.018	0.0076	-2.12
5296.34	Nb I	14211 - 33087	0.078	0.033	-1.49
5315.55	Nb I	5965 - 24773	0.012	0.0050	-2.31
5317.01	Nb I	11044 - 29846	0.016	0.0066	-2.18
5318.60	Nb I	1587 - 20384	0.016	0.0069	-2.16
5319.49	Nb I	8705 - 27499	0.025	0.011	-1.97
5334.87	Nb I	9043 - 27783	0.038	0.016	-1.79
5336.81	Nb I	695 - 19428	0.0012	0.00053	-3.27
5340.80	Nb I	11044 - 29763	0.048	0.021	-1.69
5344.17	Nb I	2805 - 21512	0.041	0.018	-1.75
5350.74	Nb I	2154 - 20838	0.025	0.011	-1.97
5353.28	Nb I	20734 - 39409	0.58	0.25	-0.60
5355.31	Nb I	12358 - 31026	0.033	0.014	-1.85
5355.70	Nb I	11525 - 30191	0.043	0.019	-1.73
5359.19	Nb I	8705 - 27360	0.014	0.0059	-2.23
5362.01	Nb I	392 - 19037	0.00075	0.00032	-3.49
5375.27	Nb I	11248 - 29846	0.036	0.015	-1.81
5381.34	Nb I	5965 - 24543	0.0089	0.0039	-2.41
5388.30	Nb I	9043 - 27597	0.0084	0.0037	-2.44
5395.86	Nb I	4998 - 23526	0.0033	0.0015	-2.84
5396.33	Nb I	8411 - 26937	0.012	0.0053	-2.27
5411.24	Nb I	11044 - 29519	0.025	0.011	-1.95
5416.30	Nb I	11318 - 29776	0.020	0.0086	-2.07
5422.44	Nb I	10923 - 29360	0.052	0.023	-1.64
5431.26	Nb I	1587 - 19994	0.0012	0.00055	-3.26
5437.27	Nb I	5298 - 23684	0.018	0.0078	-2.11
5448.31	Nb I	10923 - 29272	0.015	0.0068	-2.17
5456.19	Nb I	20316 - 38638	0.22	0.096	-1.02
5458.04	Nb I	9043 - 27360	0.018	0.0080	-2.10
5468.10	Nb I	19994 - 38277	0.20	0.088	-1.06
5481.00	Nb I	18036 - 36276	0.22	0.10	-1.00
5483.49	Nb I	8705 - 26937	0.0080	0.0036	-2.44
5491.06	Nb I	20432 - 38638	0.14	0.065	-1.18
5499.53	Nb I	1587 - 19765	0.00094	0.00043	-3.37
5504.58	Nb I	2154 - 20316	0.0028	0.0013	-2.90
5509.12	Nb I	13405 - 31551	0.026	0.012	-1.92
5523.57	Nb I	9498 - 27597	0.027	0.012	-1.91
5541.47	Nb I	10238 - 28278	0.016	0.0072	-2.14
5551.35	Nb I	4998 - 23007	0.012	0.0055	-2.26

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5563.00	Nb I	10238 - 28208	0.018	0.0084	-2.08
5571.44	Nb I	18332 - 36276	0.10	0.047	-1.33
5576.16	Nb I	2805 - 20734	0.0025	0.0012	-2.93
5578.29	Nb I	12358 - 30279	0.037	0.017	-1.76
5586.97	Nb I	1143 - 19037	0.0024	0.0011	-2.94
5594.89	Nb I	17476 - 35345	0.058	0.027	-1.56
5599.59	Nb I	9043 - 26897	0.0072	0.0034	-2.47
5603.52	Nb I	1587 - 19428	0.0022	0.0010	-2.99
5603.93	Nb I	2154 - 19994	0.00077	0.00036	-3.44
5628.26	Nb I	2154 - 19917	0.0015	0.00072	-3.14
5629.17	Nb I	12358 - 30117	0.067	0.032	-1.50
5642.11	Nb I	5965 - 23684	0.029	0.014	-1.86
5645.30	Nb I	5298 - 23007	0.0048	0.0023	-2.64
5654.14	Nb I	10238 - 27919	0.0097	0.0046	-2.33
5664.71	Nb I	1143 - 18791	0.0055	0.0027	-2.58
5665.63	Nb I	13012 - 30658	0.21	0.10	-1.00
5666.86	Nb I	15282 - 32924	0.040	0.019	-1.72
5671.02	Nb I	11345 - 28973	0.049	0.024	-1.63
5671.91	Nb I	12137 - 29763	0.081	0.039	-1.41
5677.47	Nb I	5965 - 23574	0.0043	0.0021	-2.69
5693.09	Nb I	5965 - 23526	0.0042	0.0021	-2.69
5697.90	Nb I	13629 - 31175	0.049	0.024	-1.62
5706.16	Nb I	15282 - 32802	0.097	0.047	-1.33
5706.48	Nb I	8411 - 25930	0.028	0.014	-1.87
5709.33	Nb I	13515 - 31026	0.041	0.020	-1.70
5715.59	Nb I	12288 - 29779	0.016	0.0081	-2.09
5716.35	Nb I	12358 - 29846	0.063	0.031	-1.51
5725.66	Nb I	18036 - 35496	0.12	0.061	-1.21
5729.19	Nb I	1587 - 19037	0.0060	0.0029	-2.53
5751.44	Nb I	12137 - 29519	0.077	0.038	-1.42
5760.34	Nb I	8705 - 26061	0.036	0.018	-1.74
5764.99	Nb I	12018 - 29360	0.055	0.028	-1.56
5771.08	Nb I	15282 - 32605	0.065	0.032	-1.49
5776.07	Nb I	11345 - 28653	0.038	0.019	-1.72
5780.34	Nb I	12692 - 29987	0.018	0.0089	-2.05
5787.54	Nb I	2154 - 19428	0.0045	0.0023	-2.65
5789.79	Nb I	13012 - 30279	0.019	0.0097	-2.01
5794.24	Nb I	12018 - 29272	0.045	0.023	-1.64
5804.03	Nb I	8705 - 25930	0.018	0.0089	-2.05
5815.33	Nb I	12018 - 29209	0.025	0.013	-1.90
5819.43	Nb I	13012 - 30191	0.12	0.060	-1.22
5820.62	Nb I	16829 - 34004	0.11	0.056	-1.25
5834.90	Nb I	13146 - 30279	0.085	0.043	-1.36
5838.15	Nb I	11318 - 28442	0.017	0.0089	-2.05
5838.64	Nb I	9043 - 26166	0.046	0.023	-1.63
5842.47	Nb I	2805 - 19917	0.0033	0.0017	-2.78
5846.09	Nb I	11345 - 28445	0.012	0.0059	-2.23
5866.47	Nb I	5965 - 23007	0.0094	0.0049	-2.31
5874.70	Nb I	9043 - 26061	0.012	0.0062	-2.21
5877.79	Nb I	4998 - 22007	0.0019	0.00098	-3.01

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5893.44	Nb I	14211 - 31175	0.063	0.033	-1.48
5900.62	Nb I	9498 - 26440	0.075	0.039	-1.41
5903.80	Nb I	11345 - 28278	0.028	0.015	-1.84
5927.41	Nb I	15467 - 32333	0.062	0.032	-1.49
5934.16	Nb I	17476 - 34323	0.15	0.082	-1.09
5957.70	Nb I	12982 - 29763	0.043	0.023	-1.64
5983.22	Nb I	5298 - 22007	0.017	0.0091	-2.04
5986.08	Nb I	13146 - 29846	0.066	0.035	-1.45
5997.93	Nb I	9498 - 26166	0.031	0.017	-1.77
6029.75	Nb I	12692 - 29272	0.047	0.026	-1.59
6031.84	Nb I	15439 - 32013	0.10	0.056	-1.25
6045.50	Nb I	12982 - 29519	0.051	0.028	-1.56
6048.72	Nb I	17476 - 34004	0.086	0.047	-1.32
6056.65	Nb I	15467 - 31973	0.057	0.031	-1.50
6107.71	Nb I	15439 - 31808	0.055	0.031	-1.51
6142.51	Nb I	14899 - 31175	0.066	0.037	-1.43
6148.13	Nb I	13515 - 29776	0.055	0.031	-1.50
6164.32	Nb I	13405 - 29623	0.053	0.030	-1.52
6213.06	Nb I	15461 - 31551	0.052	0.030	-1.52
6221.96	Nb I	8705 - 24773	0.019	0.011	-1.95
6251.76	Nb I	18332 - 34323	0.16	0.095	-1.02
6260.77	Nb I	18036 - 34004	0.074	0.044	-1.36
6430.46	Nb I	5965 - 21512	0.0090	0.0056	-2.25
6433.22	Nb I	5298 - 20838	0.0047	0.0029	-2.54
6497.84	Nb I	4998 - 20384	0.0013	0.00084	-3.08
6544.61	Nb I	9498 - 24773	0.017	0.011	-1.96
6574.73	Nb I	8705 - 23911	0.0032	0.0021	-2.69
6607.28	Nb I	13405 - 28535	0.015	0.0099	-2.00
6614.15	Nb I	8411 - 23526	0.0065	0.0043	-2.37
6626.98	Nb I	5298 - 20384	0.0015	0.0010	-3.00
6660.84	Nb I	9498 - 24507	0.054	0.036	-1.44
6677.33	Nb I	9043 - 24015	0.033	0.022	-1.65
6701.20	Nb I	13515 - 28434	0.050	0.033	-1.48
6723.62	Nb I	8705 - 23574	0.025	0.017	-1.77
6739.88	Nb I	8411 - 23244	0.013	0.0092	-2.04
6828.11	Nb I	9043 - 23684	0.018	0.012	-1.91
6849.35	Nb I	8411 - 23007	0.0044	0.0031	-2.51
6876.36	Nb I	8705 - 23244	0.0071	0.0050	-2.30
6902.89	Nb I	9043 - 23526	0.0051	0.0037	-2.44
6908.07	Nb I	9439 - 23911	0.0076	0.0055	-2.26
6918.32	Nb I	13405 - 27855	0.029	0.021	-1.68
6946.07	Nb I	13405 - 27797	0.011	0.0083	-2.08
6972.49	Nb I	14211 - 28549	0.014	0.010	-1.98
6986.09	Nb I	14899 - 29209	0.026	0.019	-1.72
6990.32	Nb I	8705 - 23007	0.015	0.011	-1.96
6996.11	Nb I	13629 - 27919	0.012	0.0088	-2.06
7023.48	Nb I	14211 - 28445	0.017	0.013	-1.89
7038.04	Nb I	12692 - 26897	0.0090	0.0067	-2.17
7046.81	Nb I	9498 - 23684	0.041	0.031	-1.52
7066.41	Nb I	12018 - 26166	0.0037	0.0028	-2.56

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7075.23	Nb I	5298 - 19428	0.00055	0.00041	-3.38
7098.94	Nb I	12358 - 26440	0.018	0.014	-1.87
7102.01	Nb I	9498 - 23574	0.0036	0.0027	-2.57
7119.31	Nb I	12018 - 26061	0.0081	0.0062	-2.21
7126.17	Nb I	12137 - 26166	0.015	0.011	-1.95
7130.06	Nb I	12692 - 26713	0.0087	0.0066	-2.18
7159.43	Nb I	9043 - 23007	0.023	0.018	-1.75
7208.94	Nb I	14211 - 28079	0.014	0.011	-1.95
7252.35	Nb I	10126 - 23911	0.012	0.0099	-2.01
7274.81	Nb I	15467 - 29209	0.016	0.012	-1.91
7317.03	Nb I	24905 - 38568	0.19	0.15	-0.82
7323.92	Nb I	14899 - 28549	0.015	0.012	-1.92
7328.38	Nb I	12288 - 25930	0.012	0.010	-2.00
7353.16	Nb I	8411 - 22007	0.0089	0.0072	-2.14
7372.50	Nb I	11345 - 24905	0.061	0.049	-1.31
7419.83	Nb I	12692 - 26166	0.0058	0.0048	-2.32
7478.20	Nb I	12692 - 26061	0.0085	0.0071	-2.15
7515.93	Nb I	8705 - 22007	0.0091	0.0077	-2.11
7519.77	Nb I	13146 - 26440	0.015	0.013	-1.90
7574.58	Nb I	11345 - 24543	0.050	0.043	-1.37
7583.21	Nb I	12982 - 26166	0.0079	0.0068	-2.17
7647.71	Nb I	24770 - 37842	0.16	0.14	-0.85
7703.33	Nb I	25200 - 38178	0.36	0.32	-0.50
7726.68	Nb I	11345 - 24283	0.021	0.019	-1.73
7757.31	Nb I	25680 - 38568	0.40	0.36	-0.44
7873.41	Nb I	14899 - 27597	0.0092	0.0086	-2.07
7885.31	Nb I	11525 - 24203	0.0094	0.0088	-2.06
7938.89	Nb I	11318 - 23911	0.0066	0.0062	-2.21
7954.76	Nb I	9439 - 22007	0.0013	0.0012	-2.91
8135.20	Nb I	11248 - 23537	0.0091	0.0090	-2.04
8240.00	Nb I	8705 - 20838	0.0014	0.0015	-2.84
8320.93	Nb I	9498 - 21512	0.0041	0.0042	-2.37
8346.08	Nb I	11044 - 23023	0.0063	0.0066	-2.18
8350.04	Nb I	8411 - 20384	0.0011	0.0011	-2.95
8439.77	Nb I	12358 - 24203	0.0051	0.0054	-2.27
8475.98	Nb I	9043 - 20838	0.0020	0.0021	-2.67
8526.99	Nb I	10923 - 22647	0.0049	0.0054	-2.27
8547.25	Nb I	8411 - 20107	0.0012	0.0013	-2.88
8560.54	Nb I	8705 - 20384	0.0017	0.0019	-2.72
8575.87	Nb I	12358 - 24015	0.0049	0.0054	-2.27
8697.55	Nb I	13012 - 24507	0.0071	0.0080	-2.09
8740.96	Nb I	12137 - 23574	0.0055	0.0063	-2.20
8767.97	Nb I	8705 - 20107	0.0021	0.0024	-2.62
8815.56	Nb I	9498 - 20838	0.0036	0.0042	-2.38
8905.78	Nb I	12018 - 23244	0.0081	0.0097	-2.01

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2032.99	Nb II	3542 - 52715	12.	0.72	-0.14
2125.21	Nb II	3030 - 50069	13.	0.87	-0.06
2126.54	Nb II	3542 - 50552	8.8	0.60	-0.22
2131.18	Nb II	2629 - 49537	12.	0.80	-0.10
2295.68	Nb II	1225 - 44771	5.8	0.45	-0.34
2302.08	Nb II	801 - 44227	4.1	0.33	-0.48
2376.40	Nb II	801 - 42869	3.8	0.32	-0.50
2387.09	Nb II	10836 - 52715	27.	2.3	0.37
2387.52	Nb II	7901 - 49772	22.	1.9	0.28
2388.27	Nb II	7901 - 49759	6.9	0.59	-0.23
2398.48	Nb II	10247 - 51927	39.	3.4	0.53
2405.34	Nb II	10653 - 52215	15.	1.3	0.13
2405.85	Nb II	10836 - 52389	16.	1.4	0.14
2412.46	Nb II	8320 - 49759	29.	2.6	0.41
2416.99	Nb II	10919 - 52280	50.	4.3	0.64
2418.69	Nb II	10604 - 51936	45.	3.9	0.59
2433.80	Nb II	9510 - 50585	24.	2.2	0.33
2435.95	Nb II	9813 - 50852	13.	1.1	0.05
2437.42	Nb II	7506 - 48520	9.6	0.85	-0.07
2442.14	Nb II	10247 - 51182	13.	1.2	0.08
2442.68	Nb II	16219 - 57145	22.	2.0	0.30
2451.87	Nb II	12263 - 53036	35.	3.2	0.50
2453.95	Nb II	13690 - 54429	41.	3.7	0.57
2458.09	Nb II	14791 - 55461	38.	3.5	0.54
2477.38	Nb II	6192 - 46545	17.	1.6	0.21
2478.29	Nb II	10247 - 50585	25.	2.3	0.36
2479.94	Nb II	10186 - 50498	24.	2.2	0.35
2483.88	Nb II	10604 - 50852	13.	1.2	0.08
2502.49	Nb II	10604 - 50552	10.	0.97	-0.01
2511.00	Nb II	5562 - 45375	12.	1.2	0.07
2521.40	Nb II	9510 - 49158	32.	3.1	0.49
2525.81	Nb II	10919 - 50498	33.	3.2	0.50
2530.97	Nb II	14626 - 54125	34.	3.3	0.52
2531.25	Nb II	14678 - 54173	17.	1.7	0.22
2540.62	Nb II	14661 - 54010	55.	5.3	0.72
2541.42	Nb II	1225 - 40561	2.6	0.25	-0.60
2544.80	Nb II	7261 - 46545	63.	6.1	0.79
2548.63	Nb II	13055 - 52280	14.	1.3	0.13
2551.38	Nb II	6192 - 45375	13.	1.2	0.09
2555.63	Nb II	9510 - 48627	15.	1.4	0.16
2556.94	Nb II	7261 - 46359	21.	2.0	0.31
2562.41	Nb II	6192 - 45207	15.	1.4	0.16
2571.33	Nb II	1225 - 40104	2.9	0.29	-0.54
2574.84	Nb II	159 - 38984	0.84	0.084	-1.08
2580.28	Nb II	9510 - 48253	11.	1.1	0.04
2583.99	Nb II	9813 - 48501	101.	10.	1.01
2590.94	Nb II	10186 - 48771	107.	11.	1.03
2594.34	Nb II	801 - 39335	0.94	0.094	-1.02
2594.74	Nb II	7901 - 46429	15.	1.5	0.18
2601.29	Nb II	10186 - 48617	19.	2.0	0.29

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2608.96	Nb II	9813 - 48130	6.7	0.69	-0.16
2613.85	Nb II	438 - 38685	0.20	0.020	-1.70
2620.45	Nb II	7506 - 45656	8.4	0.87	-0.06
2632.52	Nb II	8320 - 46296	12.	1.3	0.10
2637.98	Nb II	10604 - 48501	7.4	0.77	-0.11
2641.06	Nb II	10919 - 48771	6.2	0.65	-0.18
2642.24	Nb II	9510 - 47345	34.	3.6	0.55
2646.26	Nb II	438 - 38216	4.2	0.44	-0.36
2651.12	Nb II	10919 - 48627	20.	2.1	0.32
2656.08	Nb II	159 - 37797	3.6	0.38	-0.42
2658.88	Nb II	8320 - 45919	3.1	0.33	-0.49
2660.04	Nb II	10919 - 48501	5.9	0.63	-0.20
2663.56	Nb II	9813 - 47345	4.6	0.49	-0.31
2665.25	Nb II	10247 - 47756	20.	2.2	0.33
2666.59	Nb II	801 - 38291	1.5	0.16	-0.79
2667.15	Nb II	8320 - 45802	4.5	0.48	-0.32
2667.30	Nb II	0 - 37480	1.2	0.13	-0.89
2667.76	Nb II	10604 - 48078	18.	1.9	0.28
2671.93	Nb II	801 - 38216	5.3	0.56	-0.25
2673.57	Nb II	15396 - 52788	93.	9.9	1.00
2675.94	Nb II	438 - 37797	2.3	0.25	-0.60
2677.66	Nb II	10919 - 48253	5.7	0.61	-0.21
2678.66	Nb II	159 - 37480	0.72	0.077	-1.11
2680.06	Nb II	8320 - 45622	5.0	0.54	-0.27
2686.39	Nb II	18508 - 55722	43.	4.7	0.67
2691.77	Nb II	159 - 37298	1.6	0.18	-0.75
2697.06	Nb II	1225 - 38291	14.	1.5	0.17
2698.86	Nb II	438 - 37480	3.5	0.38	-0.42
2700.15	Nb II	7901 - 44925	3.5	0.39	-0.41
2700.56	Nb II	3542 - 40561	0.52	0.056	-1.25
2702.20	Nb II	801 - 37797	3.8	0.41	-0.38
2702.52	Nb II	1225 - 38216	2.0	0.21	-0.67
2704.26	Nb II	13480 - 50447	13.	1.4	0.16
2706.40	Nb II	438 - 37377	0.98	0.11	-0.97
2707.83	Nb II	9510 - 46429	4.6	0.51	-0.29
2715.34	Nb II	16219 - 53036	13.	1.4	0.16
2715.88	Nb II	13055 - 49864	12.	1.3	0.12
2716.31	Nb II	159 - 36963	0.56	0.062	-1.20
2716.62	Nb II	1225 - 38024	5.9	0.66	-0.18
2717.63	Nb II	9510 - 46296	3.6	0.40	-0.40
2720.26	Nb II	3030 - 39780	0.56	0.062	-1.21
2721.63	Nb II	0 - 36732	0.35	0.039	-1.41
2721.98	Nb II	801 - 37528	5.2	0.57	-0.24
2723.66	Nb II	13055 - 49759	9.8	1.1	0.04
2727.43	Nb II	13119 - 49772	7.8	0.88	-0.06
2730.32	Nb II	13119 - 49733	16.	1.7	0.24
2733.26	Nb II	801 - 37377	3.3	0.37	-0.44
2733.46	Nb II	159 - 36732	0.71	0.080	-1.10
2734.35	Nb II	7506 - 44067	1.4	0.16	-0.80
2737.09	Nb II	438 - 36963	1.0	0.11	-0.94

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
2740.18	Nb II	9813 - 46296	12.	1.3	0.12
2744.96	Nb II	10653 - 47073	4.4	0.50	-0.30
2745.30	Nb II	4146 - 40561	1.6	0.18	-0.75
2745.73	Nb II	9510 - 45919	7.9	0.90	-0.05
2753.14	Nb II	15396 - 51707	30.	3.4	0.53
2754.52	Nb II	438 - 36732	0.60	0.068	-1.17
2757.26	Nb II	12263 - 48520	14.	1.6	0.20
2758.78	Nb II	10836 - 47073	4.4	0.51	-0.29
2764.56	Nb II	801 - 36963	0.51	0.059	-1.23
2765.28	Nb II	1225 - 37377	0.72	0.082	-1.08
2765.93	Nb II	7506 - 43649	2.1	0.24	-0.62
2768.13	Nb II	438 - 36553	2.0	0.24	-0.63
2769.57	Nb II	10247 - 46343	2.3	0.27	-0.57
2771.40	Nb II	21073 - 57145	50.	5.8	0.76
2771.65	Nb II	13690 - 49759	6.0	0.69	-0.16
2780.24	Nb II	4146 - 40104	6.2	0.72	-0.14
2790.57	Nb II	10604 - 46429	3.8	0.45	-0.35
2791.74	Nb II	9813 - 45622	8.9	1.0	0.02
2793.05	Nb II	3542 - 39335	2.1	0.25	-0.60
2795.14	Nb II	13480 - 49246	7.3	0.85	-0.07
2797.69	Nb II	11340 - 47073	10.	1.2	0.08
2798.91	Nb II	7901 - 43618	3.0	0.35	-0.46
2803.81	Nb II	3030 - 38685	0.95	0.11	-0.95
2809.17	Nb II	2629 - 38216	0.37	0.044	-1.36
2810.81	Nb II	8320 - 43887	5.0	0.60	-0.22
2816.68	Nb II	13666 - 49158	7.2	0.86	-0.07
2820.80	Nb II	2357 - 37797	0.49	0.059	-1.23
2825.86	Nb II	10919 - 46296	3.3	0.39	-0.41
2827.08	Nb II	159 - 35521	1.2	0.15	-0.84
2829.75	Nb II	1225 - 36553	0.35	0.042	-1.38
2835.12	Nb II	3030 - 38291	1.3	0.16	-0.79
2841.15	Nb II	3030 - 38216	3.5	0.43	-0.37
2842.65	Nb II	2629 - 37797	3.5	0.42	-0.37
2843.64	Nb II	10186 - 45342	2.8	0.34	-0.47
2844.44	Nb II	14626 - 49772	8.2	0.99	-0.00
2845.80	Nb II	9510 - 44639	4.6	0.56	-0.25
2846.28	Nb II	2357 - 37480	1.8	0.22	-0.65
2847.24	Nb II	14661 - 49772	7.2	0.87	-0.06
2848.30	Nb II	14661 - 49759	20.	2.5	0.40
2849.56	Nb II	438 - 35521	0.48	0.059	-1.23
2859.04	Nb II	10836 - 45802	4.8	0.59	-0.23
2861.09	Nb II	2357 - 37298	2.6	0.32	-0.49
2865.61	Nb II	0 - 34886	0.55	0.068	-1.17
2868.52	Nb II	2629 - 37480	5.7	0.71	-0.15
2875.39	Nb II	3030 - 37797	10.	1.2	0.10
2876.95	Nb II	3542 - 38291	3.9	0.48	-0.32
2877.03	Nb II	2629 - 37377	6.0	0.74	-0.13
2878.74	Nb II	159 - 34886	0.37	0.046	-1.34
2879.36	Nb II	801 - 35521	0.31	0.039	-1.41
2880.72	Nb II	10919 - 45622	11.	1.4	0.15

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2883.18	Nb II	3542 - 38216	8.1	1.0	0.00
2887.69	Nb II	14626 - 49246	6.6	0.82	-0.08
2888.83	Nb II	2357 - 36963	2.8	0.35	-0.46
2894.42	Nb II	10836 - 45375	4.3	0.54	-0.27
2897.81	Nb II	3030 - 37528	5.5	0.69	-0.16
2899.24	Nb II	3542 - 38024	5.4	0.68	-0.17
2908.24	Nb II	2357 - 36732	4.4	0.56	-0.25
2908.88	Nb II	14791 - 49158	22.	2.8	0.45
2910.59	Nb II	3030 - 37377	7.6	0.96	-0.02
2911.74	Nb II	2629 - 36963	4.7	0.60	-0.22
2917.05	Nb II	10653 - 44925	6.4	0.81	-0.09
2927.81	Nb II	4146 - 38291	17.	2.1	0.33
2931.47	Nb II	2629 - 36732	1.0	0.13	-0.88
2932.66	Nb II	10836 - 44925	3.2	0.41	-0.38
2935.29	Nb II	9510 - 43568	1.7	0.23	-0.65
2937.33	Nb II	10604 - 44639	3.0	0.38	-0.42
2941.54	Nb II	3542 - 37528	10.	1.3	0.13
2945.88	Nb II	10836 - 44771	9.8	1.3	0.11
2946.12	Nb II	3030 - 36963	1.2	0.15	-0.82
2946.90	Nb II	2629 - 36553	0.97	0.13	-0.90
2950.88	Nb II	4146 - 38024	16.	2.0	0.31
2954.02	Nb II	14678 - 48520	5.0	0.65	-0.19
2954.53	Nb II	14791 - 48627	10.	1.3	0.12
2956.89	Nb II	7901 - 41710	1.6	0.20	-0.69
2970.40	Nb II	12263 - 45919	4.3	0.57	-0.25
2972.57	Nb II	11340 - 44971	39.	5.2	0.72
2974.10	Nb II	10919 - 44532	28.	3.7	0.57
2977.68	Nb II	10653 - 44227	17.	2.3	0.36
2978.94	Nb II	17292 - 50852	23.	3.1	0.49
2979.88	Nb II	21473 - 55021	36.	4.8	0.68
2980.72	Nb II	12263 - 45802	12.	1.6	0.19
2982.11	Nb II	3030 - 36553	1.8	0.25	-0.61
2985.05	Nb II	13055 - 46545	8.4	1.1	0.05
2990.26	Nb II	11340 - 44771	31.	4.2	0.62
2991.95	Nb II	10653 - 44067	6.1	0.83	-0.08
2994.73	Nb II	4146 - 37528	5.7	0.76	-0.12
3002.21	Nb II	11340 - 44639	6.0	0.82	-0.09
3005.77	Nb II	17292 - 50552	20.	2.7	0.43
3010.38	Nb II	15949 - 49158	9.6	1.3	0.12
3010.69	Nb II	17292 - 50498	12.	1.7	0.22
3022.74	Nb II	17425 - 50498	20.	2.7	0.43
3024.74	Nb II	10836 - 43887	8.4	1.1	0.06
3028.44	Nb II	3542 - 36553	2.6	0.36	-0.44
3029.74	Nb II	12806 - 45802	3.4	0.47	-0.33
3032.77	Nb II	10604 - 43568	16.	2.2	0.35
3039.41	Nb II	2629 - 35521	0.19	0.026	-1.59
3039.82	Nb II	11340 - 44227	2.7	0.38	-0.42
3044.76	Nb II	13666 - 46500	13.	1.8	0.25
3055.52	Nb II	16053 - 48771	22.	3.0	0.48
3063.79	Nb II	13666 - 46296	9.1	1.3	0.11

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3064.53	Nb II	10247 - 42869	9.7	1.4	0.14
3065.26	Nb II	10836 - 43450	4.0	0.56	-0.25
3066.10	Nb II	13690 - 46296	4.0	0.57	-0.24
3069.68	Nb II	13055 - 45622	11.	1.5	0.18
3070.90	Nb II	14791 - 47345	16.	2.2	0.35
3071.18	Nb II	15949 - 48501	6.9	0.97	-0.01
3071.56	Nb II	11340 - 43887	6.5	0.92	-0.04
3072.51	Nb II	13119 - 45656	6.6	0.93	-0.03
3073.24	Nb II	2357 - 34886	0.47	0.067	-1.17
3076.87	Nb II	3030 - 35521	2.3	0.32	-0.49
3080.35	Nb II	10836 - 43290	5.5	0.78	-0.11
3087.86	Nb II	12263 - 44639	5.6	0.80	-0.10
3094.18	Nb II	4146 - 36455	14.	2.0	0.29
3099.19	Nb II	2629 - 34886	0.68	0.098	-1.01
3127.53	Nb II	17425 - 49390	67.	9.8	0.99
3129.64	Nb II	10653 - 42597	1.4	0.21	-0.68
3130.79	Nb II	3542 - 35474	8.5	1.3	0.10
3140.50	Nb II	12806 - 44639	5.7	0.84	-0.07
3145.40	Nb II	8320 - 40104	8.1	1.2	0.08
3152.16	Nb II	21073 - 52788	29.	4.3	0.64
3163.40	Nb II	3030 - 34632	5.3	0.80	-0.10
3173.20	Nb II	14791 - 46296	9.4	1.4	0.15
3175.78	Nb II	10653 - 42133	5.7	0.86	-0.07
3180.29	Nb II	7901 - 39335	6.6	1.0	0.00
3181.40	Nb II	7261 - 38685	0.96	0.14	-0.84
3184.22	Nb II	15949 - 47345	12.	1.9	0.27
3189.28	Nb II	17425 - 48771	17.	2.6	0.41
3191.10	Nb II	4146 - 35474	1.7	0.27	-0.57
3191.43	Nb II	17292 - 48617	33.	5.0	0.70
3194.98	Nb II	2629 - 33919	3.8	0.57	-0.24
3203.35	Nb II	17292 - 48501	25.	3.9	0.59
3206.34	Nb II	7506 - 38685	4.3	0.67	-0.18
3215.60	Nb II	3542 - 34632	1.8	0.27	-0.56
3223.32	Nb II	8320 - 39335	1.3	0.20	-0.69
3225.48	Nb II	2357 - 33351	2.6	0.40	-0.40
3229.56	Nb II	7261 - 38216	1.8	0.28	-0.55
3236.40	Nb II	3030 - 33919	1.5	0.24	-0.62
3247.47	Nb II	7901 - 38685	2.9	0.46	-0.33
3248.94	Nb II	6192 - 36963	1.1	0.17	-0.78
3254.07	Nb II	2629 - 33351	1.0	0.16	-0.79
3260.56	Nb II	17470 - 48130	47.	7.5	0.88
3263.37	Nb II	21073 - 51707	62.	9.8	0.99
3272.22	Nb II	14791 - 45342	7.2	1.2	0.06
3283.46	Nb II	16053 - 46500	27.	4.4	0.65
3291.06	Nb II	3542 - 33919	0.32	0.052	-1.28
3292.02	Nb II	15551 - 45919	18.	2.9	0.47
3294.36	Nb II	15949 - 46296	11.	1.8	0.25
3319.58	Nb II	7261 - 37377	1.2	0.20	-0.70
3320.81	Nb II	15551 - 45656	4.5	0.74	-0.13
3341.60	Nb II	10186 - 40104	2.8	0.47	-0.33

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3343.96	Nb II	8320 - 38216	1.1	0.18	-0.73
3365.58	Nb II	8320 - 38024	1.6	0.27	-0.57
3369.16	Nb II	15949 - 45622	13.	2.3	0.36
3372.56	Nb II	10919 - 40561	1.7	0.29	-0.53
3374.25	Nb II	7901 - 37528	0.46	0.078	-1.11
3386.24	Nb II	9813 - 39335	3.1	0.53	-0.28
3394.98	Nb II	12263 - 41710	1.5	0.26	-0.59
3399.71	Nb II	14661 - 44067	5.8	1.0	0.00
3408.68	Nb II	6192 - 35521	1.5	0.26	-0.59
3409.19	Nb II	5562 - 34886	0.96	0.17	-0.77
3412.94	Nb II	7261 - 36553	2.0	0.34	-0.46
3420.63	Nb II	7506 - 36732	0.81	0.14	-0.85
3425.42	Nb II	10919 - 40104	5.4	0.95	-0.02
3426.57	Nb II	10604 - 39780	4.9	0.86	-0.06
3432.70	Nb II	16219 - 45342	19.	3.3	0.52
3436.96	Nb II	15551 - 44639	7.6	1.3	0.13
3439.92	Nb II	7901 - 36963	0.87	0.16	-0.81
3440.59	Nb II	8320 - 37377	2.0	0.35	-0.46
3452.35	Nb II	14661 - 43618	5.7	1.0	0.01
3479.56	Nb II	10604 - 39335	3.8	0.68	-0.17
3484.05	Nb II	6192 - 34886	0.54	0.098	-1.01
3489.09	Nb II	7901 - 36553	0.65	0.12	-0.93
3510.26	Nb II	16053 - 44532	16.	3.0	0.48
3515.42	Nb II	10247 - 38685	3.2	0.59	-0.23
3517.67	Nb II	16219 - 44639	17.	3.2	0.50
3540.96	Nb II	8320 - 36553	2.2	0.41	-0.39
3568.51	Nb II	7506 - 35521	0.33	0.063	-1.20
3619.51	Nb II	7901 - 35521	2.0	0.39	-0.40
3619.73	Nb II	15949 - 43568	3.2	0.64	-0.20
3633.31	Nb II	16053 - 43568	5.9	1.2	0.07
3651.19	Nb II	7506 - 34886	2.3	0.45	-0.35
3659.61	Nb II	15551 - 42869	11.	2.2	0.33
3687.97	Nb II	17425 - 44532	8.6	1.8	0.25
3688.18	Nb II	10919 - 38024	1.0	0.21	-0.68
3695.90	Nb II	14661 - 41710	3.3	0.67	-0.18
3709.25	Nb II	11340 - 38291	2.5	0.51	-0.29
3720.46	Nb II	13690 - 40561	2.1	0.44	-0.35
3740.73	Nb II	13055 - 39780	13.	2.8	0.45
3781.38	Nb II	13666 - 40104	2.3	0.50	-0.30
3818.86	Nb II	12806 - 38984	3.4	0.75	-0.12
3828.24	Nb II	13666 - 39780	0.68	0.15	-0.82
3831.84	Nb II	13690 - 39780	3.5	0.78	-0.11
3865.02	Nb II	13119 - 38984	1.1	0.25	-0.61
3879.35	Nb II	14791 - 40561	1.7	0.39	-0.41
3898.28	Nb II	13690 - 39335	1.9	0.44	-0.36
3919.72	Nb II	13480 - 38984	0.56	0.13	-0.89
3952.37	Nb II	13690 - 38984	1.1	0.26	-0.58
4000.60	Nb II	14791 - 39780	0.82	0.20	-0.71
4072.07	Nb II	13666 - 38216	0.54	0.13	-0.88
4119.28	Nb II	21073 - 45342	9.1	2.3	0.36

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4156.68	Nb II	16053 – 40104	0.81	0.21	-0.68
4367.97	Nb II	13666 – 36553	0.36	0.10	-0.99
4492.96	Nb II	21040 – 43290	1.2	0.37	-0.43
4527.65	Nb II	12806 – 34886	0.15	0.045	-1.35
4579.45	Nb II	13690 – 35521	0.18	0.055	-1.26
4789.96	Nb II	19690 – 40561	1.5	0.53	-0.28

Wavelength	Spectrum	Energy Levels	gA 10 ⁸ /sec	gf	Log gf
A		K			
4301.22	Nd I	2367 - 25609	0.77	0.21	-0.67
4343.50	Nd I	0 - 23016	0.37	0.11	-0.98
4444.99	Nd I	0 - 22491	0.29	0.085	-1.07
4475.84	Nd I	2367 - 24703	0.28	0.083	-1.08
4480.97	Nd I	1128 - 23438	0.86	0.26	-0.58
4481.90	Nd I	1128 - 23434	0.43	0.13	-0.89
4527.25	Nd I	5049 - 27131	2.2	0.67	-0.18
4542.06	Nd I	0 - 22010	0.37	0.11	-0.95
4548.24	Nd I	3682 - 25662	1.0	0.32	-0.50
4559.67	Nd I	2367 - 24292	1.4	0.44	-0.36
4603.82	Nd I	5049 - 26764	1.7	0.54	-0.27
4609.87	Nd I	1128 - 22815	0.56	0.18	-0.75
4621.94	Nd I	2367 - 23996	2.3	0.75	-0.12
4626.50	Nd I	1128 - 22737	0.46	0.15	-0.83
4627.98	Nd I	2367 - 23968	0.78	0.25	-0.60
4634.24	Nd I	0 - 21572	2.0	0.64	-0.20
4637.20	Nd I	0 - 21559	0.23	0.074	-1.13
4639.14	Nd I	1128 - 22678	0.45	0.15	-0.84
4654.73	Nd I	1128 - 22606	1.1	0.35	-0.46
4671.10	Nd I	1128 - 22530	0.35	0.11	-0.94
4673.97	Nd I	2367 - 23756	0.25	0.081	-1.09
4675.52	Nd I	3682 - 25064	0.89	0.29	-0.53
4683.45	Nd I	0 - 21346	1.6	0.54	-0.27
4684.04	Nd I	1128 - 22471	0.77	0.25	-0.59
4690.35	Nd I	0 - 21314	0.56	0.18	-0.73
4696.44	Nd I	3682 - 24968	2.8	0.92	-0.04
4706.96	Nd I	1128 - 22367	1.0	0.33	-0.48
4731.77	Nd I	1128 - 22256	0.98	0.33	-0.48
4749.75	Nd I	3682 - 24730	0.99	0.33	-0.48
4755.85	Nd I	3682 - 24703	0.66	0.22	-0.65
4760.45	Nd I	1128 - 22129	0.14	0.049	-1.31
4787.40	Nd I	1128 - 22010	0.14	0.048	-1.32
4806.62	Nd I	1128 - 21927	0.26	0.092	-1.04
4835.66	Nd I	2367 - 23040	0.26	0.091	-1.04
4853.33	Nd I	1128 - 21727	0.51	0.18	-0.75
4855.31	Nd I	1128 - 21718	0.22	0.076	-1.12
4866.74	Nd I	0 - 20542	0.83	0.29	-0.53
4869.27	Nd I	3682 - 24213	0.58	0.21	-0.68
4893.23	Nd I	1128 - 21559	0.28	0.100	-1.00
4896.93	Nd I	1128 - 21543	1.7	0.60	-0.22
4907.26	Nd I	2367 - 22739	0.24	0.088	-1.06
4907.78	Nd I	2367 - 22737	0.24	0.088	-1.06
4910.05	Nd I	0 - 20361	0.25	0.090	-1.05
4921.14	Nd I	3682 - 23996	0.42	0.15	-0.82
4924.53	Nd I	0 - 20301	2.0	0.71	-0.15
4952.46	Nd I	1128 - 21314	0.39	0.14	-0.84
4954.78	Nd I	0 - 20177	1.5	0.56	-0.25
5029.45	Nd I	1128 - 21005	0.61	0.23	-0.64
5040.20	Nd I	1128 - 20963	0.36	0.14	-0.86
5056.89	Nd I	0 - 19770	0.43	0.17	-0.78

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5071.87	Nd I	1128 - 20839	0.41	0.16	-0.80
5073.87	Nd I	3682 - 23385	0.48	0.19	-0.73
5178.75	Nd I	1128 - 20432	0.11	0.043	-1.37
5195.60	Nd I	2367 - 21608	0.45	0.18	-0.74
5198.07	Nd I	1128 - 20361	0.32	0.13	-0.89
5204.38	Nd I	0 - 19209	0.27	0.11	-0.97
5213.23	Nd I	2367 - 21543	1.3	0.51	-0.29
5300.58	Nd I	1128 - 19989	0.14	0.061	-1.21
5334.33	Nd I	0 - 18741	0.10	0.044	-1.36
5349.58	Nd I	1128 - 19816	0.19	0.080	-1.10
5411.93	Nd I	2367 - 20839	0.13	0.055	-1.26
5501.47	Nd I	0 - 18172	0.12	0.055	-1.26
5529.07	Nd I	1128 - 19209	0.081	0.037	-1.43
5533.82	Nd I	2367 - 20432	0.57	0.26	-0.58
5561.17	Nd I	0 - 17977	0.17	0.080	-1.10
5576.70	Nd I	3682 - 21608	0.24	0.11	-0.95
5620.54	Nd I	0 - 17787	0.67	0.32	-0.50
5675.97	Nd I	1128 - 18741	0.55	0.26	-0.58
5764.23	Nd I	3682 - 21025	0.084	0.042	-1.38
5784.96	Nd I	2367 - 19648	0.24	0.12	-0.92
5820.37	Nd I	1128 - 18304	0.099	0.050	-1.30
5826.74	Nd I	3682 - 20839	0.24	0.12	-0.92
6149.28	Nd I	0 - 16258	0.054	0.031	-1.51
6226.50	Nd I	2367 - 18423	0.11	0.064	-1.20
6310.49	Nd I	2367 - 18209	0.21	0.12	-0.90
6385.20	Nd I	1128 - 16785	0.16	0.099	-1.01
6485.69	Nd I	0 - 15414	0.052	0.033	-1.48
6630.14	Nd I	0 - 15078	0.057	0.037	-1.43
6670.37	Nd I	2367 - 17354	0.047	0.031	-1.50
8043.33	Nd I	1128 - 13557	0.012	0.012	-1.93

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3282.78	Nd II	0 - 30453	0.066	0.011	-1.97
3328.28	Nd II	0 - 30037	0.48	0.079	-1.10
3334.48	Nd II	1470 - 31451	0.51	0.084	-1.07
3339.07	Nd II	513 - 30453	0.38	0.064	-1.19
3354.60	Nd II	1650 - 31451	0.15	0.025	-1.60
3470.86	Nd II	1650 - 30453	0.16	0.030	-1.53
3522.05	Nd II	3067 - 31451	0.22	0.041	-1.39
3615.82	Nd II	1650 - 29298	0.39	0.076	-1.12
3752.67	Nd II	0 - 26640	0.19	0.040	-1.40
3769.65	Nd II	1650 - 28170	0.40	0.085	-1.07
3780.40	Nd II	3802 - 30247	0.82	0.18	-0.76
3807.23	Nd II	513 - 26772	0.25	0.055	-1.26
3811.06	Nd II	3067 - 29298	0.26	0.056	-1.25
3811.77	Nd II	0 - 26227	0.12	0.027	-1.57
3826.42	Nd II	513 - 26640	0.62	0.14	-0.87
3838.98	Nd II	0 - 26041	0.74	0.16	-0.78
3848.24	Nd II	1470 - 27449	1.1	0.25	-0.61
3863.33	Nd II	0 - 25877	1.6	0.35	-0.45
3869.07	Nd II	1470 - 27309	0.54	0.12	-0.92
3880.78	Nd II	513 - 26274	0.56	0.13	-0.90
3887.87	Nd II	513 - 26227	0.25	0.058	-1.24
3894.63	Nd II	513 - 26182	0.38	0.086	-1.07
3937.57	Nd II	0 - 25389	0.025	0.0059	-2.23
3941.51	Nd II	513 - 25877	0.88	0.20	-0.69
3951.16	Nd II	1470 - 26772	1.1	0.26	-0.58
3952.20	Nd II	0 - 25295	0.30	0.070	-1.16
3958.00	Nd II	513 - 25772	0.25	0.059	-1.23
3963.12	Nd II	3802 - 29027	1.4	0.34	-0.47
3973.30	Nd II	5086 - 30247	1.6	0.39	-0.41
3973.69	Nd II	2585 - 27744	0.55	0.13	-0.89
3976.85	Nd II	0 - 25138	0.26	0.062	-1.20
3979.49	Nd II	1650 - 26772	0.42	0.099	-1.00
3982.36	Nd II	3067 - 28170	0.27	0.064	-1.20
3990.10	Nd II	3802 - 28857	1.5	0.35	-0.46
3991.74	Nd II	0 - 25045	0.35	0.084	-1.08
4000.50	Nd II	1650 - 26640	0.22	0.053	-1.28
4012.25	Nd II	5086 - 30002	5.2	1.3	0.10
4018.81	Nd II	513 - 25389	0.14	0.035	-1.46
4020.87	Nd II	2585 - 27449	0.70	0.17	-0.77
4021.34	Nd II	2585 - 27446	0.70	0.17	-0.77
4024.78	Nd II	513 - 25352	0.13	0.031	-1.51
4030.47	Nd II	1470 - 26274	0.20	0.049	-1.31
4034.01	Nd II	513 - 25295	0.025	0.0062	-2.21
4038.12	Nd II	1470 - 26227	0.13	0.032	-1.49
4040.80	Nd II	1470 - 26211	1.5	0.36	-0.44
4043.59	Nd II	2585 - 27309	0.27	0.066	-1.18
4051.15	Nd II	3067 - 27744	0.64	0.16	-0.81
4059.96	Nd II	1650 - 26274	0.42	0.10	-0.98
4061.09	Nd II	3802 - 28419	4.3	1.1	0.03
4069.28	Nd II	513 - 25081	0.39	0.097	-1.01

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4075.12	Nd II	1650 - 26182	0.35	0.086	-1.07
4075.28	Nd II	513 - 25045	0.17	0.042	-1.38
4080.23	Nd II	513 - 25014	0.17	0.041	-1.38
4085.82	Nd II	0 - 24468	0.071	0.018	-1.75
4100.24	Nd II	3067 - 27449	0.13	0.033	-1.48
4106.59	Nd II	4512 - 28857	0.21	0.054	-1.27
4109.08	Nd II	513 - 24843	0.45	0.12	-0.94
4109.46	Nd II	2585 - 26913	1.5	0.39	-0.41
4110.48	Nd II	0 - 24321	0.15	0.037	-1.43
4113.83	Nd II	1470 - 25772	0.13	0.034	-1.47
4120.66	Nd II	5986 - 30247	0.13	0.033	-1.48
4123.88	Nd II	3067 - 27309	0.27	0.070	-1.15
4133.36	Nd II	2585 - 26772	0.28	0.071	-1.15
4144.56	Nd II	1650 - 25772	0.075	0.019	-1.72
4156.08	Nd II	1470 - 25524	1.3	0.32	-0.49
4173.38	Nd II	513 - 24468	0.031	0.0081	-2.09
4175.61	Nd II	5086 - 29027	0.90	0.24	-0.63
4177.32	Nd II	513 - 24445	0.72	0.19	-0.72
4179.59	Nd II	1470 - 25389	0.26	0.067	-1.17
4186.04	Nd II	1470 - 25352	0.053	0.014	-1.85
4199.11	Nd II	513 - 24321	0.035	0.0093	-2.03
4205.60	Nd II	5086 - 28857	0.51	0.13	-0.87
4211.29	Nd II	1650 - 25389	0.19	0.051	-1.30
4217.28	Nd II	3067 - 26772	0.070	0.019	-1.73
4220.25	Nd II	2585 - 26274	0.15	0.040	-1.40
4227.73	Nd II	3802 - 27449	0.32	0.085	-1.07
4228.03	Nd II	1650 - 25295	0.073	0.020	-1.71
4228.20	Nd II	3802 - 27446	0.13	0.036	-1.44
4232.38	Nd II	513 - 24134	0.36	0.097	-1.02
4234.19	Nd II	1470 - 25081	0.094	0.025	-1.60
4246.88	Nd II	513 - 24053	0.033	0.0089	-2.05
4247.38	Nd II	0 - 23537	0.49	0.13	-0.88
4256.24	Nd II	1650 - 25138	0.026	0.0070	-2.16
4266.71	Nd II	1650 - 25081	0.13	0.034	-1.46
4270.56	Nd II	0 - 23410	0.055	0.015	-1.82
4272.79	Nd II	0 - 23397	0.079	0.022	-1.67
4277.29	Nd II	1470 - 24843	0.047	0.013	-1.89
4282.57	Nd II	513 - 23857	0.063	0.017	-1.76
4284.52	Nd II	5086 - 28419	0.68	0.19	-0.73
4303.58	Nd II	0 - 23230	1.2	0.34	-0.47
4307.78	Nd II	3067 - 26274	0.11	0.030	-1.53
4310.51	Nd II	1650 - 24843	0.036	0.0100	-2.00
4314.52	Nd II	0 - 23171	0.10	0.029	-1.54
4325.76	Nd II	3802 - 26913	0.70	0.20	-0.71
4338.70	Nd II	5986 - 29027	0.63	0.18	-0.75
4342.07	Nd II	513 - 23537	0.033	0.0094	-2.03
4351.29	Nd II	1470 - 24445	0.22	0.061	-1.21
4358.17	Nd II	2585 - 25524	0.37	0.10	-0.98
4358.70	Nd II	4512 - 27449	0.063	0.018	-1.75
4359.25	Nd II	4512 - 27446	0.050	0.014	-1.84

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4368.64	Nd II	513 - 23397	0.080	0.023	-1.64
4374.93	Nd II	1470 - 24321	0.15	0.042	-1.38
4382.74	Nd II	3067 - 25877	0.057	0.016	-1.79
4385.66	Nd II	1650 - 24445	0.23	0.066	-1.18
4391.10	Nd II	2585 - 25352	0.028	0.0081	-2.09
4400.83	Nd II	513 - 23230	0.12	0.036	-1.44
4411.06	Nd II	1470 - 24134	0.15	0.044	-1.36
4412.27	Nd II	513 - 23171	0.030	0.0089	-2.05
4414.44	Nd II	513 - 23160	0.015	0.0044	-2.35
4426.83	Nd II	1470 - 24053	0.0098	0.0029	-2.54
4446.39	Nd II	1650 - 24134	0.17	0.051	-1.29
4451.57	Nd II	3067 - 25524	0.60	0.18	-0.75
4451.99	Nd II	0 - 22456	0.038	0.011	-1.95
4456.40	Nd II	5986 - 28419	0.30	0.091	-1.04
4462.42	Nd II	1650 - 24053	0.049	0.015	-1.83
4462.99	Nd II	4512 - 26913	0.49	0.15	-0.84
4465.07	Nd II	0 - 22390	0.019	0.0055	-2.26
4465.60	Nd II	1470 - 23857	0.033	0.0098	-2.01
4470.97	Nd II	5086 - 27446	0.064	0.019	-1.71
4475.57	Nd II	513 - 22851	0.0088	0.0027	-2.58
4485.95	Nd II	3067 - 25352	0.018	0.0054	-2.27
4501.82	Nd II	1650 - 23857	0.11	0.034	-1.46
4506.59	Nd II	513 - 22697	0.041	0.012	-1.91
4541.27	Nd II	3067 - 25081	0.13	0.042	-1.38
4554.97	Nd II	3067 - 25014	0.013	0.0041	-2.39
4556.14	Nd II	513 - 22456	0.019	0.0060	-2.22
4556.74	Nd II	1470 - 23410	0.021	0.0066	-2.18
4567.61	Nd II	1650 - 23537	0.022	0.0068	-2.17
4594.45	Nd II	1650 - 23410	0.021	0.0067	-2.17
4597.02	Nd II	1650 - 23397	0.051	0.016	-1.79
4607.38	Nd II	4512 - 26211	0.023	0.0075	-2.13
4612.47	Nd II	513 - 22188	0.0060	0.0019	-2.72
4632.64	Nd II	1650 - 23230	0.012	0.0039	-2.41
4680.74	Nd II	513 - 21871	0.039	0.013	-1.89
4703.57	Nd II	3067 - 24321	0.062	0.020	-1.69
4706.54	Nd II	0 - 21241	0.094	0.031	-1.50
4709.71	Nd II	1470 - 22697	0.057	0.019	-1.72
4715.59	Nd II	1650 - 22851	0.059	0.020	-1.70
4763.62	Nd II	3067 - 24053	0.021	0.0072	-2.14
4763.87	Nd II	1470 - 22456	0.024	0.0080	-2.10
4797.15	Nd II	4512 - 25352	0.077	0.026	-1.58
4799.42	Nd II	0 - 20830	0.011	0.0037	-2.43
4811.34	Nd II	513 - 21292	0.049	0.017	-1.77
4820.34	Nd II	1650 - 22390	0.040	0.014	-1.86
4824.18	Nd II	4512 - 25235	0.0089	0.0031	-2.51
4825.48	Nd II	1470 - 22188	0.095	0.033	-1.48
4835.98	Nd II	0 - 20673	0.012	0.0043	-2.36
4859.02	Nd II	2585 - 23160	0.10	0.036	-1.45
4867.84	Nd II	1650 - 22188	0.013	0.0045	-2.34
4876.12	Nd II	4512 - 25014	0.014	0.0050	-2.30

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4902.03	Nd II	513 - 20907	0.020	0.0072	-2.14
4914.37	Nd II	3067 - 23410	0.064	0.023	-1.64
4920.68	Nd II	513 - 20830	0.061	0.022	-1.65
4930.72	Nd II	6637 - 26913	0.037	0.013	-1.87
4942.95	Nd II	5986 - 26211	0.030	0.011	-1.96
4943.90	Nd II	1650 - 21871	0.015	0.0054	-2.27
4958.10	Nd II	3067 - 23230	0.026	0.0096	-2.02
4959.13	Nd II	513 - 20673	0.068	0.025	-1.60
4961.39	Nd II	5086 - 25235	0.12	0.045	-1.34
4970.93	Nd II	2585 - 22697	0.015	0.0056	-2.25
5027.85	Nd II	4438 - 24321	0.042	0.016	-1.80
5033.52	Nd II	9166 - 29027	0.36	0.14	-0.86
5089.84	Nd II	1650 - 21292	0.041	0.016	-1.79
5092.80	Nd II	3067 - 22697	0.15	0.060	-1.22
5096.52	Nd II	4438 - 24053	0.039	0.015	-1.81
5102.39	Nd II	5488 - 25081	0.15	0.059	-1.23
5107.59	Nd II	6637 - 26211	0.42	0.16	-0.79
5119.61	Nd II	5488 - 25014	0.030	0.012	-1.93
5130.60	Nd II	10517 - 30002	2.3	0.90	-0.05
5143.33	Nd II	1470 - 20907	0.021	0.0084	-2.08
5165.14	Nd II	5488 - 24843	0.14	0.054	-1.27
5167.92	Nd II	4512 - 23857	0.054	0.022	-1.66
5181.17	Nd II	6932 - 26227	0.15	0.060	-1.22
5182.60	Nd II	6005 - 25295	0.11	0.043	-1.37
5191.45	Nd II	1650 - 20907	0.13	0.053	-1.28
5192.62	Nd II	9166 - 28419	1.4	0.56	-0.25
5212.37	Nd II	1650 - 20830	0.079	0.032	-1.49
5225.05	Nd II	6005 - 25138	0.11	0.045	-1.35
5228.43	Nd II	3067 - 22188	0.048	0.020	-1.71
5234.20	Nd II	4438 - 23537	0.25	0.10	-0.99
5249.59	Nd II	7869 - 26913	1.0	0.43	-0.37
5250.82	Nd II	6005 - 25045	0.17	0.070	-1.16
5255.51	Nd II	1650 - 20673	0.090	0.037	-1.43
5273.43	Nd II	5488 - 24445	0.42	0.18	-0.75
5276.88	Nd II	6932 - 25877	0.16	0.065	-1.19
5293.17	Nd II	6637 - 25524	0.67	0.28	-0.55
5302.28	Nd II	11392 - 30247	0.61	0.26	-0.59
5306.47	Nd II	6932 - 25772	0.11	0.048	-1.32
5308.42	Nd II	10195 - 29027	0.072	0.030	-1.52
5311.46	Nd II	7950 - 26772	0.30	0.13	-0.89
5319.82	Nd II	4438 - 23230	0.26	0.11	-0.96
5336.55	Nd II	4438 - 23171	0.046	0.020	-1.71
5345.71	Nd II	9043 - 27744	0.15	0.065	-1.19
5356.98	Nd II	10195 - 28857	0.46	0.20	-0.70
5361.17	Nd II	4512 - 23160	0.023	0.0099	-2.00
5361.47	Nd II	5488 - 24134	0.19	0.084	-1.08
5371.94	Nd II	11392 - 30002	0.54	0.23	-0.63
5399.12	Nd II	7525 - 26041	0.026	0.011	-1.94
5416.38	Nd II	6932 - 25389	0.070	0.031	-1.51
5421.56	Nd II	6005 - 24445	0.060	0.027	-1.58

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
5431.53	Nd II	9043 - 27449	0.28	0.12	-0.90
5432.36	Nd II	9043 - 27446	0.063	0.028	-1.56
5442.27	Nd II	5488 - 23857	0.057	0.025	-1.60
5447.56	Nd II	8420 - 26772	0.052	0.023	-1.64
5455.82	Nd II	7950 - 26274	0.090	0.040	-1.39
5473.08	Nd II	9043 - 27309	0.061	0.027	-1.56
5474.73	Nd II	7950 - 26211	0.056	0.025	-1.60
5483.12	Nd II	7950 - 26182	0.022	0.0100	-2.00
5485.70	Nd II	10195 - 28419	0.40	0.18	-0.75
5487.03	Nd II	8420 - 26640	0.032	0.014	-1.85
5508.40	Nd II	6932 - 25081	0.033	0.015	-1.83
5539.26	Nd II	6005 - 24053	0.018	0.0085	-2.07
5548.47	Nd II	4438 - 22456	0.023	0.011	-1.96
5581.60	Nd II	6932 - 24843	0.027	0.013	-1.90
5594.43	Nd II	9043 - 26913	0.36	0.17	-0.77
5603.65	Nd II	3067 - 20907	0.0077	0.0036	-2.44
5614.30	Nd II	8420 - 26227	0.046	0.022	-1.66
5625.72	Nd II	7525 - 25295	0.035	0.017	-1.78
5668.87	Nd II	11392 - 29027	0.20	0.098	-1.01
5688.53	Nd II	7950 - 25524	0.23	0.11	-0.95
5698.93	Nd II	12460 - 30002	0.17	0.082	-1.08
5702.24	Nd II	6005 - 23537	0.076	0.037	-1.43
5706.21	Nd II	7525 - 25045	0.075	0.037	-1.44
5708.28	Nd II	6932 - 24445	0.13	0.062	-1.21
5718.12	Nd II	11373 - 28857	0.22	0.11	-0.97
5726.83	Nd II	8420 - 25877	0.074	0.037	-1.44
5740.86	Nd II	9358 - 26772	0.11	0.054	-1.27
5743.20	Nd II	10337 - 27744	0.063	0.031	-1.51
5744.14	Nd II	6005 - 23410	0.0064	0.0031	-2.50
5744.77	Nd II	7950 - 25352	0.046	0.023	-1.64
5748.15	Nd II	6005 - 23397	0.019	0.0092	-2.04
5761.70	Nd II	8420 - 25772	0.036	0.018	-1.74
5770.50	Nd II	8717 - 26041	0.056	0.028	-1.55
5804.02	Nd II	6005 - 23230	0.092	0.046	-1.33
5811.57	Nd II	6931 - 24134	0.059	0.030	-1.52
5825.87	Nd II	8717 - 25877	0.086	0.044	-1.36
5842.39	Nd II	10337 - 27449	0.15	0.078	-1.11
5865.06	Nd II	11373 - 28419	0.089	0.046	-1.34
5891.53	Nd II	8420 - 25389	0.038	0.020	-1.70
5900.43	Nd II	7525 - 24468	0.018	0.0096	-2.02
5906.65	Nd II	6932 - 23857	0.019	0.0097	-2.01
5934.75	Nd II	6005 - 22851	0.014	0.0074	-2.13
5989.34	Nd II	6005 - 22697	0.016	0.0085	-2.07
6031.27	Nd II	10337 - 26913	0.060	0.033	-1.49
6034.24	Nd II	12460 - 29027	0.14	0.074	-1.13
6108.41	Nd II	9674 - 26041	0.019	0.011	-1.97
6170.49	Nd II	9674 - 25877	0.046	0.026	-1.58
6183.91	Nd II	9358 - 25524	0.031	0.018	-1.75
6238.50	Nd II	8420 - 24445	0.019	0.011	-1.95
6298.42	Nd II	7525 - 23397	0.010	0.0062	-2.21

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6362.09	Nd II	8420 - 24134	0.014	0.0087	-2.06
6365.55	Nd II	7525 - 23230	0.011	0.0068	-2.17
6504.46	Nd II	9675 - 25045	0.0086	0.0054	-2.26
6523.15	Nd II	7525 - 22851	0.0041	0.0026	-2.58
6539.94	Nd II	6005 - 21292	0.0047	0.0030	-2.53
6553.07	Nd II	6932 - 22188	0.0060	0.0039	-2.41
6669.65	Nd II	8420 - 23410	0.0099	0.0066	-2.18
6816.02	Nd II	6005 - 20673	0.0058	0.0041	-2.39
7261.64	Nd II	8420 - 22188	0.0066	0.0053	-2.28
7285.29	Nd II	9675 - 23397	0.012	0.0096	-2.02
7288.56	Nd II	7525 - 21241	0.0066	0.0052	-2.28
7513.77	Nd II	7525 - 20830	0.012	0.0099	-2.00
7587.66	Nd II	9675 - 22851	0.0084	0.0072	-2.14
7603.75	Nd II	7525 - 20673	0.0039	0.0034	-2.47
7792.24	Nd II	9358 - 22188	0.0071	0.0065	-2.19
7796.42	Nd II	10337 - 23160	0.0080	0.0073	-2.13
7825.20	Nd II	12460 - 25235	0.012	0.011	-1.95
7982.09	Nd II	8717 - 21241	0.012	0.011	-1.94
8643.48	Nd II	9675 - 21241	0.0069	0.0078	-2.11

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2289.98	Ni I	0 - 43655	5.0	0.39	-0.40
2300.78	Ni I	205 - 43655	2.2	0.18	-0.75
2310.96	Ni I	0 - 43259	7.6	0.60	-0.22
2312.34	Ni I	1332 - 44565	9.5	0.76	-0.12
2313.98	Ni I	2217 - 45419	10.	0.82	-0.09
2317.16	Ni I	1332 - 44475	7.8	0.63	-0.20
2320.03	Ni I	0 - 43090	11.	0.86	-0.07
2321.38	Ni I	2217 - 45281	13.	1.1	0.04
2325.79	Ni I	1332 - 44315	8.9	0.72	-0.14
2329.96	Ni I	2217 - 45122	7.3	0.59	-0.23
2337.49	Ni I	0 - 42768	2.0	0.16	-0.79
2337.82	Ni I	1713 - 44475	1.1	0.088	-1.05
2345.54	Ni I	0 - 42621	5.5	0.46	-0.34
2346.63	Ni I	1332 - 43933	1.2	0.10	-0.99
2347.52	Ni I	0 - 42585	1.9	0.16	-0.80
2360.63	Ni I	2217 - 44565	1.5	0.12	-0.91
2362.06	Ni I	1332 - 43655	1.4	0.12	-0.92
2386.58	Ni I	880 - 42768	1.8	0.15	-0.81
2419.31	Ni I	1332 - 42654	2.7	0.23	-0.63
2421.23	Ni I	1332 - 42621	0.88	0.077	-1.11
2423.33	Ni I	1332 - 42585	0.87	0.077	-1.11
2423.66	Ni I	2217 - 43464	1.1	0.099	-1.01
2424.03	Ni I	1713 - 42954	0.97	0.085	-1.07
2453.99	Ni I	2217 - 42954	1.5	0.13	-0.88
2472.06	Ni I	2217 - 42656	2.5	0.23	-0.64
2476.87	Ni I	0 - 40361	0.71	0.066	-1.18
2696.49	Ni I	3410 - 40484	0.40	0.044	-1.36
2798.65	Ni I	880 - 36601	0.56	0.066	-1.18
2821.29	Ni I	205 - 35639	0.72	0.086	-1.07
2865.50	Ni I	1713 - 36601	0.19	0.024	-1.63
2907.46	Ni I	2217 - 36601	0.24	0.031	-1.51
2914.01	Ni I	1332 - 35639	0.074	0.0094	-2.03
2943.91	Ni I	205 - 34163	0.99	0.13	-0.89
2981.65	Ni I	880 - 34409	1.2	0.16	-0.78
2984.13	Ni I	0 - 33501	0.41	0.055	-1.26
2992.60	Ni I	205 - 33611	0.86	0.12	-0.94
2994.46	Ni I	205 - 33590	1.7	0.23	-0.64
3002.49	Ni I	205 - 33501	6.7	0.90	-0.04
3003.63	Ni I	880 - 34163	4.5	0.61	-0.21
3012.00	Ni I	3410 - 36601	15.	2.0	0.31
3019.14	Ni I	0 - 33112	0.53	0.072	-1.14
3031.87	Ni I	0 - 32973	0.18	0.025	-1.60
3037.94	Ni I	205 - 33112	2.6	0.37	-0.44
3045.01	Ni I	1332 - 34163	0.31	0.043	-1.37
3050.82	Ni I	205 - 32973	5.1	0.71	-0.15
3054.32	Ni I	880 - 33611	2.6	0.37	-0.43
3057.64	Ni I	1713 - 34409	4.1	0.58	-0.24
3064.62	Ni I	880 - 33501	0.85	0.12	-0.92
3080.76	Ni I	1713 - 34163	0.98	0.14	-0.86
3097.12	Ni I	1332 - 33611	0.53	0.077	-1.12

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3099.12	Ni I	1332 - 33590	0.42	0.060	-1.22
3101.55	Ni I	880 - 33112	4.6	0.67	-0.17
3101.88	Ni I	3410 - 35639	4.7	0.68	-0.17
3105.47	Ni I	2217 - 34409	0.56	0.081	-1.09
3114.12	Ni I	880 - 32982	0.47	0.068	-1.17
3134.11	Ni I	1713 - 33611	5.8	0.86	-0.07
3145.72	Ni I	1332 - 33112	0.098	0.015	-1.84
3181.74	Ni I	15610 - 47030	5.1	0.77	-0.11
3184.37	Ni I	2217 - 33611	0.21	0.031	-1.51
3195.57	Ni I	2217 - 33501	0.11	0.017	-1.77
3197.11	Ni I	1713 - 32982	0.27	0.041	-1.39
3202.14	Ni I	25754 - 56974	23.	3.5	0.55
3214.06	Ni I	25754 - 56858	73.	11.	1.05
3217.83	Ni I	25754 - 56821	73.	11.	1.05
3221.27	Ni I	30923 - 61958	56.	8.8	0.94
3221.65	Ni I	0 - 31031	0.16	0.024	-1.61
3225.02	Ni I	3410 - 34409	0.55	0.086	-1.07
3232.96	Ni I	0 - 30923	1.1	0.17	-0.77
3234.65	Ni I	880 - 31786	0.36	0.057	-1.25
3243.06	Ni I	205 - 31031	0.62	0.097	-1.01
3248.46	Ni I	205 - 30980	0.100	0.016	-1.80
3250.74	Ni I	3410 - 34163	0.30	0.047	-1.32
3271.12	Ni I	880 - 31442	0.11	0.018	-1.74
3282.70	Ni I	1332 - 31786	0.15	0.025	-1.60
3315.66	Ni I	880 - 31031	0.69	0.11	-0.95
3320.26	Ni I	1332 - 31442	0.39	0.064	-1.19
3322.31	Ni I	3410 - 33501	0.65	0.11	-0.97
3361.56	Ni I	880 - 30619	0.31	0.053	-1.28
3365.77	Ni I	3410 - 33112	0.63	0.11	-0.97
3366.17	Ni I	1332 - 31031	0.35	0.059	-1.23
3366.81	Ni I	27261 - 56954	29.	4.9	0.69
3367.89	Ni I	205 - 29888	0.051	0.0086	-2.06
3369.57	Ni I	0 - 29669	2.1	0.35	-0.45
3371.99	Ni I	1332 - 30980	0.41	0.071	-1.15
3374.22	Ni I	205 - 29833	0.20	0.034	-1.47
3374.64	Ni I	27261 - 56885	57.	9.8	0.99
3380.57	Ni I	3410 - 32982	6.1	1.0	0.02
3380.85	Ni I	2217 - 31786	0.32	0.055	-1.26
3391.05	Ni I	0 - 29481	0.91	0.16	-0.80
3392.99	Ni I	205 - 29669	2.4	0.41	-0.38
3409.58	Ni I	0 - 29321	0.087	0.015	-1.82
3413.48	Ni I	1332 - 30619	0.32	0.055	-1.26
3413.94	Ni I	880 - 30163	0.28	0.048	-1.31
3414.76	Ni I	205 - 29481	5.7	1.0	0.00
3423.71	Ni I	1713 - 30913	1.7	0.30	-0.52
3433.56	Ni I	205 - 29321	1.8	0.31	-0.51
3437.28	Ni I	0 - 29084	0.62	0.11	-0.96
3446.26	Ni I	880 - 29888	3.8	0.68	-0.17
3452.89	Ni I	880 - 29833	1.0	0.18	-0.74
3458.47	Ni I	1713 - 30619	4.9	0.88	-0.06

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3461.65	Ni I	205 - 29084	3.2	0.57	-0.24
3467.50	Ni I	1332 - 30163	0.17	0.030	-1.52
3469.49	Ni I	2217 - 31031	0.26	0.048	-1.32
3472.54	Ni I	880 - 29669	1.2	0.22	-0.65
3483.77	Ni I	2217 - 30913	0.58	0.11	-0.97
3485.89	Ni I	1713 - 30392	0.12	0.022	-1.66
3492.96	Ni I	880 - 29501	3.9	0.72	-0.14
3500.85	Ni I	1332 - 29888	0.53	0.097	-1.01
3502.60	Ni I	0 - 28542	0.036	0.0066	-2.18
3507.69	Ni I	1332 - 29833	0.043	0.0080	-2.10
3510.34	Ni I	1713 - 30192	2.3	0.43	-0.37
3513.93	Ni I	1713 - 30163	0.23	0.042	-1.37
3515.05	Ni I	880 - 29321	4.5	0.83	-0.08
3519.77	Ni I	2217 - 30619	0.65	0.12	-0.92
3524.54	Ni I	205 - 28569	4.6	0.85	-0.07
3527.98	Ni I	1332 - 29669	0.083	0.016	-1.81
3548.18	Ni I	2217 - 30392	0.31	0.058	-1.24
3551.53	Ni I	1332 - 29481	0.040	0.0075	-2.12
3561.75	Ni I	0 - 28068	0.032	0.0061	-2.21
3566.37	Ni I	3410 - 31442	6.4	1.2	0.08
3571.87	Ni I	1332 - 29321	0.69	0.13	-0.88
3587.93	Ni I	205 - 28068	0.065	0.012	-1.90
3597.70	Ni I	1713 - 29501	0.97	0.19	-0.73
3610.46	Ni I	880 - 28569	0.75	0.15	-0.83
3612.74	Ni I	2217 - 29888	0.43	0.085	-1.07
3619.39	Ni I	3410 - 31031	7.5	1.5	0.17
3624.73	Ni I	0 - 27580	0.057	0.011	-1.95
3664.10	Ni I	2217 - 29501	0.15	0.030	-1.53
3669.24	Ni I	1332 - 28578	0.076	0.015	-1.81
3670.43	Ni I	1332 - 28569	0.10	0.020	-1.69
3674.15	Ni I	205 - 27415	0.11	0.022	-1.65
3688.42	Ni I	2217 - 29321	0.13	0.026	-1.59
3693.93	Ni I	880 - 27944	0.043	0.0088	-2.06
3722.48	Ni I	1713 - 28569	0.077	0.016	-1.79
3736.81	Ni I	3410 - 30163	0.15	0.032	-1.50
3739.23	Ni I	1332 - 28068	0.034	0.0071	-2.15
3775.57	Ni I	3410 - 29888	0.57	0.12	-0.92
3783.53	Ni I	3410 - 29833	0.65	0.14	-0.85
3807.14	Ni I	3410 - 29669	0.63	0.14	-0.86
3831.69	Ni I	3410 - 29501	0.10	0.023	-1.64
3858.30	Ni I	3410 - 29321	1.1	0.24	-0.62
3889.67	Ni I	1713 - 27415	0.017	0.0039	-2.41
3972.17	Ni I	3410 - 28578	0.028	0.0065	-2.19
3973.56	Ni I	3410 - 28569	0.082	0.020	-1.71
4401.55	Ni I	25754 - 48467	23.	6.8	0.83
4459.04	Ni I	26666 - 49086	20.	6.0	0.78
4462.46	Ni I	27944 - 50346	5.7	1.7	0.23
4470.48	Ni I	27415 - 49778	15.	4.6	0.67
4592.53	Ni I	28578 - 50346	12.	3.7	0.57
4600.37	Ni I	29013 - 50745	6.3	2.0	0.30

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
4605.00	Ni I	28068 - 49778	19.	5.9	0.77
4606.23	Ni I	29013 - 50717	6.2	2.0	0.30
4648.66	Ni I	27580 - 49086	19.	6.1	0.78
4686.22	Ni I	29013 - 50346	7.5	2.5	0.39
4714.42	Ni I	27261 - 48467	21.	7.0	0.84
4715.78	Ni I	28578 - 49778	5.4	1.8	0.26
4756.52	Ni I	28068 - 49086	7.2	2.4	0.39
4763.95	Ni I	29481 - 50466	4.3	1.5	0.17
4786.54	Ni I	27580 - 48467	8.5	2.9	0.47
4807.00	Ni I	29669 - 50466	6.3	2.2	0.34
4829.03	Ni I	28569 - 49271	5.0	1.8	0.25
4831.18	Ni I	29084 - 49778	5.0	1.8	0.24
4855.41	Ni I	28569 - 49159	9.9	3.5	0.55
4866.27	Ni I	28542 - 49086	7.4	2.6	0.42
4873.44	Ni I	29833 - 50346	5.0	1.8	0.25
4904.41	Ni I	28569 - 48953	8.4	3.0	0.48
4918.36	Ni I	30980 - 51306	7.3	2.7	0.43
4935.83	Ni I	31786 - 52040	4.9	1.8	0.26
4980.16	Ni I	29084 - 49158	8.9	3.3	0.52
4984.13	Ni I	30619 - 50678	12.	4.4	0.64
5000.34	Ni I	29321 - 49314	3.2	1.2	0.07
5012.46	Ni I	29833 - 49778	4.0	1.5	0.18
5017.59	Ni I	28542 - 48467	8.9	3.4	0.53
5035.37	Ni I	29321 - 49175	21.	7.9	0.90
5048.85	Ni I	31031 - 50832	4.2	1.6	0.20
5080.52	Ni I	29481 - 49158	21.	8.0	0.91
5081.11	Ni I	31031 - 50706	17.	6.7	0.82
5084.08	Ni I	29669 - 49333	5.4	2.1	0.32
5099.32	Ni I	29481 - 49086	3.6	1.4	0.15
5099.95	Ni I	29669 - 49271	5.3	2.1	0.32
5115.40	Ni I	30923 - 50466	5.3	2.1	0.32
5129.38	Ni I	29669 - 49159	3.7	1.4	0.16
5137.08	Ni I	13521 - 32982	0.055	0.022	-1.66
5142.77	Ni I	29888 - 49328	4.9	1.9	0.29
5146.48	Ni I	29888 - 49314	8.1	3.2	0.51
5155.76	Ni I	31442 - 50832	11.	4.3	0.63
5168.66	Ni I	29833 - 49175	3.2	1.3	0.11
5176.56	Ni I	31442 - 50754	3.5	1.4	0.15
5435.87	Ni I	16017 - 34409	0.029	0.013	-1.89
5476.91	Ni I	14729 - 32982	0.46	0.21	-0.68
5510.00	Ni I	31031 - 49175	1.4	0.64	-0.19
5578.73	Ni I	13521 - 31442	0.011	0.0051	-2.30
5587.86	Ni I	15610 - 33501	0.027	0.013	-1.90
5592.28	Ni I	15734 - 33611	0.040	0.019	-1.73
5614.79	Ni I	33501 - 51306	2.9	1.4	0.14
5625.33	Ni I	32982 - 50754	1.5	0.73	-0.14
5649.70	Ni I	33611 - 51306	1.3	0.61	-0.22
5664.02	Ni I	36601 - 54251	2.5	1.2	0.08
5682.20	Ni I	33112 - 50706	3.5	1.7	0.22
5695.00	Ni I	32982 - 50537	2.2	1.1	0.04

Wavelength	Spectrum	Energy Levels	gA 10 ⁸ /sec	gf	Log gf
A		K			
5709.56	Ni I	13521 - 31031	0.036	0.017	-1.76
5711.90	Ni I	15610 - 33112	0.028	0.014	-1.86
5715.09	Ni I	32973 - 50466	3.0	1.5	0.16
5754.68	Ni I	15610 - 32982	0.041	0.021	-1.69
5760.85	Ni I	33112 - 50466	2.2	1.1	0.05
5857.76	Ni I	33611 - 50678	3.2	1.6	0.21
5892.88	Ni I	16017 - 32982	0.028	0.015	-1.83
6108.12	Ni I	13521 - 29888	0.012	0.0069	-2.16
6176.81	Ni I	32973 - 49158	2.5	1.4	0.16
6191.18	Ni I	13521 - 29669	0.012	0.0067	-2.17
6256.36	Ni I	13521 - 29501	0.014	0.0083	-2.08
6314.66	Ni I	15610 - 31442	0.020	0.012	-1.93
6643.64	Ni I	13521 - 28569	0.021	0.014	-1.86
6767.77	Ni I	14729 - 29501	0.038	0.026	-1.58
6772.32	Ni I	29501 - 44263	0.98	0.67	-0.17
6914.56	Ni I	15734 - 30192	0.023	0.016	-1.79
7110.90	Ni I	15610 - 29669	0.013	0.010	-1.99
7122.20	Ni I	28569 - 42606	2.6	2.0	0.29
7182.00	Ni I	30192 - 44112	1.00	0.77	-0.11
7197.02	Ni I	15610 - 29501	0.013	0.010	-2.00
7261.93	Ni I	15734 - 29501	0.013	0.010	-1.99
7291.45	Ni I	15610 - 29321	0.011	0.0087	-2.06
7385.24	Ni I	22102 - 35639	0.056	0.046	-1.34
7393.60	Ni I	29084 - 42606	1.7	1.4	0.14
7409.35	Ni I	30619 - 44112	2.6	2.1	0.33
7414.51	Ni I	16017 - 29501	0.013	0.011	-1.96
7422.28	Ni I	29321 - 42790	2.5	2.0	0.31
7522.76	Ni I	29501 - 42790	1.4	1.2	0.09
7525.12	Ni I	29321 - 42606	0.95	0.81	-0.09
7555.60	Ni I	31031 - 44263	3.3	2.8	0.45
7574.05	Ni I	30913 - 44112	1.3	1.1	0.03
7617.00	Ni I	29481 - 42606	2.4	2.1	0.32
7619.21	Ni I	29669 - 42790	1.0	0.89	-0.05
7714.32	Ni I	15610 - 28569	0.033	0.030	-1.53
7715.58	Ni I	29833 - 42790	0.59	0.53	-0.28
7727.61	Ni I	29669 - 42606	2.1	1.9	0.27
7748.89	Ni I	29888 - 42790	2.2	2.0	0.30
7788.94	Ni I	15734 - 28569	0.022	0.020	-1.71
7797.59	Ni I	31442 - 44263	2.3	2.1	0.31
7917.44	Ni I	30163 - 42790	0.23	0.21	-0.67
8809.42	Ni I	31442 - 42790	0.25	0.29	-0.53
8862.55	Ni I	32982 - 44263	1.8	2.1	0.33

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2316.04	Ni II	8394 - 51558	59.	4.8	0.68
2394.52	Ni II	13550 - 55300	167.	14.	1.16
2416.14	Ni II	14995 - 56371	155.	14.	1.13
2437.89	Ni II	13550 - 54557	79.	7.0	0.85

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2001.45	0s I	0 - 49947	2.9	0.17	-0.76
2003.73	0s I	4159 - 54050	7.4	0.45	-0.35
2018.14	0s I	0 - 49534	10.	0.63	-0.20
2022.76	0s I	2740 - 52162	8.4	0.52	-0.29
2028.23	0s I	4159 - 53447	10.0	0.62	-0.21
2034.44	0s I	0 - 49138	7.1	0.44	-0.36
2048.28	0s I	2740 - 51546	5.4	0.34	-0.47
2049.42	0s I	4159 - 52938	6.6	0.42	-0.38
2061.69	0s I	2740 - 51229	10.	0.67	-0.18
2076.95	0s I	0 - 48132	3.8	0.24	-0.61
2079.97	0s I	0 - 48062	7.5	0.48	-0.32
2082.54	0s I	4159 - 52162	3.5	0.23	-0.65
2089.03	0s I	0 - 47854	1.6	0.10	-0.98
2089.21	0s I	2740 - 50589	2.7	0.18	-0.75
2097.60	0s I	5144 - 52802	8.6	0.56	-0.25
2100.63	0s I	2740 - 50330	5.9	0.39	-0.41
2117.66	0s I	2740 - 49947	2.5	0.17	-0.78
2117.96	0s I	0 - 47200	3.1	0.21	-0.68
2123.84	0s I	4159 - 51229	3.1	0.21	-0.68
2137.11	0s I	4159 - 50937	9.6	0.66	-0.18
2154.59	0s I	2740 - 49138	4.3	0.30	-0.52
2157.84	0s I	0 - 46328	1.1	0.079	-1.10
2158.53	0s I	2740 - 49054	2.1	0.15	-0.83
2166.90	0s I	4159 - 50294	7.4	0.52	-0.28
2171.65	0s I	2740 - 48773	4.0	0.28	-0.55
2184.68	0s I	0 - 45759	0.94	0.068	-1.17
2202.49	0s I	0 - 45389	0.86	0.062	-1.20
2227.98	0s I	0 - 44870	0.75	0.056	-1.25
2234.61	0s I	2740 - 47477	3.1	0.23	-0.63
2252.15	0s I	8743 - 53131	13.	0.97	-0.01
2255.85	0s I	2740 - 47052	6.7	0.51	-0.29
2264.60	0s I	4159 - 48303	7.1	0.55	-0.26
2268.28	0s I	2740 - 46813	1.3	0.10	-0.98
2270.17	0s I	2740 - 46776	3.7	0.28	-0.55
2283.67	0s I	4159 - 47935	4.9	0.38	-0.42
2289.32	0s I	4159 - 47828	3.5	0.27	-0.57
2297.31	0s I	0 - 43516	0.79	0.063	-1.20
2324.24	0s I	0 - 43011	1.5	0.12	-0.91
2325.51	0s I	5144 - 48132	1.6	0.13	-0.87
2326.99	0s I	6093 - 49054	4.0	0.32	-0.49
2334.56	0s I	2740 - 45562	1.7	0.14	-0.86
2338.63	0s I	0 - 42747	1.2	0.098	-1.01
2340.69	0s I	5144 - 47854	3.1	0.26	-0.59
2343.74	0s I	4159 - 46813	3.8	0.31	-0.50
2345.75	0s I	4159 - 46776	2.4	0.20	-0.70
2347.38	0s I	8743 - 51329	9.5	0.78	-0.11
2351.55	0s I	10166 - 52678	1.7	0.14	-0.86
2351.72	0s I	11378 - 53887	2.0	0.16	-0.79
2352.99	0s I	8743 - 51229	8.5	0.71	-0.15
2357.25	0s I	8743 - 51152	5.9	0.49	-0.31

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2362.41	0s I	0 - 42317	0.97	0.081	-1.09
2362.77	0s I	0 - 42310	2.7	0.23	-0.65
2363.33	0s I	8743 - 51043	5.0	0.42	-0.38
2369.24	0s I	8743 - 50937	8.2	0.69	-0.16
2370.70	0s I	4159 - 46328	5.3	0.44	-0.35
2371.18	0s I	8743 - 50903	14.	1.2	0.07
2374.33	0s I	4159 - 46264	0.91	0.077	-1.11
2374.51	0s I	11031 - 53131	3.9	0.33	-0.48
2377.03	0s I	5144 - 47200	39.	3.3	0.52
2377.61	0s I	11378 - 53424	12.	0.99	-0.00
2378.14	0s I	5766 - 47802	1.6	0.13	-0.88
2378.74	0s I	12774 - 54800	4.8	0.41	-0.39
2379.39	0s I	5144 - 47158	13.	1.1	0.04
2379.64	0s I	4159 - 46170	2.1	0.18	-0.75
2380.82	0s I	2740 - 44730	0.67	0.057	-1.24
2382.46	0s I	11378 - 53338	8.1	0.69	-0.16
2384.62	0s I	2740 - 44663	1.9	0.16	-0.79
2387.29	0s I	0 - 41876	6.0	0.52	-0.29
2394.29	0s I	11378 - 53131	17.	1.5	0.16
2395.39	0s I	2740 - 44475	2.3	0.20	-0.70
2395.88	0s I	0 - 41726	4.0	0.34	-0.46
2396.78	0s I	12774 - 54484	13.	1.1	0.06
2397.61	0s I	11378 - 53073	3.4	0.29	-0.54
2398.18	0s I	11031 - 52716	5.4	0.46	-0.33
2401.13	0s I	8743 - 50377	36.	3.1	0.50
2402.23	0s I	4159 - 45775	3.4	0.29	-0.53
2403.54	0s I	10166 - 51759	9.4	0.82	-0.09
2403.85	0s I	8743 - 50330	12.	1.0	0.02
2405.45	0s I	11378 - 52938	16.	1.3	0.13
2405.96	0s I	8743 - 50294	7.4	0.65	-0.19
2408.67	0s I	11031 - 52535	20.	1.7	0.24
2410.98	0s I	13020 - 54484	17.	1.5	0.18
2414.10	0s I	8743 - 50154	3.6	0.32	-0.50
2414.52	0s I	2740 - 44144	2.6	0.23	-0.64
2417.99	0s I	4159 - 45503	7.8	0.68	-0.17
2418.35	0s I	11378 - 52716	5.4	0.48	-0.32
2418.53	0s I	2740 - 44075	5.2	0.46	-0.34
2421.15	0s I	12774 - 54064	3.8	0.34	-0.47
2424.56	0s I	0 - 41232	2.3	0.21	-0.69
2424.97	0s I	0 - 41225	6.9	0.61	-0.21
2426.19	0s I	8743 - 49947	2.8	0.25	-0.60
2429.67	0s I	10166 - 51311	2.7	0.24	-0.63
2431.19	0s I	5144 - 46264	8.1	0.72	-0.14
2431.61	0s I	11378 - 52491	27.	2.4	0.39
2435.51	0s I	5766 - 46813	3.6	0.32	-0.49
2435.65	0s I	13020 - 54064	13.	1.1	0.06
2436.51	0s I	13020 - 54050	2.6	0.23	-0.64
2440.68	0s I	11378 - 52338	3.1	0.28	-0.56
2442.00	0s I	13365 - 54302	8.0	0.71	-0.15
2445.88	0s I	12774 - 53647	7.4	0.66	-0.18

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2446.02	0s I	2740 - 43611	4.0	0.36	-0.44
2450.74	0s I	8743 - 49534	50.	4.5	0.65
2451.19	0s I	11378 - 52162	6.1	0.55	-0.26
2451.73	0s I	2740 - 43516	6.2	0.56	-0.25
2453.29	0s I	5766 - 46515	1.7	0.15	-0.82
2453.90	0s I	8743 - 49483	29.	2.6	0.42
2456.46	0s I	2740 - 43437	6.1	0.55	-0.26
2457.16	0s I	13365 - 54050	7.8	0.71	-0.15
2459.84	0s I	5766 - 46407	2.9	0.27	-0.57
2461.42	0s I	5144 - 45759	40.	3.6	0.56
2464.50	0s I	12774 - 53338	18.	1.6	0.21
2468.09	0s I	10166 - 50671	7.3	0.67	-0.17
2472.28	0s I	5766 - 46202	7.5	0.69	-0.16
2474.78	0s I	8743 - 49138	15.	1.4	0.13
2475.69	0s I	11378 - 51759	8.7	0.80	-0.10
2476.84	0s I	0 - 40362	4.4	0.40	-0.39
2480.71	0s I	11031 - 51329	2.3	0.21	-0.68
2482.43	0s I	2740 - 43011	3.7	0.34	-0.46
2484.04	0s I	5144 - 45389	0.73	0.067	-1.17
2488.55	0s I	5144 - 45316	90.	8.4	0.92
2489.04	0s I	10166 - 50330	4.7	0.43	-0.36
2491.02	0s I	8743 - 48875	14.	1.3	0.12
2491.69	0s I	11031 - 51152	21.	2.0	0.30
2492.42	0s I	6093 - 46202	9.4	0.88	-0.06
2493.83	0s I	0 - 40087	0.27	0.025	-1.60
2498.41	0s I	8743 - 48756	127.	12.	1.08
2499.92	0s I	14339 - 54328	38.	3.6	0.55
2500.91	0s I	14091 - 54064	11.	0.99	-0.00
2501.84	0s I	14091 - 54050	6.6	0.62	-0.21
2502.29	0s I	11378 - 51329	26.	2.4	0.38
2504.39	0s I	2740 - 42658	4.7	0.45	-0.35
2504.51	0s I	4159 - 44075	3.7	0.35	-0.46
2508.61	0s I	11378 - 51229	13.	1.2	0.08
2509.94	0s I	12774 - 52604	16.	1.5	0.17
2512.87	0s I	8743 - 48526	30.	2.9	0.46
2513.25	0s I	5144 - 44921	43.	4.1	0.61
2515.04	0s I	5144 - 44893	12.	1.1	0.05
2517.61	0s I	13365 - 53073	3.5	0.34	-0.47
2517.92	0s I	4159 - 43863	6.7	0.64	-0.20
2518.44	0s I	5144 - 44839	12.	1.1	0.04
2519.29	0s I	2740 - 42422	1.8	0.17	-0.76
2524.79	0s I	4159 - 43755	0.93	0.089	-1.05
2526.01	0s I	2740 - 42317	1.4	0.14	-0.86
2526.83	0s I	12774 - 52338	6.5	0.62	-0.21
2527.09	0s I	8743 - 48303	5.8	0.56	-0.25
2532.44	0s I	14852 - 54328	23.	2.3	0.35
2534.17	0s I	10166 - 49615	6.9	0.67	-0.18
2538.10	0s I	12774 - 52162	21.	2.0	0.31
2539.73	0s I	14091 - 53454	14.	1.3	0.12
2540.14	0s I	4159 - 43516	2.0	0.20	-0.70

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2540.74	0s I	11031 - 50377	12.	1.2	0.06
2541.65	0s I	14091 - 53424	7.5	0.73	-0.14
2542.51	0s I	8743 - 48062	43.	4.2	0.62
2543.80	0s I	11031 - 50330	8.7	0.85	-0.07
2546.17	0s I	11031 - 50294	10.	1.00	-0.00
2547.70	0s I	13365 - 52604	14.	1.3	0.12
2548.10	0s I	14339 - 53572	17.	1.6	0.21
2554.46	0s I	2740 - 41876	2.4	0.24	-0.63
2555.11	0s I	11378 - 50503	11.	1.0	0.02
2555.27	0s I	11031 - 50154	7.7	0.76	-0.12
2555.80	0s I	14339 - 53454	16.	1.6	0.21
2556.08	0s I	8743 - 47854	4.4	0.43	-0.37
2557.77	0s I	8743 - 47828	3.9	0.38	-0.42
2558.09	0s I	15223 - 54302	14.	1.4	0.14
2562.66	0s I	13365 - 52375	14.	1.4	0.15
2564.37	0s I	12774 - 51759	10.	0.99	-0.00
2565.17	0s I	10166 - 49138	7.0	0.70	-0.16
2565.72	0s I	5766 - 44730	1.0	0.10	-0.99
2566.49	0s I	11378 - 50330	40.	3.9	0.60
2566.88	0s I	10166 - 49112	15.	1.5	0.18
2568.83	0s I	11031 - 49947	30.	3.0	0.47
2571.14	0s I	12774 - 51656	6.9	0.69	-0.16
2571.78	0s I	8743 - 47615	15.	1.5	0.17
2573.09	0s I	4159 - 43011	0.90	0.089	-1.05
2573.48	0s I	14091 - 52938	4.8	0.47	-0.33
2574.74	0s I	15223 - 54050	3.4	0.34	-0.47
2578.16	0s I	11378 - 50154	6.2	0.62	-0.21
2581.05	0s I	5144 - 43876	5.6	0.56	-0.25
2581.96	0s I	5144 - 43863	11.	1.1	0.06
2582.62	0s I	5766 - 44475	1.9	0.19	-0.71
2587.49	0s I	13020 - 51656	12.	1.2	0.08
2588.26	0s I	14091 - 52716	4.6	0.47	-0.33
2589.39	0s I	10166 - 48774	4.8	0.48	-0.32
2589.51	0s I	14848 - 53454	6.4	0.64	-0.19
2590.76	0s I	4159 - 42747	11.	1.1	0.06
2591.98	0s I	11378 - 49947	14.	1.4	0.16
2593.90	0s I	16212 - 54753	4.4	0.45	-0.35
2594.14	0s I	12774 - 51311	13.	1.3	0.13
2596.37	0s I	11031 - 49534	1.7	0.18	-0.75
2596.69	0s I	4159 - 42658	1.6	0.17	-0.78
2597.20	0s I	2740 - 41232	1.1	0.11	-0.95
2597.58	0s I	0 - 38486	0.43	0.044	-1.36
2599.13	0s I	14339 - 52802	12.	1.2	0.08
2599.91	0s I	11031 - 49482	9.7	0.98	-0.01
2600.45	0s I	12774 - 51218	9.4	0.95	-0.02
2602.33	0s I	8743 - 47158	3.8	0.38	-0.42
2603.80	0s I	13365 - 51759	6.1	0.62	-0.21
2604.60	0s I	6093 - 44475	3.5	0.36	-0.44
2604.96	0s I	14339 - 52716	4.7	0.48	-0.32
2609.20	0s I	8743 - 47057	8.2	0.84	-0.08

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2609.56	0s I	5766 - 44075	6.3	0.65	-0.19
2610.78	0s I	13365 - 51656	38.	3.9	0.59
2611.33	0s I	14848 - 53131	12.	1.3	0.10
2612.63	0s I	0 - 38264	1.5	0.15	-0.81
2613.06	0s I	5144 - 43402	25.	2.5	0.40
2614.06	0s I	10166 - 48409	2.8	0.29	-0.54
2614.50	0s I	11378 - 49615	1.8	0.18	-0.74
2615.96	0s I	12774 - 50990	5.5	0.56	-0.25
2617.18	0s I	13020 - 51218	4.7	0.49	-0.31
2619.94	0s I	4159 - 42317	8.0	0.83	-0.08
2620.62	0s I	2740 - 40888	1.6	0.16	-0.79
2621.82	0s I	0 - 38130	1.6	0.17	-0.77
2623.61	0s I	11378 - 49482	4.2	0.43	-0.36
2624.57	0s I	16212 - 54302	8.6	0.88	-0.05
2628.48	0s I	8743 - 46776	14.	1.4	0.16
2632.89	0s I	13020 - 50990	9.2	0.95	-0.02
2634.29	0s I	14852 - 52802	7.2	0.75	-0.13
2634.44	0s I	15391 - 53338	7.7	0.80	-0.10
2637.13	0s I	0 - 37909	11.	1.2	0.07
2637.98	0s I	12774 - 50671	5.2	0.55	-0.26
2639.98	0s I	14848 - 52716	3.0	0.31	-0.51
2641.17	0s I	15223 - 53073	7.4	0.78	-0.11
2641.60	0s I	11031 - 48875	10.	1.0	0.02
2643.63	0s I	12774 - 50590	6.9	0.72	-0.14
2644.11	0s I	0 - 37809	5.5	0.57	-0.24
2646.89	0s I	10166 - 47935	16.	1.7	0.24
2647.73	0s I	2740 - 40498	2.3	0.25	-0.61
2649.34	0s I	11378 - 49112	24.	2.5	0.40
2650.68	0s I	15223 - 52938	7.3	0.77	-0.11
2652.98	0s I	15391 - 53073	17.	1.8	0.27
2653.78	0s I	5766 - 43437	2.1	0.22	-0.66
2655.19	0s I	13020 - 50671	5.3	0.56	-0.25
2655.78	0s I	14848 - 52491	5.8	0.61	-0.21
2658.60	0s I	5144 - 42747	22.	2.3	0.37
2659.83	0s I	8743 - 46328	21.	2.2	0.34
2660.92	0s I	13020 - 50590	7.8	0.83	-0.08
2661.18	0s I	4159 - 41726	3.3	0.35	-0.45
2661.93	0s I	12774 - 50330	3.3	0.35	-0.45
2662.55	0s I	15391 - 52938	12.	1.3	0.12
2663.22	0s I	12774 - 50312	8.3	0.88	-0.06
2666.21	0s I	11031 - 48526	6.5	0.69	-0.16
2669.53	0s I	10166 - 47615	6.7	0.72	-0.14
2674.57	0s I	11378 - 48756	34.	3.6	0.56
2674.88	0s I	10166 - 47540	18.	1.9	0.28
2679.38	0s I	15391 - 52702	6.0	0.65	-0.19
2679.74	0s I	13365 - 50671	6.2	0.67	-0.18
2682.19	0s I	11031 - 48303	5.6	0.61	-0.22
2684.36	0s I	16212 - 53454	9.3	1.0	0.00
2688.08	0s I	14852 - 52043	11.	1.2	0.08
2689.35	0s I	12774 - 49947	7.8	0.85	-0.07

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2689.82	0s I	5144 - 42310	22.	2.4	0.38
2692.70	0s I	14091 - 51218	14.	1.5	0.17
2694.52	0s I	11031 - 48132	7.1	0.77	-0.11
2694.75	0s I	12774 - 49873	4.6	0.51	-0.30
2696.61	0s I	4159 - 41232	0.33	0.035	-1.45
2699.59	0s I	2740 - 39772	2.6	0.28	-0.55
2700.75	0s I	8743 - 45759	2.9	0.32	-0.50
2702.83	0s I	13020 - 50007	5.6	0.61	-0.21
2704.45	0s I	13365 - 50330	5.9	0.65	-0.19
2706.70	0s I	2740 - 39675	2.9	0.32	-0.50
2707.42	0s I	11378 - 48302	9.7	1.1	0.03
2709.86	0s I	10166 - 47057	7.7	0.84	-0.07
2714.64	0s I	0 - 36826	6.6	0.73	-0.14
2715.36	0s I	5766 - 42583	6.6	0.73	-0.14
2715.64	0s I	14339 - 51152	14.	1.5	0.18
2716.80	0s I	11031 - 47828	3.1	0.34	-0.47
2718.71	0s I	15391 - 52162	11.	1.3	0.10
2720.04	0s I	2740 - 39494	6.0	0.67	-0.17
2721.86	0s I	4159 - 40888	6.0	0.66	-0.18
2727.94	0s I	10166 - 46813	5.7	0.63	-0.20
2728.27	0s I	2740 - 39383	0.54	0.060	-1.22
2730.61	0s I	5144 - 41754	5.2	0.59	-0.23
2732.80	0s I	5144 - 41726	5.2	0.58	-0.23
2736.39	0s I	5766 - 42300	0.89	0.10	-1.00
2738.33	0s I	13365 - 49873	3.9	0.44	-0.35
2738.46	0s I	15391 - 51897	6.6	0.74	-0.13
2740.32	0s I	14848 - 51329	16.	1.8	0.26
2740.75	0s I	11378 - 47854	6.2	0.70	-0.15
2741.38	0s I	11378 - 47845	3.1	0.35	-0.45
2742.69	0s I	11378 - 47828	2.1	0.23	-0.63
2747.91	0s I	14848 - 51229	14.	1.6	0.20
2748.86	0s I	15391 - 51759	13.	1.5	0.17
2749.18	0s I	12774 - 49138	8.2	0.93	-0.03
2751.15	0s I	12774 - 49112	5.5	0.62	-0.21
2753.72	0s I	14848 - 51152	5.9	0.67	-0.17
2755.59	0s I	12774 - 49054	6.8	0.77	-0.11
2757.81	0s I	13365 - 49615	12.	1.4	0.14
2758.82	0s I	11378 - 47615	6.4	0.74	-0.13
2761.08	0s I	6093 - 42300	1.6	0.18	-0.74
2761.42	0s I	4159 - 40362	4.2	0.48	-0.31
2763.27	0s I	8743 - 44921	10.	1.2	0.08
2763.94	0s I	11031 - 47200	6.3	0.72	-0.14
2765.04	0s I	15391 - 51546	34.	3.9	0.59
2765.45	0s I	8743 - 44893	1.4	0.16	-0.79
2767.12	0s I	11031 - 47158	5.4	0.61	-0.21
2769.88	0s I	13020 - 49112	10.	1.2	0.07
2770.10	0s I	14848 - 50937	9.6	1.1	0.04
2770.71	0s I	5144 - 41225	7.5	0.86	-0.06
2773.07	0s I	14852 - 50903	10.	1.2	0.08
2774.02	0s I	14339 - 50377	9.6	1.1	0.04

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2774.38	0s I	13020 - 49054	6.8	0.79	-0.10
2774.90	0s I	11031 - 47057	4.4	0.50	-0.30
2776.91	0s I	2740 - 38741	1.2	0.13	-0.87
2782.55	0s I	4159 - 40087	4.3	0.49	-0.31
2786.31	0s I	5144 - 41023	4.8	0.55	-0.26
2786.80	0s I	2740 - 38614	0.48	0.056	-1.25
2790.90	0s I	15223 - 51043	5.9	0.69	-0.16
2793.99	0s I	11378 - 47158	9.9	1.2	0.06
2794.19	0s I	14852 - 50630	20.	2.4	0.37
2796.11	0s I	13020 - 48774	1.3	0.15	-0.82
2796.73	0s I	2740 - 38486	1.9	0.23	-0.64
2801.93	0s I	11378 - 47057	4.0	0.47	-0.33
2804.07	0s I	15391 - 51043	30.	3.5	0.54
2806.91	0s I	0 - 35616	4.5	0.53	-0.27
2807.48	0s I	10166 - 45775	1.2	0.14	-0.84
2808.24	0s I	15391 - 50990	2.9	0.35	-0.46
2808.94	0s I	2740 - 38331	1.6	0.19	-0.71
2813.84	0s I	14848 - 50377	35.	4.2	0.62
2814.20	0s I	2740 - 38264	2.6	0.31	-0.52
2814.84	0s I	4159 - 39675	0.22	0.026	-1.58
2815.27	0s I	13365 - 48875	2.7	0.32	-0.50
2815.78	0s I	2740 - 38244	1.0	0.12	-0.91
2817.51	0s I	14848 - 50330	3.5	0.42	-0.38
2820.18	0s I	15223 - 50671	12.	1.4	0.16
2820.56	0s I	14091 - 49534	6.8	0.82	-0.09
2821.25	0s I	11378 - 46813	7.5	0.90	-0.05
2824.17	0s I	11378 - 46776	5.0	0.59	-0.23
2829.03	0s I	10166 - 45503	0.57	0.068	-1.17
2829.27	0s I	4159 - 39494	2.1	0.25	-0.60
2831.59	0s I	14848 - 50154	1.7	0.21	-0.69
2832.24	0s I	11031 - 46328	4.4	0.53	-0.27
2837.42	0s I	11031 - 46264	8.0	0.97	-0.01
2838.17	0s I	4159 - 39383	2.2	0.27	-0.57
2838.63	0s I	5144 - 40362	32.	3.9	0.59
2840.44	0s I	14339 - 49534	7.7	0.93	-0.03
2841.60	0s I	2740 - 37922	2.4	0.29	-0.54
2844.40	0s I	5144 - 40291	14.	1.8	0.24
2844.68	0s I	14339 - 49482	6.1	0.74	-0.13
2846.39	0s I	5766 - 40888	3.1	0.38	-0.42
2846.55	0s I	8743 - 43863	2.5	0.31	-0.51
2848.25	0s I	14848 - 49947	33.	4.0	0.61
2849.05	0s I	15223 - 50312	8.0	0.97	-0.01
2849.30	0s I	10166 - 45252	1.1	0.13	-0.89
2850.76	0s I	2740 - 37809	4.6	0.56	-0.25
2855.34	0s I	8743 - 43755	2.1	0.26	-0.59
2857.54	0s I	18902 - 53887	7.4	0.91	-0.04
2860.06	0s I	16212 - 51166	10.	1.3	0.10
2860.96	0s I	5144 - 40087	8.7	1.1	0.03
2864.26	0s I	15391 - 50294	3.5	0.44	-0.36
2865.68	0s I	11378 - 46264	2.9	0.36	-0.44

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2869.39	0s I	12774 - 47615	2.1	0.25	-0.59
2872.40	0s I	0 - 34804	0.23	0.028	-1.55
2873.42	0s I	11378 - 46170	5.7	0.71	-0.15
2874.15	0s I	13020 - 47802	4.9	0.60	-0.22
2874.59	0s I	16212 - 50990	4.0	0.50	-0.30
2874.96	0s I	8743 - 43516	5.6	0.70	-0.16
2877.35	0s I	11031 - 45775	5.6	0.70	-0.16
2878.40	0s I	5766 - 40498	2.0	0.25	-0.61
2883.94	0s I	14091 - 48756	2.0	0.25	-0.60
2884.41	0s I	8743 - 43402	1.3	0.16	-0.80
2886.06	0s I	19411 - 54050	3.1	0.38	-0.42
2886.50	0s I	14848 - 49482	3.1	0.39	-0.41
2890.85	0s I	4159 - 38741	0.17	0.022	-1.66
2891.83	0s I	25013 - 59583	12.	1.5	0.18
2892.35	0s I	10166 - 44730	1.9	0.23	-0.63
2895.06	0s I	11031 - 45562	2.7	0.34	-0.47
2896.06	0s I	13020 - 47540	12.	1.5	0.19
2901.32	0s I	13020 - 47477	3.0	0.38	-0.42
2903.07	0s I	18902 - 53338	8.5	1.1	0.03
2903.21	0s I	14091 - 48526	7.7	0.97	-0.01
2905.73	0s I	6093 - 40498	1.3	0.16	-0.79
2908.03	0s I	16212 - 50590	2.8	0.36	-0.44
2909.06	0s I	0 - 34365	11.	1.4	0.16
2909.67	0s I	11031 - 45389	2.8	0.36	-0.44
2911.34	0s I	19109 - 53447	5.0	0.64	-0.20
2912.33	0s I	4159 - 38486	8.1	1.0	0.01
2913.84	0s I	10166 - 44475	2.9	0.36	-0.44
2914.71	0s I	18417 - 52716	9.1	1.2	0.07
2917.26	0s I	8743 - 43011	7.3	0.93	-0.03
2917.83	0s I	5144 - 39406	0.63	0.081	-1.09
2919.79	0s I	15223 - 49461	155.	20.	1.30
2921.07	0s I	15391 - 49615	4.0	0.51	-0.29
2924.49	0s I	11378 - 45562	3.0	0.38	-0.42
2925.28	0s I	13365 - 47540	2.1	0.27	-0.58
2925.57	0s I	4159 - 38331	1.1	0.14	-0.85
2929.51	0s I	0 - 34126	0.40	0.052	-1.28
2930.57	0s I	22616 - 56729	22.	2.9	0.46
2931.28	0s I	4159 - 38264	1.8	0.24	-0.63
2932.45	0s I	15391 - 49482	3.1	0.40	-0.39
2933.98	0s I	18301 - 52375	5.0	0.65	-0.19
2934.64	0s I	2740 - 36806	0.61	0.079	-1.10
2936.81	0s I	14091 - 48132	1.5	0.19	-0.72
2936.99	0s I	12774 - 46813	5.2	0.67	-0.17
2938.38	0s I	19109 - 53131	5.6	0.72	-0.14
2942.20	0s I	10166 - 44144	2.0	0.26	-0.58
2942.85	0s I	4159 - 38130	0.70	0.091	-1.04
2948.23	0s I	5766 - 39675	5.7	0.75	-0.13
2949.53	0s I	2740 - 36634	3.2	0.41	-0.38
2949.81	0s I	11031 - 44921	5.0	0.66	-0.18
2952.34	0s I	11031 - 44893	3.0	0.39	-0.41

Wavelength	Spectrum	Energy Levels	gA 10 ⁸ /sec	gf	Log gf
A		K			
2955.00	0s I	15223 - 49054	5.8	0.76	-0.12
2958.34	0s I	14339 - 48132	3.0	0.39	-0.41
2961.01	0s I	4159 - 37922	0.98	0.13	-0.89
2962.15	0s I	4159 - 37909	1.7	0.23	-0.64
2962.33	0s I	15391 - 49138	7.4	0.97	-0.01
2964.06	0s I	5766 - 39494	2.3	0.30	-0.52
2964.62	0s I	15391 - 49112	3.7	0.49	-0.31
2968.45	0s I	14848 - 48526	2.0	0.26	-0.59
2970.69	0s I	15223 - 48875	2.5	0.33	-0.49
2970.97	0s I	4159 - 37809	2.4	0.32	-0.50
2972.25	0s I	25013 - 58648	24.	3.1	0.49
2973.06	0s I	18417 - 52043	15.	1.9	0.29
2977.64	0s I	8743 - 42317	5.1	0.68	-0.17
2978.21	0s I	8743 - 42310	1.2	0.16	-0.79
2978.53	0s I	21303 - 54868	15.	2.1	0.31
2979.43	0s I	12774 - 46328	3.1	0.41	-0.38
2982.90	0s I	11378 - 44893	12.	1.6	0.21
2985.61	0s I	15391 - 48875	8.5	1.1	0.05
2988.26	0s I	14848 - 48303	3.8	0.50	-0.30
2989.13	0s I	19893 - 53338	15.	1.9	0.29
2992.11	0s I	13365 - 46776	6.1	0.82	-0.08
2993.57	0s I	12774 - 46170	3.7	0.50	-0.30
2997.65	0s I	10166 - 43516	4.1	0.56	-0.25
3003.48	0s I	11378 - 44663	3.8	0.52	-0.29
3007.90	0s I	18902 - 52138	12.	1.7	0.23
3013.07	0s I	2740 - 35920	0.69	0.094	-1.03
3015.65	0s I	13365 - 46515	5.0	0.68	-0.17
3017.25	0s I	8743 - 41876	6.5	0.89	-0.05
3018.04	0s I	0 - 33124	4.3	0.58	-0.24
3019.38	0s I	5766 - 38876	2.3	0.32	-0.49
3030.70	0s I	5144 - 38130	4.6	0.63	-0.20
3031.01	0s I	8743 - 41726	1.3	0.17	-0.76
3031.30	0s I	14848 - 47828	4.6	0.63	-0.20
3032.81	0s I	13365 - 46328	4.0	0.55	-0.26
3040.90	0s I	2740 - 35616	5.6	0.78	-0.11
3043.50	0s I	5766 - 38614	0.96	0.13	-0.87
3043.64	0s I	10166 - 43011	1.8	0.25	-0.60
3044.07	0s I	16212 - 49054	4.5	0.62	-0.21
3044.41	0s I	13365 - 46202	2.3	0.32	-0.49
3044.91	0s I	11031 - 43863	3.1	0.43	-0.37
3049.04	0s I	12774 - 45562	3.1	0.43	-0.36
3049.46	0s I	6093 - 38876	1.1	0.16	-0.80
3050.39	0s I	22616 - 55389	41.	5.7	0.76
3051.17	0s I	5144 - 37909	0.43	0.060	-1.22
3054.97	0s I	11031 - 43755	1.9	0.26	-0.58
3055.21	0s I	14091 - 46813	7.2	1.0	0.01
3058.66	0s I	0 - 32685	7.4	1.0	0.02
3060.30	0s I	4159 - 36826	0.80	0.11	-0.95
3062.19	0s I	4159 - 36806	1.6	0.22	-0.65
3066.12	0s I	15223 - 47828	4.6	0.65	-0.18

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
3069.94	0s I	5766 - 38331	0.90	0.13	-0.90
3074.08	0s I	6093 - 38614	1.7	0.24	-0.62
3074.96	0s I	22616 - 55127	55.	7.8	0.89
3077.06	0s I	8743 - 41232	1.8	0.25	-0.60
3077.44	0s I	11031 - 43516	5.3	0.75	-0.12
3077.72	0s I	8743 - 41225	11.	1.6	0.20
3078.11	0s I	5766 - 38244	1.5	0.22	-0.67
3078.38	0s I	4159 - 36634	0.61	0.087	-1.06
3083.74	0s I	22616 - 55034	29.	4.1	0.62
3084.60	0s I	13365 - 45775	2.0	0.29	-0.54
3086.27	0s I	15223 - 47615	3.3	0.48	-0.32
3090.08	0s I	14848 - 47200	12.	1.7	0.24
3090.30	0s I	2740 - 35090	0.25	0.035	-1.45
3090.49	0s I	14852 - 47200	6.0	0.87	-0.06
3091.25	0s I	17667 - 50007	5.5	0.78	-0.11
3093.59	0s I	18902 - 51218	31.	4.5	0.65
3101.53	0s I	13020 - 45253	9.3	1.3	0.13
3104.98	0s I	13365 - 45562	3.2	0.46	-0.34
3105.99	0s I	4159 - 36346	0.90	0.13	-0.89
3107.38	0s I	14091 - 46264	2.4	0.35	-0.46
3108.98	0s I	5766 - 37922	1.2	0.17	-0.77
3109.38	0s I	6093 - 38244	2.6	0.38	-0.42
3111.09	0s I	10166 - 42300	3.3	0.48	-0.32
3114.81	0s I	12774 - 44870	3.1	0.46	-0.34
3116.48	0s I	14091 - 46170	4.7	0.68	-0.17
3118.12	0s I	22616 - 54677	18.	2.6	0.41
3118.33	0s I	11378 - 43437	5.6	0.82	-0.09
3129.23	0s I	17667 - 49615	11.	1.6	0.21
3131.12	0s I	14848 - 46776	23.	3.4	0.53
3140.31	0s I	15223 - 47057	4.9	0.73	-0.14
3152.07	0s I	11031 - 42747	1.5	0.22	-0.66
3152.67	0s I	10166 - 41876	3.0	0.44	-0.35
3153.61	0s I	12774 - 44475	7.1	1.1	0.03
3156.25	0s I	5144 - 36818	8.8	1.3	0.12
3156.78	0s I	23463 - 55132	49.	7.3	0.86
3157.24	0s I	23463 - 55127	26.	3.9	0.59
3161.44	0s I	19049 - 50671	14.	2.0	0.31
3161.73	0s I	8743 - 40362	0.90	0.13	-0.87
3164.61	0s I	15223 - 46813	4.2	0.63	-0.20
3166.51	0s I	23463 - 55034	60.	9.0	0.95
3168.28	0s I	15223 - 46776	6.0	0.91	-0.04
3173.20	0s I	13365 - 44870	3.5	0.52	-0.28
3178.06	0s I	4159 - 35616	0.86	0.13	-0.88
3180.12	0s I	19893 - 51329	13.	1.9	0.29
3181.88	0s I	14339 - 45758	8.3	1.3	0.10
3182.57	0s I	14091 - 45503	5.8	0.88	-0.06
3185.33	0s I	2740 - 34126	0.31	0.047	-1.33
3186.98	0s I	11378 - 42747	4.7	0.72	-0.14
3187.34	0s I	13365 - 44730	1.5	0.24	-0.63
3189.46	0s I	8742 - 40087	2.2	0.34	-0.47

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3194.23	0s I	14091 - 45389	10.0	1.5	0.18
3195.38	0s I	11031 - 42317	2.6	0.40	-0.40
3195.97	0s I	11378 - 42658	1.9	0.29	-0.54
3232.06	0s I	4159 - 35090	3.4	0.54	-0.27
3238.63	0s I	5766 - 36634	0.80	0.13	-0.90
3241.04	0s I	11031 - 41876	2.3	0.37	-0.43
3248.00	0s I	13365 - 44144	2.9	0.46	-0.34
3254.91	0s I	14848 - 45562	6.7	1.1	0.02
3256.92	0s I	11031 - 41726	2.3	0.36	-0.44
3260.30	0s I	8743 - 39406	1.2	0.19	-0.73
3262.29	0s I	4159 - 34804	5.1	0.82	-0.09
3262.75	0s I	8743 - 39383	2.3	0.37	-0.43
3267.94	0s I	0 - 30592	1.6	0.25	-0.60
3269.21	0s I	5766 - 36346	1.6	0.26	-0.59
3272.16	0s I	15223 - 45775	7.1	1.1	0.06
3275.20	0s I	5766 - 36290	1.3	0.22	-0.66
3277.97	0s I	5766 - 36264	0.83	0.13	-0.87
3286.67	0s I	13020 - 43437	1.3	0.21	-0.68
3288.84	0s I	28372 - 58769	53.	8.5	0.93
3290.26	0s I	2740 - 33124	1.3	0.21	-0.67
3301.56	0s I	0 - 30280	3.6	0.59	-0.23
3306.23	0s I	12774 - 43011	4.3	0.70	-0.15
3310.91	0s I	11031 - 41225	6.5	1.1	0.03
3315.42	0s I	5766 - 35920	0.29	0.048	-1.32
3315.69	0s I	13365 - 43516	1.9	0.31	-0.50
3324.33	0s I	13365 - 43437	4.9	0.80	-0.09
3327.42	0s I	14848 - 44893	9.0	1.5	0.18
3336.15	0s I	4159 - 34126	1.4	0.23	-0.65
3351.74	0s I	6093 - 35920	0.25	0.042	-1.38
3357.97	0s I	14091 - 43863	5.1	0.86	-0.06
3361.15	0s I	8743 - 38486	1.2	0.21	-0.69
3364.12	0s I	2740 - 32457	0.17	0.029	-1.54
3370.20	0s I	14091 - 43755	2.7	0.46	-0.34
3370.59	0s I	5144 - 34804	1.7	0.28	-0.55
3372.08	0s I	13365 - 43011	2.9	0.49	-0.31
3378.68	0s I	19893 - 49482	12.	2.0	0.30
3384.00	0s I	12774 - 42317	4.4	0.76	-0.12
3384.60	0s I	14339 - 43876	1.9	0.33	-0.48
3385.94	0s I	12774 - 42300	2.8	0.47	-0.32
3386.14	0s I	14339 - 43863	1.9	0.33	-0.48
3387.84	0s I	10166 - 39675	4.3	0.74	-0.13
3395.72	0s I	15223 - 44663	2.7	0.47	-0.33
3401.17	0s I	23323 - 52716	20.	3.4	0.54
3401.86	0s I	8743 - 38130	2.8	0.48	-0.32
3402.51	0s I	0 - 29382	0.094	0.016	-1.79
3406.67	0s I	14091 - 43437	1.9	0.33	-0.48
3408.76	0s I	10166 - 39494	0.82	0.14	-0.85
3412.74	0s I	13365 - 42658	2.0	0.35	-0.46
3421.69	0s I	10166 - 39383	0.80	0.14	-0.85
3427.44	0s I	23323 - 52491	10.	1.8	0.26

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3427.67	Os I	8743 - 37909	0.65	0.11	-0.94
3435.26	Os I	12774 - 41876	0.87	0.15	-0.81
3439.49	Os I	8743 - 37809	0.39	0.070	-1.15
3440.60	Os I	11031 - 40087	2.0	0.35	-0.46
3444.46	Os I	14852 - 43876	2.8	0.51	-0.30
3445.55	Os I	14848 - 43863	3.7	0.66	-0.18
3449.20	Os I	11378 - 40362	2.6	0.46	-0.33
3455.03	Os I	13365 - 42300	0.99	0.18	-0.75
3458.38	Os I	14848 - 43755	2.8	0.50	-0.30
3465.44	Os I	17667 - 46515	6.2	1.1	0.05
3478.53	Os I	17667 - 46407	6.0	1.1	0.04
3482.11	Os I	10166 - 38876	0.70	0.13	-0.89
3482.23	Os I	11378 - 40087	0.53	0.097	-1.01
3487.25	Os I	14848 - 43516	1.4	0.26	-0.59
3491.50	Os I	19893 - 48526	7.7	1.4	0.15
3498.54	Os I	10166 - 38741	0.89	0.16	-0.79
3501.16	Os I	14848 - 43402	5.1	0.93	-0.03
3504.66	Os I	4159 - 32685	0.62	0.11	-0.94
3512.99	Os I	12774 - 41232	4.9	0.90	-0.04
3513.86	Os I	16212 - 44663	2.8	0.52	-0.29
3516.63	Os I	19049 - 47477	4.3	0.79	-0.10
3523.64	Os I	0 - 28372	0.14	0.026	-1.58
3526.04	Os I	11031 - 39383	0.82	0.15	-0.82
3528.60	Os I	0 - 28332	0.36	0.068	-1.17
3530.06	Os I	10166 - 38486	1.2	0.22	-0.66
3532.80	Os I	4159 - 32457	0.22	0.040	-1.40
3533.41	Os I	15223 - 43516	2.6	0.49	-0.31
3541.91	Os I	14091 - 42317	1.0	0.19	-0.72
3542.71	Os I	14091 - 42310	3.5	0.65	-0.18
3555.97	Os I	12774 - 40888	0.97	0.18	-0.73
3559.79	Os I	8743 - 36826	3.1	0.59	-0.23
3560.86	Os I	8743 - 36818	4.0	0.76	-0.12
3562.34	Os I	8743 - 36806	0.40	0.076	-1.12
3569.78	Os I	11378 - 39383	2.0	0.39	-0.41
3574.08	Os I	14339 - 42310	1.9	0.36	-0.44
3586.51	Os I	18902 - 46776	3.7	0.71	-0.15
3587.32	Os I	13020 - 40888	1.3	0.25	-0.61
3592.32	Os I	23323 - 51152	9.0	1.7	0.24
3598.11	Os I	2740 - 30525	0.34	0.067	-1.18
3601.83	Os I	10166 - 37922	0.85	0.17	-0.78
3616.57	Os I	10166 - 37809	1.1	0.21	-0.67
3619.43	Os I	15391 - 43011	2.3	0.46	-0.34
3629.95	Os I	5144 - 32685	0.069	0.014	-1.87
3640.33	Os I	14848 - 42310	6.5	1.3	0.11
3648.81	Os I	19760 - 47158	2.9	0.59	-0.23
3654.49	Os I	15391 - 42747	3.7	0.74	-0.13
3656.90	Os I	2740 - 30078	0.15	0.030	-1.52
3666.31	Os I	18902 - 46170	5.5	1.1	0.04
3670.89	Os I	11031 - 38264	2.2	0.45	-0.35
3675.45	Os I	15223 - 42422	1.9	0.38	-0.42

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3681.57	0s I	19109 - 46264	3.8	0.77	-0.11
3689.06	0s I	11031 - 38130	1.1	0.23	-0.64
3698.83	0s I	14848 - 41876	0.47	0.096	-1.02
3703.25	0s I	17667 - 44663	5.3	1.1	0.04
3706.56	0s I	23323 - 50294	14.	2.8	0.45
3709.14	0s I	11378 - 38331	0.59	0.12	-0.91
3712.84	0s I	15391 - 42317	1.2	0.25	-0.60
3713.73	0s I	15391 - 42310	3.3	0.69	-0.16
3718.34	0s I	11378 - 38264	0.39	0.081	-1.09
3719.52	0s I	14848 - 41726	2.6	0.54	-0.27
3720.13	0s I	8743 - 35616	0.51	0.11	-0.98
3721.96	0s I	24292 - 51152	4.7	0.97	-0.01
3729.22	0s I	17667 - 44475	1.7	0.35	-0.45
3730.73	0s I	14091 - 40888	0.82	0.17	-0.77
3746.47	0s I	14339 - 41023	1.8	0.38	-0.42
3752.52	0s I	2740 - 29382	1.4	0.30	-0.52
3757.12	0s I	12774 - 39383	0.67	0.14	-0.85
3766.30	0s I	11378 - 37922	0.58	0.12	-0.91
3768.14	0s I	11378 - 37909	0.53	0.11	-0.94
3774.40	0s I	18902 - 45389	4.4	0.94	-0.03
3774.62	0s I	15391 - 41876	1.5	0.32	-0.49
3776.25	0s I	13020 - 39494	0.84	0.18	-0.75
3776.99	0s I	10166 - 36634	0.87	0.19	-0.73
3782.20	0s I	4159 - 30592	1.1	0.24	-0.61
3789.11	0s I	14848 - 41232	0.91	0.20	-0.71
3790.14	0s I	14848 - 41225	6.8	1.5	0.17
3790.73	0s I	14852 - 41225	1.9	0.42	-0.38
3793.91	0s I	18902 - 45252	13.	2.8	0.44
3794.66	0s I	28332 - 54677	8.6	1.9	0.27
3795.67	0s I	24292 - 50630	10.0	2.2	0.33
3827.14	0s I	22616 - 48737	7.0	1.5	0.19
3836.06	0s I	8743 - 34804	0.45	0.100	-1.00
3840.30	0s I	29099 - 55132	30.	6.6	0.82
3841.29	0s I	25013 - 51039	18.	3.9	0.59
3843.66	0s I	15223 - 41232	0.81	0.18	-0.75
3849.94	0s I	12774 - 38741	0.98	0.22	-0.66
3857.09	0s I	4159 - 30078	0.10	0.022	-1.65
3865.47	0s I	25275 - 51138	28.	6.2	0.79
3876.77	0s I	11031 - 36818	2.2	0.49	-0.31
3881.86	0s I	10166 - 35920	0.58	0.13	-0.89
3886.75	0s I	13020 - 38741	0.20	0.046	-1.34
3895.18	0s I	15223 - 40888	0.37	0.085	-1.07
3900.39	0s I	2740 - 28372	0.038	0.0086	-2.07
3901.71	0s I	8743 - 34365	0.29	0.066	-1.18
3907.65	0s I	14091 - 39675	0.23	0.052	-1.28
3911.81	0s I	12774 - 38331	0.16	0.036	-1.45
3918.97	0s I	27954 - 53464	5.8	1.3	0.13
3922.03	0s I	12774 - 38264	0.15	0.035	-1.45
3925.10	0s I	12774 - 38244	0.15	0.035	-1.45
3926.77	0s I	18417 - 43876	0.75	0.17	-0.76

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3928.41	0s I	11378 - 36826	0.14	0.032	-1.50
3928.54	0s I	5144 - 30592	0.024	0.0055	-2.26
3930.00	0s I	14852 - 40291	0.82	0.19	-0.72
3931.52	0s I	11378 - 36806	0.24	0.055	-1.26
3938.59	0s I	8743 - 34126	0.35	0.082	-1.09
3939.57	0s I	13365 - 38741	0.47	0.11	-0.96
3949.78	0s I	13020 - 38331	0.47	0.11	-0.96
3952.77	0s I	14091 - 39383	0.35	0.083	-1.08
3955.37	0s I	15223 - 40498	0.39	0.091	-1.04
3960.51	0s I	24292 - 49534	8.5	2.0	0.30
3961.02	0s I	14848 - 40087	1.6	0.37	-0.44
3963.63	0s I	4159 - 29382	0.38	0.090	-1.05
3964.96	0s I	2740 - 27954	0.025	0.0060	-2.22
3969.67	0s I	14852 - 40036	1.1	0.26	-0.58
3975.44	0s I	12774 - 37922	0.47	0.11	-0.95
3977.23	0s I	5144 - 30280	0.35	0.084	-1.07
3979.36	0s I	30280 - 55403	9.7	2.3	0.36
3988.18	0s I	14339 - 39406	0.65	0.15	-0.81
3988.62	0s I	19411 - 44475	1.1	0.25	-0.60
3991.49	0s I	2740 - 27787	0.0095	0.0023	-2.64
3994.93	0s I	21303 - 46328	2.1	0.50	-0.30
3996.80	0s I	0 - 25013	0.0043	0.0010	-2.98
3998.93	0s I	19893 - 44893	1.7	0.41	-0.39
4003.48	0s I	15391 - 40362	1.2	0.30	-0.53
4004.02	0s I	11378 - 36346	0.27	0.066	-1.18
4005.16	0s I	18902 - 43863	3.3	0.79	-0.10
4015.04	0s I	13365 - 38264	0.31	0.076	-1.12
4018.26	0s I	13365 - 38244	0.73	0.18	-0.75
4029.32	0s I	30592 - 55403	12.	3.0	0.48
4032.92	0s I	23985 - 48773	7.5	1.8	0.26
4037.84	0s I	5766 - 30525	0.053	0.013	-1.88
4038.64	0s I	19109 - 43863	1.3	0.31	-0.50
4041.92	0s I	19411 - 44144	6.9	1.7	0.23
4048.05	0s I	15391 - 40087	1.2	0.30	-0.52
4051.43	0s I	16212 - 40888	0.55	0.14	-0.86
4066.69	0s I	22616 - 47199	56.	14.	1.14
4070.86	0s I	14848 - 39406	1.6	0.40	-0.40
4071.56	0s I	14852 - 39406	1.2	0.31	-0.51
4074.68	0s I	14848 - 39383	1.5	0.36	-0.44
4088.44	0s I	15223 - 39675	0.48	0.12	-0.92
4091.82	0s I	6093 - 30525	0.26	0.067	-1.18
4098.10	0s I	14091 - 38486	0.28	0.072	-1.14
4100.30	0s I	8743 - 33124	0.14	0.035	-1.46
4103.62	0s I	27787 - 52149	8.5	2.1	0.33
4112.02	0s I	5766 - 30078	0.59	0.15	-0.83
4124.60	0s I	11378 - 35616	0.41	0.10	-0.98
4128.96	0s I	4159 - 28372	0.053	0.014	-1.87
4135.78	0s I	4159 - 28332	0.72	0.18	-0.73
4137.84	0s I	15223 - 39383	0.96	0.25	-0.61
4158.78	0s I	14091 - 38130	0.31	0.081	-1.09

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4159.96	0s I	12774 - 36806	0.22	0.056	-1.25
4172.57	0s I	10166 - 34126	0.27	0.071	-1.15
4173.23	0s I	5144 - 29099	0.45	0.12	-0.93
4175.63	0s I	8743 - 32685	0.62	0.16	-0.79
4184.13	0s I	18417 - 42310	1.9	0.49	-0.31
4189.91	0s I	12774 - 36634	0.97	0.25	-0.59
4195.14	0s I	14091 - 37922	0.25	0.066	-1.18
4201.45	0s I	4159 - 27954	0.048	0.013	-1.90
4202.06	0s I	14339 - 38130	1.2	0.31	-0.51
4211.86	0s I	23463 - 47199	75.	20.	1.30
4213.86	0s I	25013 - 48737	11.	2.8	0.45
4215.16	0s I	14091 - 37809	0.44	0.12	-0.94
4226.53	0s I	15223 - 38876	0.33	0.088	-1.06
4233.46	0s I	13020 - 36634	0.52	0.14	-0.85
4260.85	0s I	0 - 23463	0.38	0.10	-0.99
4264.75	0s I	13365 - 36806	0.33	0.091	-1.04
4269.61	0s I	18902 - 42317	1.9	0.53	-0.28
4277.15	0s I	19049 - 42422	0.90	0.25	-0.61
4285.90	0s I	13020 - 36346	0.29	0.081	-1.09
4293.95	0s I	14848 - 38130	2.7	0.75	-0.13
4296.22	0s I	13365 - 36634	0.21	0.059	-1.23
4308.88	0s I	19109 - 42310	0.88	0.25	-0.61
4311.40	0s I	5144 - 28332	0.17	0.048	-1.32
4326.25	0s I	15223 - 38331	0.58	0.16	-0.79
4328.68	0s I	11031 - 34126	0.53	0.15	-0.83
4338.75	0s I	15223 - 38264	0.51	0.14	-0.84
4351.53	0s I	18902 - 41876	1.4	0.40	-0.40
4354.46	0s I	10166 - 33124	0.080	0.023	-1.64
4357.98	0s I	15391 - 38331	0.23	0.066	-1.18
4358.14	0s I	30525 - 53464	13.	3.7	0.57
4365.67	0s I	13020 - 35920	0.56	0.16	-0.80
4370.66	0s I	15391 - 38264	0.57	0.16	-0.79
4376.90	0s I	37809 - 60649	16.	4.5	0.65
4391.08	0s I	19109 - 41876	1.3	0.37	-0.43
4394.86	0s I	11378 - 34126	0.82	0.24	-0.62
4397.26	0s I	14091 - 36826	0.54	0.16	-0.81
4400.58	0s I	32685 - 55403	13.	3.9	0.59
4402.74	0s I	28332 - 51039	22.	6.3	0.80
4404.21	0s I	15223 - 37922	0.26	0.076	-1.12
4411.13	0s I	16212 - 38876	0.24	0.070	-1.16
4420.47	0s I	0 - 22616	0.31	0.090	-1.05
4432.41	0s I	13365 - 35920	0.27	0.079	-1.10
4436.32	0s I	2740 - 25275	0.039	0.011	-1.94
4437.09	0s I	15391 - 37922	0.24	0.070	-1.16
4439.64	0s I	15391 - 37909	0.47	0.14	-0.86
4445.69	0s I	14339 - 36826	0.14	0.040	-1.40
4447.35	0s I	14339 - 36818	0.77	0.23	-0.64
4459.53	0s I	15391 - 37809	0.36	0.11	-0.97
4462.29	0s I	21034 - 43437	0.75	0.22	-0.65
4465.94	0s I	38264 - 60649	12.	3.6	0.55

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4479.81	0s I	12774 - 35090	0.19	0.058	-1.24
4484.76	0s I	10166 - 32457	0.13	0.038	-1.42
4488.60	0s I	2740 - 25013	0.0049	0.0015	-2.83
4518.89	0s I	19109 - 41232	0.41	0.13	-0.90
4520.32	0s I	19109 - 41225	0.41	0.13	-0.90
4524.87	0s I	11031 - 33124	0.083	0.026	-1.59
4529.67	0s I	13020 - 35090	0.14	0.045	-1.35
4537.62	0s I	16212 - 38244	0.15	0.045	-1.34
4539.92	0s I	25594 - 47615	4.9	1.5	0.18
4548.66	0s I	14848 - 36826	0.40	0.12	-0.91
4550.41	0s I	14848 - 36818	1.9	0.59	-0.23
4551.30	0s I	14852 - 36818	0.47	0.15	-0.83
4579.04	0s I	19893 - 41726	0.48	0.15	-0.82
4595.04	0s I	29382 - 51138	13.	4.1	0.62
4597.16	0s I	11378 - 33124	0.11	0.036	-1.45
4605.04	0s I	16212 - 37922	0.14	0.043	-1.36
4616.78	0s I	11031 - 32685	0.19	0.060	-1.22
4631.83	0s I	15223 - 36806	0.60	0.19	-0.71
4634.77	0s I	23323 - 44893	1.2	0.38	-0.42
4641.83	0s I	8743 - 30280	0.019	0.0062	-2.21
4663.82	0s I	15391 - 36826	0.49	0.16	-0.80
4682.31	0s I	12774 - 34126	0.048	0.016	-1.81
4692.06	0s I	11378 - 32685	0.076	0.025	-1.60
4732.80	0s I	15223 - 36346	0.090	0.030	-1.52
4738.04	0s I	25070 - 46170	1.2	0.40	-0.40
4743.89	0s I	17667 - 38741	0.28	0.096	-1.02
4752.16	0s I	34365 - 55403	7.2	2.5	0.39
4763.10	0s I	38613 - 59602	12.	4.1	0.61
4793.99	0s I	4159 - 25013	0.089	0.031	-1.51
4813.80	0s I	14848 - 35616	0.060	0.021	-1.68
4815.50	0s I	13365 - 34126	0.039	0.014	-1.87
4815.96	0s I	30280 - 51039	6.8	2.3	0.37
4826.66	0s I	14091 - 34804	0.047	0.017	-1.78
4843.87	0s I	8743 - 29382	0.010	0.0036	-2.44
4865.60	0s I	30592 - 51138	17.	6.2	0.79
4899.22	0s I	28332 - 48737	4.5	1.6	0.21
4912.60	0s I	12774 - 33124	0.090	0.033	-1.49
4935.81	0s I	17667 - 37922	0.15	0.053	-1.27
4942.94	0s I	15391 - 35616	0.076	0.028	-1.55
4979.32	0s I	16212 - 36290	0.13	0.048	-1.31
5031.83	0s I	15223 - 35090	0.13	0.051	-1.29
5039.12	0s I	18902 - 38741	0.30	0.11	-0.94
5072.88	0s I	16212 - 35920	0.10	0.040	-1.40
5074.77	0s I	15391 - 35090	0.081	0.031	-1.50
5079.09	0s I	12774 - 32457	0.039	0.015	-1.83
5103.50	0s I	8743 - 28332	0.032	0.013	-1.90
5110.81	0s I	11031 - 30592	0.038	0.015	-1.82
5122.23	0s I	14848 - 34365	0.045	0.018	-1.76
5145.54	0s I	18902 - 38331	0.14	0.054	-1.26
5149.74	0s I	15391 - 34804	0.30	0.12	-0.92

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5152.01	0s I	36818 - 56223	8.5	3.4	0.53
5168.98	0s I	38486 - 57827	9.7	3.9	-0.59
5193.52	0s I	11031 - 30280	0.025	0.010	-2.00
5202.63	0s I	10166 - 29382	0.13	0.054	-1.27
5203.23	0s I	11378 - 30592	0.023	0.0095	-2.02
5255.82	0s I	19109 - 38130	0.26	0.11	-0.96
5265.15	0s I	23323 - 42310	1.1	0.45	-0.35
5283.89	0s I	19411 - 38331	0.13	0.053	-1.28
5295.65	0s I	16212 - 35090	0.051	0.021	-1.67
5298.78	0s I	28332 - 47199	3.0	1.3	0.10
5302.58	0s I	19411 - 38264	0.083	0.035	-1.46
5336.23	0s I	15391 - 34126	0.035	0.015	-1.83
5346.03	0s I	11378 - 30078	0.0069	0.0030	-2.53
5352.25	0s I	17667 - 36346	0.049	0.021	-1.68
5376.79	0s I	14091 - 32685	0.15	0.063	-1.20
5403.43	0s I	36346 - 54847	4.4	1.9	0.28
5412.14	0s I	21033 - 39505	0.12	0.053	-1.28
5416.34	0s I	30280 - 48737	14.	6.0	0.78
5416.69	0s I	4159 - 22616	0.0034	0.0015	-2.82
5417.51	0s I	32685 - 51138	4.8	2.1	0.33
5441.82	0s I	19893 - 38264	0.099	0.044	-1.35
5443.31	0s I	14091 - 32457	0.069	0.031	-1.51
5446.93	0s I	32685 - 51039	3.8	1.7	0.23
5447.76	0s I	11031 - 29382	0.0058	0.0026	-2.59
5449.37	0s I	14339 - 32685	0.027	0.012	-1.93
5453.40	0s I	23985 - 42317	0.40	0.18	-0.75
5457.30	0s I	5144 - 23463	0.0022	0.00098	-3.01
5470.00	0s I	14848 - 33124	0.042	0.019	-1.73
5474.58	0s I	25602 - 43863	0.42	0.19	-0.73
5475.13	0s I	21124 - 39383	0.12	0.053	-1.28
5477.27	0s I	17667 - 35920	0.030	0.013	-1.88
5481.85	0s I	19893 - 38130	0.096	0.043	-1.36
5509.33	0s I	30592 - 48737	2.5	1.2	0.06
5516.01	0s I	28140 - 46263	0.57	0.26	-0.59
5523.53	0s I	29099 - 47199	22.	9.9	0.99
5546.82	0s I	34125 - 52149	4.6	2.1	0.33
5549.79	0s I	33124 - 51138	1.6	0.73	-0.14
5552.88	0s I	11378 - 29382	0.0071	0.0033	-2.48
5560.62	0s I	35616 - 53595	2.8	1.3	0.11
5580.66	0s I	33124 - 51039	2.7	1.3	0.11
5584.44	0s I	15223 - 33124	0.12	0.056	-1.25
5600.50	0s I	36826 - 54677	2.2	1.0	0.02
5620.08	0s I	10166 - 27954	0.012	0.0057	-2.24
5637.41	0s I	15391 - 33124	0.014	0.0066	-2.18
5642.56	0s I	19109 - 36826	0.098	0.047	-1.33
5645.25	0s I	19109 - 36818	0.12	0.059	-1.23
5648.98	0s I	19109 - 36806	0.029	0.014	-1.85
5674.38	0s I	18301 - 35920	0.023	0.011	-1.96
5680.88	0s I	34804 - 52402	6.1	3.0	0.47
5709.37	0s I	37909 - 55419	3.5	1.7	0.23

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5721.93	0s I	5144 - 22616	0.014	0.0067	-2.18
5737.89	0s I	17667 - 35090	0.021	0.011	-1.98
5739.72	0s I	25594 - 43011	0.20	0.099	-1.00
5765.05	0s I	11031 - 28372	0.0092	0.0046	-2.34
5780.82	0s I	15391 - 32685	0.23	0.12	-0.93
5800.60	0s I	15223 - 32457	0.052	0.026	-1.59
5842.49	0s I	22564 - 39675	0.079	0.041	-1.39
5857.76	0s I	15391 - 32457	0.15	0.076	-1.12
5860.64	0s I	13020 - 30078	0.019	0.0098	-2.01
5882.92	0s I	11378 - 28372	0.0047	0.0024	-2.61
5903.98	0s I	19893 - 36826	0.051	0.027	-1.57
5906.84	0s I	19893 - 36818	0.051	0.027	-1.57
5908.95	0s I	30280 - 47199	0.58	0.30	-0.52
5981.36	0s I	18902 - 35616	0.022	0.012	-1.92
5983.22	0s I	25602 - 42310	0.24	0.13	-0.88
5996.00	0s I	34365 - 51039	13.	6.8	0.83
6015.79	0s I	21303 - 37922	0.13	0.070	-1.16
6054.63	0s I	27351 - 43863	0.23	0.13	-0.90
6144.53	0s I	8743 - 25013	0.0034	0.0019	-2.71
6158.03	0s I	34804 - 51039	2.2	1.2	0.09
6227.70	0s I	32685 - 48737	4.3	2.5	0.40
6241.70	0s I	13365 - 29382	0.0040	0.0023	-2.63
6269.41	0s I	43012 - 58957	10.	6.0	0.78
6274.94	0s I	40291 - 56222	4.1	2.4	0.39
6286.83	0s I	18902 - 34804	0.031	0.018	-1.74
6398.86	0s I	25602 - 41225	0.15	0.095	-1.02
6403.15	0s I	33124 - 48737	2.9	1.8	0.26
6448.13	0s I	41225 - 56729	3.5	2.2	0.34
6520.85	0s I	21303 - 36634	0.027	0.017	-1.77
6528.87	0s I	21034 - 36346	0.030	0.019	-1.72
6533.14	0s I	15223 - 30525	0.0058	0.0037	-2.43
6538.30	0s I	14091 - 29382	0.0070	0.0045	-2.35
6576.83	0s I	15391 - 30592	0.0099	0.0064	-2.19
6614.56	0s I	24292 - 39406	0.083	0.055	-1.26
6615.43	0s I	40291 - 55403	1.6	1.1	0.02
6661.81	0s I	13365 - 28372	0.0032	0.0021	-2.67
6729.56	0s I	15223 - 30078	0.026	0.018	-1.75
6791.53	0s I	8743 - 23463	0.0027	0.0019	-2.72
6806.61	0s I	15391 - 30078	0.014	0.0098	-2.01
6878.70	0s I	14848 - 29382	0.0044	0.0031	-2.51
6901.58	0s I	25602 - 40087	0.075	0.054	-1.27
6956.02	0s I	34365 - 48737	1.9	1.4	0.14
6984.95	0s I	16212 - 30525	0.0082	0.0060	-2.22
7060.67	0s I	15223 - 29382	0.015	0.011	-1.95
7145.54	0s I	15391 - 29382	0.023	0.017	-1.76
7149.89	0s I	11031 - 25013	0.0031	0.0024	-2.62
7184.10	0s I	38486 - 52402	1.9	1.4	0.16
7206.33	0s I	8743 - 22616	0.0016	0.0012	-2.91
7209.96	0s I	16212 - 30078	0.0065	0.0051	-2.29
7251.16	0s I	21303 - 35090	0.046	0.037	-1.44

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7253.49	0s I	18902 - 32685	0.016	0.012	-1.91
7375.07	0s I	18902 - 32457	0.015	0.012	-1.91
7407.95	0s I	23323 - 36818	0.077	0.064	-1.20
7602.95	0s I	15223 - 28372	0.021	0.018	-1.73
7701.46	0s I	15391 - 28372	0.0037	0.0033	-2.48
7789.96	0s I	34365 - 47199	1.3	1.2	0.06
7852.17	0s I	15223 - 27954	0.0056	0.0052	-2.29
7981.20	0s I	24292 - 36818	0.055	0.053	-1.28
8041.29	0s I	11031 - 23463	0.0015	0.0014	-2.85

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2067.21	0s II	3593 - 51952	250.	16.	1.20
2070.67	0s II	3929 - 52206	144.	9.3	0.97
2194.39	0s II	3593 - 49149	73.	5.3	0.72
2282.26	0s II	0 - 43802	85.	6.6	0.82
2313.75	0s II	5592 - 48799	63.	5.0	0.70
2336.80	0s II	3593 - 46374	175.	14.	1.16
2350.23	0s II	5592 - 48128	95.	7.9	0.90
2355.28	0s II	3929 - 46374	36.	3.0	0.48
2367.35	0s II	3929 - 46157	157.	13.	1.12
2420.02	0s II	13137 - 54445	267.	23.	1.37
2423.07	0s II	7892 - 49149	262.	23.	1.36
2424.02	0s II	13204 - 54445	223.	20.	1.29
2427.90	0s II	13204 - 54379	222.	20.	1.29
2454.91	0s II	3593 - 44315	53.	4.8	0.68
2468.90	0s II	11460 - 51952	298.	27.	1.44
2486.24	0s II	3593 - 43802	227.	21.	1.32
2507.18	0s II	3929 - 43802	16.	1.5	0.17
2509.71	0s II	17569 - 57403	364.	34.	1.54
2538.00	0s II	0 - 39390	98.	9.5	0.98
2548.83	0s II	17569 - 56791	147.	14.	1.15
2563.16	0s II	13204 - 52206	571.	56.	1.75
2578.32	0s II	15606 - 54379	659.	66.	1.82
2580.03	0s II	13204 - 51952	415.	41.	1.62
2596.00	0s II	24466 - 62974	1374.	139.	2.14
2631.22	0s II	24981 - 62974	218.	23.	1.35
2664.29	0s II	25452 - 62974	352.	38.	1.57
2731.36	0s II	15606 - 52206	152.	17.	1.23
2783.88	0s II	7892 - 43802	23.	2.7	0.43
2863.37	0s II	11460 - 46374	44.	5.4	0.73
2879.39	0s II	11654 - 46374	44.	5.5	0.74
2880.20	0s II	17242 - 51952	116.	14.	1.16
3042.74	0s II	11460 - 44315	87.	12.	1.08
3173.93	0s II	7892 - 39390	36.	5.4	0.74
3213.31	0s II	13204 - 44315	123.	19.	1.28
3604.48	0s II	11654 - 39390	22.	4.2	0.62

Wavelength	Spectrum	Energy Levels	gA 10 ⁸ /sec	gf	Log gf
A		K			
2135.47	P I	11362 - 58174	0.52	0.035	-1.45
2136.20	P I	11376 - 58174	5.2	0.35	-0.45
2149.11	P I	11362 - 57877	4.6	0.32	-0.50
2152.95	P I	18722 - 65157	0.73	0.051	-1.29
2154.08	P I	18748 - 65157	1.5	0.10	-0.99
2534.01	P I	18722 - 58174	14.	1.3	0.11
2535.65	P I	18748 - 58174	37.	3.6	0.55
2553.28	P I	18722 - 57877	23.	2.3	0.35
2554.93	P I	18748 - 57877	9.1	0.89	-0.05

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2022.02	Pb I	0 – 49440	0.32	0.019	-1.71
2053.27	Pb I	0 – 48687	0.44	0.028	-1.56
2169.99	Pb I	0 – 46069	0.68	0.048	-1.32
2246.88	Pb I	7819 – 52312	0.22	0.017	-1.77
2332.44	Pb I	10650 – 53511	0.27	0.022	-1.65
2388.80	Pb I	10650 – 52500	0.22	0.019	-1.72
2393.79	Pb I	10650 – 52412	11.	0.94	-0.03
2399.60	Pb I	10650 – 52312	0.22	0.019	-1.73
2401.95	Pb I	7819 – 49440	2.7	0.23	-0.63
2411.73	Pb I	10650 – 52102	0.94	0.082	-1.09
2428.63	Pb I	21458 – 62621	0.45	0.040	-1.40
2443.84	Pb I	7819 – 48726	2.4	0.21	-0.67
2446.19	Pb I	7819 – 48687	4.3	0.38	-0.42
2476.38	Pb I	7819 – 48189	7.8	0.71	-0.15
2577.27	Pb I	10650 – 49440	8.8	0.88	-0.06
2613.65	Pb I	7819 – 46069	1.9	0.19	-0.72
2614.18	Pb I	7819 – 46061	26.	2.7	0.43
2628.28	Pb I	10650 – 48687	1.7	0.18	-0.76
2657.09	Pb I	7819 – 45443	0.050	0.0052	-2.28
2663.16	Pb I	10650 – 48189	19.	2.0	0.31
2801.99	Pb I	10650 – 46329	43.	5.1	0.70
2823.20	Pb I	10650 – 46061	17.	2.0	0.30
2833.06	Pb I	0 – 35287	1.8	0.22	-0.67
2873.32	Pb I	10650 – 45443	9.4	1.2	0.06
3220.57	Pb I	21458 – 52500	0.50	0.077	-1.11
3572.74	Pb I	21458 – 49440	12.	2.3	0.37
3639.58	Pb I	7819 – 35287	1.3	0.26	-0.58
3671.51	Pb I	21458 – 48687	3.3	0.68	-0.17
3683.48	Pb I	7819 – 34960	3.1	0.64	-0.20
3739.95	Pb I	21458 – 48189	25.	5.3	0.72
4019.64	Pb I	21458 – 46329	2.5	0.60	-0.22
4057.83	Pb I	10650 – 35287	9.2	2.3	0.35
4062.14	Pb I	21458 – 46069	3.2	0.79	-0.10
4168.03	Pb I	21458 – 45443	0.63	0.16	-0.78
5005.44	Pb I	29467 – 49440	1.4	0.53	-0.28
5201.47	Pb I	29467 – 48687	0.49	0.20	-0.70
6001.93	Pb I	35287 – 51944	0.23	0.12	-0.91
7229.00	Pb I	21458 – 35287	0.067	0.053	-1.28

Wavelength A	Spectrum	Energy Levels K	$\frac{gA}{10^8/\text{sec}}$	gf	Log gf
2203.53	Pb II	14081 - 59448	5.6	0.41	-0.39

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2447.91	Pd I	0 - 40839	0.83	0.074	-1.13
2476.42	Pd I	0 - 40369	1.1	0.10	-0.98
2763.09	Pd I	0 - 36181	0.62	0.071	-1.15
2922.49	Pd I	6564 - 40771	0.66	0.084	-1.08
3002.65	Pd I	6564 - 39858	0.65	0.088	-1.06
3009.78	Pd I	25101 - 58317	1.8	0.24	-0.61
3027.91	Pd I	7755 - 40771	2.0	0.28	-0.56
3065.31	Pd I	7755 - 40369	1.3	0.19	-0.73
3114.04	Pd I	7755 - 39858	2.7	0.39	-0.41
3142.81	Pd I	25101 - 56911	13.	1.9	0.27
3242.70	Pd I	6564 - 37394	7.7	1.2	0.08
3251.64	Pd I	10094 - 40839	5.1	0.80	-0.09
3258.78	Pd I	10094 - 40771	6.3	1.0	0.00
3287.25	Pd I	6564 - 36976	0.29	0.047	-1.33
3302.13	Pd I	10094 - 40369	6.0	0.98	-0.01
3373.00	Pd I	7755 - 37394	3.6	0.62	-0.21
3404.58	Pd I	6564 - 35928	12.	2.0	0.30
3421.24	Pd I	7755 - 36976	8.4	1.5	0.17
3433.45	Pd I	11722 - 40839	9.8	1.7	0.24
3441.40	Pd I	11722 - 40771	12.	2.2	0.34
3460.77	Pd I	6564 - 35451	3.3	0.60	-0.22
3481.15	Pd I	10094 - 38812	11.	2.0	0.31
3489.77	Pd I	11722 - 40369	3.5	0.64	-0.19
3516.94	Pd I	7755 - 36181	6.4	1.2	0.07
3553.08	Pd I	11722 - 39858	18.	3.4	0.54
3571.16	Pd I	10094 - 38088	4.3	0.82	-0.09
3609.55	Pd I	7755 - 35451	9.0	1.8	0.25
3634.70	Pd I	6564 - 34069	6.2	1.2	0.09
3690.34	Pd I	11722 - 38812	6.5	1.3	0.12
3718.91	Pd I	10094 - 36976	0.98	0.20	-0.69
3799.19	Pd I	7755 - 34069	0.47	0.10	-0.99
3832.29	Pd I	10094 - 36181	0.86	0.19	-0.72
3894.20	Pd I	11722 - 37394	1.8	0.42	-0.38
3958.64	Pd I	11722 - 36976	1.1	0.26	-0.58
4087.34	Pd I	11722 - 36181	0.18	0.046	-1.34
4169.84	Pd I	10094 - 34069	0.032	0.0084	-2.08
4212.95	Pd I	11722 - 35451	1.3	0.36	-0.45
4473.59	Pd I	11722 - 34069	0.069	0.021	-1.68
4788.18	Pd I	34069 - 54948	3.2	1.1	0.04
4817.51	Pd I	34069 - 54821	2.7	0.93	-0.03
4875.43	Pd I	34069 - 54574	2.1	0.75	-0.12
5110.81	Pd I	35451 - 55012	3.5	1.4	0.13
5117.02	Pd I	38812 - 58349	6.1	2.4	0.38
5163.84	Pd I	35451 - 54811	9.7	3.9	0.59
5234.86	Pd I	35928 - 55025	3.6	1.5	0.16
5295.63	Pd I	35928 - 54806	7.6	3.2	0.51
5312.57	Pd I	36181 - 54998	1.2	0.51	-0.29
5345.10	Pd I	39858 - 58562	1.3	0.56	-0.25
5395.24	Pd I	39858 - 58388	3.2	1.4	0.15
5542.80	Pd I	36976 - 55012	3.8	1.7	0.24

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5547.02	Pd I	36976 - 54998	2.5	1.2	0.06
5619.44	Pd I	40771 - 58562	2.6	1.2	0.08
5642.69	Pd I	40839 - 58556	1.5	0.70	-0.16
5655.42	Pd I	40771 - 58448	1.3	0.61	-0.21
5670.07	Pd I	37394 - 55025	5.1	2.5	0.39
5690.14	Pd I	40839 - 58408	1.0	0.50	-0.30
5695.09	Pd I	37394 - 54948	3.8	1.9	0.27
5736.61	Pd I	37394 - 54821	1.3	0.63	-0.20
6774.54	Pd I	25101 - 39858	0.067	0.046	-1.34
6784.52	Pd I	34069 - 48804	2.1	1.5	0.17
6833.42	Pd I	40369 - 54998	0.31	0.22	-0.67
7016.44	Pd I	38088 - 52336	0.69	0.51	-0.29
7310.06	Pd I	38812 - 52488	0.86	0.69	-0.16
7368.12	Pd I	35451 - 49020	2.8	2.3	0.35
7391.92	Pd I	38812 - 52336	1.8	1.5	0.17
7486.90	Pd I	35451 - 48804	0.61	0.51	-0.29
7764.03	Pd I	35928 - 48804	4.5	4.1	0.61
7786.67	Pd I	36181 - 49020	1.1	1.00	-0.00
7915.80	Pd I	39858 - 52488	3.3	3.1	0.49
7961.08	Pd I	28214 - 40771	0.081	0.077	-1.11
8132.82	Pd I	25101 - 37394	0.096	0.095	-1.02
8300.83	Pd I	36976 - 49020	1.9	2.0	0.30
8353.58	Pd I	40369 - 52336	0.68	0.72	-0.14
8532.74	Pd I	40771 - 52488	1.4	1.6	0.19
8599.10	Pd I	37394 - 49020	0.73	0.81	-0.09
8761.35	Pd I	37394 - 48804	2.8	3.2	0.50

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2486.53	Pd II	27094 - 67299	37.	3.4	0.54
2488.92	Pd II	25081 - 65247	94.	8.7	0.94
2498.78	Pd II	32278 - 72285	48.	4.5	0.65
2854.58	Pd II	32278 - 67299	28.	3.5	0.54

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3650.18	Pr II	0 - 27388	0.083	0.017	-1.78
3711.10	Pr II	442 - 27380	0.19	0.039	-1.41
3769.70	Pr II	442 - 26962	0.095	0.020	-1.69
3823.57	Pr II	0 - 26146	0.031	0.0067	-2.17
3826.71	Pr II	3893 - 30018	0.27	0.060	-1.22
3868.58	Pr II	0 - 25842	0.050	0.011	-1.95
3878.31	Pr II	1649 - 27425	0.11	0.025	-1.60
3884.04	Pr II	1649 - 27388	0.044	0.010	-2.00
3885.19	Pr II	1649 - 27380	0.51	0.11	-0.94
3889.33	Pr II	442 - 26146	0.36	0.081	-1.09
3899.56	Pr II	1744 - 27380	0.100	0.023	-1.64
3908.03	Pr II	4437 - 30018	1.9	0.43	-0.37
3912.90	Pr II	1649 - 27198	0.69	0.16	-0.80
3918.86	Pr II	2998 - 28509	2.0	0.46	-0.34
3920.52	Pr II	0 - 25500	0.17	0.039	-1.41
3925.46	Pr II	0 - 25468	0.65	0.15	-0.82
3927.45	Pr II	1744 - 27198	0.53	0.12	-0.91
3935.82	Pr II	442 - 25842	0.28	0.064	-1.19
3947.63	Pr II	1649 - 26974	0.65	0.15	-0.82
3949.44	Pr II	1649 - 26962	0.80	0.19	-0.73
3953.52	Pr II	4437 - 29724	1.7	0.41	-0.39
3962.45	Pr II	1744 - 26974	0.42	0.099	-1.00
3964.26	Pr II	1744 - 26962	0.50	0.12	-0.93
3964.83	Pr II	442 - 25657	0.97	0.23	-0.64
3965.26	Pr II	1649 - 26861	0.97	0.23	-0.64
3966.57	Pr II	2998 - 28202	0.71	0.17	-0.78
3971.16	Pr II	3403 - 28578	0.70	0.16	-0.78
3972.16	Pr II	442 - 25610	0.38	0.089	-1.05
3982.06	Pr II	3403 - 28509	3.0	0.70	-0.15
3989.72	Pr II	442 - 25500	0.80	0.19	-0.72
3994.83	Pr II	442 - 25468	0.93	0.22	-0.65
3997.05	Pr II	2998 - 28010	0.68	0.16	-0.79
4000.19	Pr II	1649 - 26641	0.51	0.12	-0.91
4008.71	Pr II	5079 - 30018	4.1	0.98	-0.01
4015.39	Pr II	1744 - 26641	0.60	0.15	-0.84
4031.76	Pr II	1649 - 26445	0.57	0.14	-0.86
4033.86	Pr II	2998 - 27782	1.1	0.27	-0.57
4034.30	Pr II	1744 - 26524	0.18	0.044	-1.36
4038.47	Pr II	0 - 24755	0.36	0.087	-1.06
4039.36	Pr II	1649 - 26398	0.37	0.089	-1.05
4044.82	Pr II	0 - 24716	0.65	0.16	-0.80
4054.85	Pr II	1744 - 26398	1.7	0.43	-0.37
4056.54	Pr II	5079 - 29724	4.5	1.1	0.04
4061.34	Pr II	5108 - 29724	0.22	0.055	-1.26
4062.82	Pr II	3403 - 28010	4.1	1.0	0.01
4081.02	Pr II	1649 - 26146	0.36	0.090	-1.05
4096.82	Pr II	1744 - 26146	0.41	0.10	-0.99
4100.22	Pr II	2998 - 27380	0.16	0.041	-1.39
4100.75	Pr II	4437 - 28816	4.5	1.1	0.06
4111.87	Pr II	442 - 24755	0.072	0.018	-1.74

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
4118.48	Pr II	442 - 24716	0.83	0.21	-0.68
4132.23	Pr II	1649 - 25842	0.11	0.029	-1.53
4141.26	Pr II	4437 - 28578	2.1	0.55	-0.26
4143.14	Pr II	2998 - 27128	2.6	0.68	-0.17
4148.46	Pr II	1744 - 25842	0.18	0.047	-1.32
4164.19	Pr II	1649 - 25657	1.1	0.28	-0.55
4168.08	Pr II	3403 - 27388	0.28	0.074	-1.13
4169.46	Pr II	3403 - 27380	0.24	0.062	-1.21
4171.82	Pr II	2998 - 26962	0.58	0.15	-0.82
4172.27	Pr II	1649 - 25610	0.47	0.12	-0.91
4179.42	Pr II	1649 - 25569	3.3	0.86	-0.07
4180.68	Pr II	1744 - 25657	0.044	0.011	-1.94
4189.52	Pr II	2998 - 26861	2.3	0.60	-0.22
4191.62	Pr II	1649 - 25500	0.35	0.092	-1.03
4206.74	Pr II	4437 - 28202	3.3	0.88	-0.06
4208.31	Pr II	1744 - 25500	0.31	0.082	-1.08
4213.96	Pr II	1744 - 25468	0.035	0.0093	-2.03
4222.98	Pr II	442 - 24115	1.6	0.43	-0.36
4225.33	Pr II	0 - 23660	1.4	0.38	-0.42
4236.21	Pr II	1649 - 25249	0.18	0.050	-1.30
4241.02	Pr II	4437 - 28010	1.2	0.33	-0.48
4243.53	Pr II	3403 - 26962	0.32	0.087	-1.06
4247.66	Pr II	442 - 23978	0.35	0.094	-1.03
4249.48	Pr II	2998 - 26524	0.076	0.021	-1.69
4254.42	Pr II	5079 - 28578	0.75	0.20	-0.69
4261.80	Pr II	3403 - 26861	0.13	0.034	-1.47
4263.81	Pr II	2998 - 26445	0.22	0.061	-1.22
4272.27	Pr II	2998 - 26398	0.64	0.18	-0.75
4282.44	Pr II	4437 - 27782	0.95	0.26	-0.58
4290.99	Pr II	1649 - 24947	0.031	0.0085	-2.07
4297.76	Pr II	0 - 23261	0.38	0.11	-0.98
4302.10	Pr II	3403 - 26641	0.089	0.025	-1.61
4305.76	Pr II	442 - 23660	0.56	0.15	-0.81
4323.55	Pr II	5079 - 28202	0.29	0.083	-1.08
4329.42	Pr II	1744 - 24835	0.14	0.040	-1.39
4333.91	Pr II	1649 - 24716	0.70	0.20	-0.71
4338.69	Pr II	3403 - 26445	0.30	0.086	-1.07
4347.49	Pr II	3403 - 26398	0.39	0.11	-0.95
4351.85	Pr II	1744 - 24716	0.58	0.17	-0.78
4359.80	Pr II	5079 - 28010	0.53	0.15	-0.82
4368.33	Pr II	0 - 22886	0.38	0.11	-0.96
4395.79	Pr II	3403 - 26146	0.14	0.041	-1.39
4403.61	Pr II	5079 - 27782	0.21	0.061	-1.21
4405.85	Pr II	4437 - 27128	0.44	0.13	-0.89
4408.84	Pr II	0 - 22675	0.50	0.15	-0.84
4412.16	Pr II	2998 - 25657	0.054	0.016	-1.80
4413.77	Pr II	1744 - 24394	0.19	0.057	-1.25
4421.23	Pr II	2998 - 25610	0.11	0.031	-1.50
4429.24	Pr II	2998 - 25569	0.83	0.24	-0.61
4449.87	Pr II	1649 - 24115	0.33	0.097	-1.01

Wavelength	Spectrum	Energy Levels	gA 10 ⁸ /sec	gf	Log gf
A		K			
4454.38	Pr II	442 - 22886	0.021	0.0064	-2.20
4458.34	Pr II	4437 - 26861	0.088	0.026	-1.58
4468.71	Pr II	1744 - 24115	0.43	0.13	-0.89
4473.84	Pr II	5079 - 27425	0.064	0.019	-1.71
4477.26	Pr II	1649 - 23978	0.058	0.018	-1.75
4487.82	Pr II	442 - 22718	0.0086	0.0026	-2.59
4492.43	Pr II	3403 - 25657	0.039	0.012	-1.93
4496.43	Pr II	442 - 22675	0.32	0.098	-1.01
4501.83	Pr II	3403 - 25610	0.027	0.0083	-2.08
4510.16	Pr II	3403 - 25569	0.54	0.16	-0.78
4517.60	Pr II	442 - 22571	0.060	0.018	-1.74
4534.15	Pr II	5079 - 27128	0.36	0.11	-0.95
4535.92	Pr II	0 - 22040	0.086	0.026	-1.58
4550.06	Pr II	5226 - 27198	0.031	0.0095	-2.02
4550.88	Pr II	1649 - 23617	0.013	0.0042	-2.38
4568.55	Pr II	5079 - 26962	0.023	0.0072	-2.14
4570.57	Pr II	1744 - 23616	0.027	0.0084	-2.07
4576.32	Pr II	3403 - 25249	0.043	0.013	-1.87
4578.14	Pr II	2998 - 24835	0.032	0.0100	-2.00
4595.87	Pr II	5108 - 26860	0.028	0.0089	-2.05
4612.07	Pr II	0 - 21676	0.031	0.010	-2.00
4627.05	Pr II	3893 - 25500	0.023	0.0075	-2.13
4628.75	Pr II	442 - 22040	0.070	0.022	-1.65
4646.06	Pr II	1744 - 23261	0.050	0.016	-1.79
4651.52	Pr II	1649 - 23141	0.072	0.023	-1.63
4664.65	Pr II	3403 - 24835	0.078	0.025	-1.60
4672.08	Pr II	1744 - 23141	0.096	0.032	-1.50
4678.17	Pr II	4098 - 25468	0.039	0.013	-1.90
4679.11	Pr II	5079 - 26445	0.036	0.012	-1.93
4707.54	Pr II	1649 - 22886	0.019	0.0063	-2.20
4707.94	Pr II	442 - 21676	0.016	0.0053	-2.27
4728.63	Pr II	1744 - 22886	0.019	0.0063	-2.20
4734.18	Pr II	2998 - 24115	0.021	0.0072	-2.14
4744.93	Pr II	1649 - 22718	0.029	0.0098	-2.01
4746.93	Pr II	5226 - 26287	0.13	0.044	-1.36
4757.94	Pr II	6414 - 27425	0.096	0.033	-1.49
4762.73	Pr II	3403 - 24394	0.052	0.018	-1.75
4765.22	Pr II	2998 - 23978	0.031	0.011	-1.97
4779.20	Pr II	7660 - 28578	0.048	0.016	-1.79
4783.35	Pr II	2998 - 23898	0.051	0.017	-1.76
4799.94	Pr II	1744 - 22571	0.0042	0.0015	-2.84
4801.15	Pr II	3893 - 24716	0.051	0.018	-1.75
4814.34	Pr II	8958 - 29724	0.11	0.037	-1.43
4839.54	Pr II	4098 - 24755	0.023	0.0081	-2.09
4859.04	Pr II	3403 - 23978	0.013	0.0047	-2.33
4865.24	Pr II	6414 - 26962	0.061	0.022	-1.66
4876.26	Pr II	5108 - 25610	0.025	0.0090	-2.05
4877.82	Pr II	3403 - 23898	0.042	0.015	-1.83
4879.12	Pr II	5079 - 25569	0.0083	0.0030	-2.53
4886.05	Pr II	5108 - 25569	0.021	0.0075	-2.13

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4901.48	Pr II	7806 - 28202	0.044	0.016	-1.80
4912.63	Pr II	7660 - 28010	0.083	0.030	-1.52
4925.63	Pr II	1744 - 22040	0.0078	0.0028	-2.55
4943.74	Pr II	3893 - 24115	0.014	0.0051	-2.29
4956.65	Pr II	5079 - 25249	0.054	0.020	-1.70
5002.45	Pr II	6414 - 26398	0.086	0.032	-1.49
5004.58	Pr II	7806 - 27782	0.064	0.024	-1.62
5015.54	Pr II	1744 - 21676	0.0071	0.0027	-2.57
5034.42	Pr II	8958 - 28816	0.51	0.20	-0.71
5064.84	Pr II	3403 - 23141	0.011	0.0042	-2.38
5110.38	Pr II	4098 - 23660	0.16	0.064	-1.20
5110.77	Pr II	9255 - 28816	1.1	0.43	-0.37
5118.02	Pr II	4437 - 23970	0.011	0.0044	-2.36
5129.52	Pr II	5226 - 24716	0.25	0.098	-1.01
5135.13	Pr II	7660 - 27128	0.33	0.13	-0.89
5161.74	Pr II	3893 - 23261	0.083	0.033	-1.48
5173.90	Pr II	7806 - 27128	0.75	0.30	-0.52
5175.83	Pr II	3403 - 22718	0.016	0.0063	-2.20
5183.85	Pr II	5108 - 24394	0.025	0.010	-1.99
5195.11	Pr II	8958 - 28202	0.24	0.098	-1.01
5195.31	Pr II	6414 - 25657	0.16	0.066	-1.18
5206.56	Pr II	7660 - 26861	0.41	0.17	-0.78
5207.90	Pr II	6414 - 25610	0.12	0.048	-1.32
5216.76	Pr II	4098 - 23261	0.019	0.0076	-2.12
5219.05	Pr II	6414 - 25569	0.28	0.12	-0.93
5220.11	Pr II	6418 - 25569	0.45	0.18	-0.74
5251.74	Pr II	5079 - 24115	0.036	0.015	-1.83
5259.74	Pr II	5108 - 24115	0.36	0.15	-0.83
5263.88	Pr II	3893 - 22886	0.067	0.028	-1.55
5292.10	Pr II	5079 - 23970	0.17	0.072	-1.14
5292.63	Pr II	5226 - 24115	0.18	0.075	-1.12
5298.11	Pr II	5108 - 23978	0.12	0.049	-1.31
5308.96	Pr II	6418 - 25249	0.017	0.0070	-2.16
5311.12	Pr II	8958 - 27782	0.14	0.057	-1.24
5312.33	Pr II	5079 - 23898	0.034	0.014	-1.84
5321.09	Pr II	4098 - 22886	0.034	0.014	-1.84
5321.81	Pr II	7660 - 26445	0.041	0.017	-1.76
5322.78	Pr II	3893 - 22675	0.15	0.065	-1.19
5331.48	Pr II	5226 - 23978	0.035	0.015	-1.83
5352.40	Pr II	3893 - 22571	0.071	0.030	-1.52
5381.26	Pr II	4098 - 22675	0.0065	0.0028	-2.55
5411.56	Pr II	4098 - 22571	0.020	0.0087	-2.06
5509.15	Pr II	3893 - 22040	0.021	0.0095	-2.02
5519.38	Pr II	11611 - 29724	0.036	0.017	-1.78
5571.84	Pr II	4098 - 22040	0.014	0.0065	-2.18
5582.40	Pr II	8490 - 26398	0.014	0.0067	-2.17
5610.22	Pr II	9379 - 27198	0.076	0.036	-1.45
5621.85	Pr II	3893 - 21676	0.013	0.0061	-2.22
5662.19	Pr II	8490 - 26146	0.016	0.0076	-2.12
5677.04	Pr II	5108 - 22718	0.0061	0.0029	-2.53

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5681.90	Pr II	9379 - 26974	0.072	0.035	-1.46
5685.61	Pr II	9379 - 26962	0.017	0.0084	-2.08
5687.19	Pr II	4098 - 21676	0.0065	0.0031	-2.50
5689.18	Pr II	11005 - 28578	0.045	0.022	-1.66
5695.93	Pr II	9647 - 27198	0.031	0.015	-1.82
5711.65	Pr II	11005 - 28509	0.078	0.038	-1.42
5719.09	Pr II	6418 - 23898	0.024	0.012	-1.92
5775.92	Pr II	7447 - 24755	0.0078	0.0039	-2.41
5791.38	Pr II	9379 - 26641	0.053	0.027	-1.57
5810.62	Pr II	11611 - 28816	0.087	0.044	-1.36
5813.59	Pr II	11005 - 28202	0.029	0.015	-1.83
5823.72	Pr II	8490 - 25657	0.081	0.041	-1.38
5879.25	Pr II	11005 - 28010	0.14	0.072	-1.14
5892.23	Pr II	11611 - 28578	0.12	0.061	-1.21
5967.84	Pr II	9647 - 26398	0.13	0.069	-1.16
6025.72	Pr II	11611 - 28202	0.28	0.15	-0.82
6141.51	Pr II	9379 - 25657	0.032	0.018	-1.74
6159.09	Pr II	9379 - 25610	0.013	0.0073	-2.14
6161.19	Pr II	8490 - 24716	0.14	0.080	-1.10
6165.95	Pr II	7447 - 23660	0.15	0.084	-1.08
6182.34	Pr II	11611 - 27782	0.098	0.056	-1.25
6200.79	Pr II	11005 - 27128	0.049	0.028	-1.55
6244.34	Pr II	9647 - 25657	0.044	0.026	-1.59
6262.54	Pr II	9647 - 25610	0.038	0.022	-1.65
6278.68	Pr II	9647 - 25569	0.037	0.022	-1.65
6305.26	Pr II	11005 - 26861	0.046	0.028	-1.56
6398.00	Pr II	8490 - 24115	0.029	0.018	-1.75
6454.87	Pr II	8490 - 23978	0.0056	0.0035	-2.45
6475.29	Pr II	7447 - 22886	0.0041	0.0026	-2.58
6564.63	Pr II	7447 - 22675	0.0099	0.0064	-2.19
6850.55	Pr II	7447 - 22040	0.0078	0.0055	-2.26
7021.54	Pr II	9379 - 23617	0.035	0.026	-1.59

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2049.37	Pt I	0 - 48779	2.9	0.18	-0.74
2067.50	Pt I	0 - 48352	0.89	0.057	-1.24
2084.59	Pt I	824 - 48779	2.5	0.16	-0.79
2103.33	Pt I	824 - 48352	0.91	0.060	-1.22
2128.61	Pt I	776 - 47741	1.0	0.068	-1.17
2144.23	Pt I	0 - 46622	1.8	0.13	-0.90
2165.17	Pt I	0 - 46170	0.69	0.048	-1.32
2202.22	Pt I	776 - 46170	0.70	0.051	-1.29
2222.61	Pt I	6568 - 51546	2.1	0.16	-0.80
2249.30	Pt I	0 - 44444	0.27	0.021	-1.68
2274.38	Pt I	776 - 44730	0.75	0.058	-1.24
2289.27	Pt I	776 - 44444	0.43	0.034	-1.47
2292.40	Pt I	824 - 44433	0.43	0.034	-1.47
2308.04	Pt I	6568 - 49881	3.4	0.27	-0.57
2318.29	Pt I	824 - 43946	0.76	0.062	-1.21
2326.10	Pt I	6568 - 49545	1.6	0.13	-0.89
2340.18	Pt I	6568 - 49286	3.1	0.25	-0.60
2357.10	Pt I	776 - 43188	1.3	0.10	-0.98
2368.28	Pt I	6568 - 48779	3.9	0.33	-0.48
2383.64	Pt I	10132 - 52072	6.0	0.51	-0.29
2386.81	Pt I	776 - 42660	0.22	0.019	-1.73
2389.53	Pt I	824 - 42660	0.66	0.056	-1.25
2396.17	Pt I	13496 - 55217	2.9	0.25	-0.60
2401.87	Pt I	10132 - 51752	3.8	0.33	-0.48
2403.09	Pt I	6140 - 47741	5.4	0.47	-0.33
2418.06	Pt I	13496 - 54839	9.9	0.87	-0.06
2428.04	Pt I	6568 - 47741	2.7	0.24	-0.62
2428.20	Pt I	10117 - 51287	3.6	0.32	-0.50
2429.10	Pt I	10132 - 51287	1.8	0.16	-0.80
2436.69	Pt I	776 - 41803	1.3	0.12	-0.93
2440.06	Pt I	0 - 40970	4.2	0.37	-0.43
2450.97	Pt I	0 - 40788	0.40	0.036	-1.45
2467.44	Pt I	0 - 40516	2.7	0.25	-0.60
2471.01	Pt I	13496 - 53953	4.6	0.42	-0.38
2487.17	Pt I	0 - 40194	5.7	0.53	-0.28
2490.12	Pt I	824 - 40970	1.4	0.13	-0.88
2495.82	Pt I	6568 - 46623	5.7	0.53	-0.27
2498.50	Pt I	776 - 40788	1.6	0.15	-0.82
2508.50	Pt I	6568 - 46420	4.1	0.39	-0.41
2514.07	Pt I	10117 - 49881	3.7	0.35	-0.46
2515.03	Pt I	10132 - 49881	4.4	0.42	-0.38
2515.58	Pt I	776 - 40516	1.5	0.14	-0.84
2524.30	Pt I	6568 - 46170	4.5	0.43	-0.37
2529.41	Pt I	13496 - 53019	4.8	0.46	-0.34
2536.49	Pt I	10132 - 49545	3.5	0.34	-0.47
2539.20	Pt I	824 - 40194	0.93	0.090	-1.05
2549.46	Pt I	13496 - 52708	2.1	0.20	-0.69
2552.25	Pt I	10117 - 49286	3.3	0.33	-0.49
2596.00	Pt I	15502 - 54011	6.9	0.70	-0.15
2603.14	Pt I	10132 - 48536	4.1	0.42	-0.38

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2619.57	Pt I	6568 - 44730	1.1	0.11	-0.96
2628.03	Pt I	776 - 38816	4.5	0.46	-0.33
2639.35	Pt I	6568 - 44444	2.6	0.27	-0.57
2646.89	Pt I	0 - 37769	3.1	0.32	-0.49
2650.86	Pt I	824 - 38536	1.9	0.20	-0.70
2658.17	Pt I	10132 - 47741	1.0	0.11	-0.97
2659.45	Pt I	0 - 37591	8.2	0.87	-0.06
2674.57	Pt I	6568 - 43946	0.71	0.076	-1.12
2677.15	Pt I	0 - 37342	1.2	0.13	-0.89
2698.43	Pt I	6140 - 43188	2.9	0.31	-0.50
2702.40	Pt I	776 - 37769	6.2	0.68	-0.17
2705.89	Pt I	824 - 37769	5.0	0.55	-0.26
2713.13	Pt I	10117 - 46965	2.5	0.28	-0.55
2719.04	Pt I	824 - 37591	3.9	0.43	-0.37
2729.92	Pt I	6568 - 43188	1.9	0.21	-0.68
2733.96	Pt I	776 - 37342	5.0	0.56	-0.25
2738.48	Pt I	10117 - 46623	2.7	0.31	-0.51
2747.61	Pt I	13496 - 49881	5.6	0.64	-0.20
2753.86	Pt I	10132 - 46434	3.0	0.34	-0.47
2754.92	Pt I	10132 - 46420	7.5	0.85	-0.07
2769.84	Pt I	6568 - 42660	0.38	0.044	-1.36
2771.67	Pt I	776 - 36845	1.2	0.14	-0.85
2773.24	Pt I	13496 - 49545	3.0	0.35	-0.45
2774.00	Pt I	10132 - 46170	0.71	0.081	-1.09
2793.27	Pt I	13496 - 49286	3.6	0.43	-0.37
2803.24	Pt I	6140 - 41803	1.4	0.17	-0.78
2808.51	Pt I	15502 - 51098	1.0	0.12	-0.92
2818.25	Pt I	824 - 36296	0.11	0.013	-1.89
2830.30	Pt I	0 - 35322	2.3	0.28	-0.56
2834.71	Pt I	10132 - 45398	2.0	0.24	-0.62
2853.11	Pt I	13496 - 48536	1.0	0.13	-0.90
2888.20	Pt I	10117 - 44730	0.59	0.074	-1.13
2893.22	Pt I	15502 - 50055	2.2	0.27	-0.56
2893.86	Pt I	776 - 35322	1.0	0.13	-0.90
2897.87	Pt I	824 - 35322	0.50	0.063	-1.20
2905.90	Pt I	6568 - 40970	0.50	0.063	-1.20
2912.26	Pt I	10117 - 44444	2.7	0.34	-0.47
2913.54	Pt I	10132 - 44444	2.7	0.34	-0.47
2919.34	Pt I	13496 - 47741	3.8	0.49	-0.31
2921.38	Pt I	6568 - 40788	0.24	0.030	-1.52
2929.79	Pt I	0 - 34122	2.1	0.26	-0.58
2942.76	Pt I	30157 - 64129	9.3	1.2	0.08
2944.75	Pt I	6568 - 40516	0.22	0.029	-1.54
2959.10	Pt I	15502 - 49286	1.9	0.25	-0.60
2997.97	Pt I	776 - 34122	2.2	0.30	-0.52
3002.27	Pt I	824 - 34122	0.27	0.037	-1.43
3017.88	Pt I	13496 - 46623	1.3	0.18	-0.75
3036.45	Pt I	13496 - 46420	5.4	0.74	-0.13
3042.64	Pt I	824 - 33681	0.89	0.12	-0.91
3064.71	Pt I	0 - 32620	2.6	0.37	-0.43

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3071.94	Pt I	10117 - 42660	0.42	0.060	-1.22
3100.04	Pt I	6568 - 38816	0.63	0.090	-1.05
3139.39	Pt I	776 - 32620	0.27	0.040	-1.40
3156.56	Pt I	10132 - 41803	1.6	0.24	-0.62
3200.71	Pt I	13496 - 44730	3.2	0.49	-0.31
3204.04	Pt I	6568 - 37769	1.2	0.18	-0.74
3230.29	Pt I	13496 - 44444	0.74	0.12	-0.94
3233.42	Pt I	15502 - 46420	0.88	0.14	-0.86
3251.98	Pt I	10132 - 40874	0.36	0.057	-1.24
3255.92	Pt I	6140 - 36845	0.46	0.074	-1.13
3281.97	Pt I	33681 - 64141	8.7	1.4	0.15
3290.22	Pt I	10132 - 40516	0.99	0.16	-0.79
3301.86	Pt I	6568 - 36845	1.5	0.24	-0.62
3315.05	Pt I	0 - 30157	0.027	0.0044	-2.35
3323.80	Pt I	10117 - 40194	0.27	0.044	-1.36
3408.13	Pt I	824 - 30157	0.16	0.027	-1.57
3427.93	Pt I	13496 - 42660	0.55	0.097	-1.01
3483.43	Pt I	10117 - 38816	0.32	0.059	-1.23
3485.27	Pt I	10132 - 38816	0.86	0.16	-0.80
3628.11	Pt I	6568 - 34122	0.18	0.035	-1.45
3638.79	Pt I	10117 - 37591	0.28	0.056	-1.26
3643.17	Pt I	18567 - 46007	3.1	0.62	-0.21
3699.91	Pt I	13496 - 40516	0.32	0.067	-1.18
3818.69	Pt I	10117 - 36296	0.23	0.051	-1.29
3900.73	Pt I	34122 - 59751	13.	3.1	0.49
3922.96	Pt I	30157 - 55641	27.	6.3	0.80
3948.40	Pt I	13496 - 38816	0.21	0.050	-1.30
3966.36	Pt I	10117 - 35322	0.23	0.054	-1.27
3996.57	Pt I	15502 - 40516	0.20	0.048	-1.32
4118.69	Pt I	13496 - 37769	0.52	0.13	-0.88
4164.56	Pt I	10117 - 34122	0.14	0.036	-1.45
4192.43	Pt I	13496 - 37342	0.17	0.045	-1.34
4327.06	Pt I	33680 - 56784	5.5	1.5	0.19
4391.83	Pt I	21967 - 44730	0.65	0.19	-0.73
4442.55	Pt I	10117 - 32620	0.096	0.028	-1.55
4445.55	Pt I	10132 - 32620	0.017	0.0050	-2.30
4498.76	Pt I	30157 - 52379	4.9	1.5	0.17
4520.90	Pt I	37769 - 59882	4.7	1.4	0.16
4552.42	Pt I	33680 - 55641	10.	3.1	0.50
4879.53	Pt I	36296 - 56784	4.1	1.5	0.17
5044.04	Pt I	15502 - 35322	0.041	0.016	-1.81
5059.48	Pt I	32620 - 52379	6.6	2.5	0.40
5227.66	Pt I	13496 - 32620	0.049	0.020	-1.69
5301.02	Pt I	36782 - 55641	13.	5.7	0.75
5368.99	Pt I	15502 - 34122	0.027	0.011	-1.94
5390.79	Pt I	34122 - 52667	2.9	1.3	0.11
5475.77	Pt I	34122 - 52379	3.3	1.5	0.18
5478.50	Pt I	38536 - 56784	5.4	2.4	0.38
5763.57	Pt I	35322 - 52667	1.6	0.78	-0.11
5840.12	Pt I	15502 - 32620	0.032	0.016	-1.79

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
5844.84	Pt I	38536 - 55641	3.0	1.5	0.18
6026.04	Pt I	40194 - 56784	2.5	1.4	0.14
6318.37	Pt I	36845 - 52667	2.0	1.2	0.08
6326.58	Pt I	21967 - 37769	0.058	0.035	-1.46
6523.45	Pt I	37342 - 52667	2.7	1.7	0.23
6710.42	Pt I	37769 - 52667	3.0	2.1	0.31
6760.02	Pt I	37591 - 52379	5.9	4.0	0.61
6842.60	Pt I	37769 - 52379	18.	13.	1.10
7113.73	Pt I	18566 - 32620	0.038	0.029	-1.54
8224.74	Pt I	21967 - 34122	0.034	0.034	-1.46

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2794.21	Pt II	13311 - 49089	120.	14.	1.15

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4201.85	Rb I	0 – 23793	0.96	0.25	-0.60
4215.56	Rb I	0 – 23715	0.47	0.13	-0.90
5648.10	Rb I	12579 – 30280	0.30	0.14	-0.84
5724.45	Rb I	12817 – 30282	0.51	0.25	-0.60
6206.31	Rb I	12579 – 28687	0.44	0.25	-0.60
6298.33	Rb I	12817 – 28689	0.71	0.42	-0.37
7280.00	Rb I	12579 – 26311	0.37	0.29	-0.53
7408.17	Rb I	12817 – 26311	0.54	0.44	-0.36
7618.93	Rb I	12579 – 25701	0.65	0.57	-0.25
7757.65	Rb I	12817 – 25704	1.0	0.94	-0.03
7759.43	Rb I	12817 – 25701	0.19	0.17	-0.77
7800.23	Rb I	0 – 12817	3.0	2.7	0.43
7947.60	Rb I	0 – 12579	1.3	1.2	0.08

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2003.53	Re I	0 - 49895	2.9	0.17	-0.76
2017.87	Re I	0 - 49541	2.1	0.13	-0.89
2049.08	Re I	0 - 48786	4.4	0.28	-0.56
2074.70	Re I	0 - 48184	0.82	0.053	-1.28
2083.92	Re I	0 - 47971	0.78	0.051	-1.29
2085.59	Re I	0 - 47932	2.2	0.14	-0.85
2097.12	Re I	0 - 47669	2.1	0.14	-0.87
2156.67	Re I	0 - 46353	1.2	0.084	-1.08
2167.94	Re I	0 - 46112	1.7	0.12	-0.91
2176.21	Re I	0 - 45937	1.2	0.088	-1.05
2226.42	Re I	0 - 44901	0.87	0.065	-1.19
2235.44	Re I	0 - 44720	0.49	0.036	-1.44
2255.73	Re I	11584 - 55902	2.2	0.17	-0.77
2256.19	Re I	0 - 44309	0.50	0.038	-1.42
2264.39	Re I	0 - 44148	1.2	0.092	-1.04
2274.62	Re I	0 - 43950	1.4	0.11	-0.97
2281.62	Re I	0 - 43815	1.1	0.086	-1.07
2287.51	Re I	0 - 43702	2.1	0.17	-0.78
2294.49	Re I	0 - 43569	2.1	0.16	-0.79
2299.77	Re I	11755 - 55224	3.2	0.25	-0.60
2302.99	Re I	0 - 43408	0.49	0.039	-1.40
2306.54	Re I	0 - 43342	0.53	0.043	-1.37
2312.97	Re I	15058 - 58280	2.8	0.22	-0.65
2319.19	Re I	16307 - 59412	3.0	0.24	-0.62
2320.16	Re I	16307 - 59394	5.2	0.42	-0.38
2322.49	Re I	0 - 43044	0.68	0.055	-1.26
2328.66	Re I	11584 - 54514	3.0	0.24	-0.61
2334.33	Re I	11584 - 54410	3.0	0.24	-0.61
2335.73	Re I	11754 - 54554	3.0	0.25	-0.61
2336.10	Re I	16619 - 59412	3.8	0.31	-0.51
2337.95	Re I	11754 - 54514	3.0	0.25	-0.61
2345.28	Re I	13826 - 56452	2.1	0.18	-0.76
2347.06	Re I	11584 - 54177	1.7	0.14	-0.85
2349.39	Re I	14621 - 57173	3.9	0.32	-0.49
2352.07	Re I	11584 - 54087	8.7	0.72	-0.14
2356.50	Re I	11754 - 54177	3.4	0.28	-0.55
2365.90	Re I	0 - 42254	1.3	0.11	-0.95
2367.68	Re I	15058 - 57281	12.	0.99	-0.00
2369.27	Re I	11755 - 53949	8.1	0.68	-0.17
2371.52	Re I	11584 - 53738	3.3	0.28	-0.56
2375.07	Re I	14217 - 56308	6.7	0.57	-0.25
2375.82	Re I	11584 - 53662	2.3	0.20	-0.71
2380.22	Re I	16619 - 58619	5.1	0.43	-0.36
2380.89	Re I	16307 - 58295	1.8	0.15	-0.82
2381.14	Re I	11754 - 53738	3.3	0.28	-0.56
2383.46	Re I	14217 - 56160	4.2	0.36	-0.45
2387.46	Re I	16307 - 58180	2.5	0.21	-0.67
2389.11	Re I	0 - 41844	0.23	0.020	-1.70
2391.28	Re I	11584 - 53390	1.6	0.14	-0.87
2393.65	Re I	13826 - 55590	5.7	0.49	-0.31

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2394.37	Re I	11584 - 53336	6.3	0.54	-0.27
2396.79	Re I	11584 - 53294	6.7	0.58	-0.24
2397.31	Re I	15166 - 56866	5.8	0.50	-0.30
2398.71	Re I	16619 - 58295	2.5	0.22	-0.66
2400.72	Re I	15058 - 56699	6.3	0.55	-0.26
2401.68	Re I	11754 - 53379	4.5	0.39	-0.41
2405.06	Re I	11754 - 53321	31.	2.7	0.44
2405.60	Re I	0 - 41557	1.1	0.096	-1.02
2410.37	Re I	11584 - 53059	6.1	0.53	-0.27
2414.59	Re I	15770 - 57173	4.6	0.41	-0.39
2416.44	Re I	11584 - 52954	3.0	0.26	-0.58
2417.66	Re I	16307 - 57657	4.8	0.42	-0.37
2419.40	Re I	15770 - 57090	6.6	0.58	-0.24
2419.81	Re I	0 - 41313	2.0	0.18	-0.75
2421.38	Re I	15166 - 56452	6.3	0.55	-0.26
2421.73	Re I	14621 - 55901	10.	0.89	-0.05
2423.50	Re I	15058 - 56308	2.2	0.19	-0.72
2426.64	Re I	16328 - 57524	4.1	0.36	-0.44
2428.58	Re I	0 - 41164	4.4	0.39	-0.41
2429.65	Re I	16307 - 57453	4.8	0.42	-0.37
2432.18	Re I	11754 - 52857	12.	1.1	0.03
2432.70	Re I	15166 - 56260	6.2	0.55	-0.26
2433.28	Re I	16307 - 57391	8.2	0.72	-0.14
2436.05	Re I	16619 - 57657	4.9	0.43	-0.36
2438.46	Re I	13826 - 54823	7.6	0.68	-0.17
2439.06	Re I	11754 - 52741	4.2	0.38	-0.42
2441.47	Re I	0 - 40946	0.65	0.059	-1.23
2442.51	Re I	15770 - 56699	11.	0.98	-0.01
2444.94	Re I	11584 - 52472	8.2	0.73	-0.13
2446.98	Re I	15058 - 55912	30.	2.7	0.43
2449.71	Re I	0 - 40809	1.3	0.11	-0.94
2450.89	Re I	11584 - 52373	2.8	0.26	-0.59
2453.14	Re I	16619 - 57372	4.8	0.43	-0.36
2460.24	Re I	11584 - 52218	2.8	0.25	-0.60
2461.20	Re I	11754 - 52373	13.	1.2	0.07
2463.31	Re I	13826 - 54410	4.7	0.43	-0.37
2465.13	Re I	16619 - 57173	6.8	0.62	-0.21
2474.73	Re I	15058 - 55454	7.6	0.70	-0.16
2476.28	Re I	11584 - 51955	2.3	0.21	-0.67
2479.02	Re I	17331 - 57657	11.	1.0	0.02
2480.82	Re I	14217 - 54514	8.0	0.74	-0.13
2483.92	Re I	11754 - 52001	39.	3.6	0.56
2485.81	Re I	16307 - 56523	21.	1.9	0.28
2486.78	Re I	11754 - 51955	3.9	0.36	-0.45
2487.33	Re I	11755 - 51946	31.	2.9	0.46
2492.84	Re I	13826 - 53929	8.0	0.75	-0.13
2495.26	Re I	11584 - 51648	4.5	0.42	-0.38
2496.04	Re I	14217 - 54268	16.	1.5	0.16
2496.70	Re I	17331 - 57372	2.1	0.20	-0.71
2498.22	Re I	13826 - 53843	8.0	0.74	-0.13

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2498.86	Re I	11584 - 51590	3.3	0.31	-0.51
2500.31	Re I	22160 - 62143	5.6	0.52	-0.28
2500.57	Re I	23956 - 63935	11.	1.0	0.01
2501.72	Re I	14217 - 54177	16.	1.5	0.16
2505.94	Re I	11754 - 51648	8.2	0.77	-0.11
2507.40	Re I	14217 - 54087	6.2	0.58	-0.24
2508.99	Re I	0 - 39845	3.0	0.28	-0.55
2512.55	Re I	14621 - 54410	3.2	0.30	-0.52
2516.12	Re I	11754 - 51486	3.6	0.35	-0.46
2520.01	Re I	0 - 39670	0.87	0.083	-1.08
2521.50	Re I	14621 - 54268	23.	2.2	0.34
2526.81	Re I	13826 - 53390	2.4	0.23	-0.64
2529.50	Re I	14217 - 53738	5.5	0.52	-0.28
2533.31	Re I	13826 - 53288	5.7	0.54	-0.26
2534.80	Re I	11754 - 51193	11.	1.0	0.01
2539.33	Re I	17331 - 56699	6.0	0.58	-0.23
2540.51	Re I	11584 - 50934	16.	1.5	0.18
2543.67	Re I	15166 - 54467	4.9	0.47	-0.32
2543.84	Re I	13826 - 53125	2.3	0.23	-0.65
2544.22	Re I	16619 - 55912	5.6	0.55	-0.26
2544.74	Re I	11584 - 50869	20.	2.0	0.29
2545.48	Re I	11754 - 51028	10.	1.0	0.00
2548.14	Re I	13826 - 53059	4.1	0.40	-0.39
2548.88	Re I	14621 - 53842	6.1	0.59	-0.23
2549.37	Re I	17238 - 56452	3.3	0.32	-0.49
2552.02	Re I	14217 - 53390	12.	1.1	0.05
2552.73	Re I	14217 - 53379	1.4	0.14	-0.85
2554.93	Re I	13826 - 52954	2.3	0.22	-0.65
2556.51	Re I	14217 - 53321	41.	4.0	0.60
2558.06	Re I	17331 - 56411	7.9	0.78	-0.11
2559.08	Re I	0 - 39065	0.32	0.032	-1.50
2559.71	Re I	13826 - 52881	2.7	0.27	-0.57
2559.88	Re I	15770 - 54823	3.4	0.33	-0.48
2561.46	Re I	15058 - 54087	6.3	0.62	-0.21
2564.19	Re I	11584 - 50571	9.0	0.89	-0.05
2565.84	Re I	21775 - 60737	5.3	0.53	-0.28
2571.26	Re I	11584 - 50464	3.8	0.38	-0.42
2573.76	Re I	14217 - 53059	5.6	0.55	-0.26
2574.21	Re I	16619 - 55454	2.4	0.24	-0.62
2576.32	Re I	17331 - 56134	3.9	0.39	-0.41
2579.01	Re I	15166 - 53929	6.2	0.62	-0.21
2580.31	Re I	15770 - 54514	4.4	0.44	-0.35
2581.44	Re I	11584 - 50311	3.7	0.37	-0.43
2584.77	Re I	15166 - 53842	3.1	0.31	-0.51
2586.79	Re I	11754 - 50401	11.	1.1	0.03
2587.00	Re I	13826 - 52469	2.6	0.26	-0.58
2591.13	Re I	17331 - 55912	3.8	0.39	-0.41
2591.59	Re I	11584 - 50159	4.8	0.49	-0.31
2592.84	Re I	11755 - 50311	2.5	0.25	-0.60
2594.85	Re I	11584 - 50110	4.2	0.42	-0.37

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2595.23	Re I	0 - 38521	0.22	0.023	-1.64
2596.78	Re I	15770 - 54268	7.6	0.77	-0.11
2596.95	Re I	16327 - 54823	5.8	0.58	-0.23
2599.86	Re I	13826 - 52278	11.	1.1	0.05
2600.87	Re I	14621 - 53059	2.8	0.29	-0.54
2601.87	Re I	16307 - 54730	4.6	0.46	-0.33
2602.93	Re I	15770 - 54177	4.3	0.44	-0.36
2613.74	Re I	15770 - 54018	5.3	0.54	-0.26
2614.56	Re I	14621 - 52857	6.4	0.66	-0.18
2617.44	Re I	16619 - 54813	4.6	0.48	-0.32
2620.03	Re I	14217 - 52373	6.5	0.67	-0.18
2620.34	Re I	21775 - 59927	13.	1.3	0.13
2623.28	Re I	11754 - 49863	2.3	0.24	-0.62
2625.04	Re I	11584 - 49667	1.1	0.12	-0.94
2630.75	Re I	15058 - 53059	2.4	0.25	-0.61
2631.57	Re I	11584 - 49573	2.2	0.23	-0.64
2633.01	Re I	15770 - 53738	2.1	0.22	-0.67
2633.61	Re I	15166 - 53125	5.8	0.60	-0.22
2636.64	Re I	0 - 37916	0.60	0.063	-1.20
2642.75	Re I	11754 - 49583	6.7	0.70	-0.16
2647.13	Re I	0 - 37766	0.16	0.017	-1.77
2649.05	Re I	14217 - 51955	9.9	1.0	0.02
2649.58	Re I	17238 - 54969	2.4	0.25	-0.60
2651.90	Re I	0 - 37698	0.68	0.072	-1.14
2652.91	Re I	15058 - 52741	5.5	0.58	-0.23
2654.12	Re I	11584 - 49250	9.4	0.99	-0.00
2655.18	Re I	13826 - 51477	1.5	0.16	-0.79
2655.84	Re I	16307 - 53949	2.1	0.23	-0.65
2659.02	Re I	14621 - 52218	2.6	0.27	-0.56
2659.79	Re I	26349 - 63935	6.3	0.67	-0.17
2663.63	Re I	11755 - 49286	5.3	0.56	-0.25
2664.22	Re I	15770 - 53294	3.0	0.32	-0.50
2664.81	Re I	16327 - 53842	3.2	0.34	-0.47
2667.13	Re I	17331 - 54813	3.5	0.38	-0.42
2670.24	Re I	11584 - 49023	1.5	0.16	-0.79
2670.79	Re I	14217 - 51648	4.0	0.42	-0.37
2671.84	Re I	11754 - 49171	3.6	0.39	-0.41
2674.34	Re I	0 - 37381	0.89	0.096	-1.02
2677.76	Re I	14621 - 51955	5.0	0.54	-0.27
2679.10	Re I	15058 - 52373	5.3	0.57	-0.24
2679.91	Re I	22160 - 59464	12.	1.3	0.11
2683.56	Re I	22160 - 59412	10.	1.1	0.05
2688.53	Re I	15770 - 52954	9.6	1.0	0.02
2690.25	Re I	16307 - 53467	5.1	0.56	-0.26
2694.39	Re I	11754 - 48858	1.7	0.19	-0.73
2695.56	Re I	15770 - 52857	6.6	0.72	-0.14
2697.26	Re I	0 - 37064	0.077	0.0084	-2.07
2698.79	Re I	16619 - 53662	2.1	0.23	-0.64
2699.58	Re I	11754 - 48786	0.73	0.079	-1.10
2704.37	Re I	16327 - 53294	6.0	0.66	-0.18

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2706.06	Re I	15058 - 52001	1.7	0.19	-0.73
2712.48	Re I	14621 - 51477	2.4	0.26	-0.58
2713.02	Re I	16619 - 53467	4.1	0.46	-0.34
2713.16	Re I	17331 - 54177	3.4	0.37	-0.43
2715.47	Re I	11754 - 48570	28.	3.1	0.49
2715.77	Re I	14217 - 51028	5.9	0.65	-0.19
2716.75	Re I	16327 - 53125	3.0	0.33	-0.48
2719.54	Re I	16619 - 53379	2.0	0.23	-0.64
2722.70	Re I	14217 - 50934	6.2	0.68	-0.16
2723.84	Re I	15770 - 52472	4.1	0.46	-0.34
2727.55	Re I	14217 - 50869	3.6	0.40	-0.40
2728.63	Re I	13826 - 50464	1.3	0.15	-0.82
2729.64	Re I	16327 - 52952	2.9	0.33	-0.49
2730.83	Re I	14621 - 51230	1.5	0.17	-0.77
2732.21	Re I	15058 - 51648	8.1	0.91	-0.04
2734.31	Re I	14621 - 51183	1.9	0.21	-0.67
2738.32	Re I	15770 - 52278	3.6	0.40	-0.40
2741.97	Re I	22160 - 58619	5.0	0.57	-0.25
2743.87	Re I	16307 - 52741	3.8	0.43	-0.37
2747.44	Re I	11584 - 47971	2.7	0.30	-0.52
2752.85	Re I	11584 - 47899	1.4	0.16	-0.79
2753.05	Re I	14621 - 50934	4.4	0.50	-0.30
2755.21	Re I	13826 - 50110	1.6	0.18	-0.74
2758.00	Re I	14621 - 50869	7.3	0.83	-0.08
2758.71	Re I	16619 - 52857	2.4	0.28	-0.56
2761.93	Re I	11584 - 47780	2.0	0.23	-0.64
2763.30	Re I	11754 - 47932	1.6	0.19	-0.72
2763.79	Re I	15058 - 51230	7.3	0.84	-0.08
2766.39	Re I	27130 - 63268	19.	2.2	0.35
2767.74	Re I	11584 - 47704	5.5	0.63	-0.20
2768.85	Re I	11754 - 47860	4.1	0.47	-0.33
2770.42	Re I	11584 - 47669	6.2	0.72	-0.14
2773.11	Re I	17238 - 53288	7.7	0.89	-0.05
2777.71	Re I	17331 - 53321	3.6	0.42	-0.38
2778.50	Re I	14218 - 50197	2.3	0.26	-0.58
2781.43	Re I	14217 - 50159	5.2	0.60	-0.22
2783.57	Re I	11754 - 47669	9.8	1.1	0.06
2785.21	Re I	14217 - 50110	4.5	0.52	-0.28
2786.14	Re I	21775 - 57657	4.0	0.46	-0.33
2786.56	Re I	15058 - 50934	4.1	0.47	-0.32
2789.27	Re I	13826 - 49667	2.4	0.28	-0.56
2790.94	Re I	15770 - 51590	5.3	0.62	-0.20
2791.29	Re I	16307 - 52122	8.9	1.0	0.02
2798.10	Re I	17331 - 53059	4.6	0.53	-0.27
2807.86	Re I	11754 - 47358	1.6	0.20	-0.71
2812.07	Re I	17331 - 52881	2.5	0.29	-0.53
2812.36	Re I	16328 - 51874	3.0	0.36	-0.44
2813.11	Re I	14621 - 50159	1.6	0.19	-0.71
2813.96	Re I	17331 - 52857	7.4	0.88	-0.05
2814.68	Re I	11584 - 47102	3.5	0.41	-0.39

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2816.32	Re I	22160 - 57657	12.	1.4	0.16
2816.96	Re I	14621 - 50110	2.9	0.35	-0.46
2819.95	Re I	11754 - 47206	14.	1.7	0.23
2822.12	Re I	13826 - 49250	2.8	0.33	-0.48
2824.25	Re I	21775 - 57173	7.8	0.93	-0.03
2825.46	Re I	16619 - 52001	4.0	0.48	-0.32
2827.52	Re I	14217 - 49573	3.0	0.35	-0.45
2834.08	Re I	14621 - 49896	8.8	1.1	0.03
2837.55	Re I	22160 - 57391	14.	1.7	0.24
2840.35	Re I	13826 - 49023	4.8	0.58	-0.24
2843.00	Re I	15770 - 50934	7.6	0.92	-0.04
2844.16	Re I	11584 - 46133	1.2	0.15	-0.83
2850.98	Re I	11584 - 46649	3.7	0.46	-0.34
2852.84	Re I	17331 - 52373	3.8	0.46	-0.34
2860.07	Re I	14217 - 49171	1.4	0.17	-0.77
2860.25	Re I	14621 - 49573	1.5	0.18	-0.74
2864.56	Re I	27244 - 62143	5.3	0.65	-0.19
2867.19	Re I	16619 - 51486	9.1	1.1	0.05
2871.82	Re I	14217 - 49028	3.8	0.47	-0.33
2872.30	Re I	15058 - 49863	1.6	0.20	-0.71
2872.67	Re I	15770 - 50571	1.4	0.18	-0.75
2875.28	Re I	11584 - 46353	2.6	0.32	-0.49
2879.27	Re I	16307 - 51028	2.3	0.29	-0.54
2883.44	Re I	17331 - 52001	8.1	1.0	0.01
2884.04	Re I	23956 - 58619	5.3	0.66	-0.18
2887.31	Re I	17331 - 51955	2.7	0.34	-0.47
2887.68	Re I	11754 - 46374	38.	4.8	0.68
2889.45	Re I	11754 - 46353	1.2	0.15	-0.83
2891.48	Re I	16619 - 51193	3.6	0.45	-0.34
2891.88	Re I	14217 - 48786	4.1	0.52	-0.28
2892.63	Re I	19458 - 54018	8.2	1.0	0.01
2894.32	Re I	15770 - 50311	3.5	0.44	-0.36
2895.65	Re I	15058 - 49583	1.2	0.15	-0.82
2896.01	Re I	0 - 34520	0.22	0.028	-1.55
2898.79	Re I	20482 - 54969	2.0	0.25	-0.61
2902.48	Re I	18950 - 53392	41.	5.2	0.71
2905.58	Re I	14621 - 49028	5.2	0.66	-0.18
2906.02	Re I	14621 - 49023	4.4	0.55	-0.26
2909.82	Re I	16307 - 50663	18.	2.3	0.37
2910.08	Re I	11584 - 45937	0.64	0.081	-1.09
2913.15	Re I	17331 - 51648	2.6	0.33	-0.48
2918.88	Re I	16619 - 50869	2.3	0.29	-0.53
2919.41	Re I	16327 - 50571	3.3	0.42	-0.38
2924.60	Re I	11754 - 45937	1.8	0.23	-0.64
2925.20	Re I	26661 - 60837	11.	1.4	0.16
2926.93	Re I	17331 - 51486	2.5	0.33	-0.49
2927.42	Re I	11754 - 45904	9.5	1.2	0.09
2929.53	Re I	15770 - 49895	5.2	0.67	-0.17
2930.61	Re I	15058 - 49171	6.8	0.88	-0.06
2932.31	Re I	15770 - 49863	1.9	0.25	-0.60

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2936.50	Re I	16619 - 50663	4.5	0.58	-0.24
2941.56	Re I	20482 - 54467	2.5	0.33	-0.49
2943.14	Re I	14217 - 48184	9.3	1.2	0.08
2944.32	Re I	13826 - 47780	1.3	0.17	-0.78
2946.57	Re I	20482 - 54410	3.8	0.49	-0.31
2949.09	Re I	17331 - 51230	4.5	0.59	-0.23
2949.88	Re I	16307 - 50197	2.1	0.27	-0.57
2950.83	Re I	11584 - 45463	1.4	0.18	-0.75
2954.34	Re I	13826 - 47665	2.3	0.30	-0.53
2961.74	Re I	14217 - 47971	2.9	0.38	-0.42
2962.27	Re I	11584 - 45332	2.6	0.35	-0.46
2962.87	Re I	22160 - 55901	4.4	0.58	-0.24
2965.11	Re I	14217 - 47932	14.	1.9	0.28
2965.76	Re I	11754 - 45463	16.	2.1	0.32
2967.25	Re I	16619 - 50311	2.8	0.38	-0.43
2968.04	Re I	14217 - 47899	3.5	0.46	-0.33
2975.02	Re I	17331 - 50934	2.8	0.37	-0.43
2975.25	Re I	19458 - 53059	5.9	0.79	-0.10
2976.29	Re I	0 - 33589	0.11	0.015	-1.83
2977.30	Re I	16619 - 50197	2.1	0.28	-0.55
2978.15	Re I	16327 - 49895	6.3	0.84	-0.08
2980.82	Re I	11584 - 45122	2.1	0.28	-0.56
2981.01	Re I	19758 - 53294	3.3	0.44	-0.35
2984.75	Re I	19458 - 52952	3.2	0.43	-0.37
2988.47	Re I	14217 - 47669	4.2	0.56	-0.25
2992.36	Re I	0 - 33409	0.61	0.082	-1.08
2995.40	Re I	30560 - 63935	18.	2.4	0.38
2999.60	Re I	11754 - 45083	52.	7.0	0.84
3001.14	Re I	14621 - 47932	7.2	0.97	-0.01
3004.14	Re I	14621 - 47899	4.4	0.60	-0.22
3004.34	Re I	13826 - 47102	1.1	0.15	-0.82
3006.42	Re I	15770 - 49023	5.1	0.69	-0.16
3011.92	Re I	11754 - 44946	1.3	0.18	-0.75
3013.14	Re I	13826 - 47004	3.4	0.47	-0.33
3016.02	Re I	11754 - 44901	4.9	0.67	-0.17
3016.49	Re I	14217 - 47358	5.9	0.81	-0.09
3016.97	Re I	11584 - 44720	0.38	0.051	-1.29
3021.88	Re I	14621 - 47704	2.6	0.35	-0.45
3022.99	Re I	17331 - 50401	2.2	0.30	-0.52
3030.45	Re I	14217 - 47206	7.2	1.00	-0.00
3031.27	Re I	23155 - 56134	4.6	0.63	-0.20
3032.79	Re I	16619 - 49583	1.9	0.26	-0.58
3034.55	Re I	20448 - 53392	7.4	1.0	0.01
3036.55	Re I	16327 - 49250	1.8	0.25	-0.61
3037.96	Re I	13826 - 46733	1.7	0.24	-0.63
3040.03	Re I	14217 - 47102	2.4	0.34	-0.47
3041.00	Re I	15058 - 47932	2.3	0.31	-0.50
3041.99	Re I	16307 - 49171	1.8	0.25	-0.61
3044.08	Re I	15058 - 47899	2.3	0.31	-0.50
3047.25	Re I	28030 - 60837	25.	3.5	0.55

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3053.63	Re I	21775 - 54514	6.6	0.92	-0.04
3054.90	Re I	11584 - 44309	1.1	0.15	-0.81
3057.66	Re I	16327 - 49023	2.6	0.36	-0.44
3058.78	Re I	13826 - 46509	3.2	0.45	-0.34
3060.32	Re I	16619 - 49286	3.9	0.55	-0.26
3061.61	Re I	22160 - 54813	6.8	0.95	-0.02
3064.60	Re I	17238 - 49860	2.4	0.33	-0.48
3067.40	Re I	0 - 32592	0.50	0.070	-1.15
3069.94	Re I	11584 - 44148	2.6	0.37	-0.43
3071.16	Re I	16619 - 49171	7.7	1.1	0.04
3072.96	Re I	17331 - 49863	6.8	0.96	-0.02
3076.14	Re I	15166 - 47665	1.9	0.28	-0.56
3078.86	Re I	11754 - 44225	0.83	0.12	-0.93
3082.43	Re I	14217 - 46649	9.3	1.3	0.12
3084.21	Re I	15770 - 48184	4.4	0.62	-0.20
3087.15	Re I	14621 - 47004	1.7	0.24	-0.62
3088.76	Re I	11584 - 43950	2.6	0.38	-0.42
3089.94	Re I	22160 - 54514	7.3	1.0	0.02
3093.64	Re I	13826 - 46141	3.0	0.42	-0.37
3095.06	Re I	15058 - 47358	4.0	0.58	-0.24
3095.79	Re I	14217 - 46509	2.9	0.42	-0.37
3096.41	Re I	13826 - 46112	1.5	0.21	-0.68
3100.67	Re I	16327 - 48569	19.	2.7	0.43
3104.65	Re I	15770 - 47971	3.3	0.47	-0.33
3108.81	Re I	14217 - 46374	11.	1.6	0.21
3110.86	Re I	14217 - 46353	5.4	0.78	-0.11
3111.56	Re I	15770 - 47899	3.2	0.47	-0.33
3118.19	Re I	11754 - 43815	2.6	0.37	-0.43
3121.36	Re I	14621 - 46649	5.8	0.85	-0.07
3123.16	Re I	15770 - 47780	1.6	0.23	-0.64
3125.52	Re I	11584 - 43569	0.49	0.072	-1.14
3128.94	Re I	16619 - 48569	11.	1.7	0.22
3134.02	Re I	15770 - 47669	5.7	0.84	-0.07
3139.79	Re I	17331 - 49171	2.1	0.31	-0.50
3139.94	Re I	15166 - 47004	1.3	0.19	-0.71
3141.38	Re I	11584 - 43408	1.7	0.25	-0.60
3151.16	Re I	19458 - 51183	3.1	0.45	-0.34
3151.64	Re I	14217 - 45937	6.1	0.91	-0.04
3153.79	Re I	11754 - 43453	2.3	0.34	-0.47
3158.31	Re I	11754 - 43408	2.4	0.37	-0.44
3164.52	Re I	15058 - 46649	3.8	0.57	-0.24
3167.16	Re I	16619 - 48184	1.2	0.19	-0.73
3168.37	Re I	16307 - 47860	16.	2.4	0.39
3173.09	Re I	13826 - 45332	1.6	0.25	-0.61
3174.61	Re I	14621 - 46112	3.3	0.50	-0.30
3174.78	Re I	27130 - 58619	14.	2.1	0.31
3177.71	Re I	11584 - 43044	2.7	0.41	-0.39
3178.61	Re I	15058 - 46509	4.4	0.66	-0.18
3182.66	Re I	19458 - 50869	2.9	0.45	-0.35
3182.87	Re I	18950 - 50359	23.	3.5	0.54

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3184.76	Re I	18950 - 50341	42.	6.4	0.81
3185.57	Re I	18950 - 50333	42.	6.4	0.81
3186.29	Re I	27244 - 58619	12.	1.8	0.25
3190.17	Re I	16328 - 47665	3.4	0.51	-0.29
3190.78	Re I	17238 - 48569	7.1	1.1	0.04
3192.36	Re I	14621 - 45937	3.6	0.56	-0.25
3193.20	Re I	22160 - 53467	8.5	1.3	0.11
3194.50	Re I	15058 - 46353	3.2	0.50	-0.31
3198.58	Re I	14621 - 45876	3.0	0.47	-0.33
3199.49	Re I	14217 - 45463	0.86	0.13	-0.88
3200.04	Re I	16619 - 47860	3.5	0.54	-0.27
3200.72	Re I	15770 - 47004	1.9	0.29	-0.53
3204.25	Re I	16307 - 47507	24.	3.7	0.56
3205.42	Re I	24724 - 55912	5.5	0.85	-0.07
3211.75	Re I	14217 - 45343	1.7	0.26	-0.59
3212.94	Re I	14217 - 45332	1.4	0.22	-0.66
3214.11	Re I	26349 - 57453	11.	1.7	0.22
3227.46	Re I	15166 - 46141	2.3	0.36	-0.44
3228.73	Re I	15770 - 46733	1.3	0.20	-0.70
3235.94	Re I	13826 - 44720	3.8	0.60	-0.22
3237.51	Re I	15058 - 45937	2.1	0.33	-0.48
3241.47	Re I	14621 - 45463	0.99	0.16	-0.80
3248.55	Re I	16327 - 47102	1.6	0.25	-0.60
3252.26	Re I	15770 - 46509	2.6	0.41	-0.39
3258.85	Re I	16327 - 47004	12.	1.9	0.27
3259.55	Re I	11584 - 42254	3.0	0.48	-0.32
3261.56	Re I	15166 - 45817	2.8	0.44	-0.36
3262.77	Re I	17331 - 47971	2.9	0.47	-0.33
3266.85	Re I	17331 - 47932	2.9	0.47	-0.33
3268.48	Re I	16619 - 47206	3.1	0.49	-0.31
3268.89	Re I	15770 - 46353	5.0	0.80	-0.10
3277.71	Re I	14621 - 45122	1.8	0.29	-0.53
3285.64	Re I	17238 - 47665	3.7	0.60	-0.22
3287.13	Re I	27244 - 57657	7.5	1.2	0.08
3294.83	Re I	15770 - 46112	3.1	0.51	-0.29
3296.70	Re I	18950 - 49275	9.1	1.5	0.17
3296.99	Re I	16327 - 46649	5.1	0.82	-0.08
3300.97	Re I	15058 - 45343	0.98	0.16	-0.80
3301.60	Re I	14621 - 44901	3.0	0.49	-0.31
3302.23	Re I	15058 - 45332	2.9	0.48	-0.32
3303.75	Re I	11584 - 41844	1.3	0.21	-0.68
3307.01	Re I	27161 - 57391	7.4	1.2	0.08
3312.29	Re I	16327 - 46509	1.4	0.23	-0.64
3313.95	Re I	15770 - 45937	3.5	0.57	-0.24
3318.67	Re I	13826 - 43950	1.3	0.22	-0.66
3322.48	Re I	11754 - 41844	2.8	0.46	-0.34
3324.93	Re I	16307 - 46374	1.2	0.20	-0.71
3331.52	Re I	14217 - 44225	1.8	0.30	-0.52
3335.36	Re I	11584 - 41557	0.68	0.11	-0.95
3338.18	Re I	20448 - 50396	81.	14.	1.13

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3339.68	Re I	17238 - 47173	2.9	0.49	-0.31
3342.24	Re I	20448 - 50359	65.	11.	1.03
3344.32	Re I	20448 - 50341	32.	5.4	0.73
3346.20	Re I	13826 - 43702	2.5	0.42	-0.38
3353.21	Re I	16327 - 46141	2.1	0.35	-0.45
3355.29	Re I	22423 - 52218	8.7	1.5	0.17
3356.33	Re I	22160 - 51946	13.	2.1	0.33
3358.02	Re I	17331 - 47102	4.1	0.70	-0.16
3359.22	Re I	23632 - 53392	10.	1.7	0.23
3361.14	Re I	13826 - 43569	1.2	0.20	-0.69
3362.74	Re I	11584 - 41313	0.80	0.14	-0.87
3365.73	Re I	23155 - 52857	9.5	1.6	0.21
3377.74	Re I	16307 - 45904	3.5	0.60	-0.22
3379.70	Re I	11584 - 41164	1.2	0.21	-0.67
3384.45	Re I	27161 - 56699	14.	2.5	0.39
3385.76	Re I	14621 - 44148	1.8	0.31	-0.51
3389.43	Re I	17238 - 46733	4.5	0.78	-0.11
3390.25	Re I	22160 - 51648	10.	1.7	0.24
3394.12	Re I	21775 - 51230	3.8	0.65	-0.18
3397.21	Re I	26349 - 55777	6.6	1.1	0.06
3399.30	Re I	11754 - 41164	16.	2.7	0.43
3404.72	Re I	11584 - 40946	2.4	0.41	-0.38
3405.89	Re I	14217 - 43569	5.0	0.87	-0.06
3408.67	Re I	14621 - 43950	2.0	0.36	-0.45
3409.83	Re I	17331 - 46649	6.0	1.0	0.02
3413.74	Re I	16619 - 45904	1.2	0.21	-0.68
3417.77	Re I	15058 - 44309	3.0	0.53	-0.28
3419.41	Re I	14217 - 43453	6.0	1.0	0.02
3420.75	Re I	11584 - 40809	0.56	0.099	-1.00
3424.62	Re I	11754 - 40946	29.	5.2	0.71
3426.19	Re I	17331 - 46509	7.2	1.3	0.10
3427.61	Re I	15058 - 44225	2.8	0.49	-0.31
3437.71	Re I	14621 - 43702	2.6	0.46	-0.34
3442.97	Re I	16307 - 45343	0.77	0.14	-0.87
3449.37	Re I	15166 - 44148	3.7	0.65	-0.19
3451.88	Re I	0 - 28962	2.0	0.36	-0.44
3453.28	Re I	15770 - 44720	0.86	0.15	-0.81
3453.50	Re I	14621 - 43569	1.9	0.33	-0.48
3458.88	Re I	17238 - 46141	2.6	0.47	-0.32
3460.46	Re I	0 - 28890	6.8	1.2	0.09
3464.73	Re I	0 - 28854	4.9	0.88	-0.05
3467.96	Re I	20448 - 49275	14.	2.5	0.39
3472.72	Re I	14621 - 43409	1.2	0.22	-0.67
3476.44	Re I	15058 - 43815	2.0	0.36	-0.44
3477.14	Re I	27161 - 55912	6.9	1.2	0.10
3480.38	Re I	16619 - 45343	5.2	0.94	-0.03
3480.85	Re I	14621 - 43342	2.3	0.43	-0.37
3482.23	Re I	22160 - 50869	11.	2.0	0.30
3490.86	Re I	17238 - 45876	1.7	0.30	-0.52
3494.72	Re I	17331 - 45937	1.2	0.22	-0.65

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3502.73	Re I	20482 - 49023	2.6	0.49	-0.31
3503.06	Re I	15770 - 44309	5.4	1.0	0.00
3512.28	Re I	16619 - 45083	1.2	0.22	-0.65
3516.65	Re I	13826 - 42254	1.7	0.32	-0.49
3517.33	Re I	14621 - 43044	2.2	0.40	-0.39
3520.72	Re I	15058 - 43453	0.61	0.11	-0.94
3529.21	Re I	16619 - 44946	0.70	0.13	-0.88
3534.82	Re I	16619 - 44901	1.4	0.26	-0.58
3537.46	Re I	11584 - 39845	0.89	0.17	-0.78
3539.33	Re I	19458 - 47704	4.0	0.75	-0.12
3539.94	Re I	22160 - 50401	2.6	0.49	-0.31
3549.89	Re I	11754 - 39916	0.68	0.13	-0.89
3551.29	Re I	22160 - 50311	6.8	1.3	0.11
3553.65	Re I	17331 - 45463	2.2	0.41	-0.38
3558.94	Re I	11754 - 39845	0.45	0.085	-1.07
3564.73	Re I	15770 - 43815	0.69	0.13	-0.88
3568.23	Re I	24724 - 52741	9.9	1.9	0.28
3570.26	Re I	17331 - 45332	3.2	0.61	-0.22
3579.12	Re I	15770 - 43702	3.0	0.58	-0.24
3580.97	Re I	16307 - 44225	6.3	1.2	0.08
3583.02	Re I	11754 - 39656	2.1	0.41	-0.39
3590.88	Re I	22423 - 50263	3.0	0.58	-0.24
3595.16	Re I	21775 - 49583	3.0	0.58	-0.23
3596.39	Re I	11754 - 39552	0.42	0.081	-1.09
3598.77	Re I	23155 - 50934	3.8	0.74	-0.13
3604.39	Re I	22423 - 50159	3.4	0.65	-0.18
3610.49	Re I	16307 - 43996	1.5	0.29	-0.54
3617.08	Re I	15770 - 43409	2.5	0.49	-0.31
3617.25	Re I	15770 - 43408	0.62	0.12	-0.91
3621.46	Re I	16619 - 44225	1.6	0.31	-0.51
3625.91	Re I	15770 - 43342	1.2	0.24	-0.62
3629.20	Re I	19458 - 47004	1.3	0.26	-0.59
3637.06	Re I	13826 - 41313	0.61	0.12	-0.92
3637.84	Re I	11584 - 39065	1.8	0.36	-0.44
3642.99	Re I	11754 - 39197	0.084	0.017	-1.78
3651.66	Re I	16619 - 43996	0.74	0.15	-0.83
3651.97	Re I	16327 - 43702	3.8	0.75	-0.12
3653.62	Re I	23632 - 50994	3.9	0.79	-0.10
3660.52	Re I	27244 - 54554	4.7	0.95	-0.02
3662.13	Re I	27514 - 54813	3.2	0.65	-0.19
3669.78	Re I	16327 - 43569	0.99	0.20	-0.70
3670.36	Re I	23956 - 51193	4.1	0.82	-0.09
3670.53	Re I	14217 - 41453	1.5	0.29	-0.53
3672.41	Re I	14621 - 41844	0.41	0.082	-1.09
3676.00	Re I	16619 - 43815	0.53	0.11	-0.97
3680.21	Re I	24425 - 51590	1.9	0.39	-0.41
3681.28	Re I	26132 - 53288	2.4	0.49	-0.31
3689.50	Re I	14217 - 41313	3.7	0.76	-0.12
3691.48	Re I	16327 - 43409	12.	2.4	0.39
3697.71	Re I	27141 - 54177	7.6	1.6	0.20

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3703.24	Re I	13826 - 40822	2.0	0.41	-0.39
3704.84	Re I	13826 - 40810	0.23	0.047	-1.33
3705.02	Re I	13826 - 40809	0.38	0.079	-1.10
3709.93	Re I	14217 - 41164	1.0	0.21	-0.68
3715.02	Re I	17238 - 44148	0.34	0.071	-1.15
3717.28	Re I	17331 - 44225	3.6	0.75	-0.12
3725.76	Re I	23632 - 50464	183.	38.	1.58
3731.87	Re I	16619 - 43408	1.1	0.23	-0.63
3732.28	Re I	15058 - 41844	0.72	0.15	-0.82
3735.01	Re I	11754 - 38521	0.49	0.10	-0.99
3735.31	Re I	23632 - 50396	36.	7.6	0.88
3736.84	Re I	24724 - 51477	2.2	0.45	-0.34
3740.10	Re I	14217 - 40946	3.6	0.76	-0.12
3740.41	Re I	23632 - 50359	6.3	1.3	0.12
3745.44	Re I	14621 - 41313	1.3	0.28	-0.55
3755.62	Re I	17331 - 43950	0.75	0.16	-0.80
3766.48	Re I	14621 - 41164	0.60	0.13	-0.89
3777.66	Re I	17238 - 43702	1.2	0.26	-0.58
3787.52	Re I	15058 - 41453	3.3	0.71	-0.15
3796.59	Re I	11584 - 37916	0.28	0.060	-1.22
3797.59	Re I	14621 - 40946	0.65	0.14	-0.85
3807.74	Re I	15058 - 41313	0.86	0.19	-0.73
3815.66	Re I	14621 - 40822	0.47	0.10	-0.98
3836.30	Re I	14434 - 40494	0.43	0.096	-1.02
3869.94	Re I	16307 - 42140	1.4	0.31	-0.50
3875.26	Re I	11584 - 37381	0.36	0.082	-1.09
3876.86	Re I	15770 - 41557	1.2	0.27	-0.57
3887.49	Re I	27141 - 52857	5.5	1.2	0.09
3887.95	Re I	17331 - 43044	0.60	0.14	-0.86
3889.96	Re I	22160 - 47860	2.0	0.45	-0.34
3896.11	Re I	20482 - 46141	1.5	0.34	-0.47
3900.91	Re I	14217 - 39845	0.25	0.056	-1.25
3901.09	Re I	11754 - 37381	0.061	0.014	-1.85
3908.21	Re I	27161 - 52741	6.8	1.6	0.19
3913.92	Re I	15770 - 41313	0.61	0.14	-0.86
3917.27	Re I	16619 - 42140	2.2	0.51	-0.29
3920.85	Re I	27244 - 52741	4.1	0.94	-0.03
3927.59	Re I	14217 - 39670	0.21	0.048	-1.32
3929.85	Re I	14217 - 39656	1.6	0.37	-0.43
3931.20	Re I	21775 - 47206	1.5	0.34	-0.46
3936.90	Re I	15770 - 41164	0.63	0.15	-0.84
3941.54	Re I	19758 - 45122	0.82	0.19	-0.72
3944.72	Re I	27514 - 52857	7.6	1.8	0.25
3945.91	Re I	14217 - 39552	0.51	0.12	-0.92
3950.64	Re I	14621 - 39927	0.22	0.052	-1.28
3954.43	Re I	22423 - 47704	0.98	0.23	-0.64
3961.04	Re I	13826 - 39065	0.70	0.16	-0.78
3962.48	Re I	16327 - 41557	1.8	0.42	-0.38
3963.27	Re I	16619 - 41844	0.33	0.077	-1.11
3964.81	Re I	23956 - 49171	1.2	0.27	-0.57

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3967.39	Re I	22160 - 47358	1.8	0.43	-0.37
3975.65	Re I	16307 - 41453	0.17	0.041	-1.39
3991.03	Re I	14621 - 39670	0.10	0.025	-1.60
4004.93	Re I	19758 - 44720	1.2	0.30	-0.52
4012.26	Re I	26661 - 51578	3.5	0.85	-0.07
4018.40	Re I	27244 - 52122	2.2	0.54	-0.27
4022.96	Re I	18950 - 43801	1.4	0.33	-0.48
4023.31	Re I	14217 - 39065	0.25	0.062	-1.21
4028.53	Re I	23155 - 47971	1.8	0.44	-0.35
4029.63	Re I	13826 - 38635	0.25	0.060	-1.22
4033.31	Re I	15058 - 39845	0.70	0.17	-0.77
4037.49	Re I	15166 - 39927	0.36	0.087	-1.06
4048.99	Re I	16307 - 40998	0.88	0.22	-0.66
4061.86	Re I	15058 - 39670	0.15	0.038	-1.42
4081.43	Re I	16327 - 40822	1.0	0.25	-0.60
4083.36	Re I	16327 - 40810	0.21	0.053	-1.28
4083.58	Re I	16327 - 40809	0.21	0.053	-1.28
4089.92	Re I	14621 - 39065	0.10	0.026	-1.59
4104.42	Re I	19458 - 43815	1.4	0.35	-0.46
4110.89	Re I	17238 - 41557	1.3	0.32	-0.50
4113.40	Re I	14217 - 38521	0.11	0.028	-1.55
4121.64	Re I	20448 - 44703	2.4	0.62	-0.21
4132.28	Re I	13826 - 38019	0.097	0.025	-1.60
4133.42	Re I	16307 - 40494	0.94	0.24	-0.62
4136.45	Re I	11754 - 35923	1.9	0.50	-0.30
4137.60	Re I	21775 - 45937	0.91	0.23	-0.63
4144.36	Re I	17331 - 41453	3.6	0.92	-0.03
4149.96	Re I	13826 - 37916	0.27	0.068	-1.16
4152.29	Re I	33589 - 57665	8.3	2.1	0.33
4152.63	Re I	15770 - 39845	0.16	0.042	-1.37
4159.92	Re I	27161 - 51193	5.2	1.3	0.13
4170.40	Re I	27514 - 51486	9.7	2.5	0.40
4182.90	Re I	15770 - 39670	0.69	0.18	-0.74
4183.06	Re I	14621 - 38521	0.50	0.13	-0.88
4194.67	Re I	17331 - 41164	0.43	0.11	-0.94
4204.52	Re I	22160 - 45937	1.7	0.44	-0.36
4213.27	Re I	27141 - 50869	3.9	1.0	0.01
4221.08	Re I	11584 - 35268	0.59	0.16	-0.80
4227.46	Re I	18950 - 42598	26.	7.0	0.84
4232.96	Re I	17695 - 41313	0.18	0.047	-1.32
4236.24	Re I	16327 - 39927	0.14	0.037	-1.44
4238.59	Re I	18950 - 42536	0.21	0.058	-1.24
4241.16	Re I	17238 - 40810	0.39	0.11	-0.97
4241.39	Re I	17238 - 40809	0.66	0.18	-0.75
4246.82	Re I	34520 - 58061	8.7	2.4	0.37
4255.75	Re I	17331 - 40822	0.18	0.048	-1.32
4257.60	Re I	14217 - 37698	0.47	0.13	-0.89
4291.17	Re I	16619 - 39916	0.41	0.11	-0.94
4291.65	Re I	14621 - 37916	0.16	0.043	-1.36
4299.92	Re I	23956 - 47206	0.81	0.23	-0.65

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4304.40	Re I	16619 - 39845	0.68	0.19	-0.73
4314.58	Re I	21775 - 44946	0.43	0.12	-0.92
4318.58	Re I	27514 - 50663	4.4	1.2	0.09
4319.53	Re I	14621 - 37766	0.076	0.021	-1.67
4332.25	Re I	14621 - 37698	0.37	0.10	-0.98
4358.69	Re I	11584 - 34520	0.29	0.083	-1.08
4367.58	Re I	16307 - 39197	0.54	0.16	-0.81
4391.34	Re I	11754 - 34520	0.11	0.031	-1.51
4392.45	Re I	14621 - 37381	0.12	0.035	-1.46
4394.38	Re I	15770 - 38521	0.86	0.25	-0.61
4396.80	Re I	16327 - 39065	0.17	0.048	-1.32
4402.60	Re I	15058 - 37766	0.15	0.045	-1.35
4406.40	Re I	16307 - 38995	0.30	0.087	-1.06
4415.82	Re I	15058 - 37698	0.34	0.100	-1.00
4440.44	Re I	17331 - 39845	0.21	0.062	-1.21
4453.92	Re I	35923 - 58369	4.0	1.2	0.08
4454.62	Re I	14621 - 37064	0.048	0.014	-1.85
4463.53	Re I	35268 - 57665	3.8	1.1	0.06
4467.54	Re I	24724 - 47102	0.82	0.25	-0.61
4467.92	Re I	16619 - 38995	0.22	0.066	-1.18
4475.08	Re I	17331 - 39670	0.50	0.15	-0.82
4477.99	Re I	17331 - 39656	0.27	0.080	-1.10
4478.39	Re I	15058 - 37381	0.21	0.063	-1.20
4496.43	Re I	19758 - 41991	0.16	0.049	-1.31
4507.04	Re I	28854 - 51035	7.3	2.2	0.35
4508.01	Re I	28854 - 51031	3.0	0.93	-0.03
4513.31	Re I	20448 - 42598	20.	6.1	0.79
4516.64	Re I	28854 - 50988	16.	4.8	0.68
4519.76	Re I	28854 - 50973	4.8	1.5	0.17
4522.73	Re I	28890 - 50994	30.	9.3	0.97
4523.88	Re I	28890 - 50988	7.3	2.2	0.35
4526.01	Re I	20448 - 42536	0.61	0.19	-0.73
4528.97	Re I	28962 - 51035	4.3	1.3	0.12
4529.95	Re I	28962 - 51031	7.3	2.3	0.35
4530.89	Re I	22160 - 44225	0.61	0.19	-0.72
4541.80	Re I	28962 - 50973	2.4	0.75	-0.12
4545.17	Re I	15770 - 37766	0.20	0.062	-1.21
4559.27	Re I	15770 - 37698	0.098	0.030	-1.52
4559.68	Re I	13826 - 35751	0.079	0.025	-1.61
4565.30	Re I	15166 - 37064	0.082	0.026	-1.59
4580.68	Re I	11584 - 33409	0.070	0.022	-1.65
4591.68	Re I	20482 - 42254	0.18	0.056	-1.25
4605.73	Re I	14217 - 35923	0.14	0.046	-1.34
4614.66	Re I	17331 - 38995	0.071	0.023	-1.64
4621.38	Re I	21775 - 43408	0.99	0.32	-0.50
4625.96	Re I	15770 - 37381	0.045	0.015	-1.84
4630.82	Re I	16327 - 37916	0.17	0.054	-1.26
4652.33	Re I	14434 - 35923	0.11	0.035	-1.45
4662.49	Re I	13826 - 35268	0.040	0.013	-1.88
4682.32	Re I	19458 - 40809	0.24	0.079	-1.10

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4687.86	Re I	27244 - 48570	1.0	0.33	-0.48
4694.99	Re I	15770 - 37064	0.042	0.014	-1.86
4700.44	Re I	21775 - 43044	0.36	0.12	-0.92
4705.04	Re I	22160 - 43408	0.61	0.20	-0.70
4725.93	Re I	23155 - 44309	0.33	0.11	-0.96
4727.60	Re I	16619 - 37766	0.12	0.042	-1.38
4748.38	Re I	16327 - 37381	0.11	0.038	-1.42
4749.03	Re I	14217 - 35268	0.026	0.0087	-2.06
4758.83	Re I	11584 - 32592	0.019	0.0066	-2.18
4763.67	Re I	17238 - 38225	0.047	0.016	-1.79
4791.42	Re I	15058 - 35923	0.24	0.082	-1.09
4889.14	Re I	0 - 20448	0.036	0.013	-1.89
4915.02	Re I	12251 - 32592	0.025	0.0090	-2.04
4923.90	Re I	14217 - 34520	0.19	0.069	-1.16
4946.72	Re I	15058 - 35268	0.086	0.031	-1.50
4956.76	Re I	23632 - 43801	0.59	0.22	-0.66
4985.98	Re I	17331 - 37381	0.16	0.058	-1.23
5058.56	Re I	13826 - 33589	0.027	0.010	-1.98
5096.50	Re I	16307 - 35923	0.093	0.036	-1.44
5120.32	Re I	24425 - 43950	0.26	0.10	-1.00
5161.65	Re I	17695 - 37064	0.046	0.019	-1.73
5178.89	Re I	16619 - 35923	0.054	0.022	-1.66
5181.74	Re I	22160 - 41453	0.13	0.052	-1.29
5234.31	Re I	23155 - 42254	0.28	0.12	-0.93
5248.86	Re I	21775 - 40822	0.27	0.11	-0.95
5270.95	Re I	23632 - 42598	12.	4.9	0.69
5275.56	Re I	0 - 18950	0.018	0.0076	-2.12
5278.24	Re I	16327 - 35268	0.11	0.048	-1.32
5317.28	Re I	26661 - 45463	0.41	0.17	-0.76
5321.28	Re I	14621 - 33409	0.024	0.010	-1.99
5327.46	Re I	13826 - 32592	0.027	0.012	-1.94
5331.90	Re I	15770 - 34520	0.019	0.0080	-2.10
5333.85	Re I	27161 - 45904	0.46	0.20	-0.70
5369.48	Re I	24425 - 43044	0.36	0.16	-0.80
5369.80	Re I	13826 - 32444	0.026	0.011	-1.95
5377.10	Re I	17331 - 35923	0.14	0.061	-1.22
5431.90	Re I	39656 - 58061	4.0	1.8	0.25
5437.03	Re I	22423 - 40810	0.079	0.035	-1.46
5447.92	Re I	15058 - 33409	0.0098	0.0043	-2.36
5460.64	Re I	19458 - 37766	0.060	0.027	-1.57
5520.05	Re I	28030 - 46141	0.37	0.17	-0.77
5521.10	Re I	28542 - 46649	0.76	0.35	-0.46
5532.68	Re I	21775 - 39845	0.22	0.100	-1.00
5563.24	Re I	14621 - 32592	0.028	0.013	-1.88
5573.47	Re I	17331 - 35268	0.030	0.014	-1.85
5584.72	Re I	16619 - 34520	0.024	0.011	-1.94
5607.21	Re I	27514 - 45343	0.21	0.098	-1.01
5667.88	Re I	15770 - 33409	0.073	0.035	-1.46
5711.43	Re I	22423 - 39927	0.11	0.056	-1.25
5716.95	Re I	26661 - 44148	0.27	0.13	-0.87

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5752.93	Re I	11584 - 28962	0.023	0.011	-1.94
5776.83	Re I	11584 - 28890	0.023	0.011	-1.94
5791.60	Re I	16327 - 33589	0.014	0.0071	-2.15
5815.92	Re I	17331 - 34520	0.010	0.0052	-2.29
5834.31	Re I	11754 - 28890	0.11	0.059	-1.23
5919.86	Re I	24425 - 41313	0.070	0.037	-1.43
5943.24	Re I	15770 - 32592	0.036	0.019	-1.72
5950.21	Re I	28542 - 45343	0.22	0.12	-0.93
5969.77	Re I	26661 - 43408	0.23	0.12	-0.91
5989.99	Re I	23155 - 39845	0.047	0.025	-1.60
5995.73	Re I	27141 - 43815	0.26	0.14	-0.85
6114.22	Re I	17238 - 33589	0.025	0.014	-1.86
6145.81	Re I	27141 - 43408	0.46	0.26	-0.58
6146.82	Re I	16327 - 32592	0.031	0.018	-1.75
6203.24	Re I	16327 - 32444	0.011	0.0063	-2.20
6217.97	Re I	17331 - 33409	0.020	0.012	-1.94
6229.42	Re I	28854 - 44903	0.61	0.36	-0.45
6243.24	Re I	28890 - 44903	0.72	0.42	-0.38
6271.37	Re I	28962 - 44903	0.37	0.22	-0.66
6278.76	Re I	21775 - 37698	0.048	0.029	-1.54
6286.41	Re I	27141 - 43044	0.12	0.072	-1.14
6303.42	Re I	26132 - 41992	0.091	0.054	-1.27
6307.70	Re I	28854 - 44703	3.9	2.3	0.37
6321.90	Re I	28890 - 44703	3.9	2.3	0.37
6350.75	Re I	28962 - 44703	1.6	0.95	-0.02
6382.94	Re I	29800 - 45463	0.39	0.24	-0.62
6411.47	Re I	26661 - 42254	0.14	0.086	-1.07
6511.47	Re I	17238 - 32592	0.033	0.021	-1.68
6515.25	Re I	30560 - 45904	0.40	0.25	-0.60
6544.91	Re I	22423 - 37698	0.034	0.022	-1.66
6577.11	Re I	28854 - 44054	0.59	0.39	-0.41
6592.52	Re I	28890 - 44054	0.68	0.44	-0.35
6605.19	Re I	13826 - 28962	0.024	0.016	-1.80
6623.91	Re I	28962 - 44054	0.51	0.34	-0.47
6637.25	Re I	19458 - 34520	0.012	0.0077	-2.11
6652.39	Re I	13826 - 28854	0.0071	0.0047	-2.33
6683.28	Re I	22423 - 37381	0.042	0.028	-1.55
6711.30	Re I	17695 - 32592	0.0068	0.0046	-2.34
6761.19	Re I	20482 - 35268	0.0088	0.0060	-2.22
6813.41	Re I	14217 - 28890	0.049	0.034	-1.47
6829.90	Re I	14217 - 28854	0.068	0.047	-1.32
6971.53	Re I	14621 - 28962	0.025	0.019	-1.73
7006.63	Re I	14621 - 28890	0.010	0.0074	-2.13
7024.15	Re I	14621 - 28854	0.020	0.015	-1.83
7246.67	Re I	15058 - 28854	0.021	0.016	-1.79
7292.72	Re I	28890 - 42598	0.20	0.16	-0.80
7578.73	Re I	15770 - 28962	0.014	0.012	-1.92
7611.89	Re I	19458 - 32592	0.012	0.011	-1.97
7620.25	Re I	15770 - 28890	0.0022	0.0019	-2.72
7640.94	Re I	15770 - 28854	0.016	0.014	-1.85

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
7912.94	Re I	16327 - 28962	0.023	0.022	-1.66
7980.77	Re I	16327 - 28854	0.011	0.011	-1.97
8417.13	Re I	11754 - 23632	0.0034	0.0036	-2.44
8527.73	Re I	17238 - 28962	0.011	0.012	-1.93

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2214.26	Re II	0 - 45148	15.	1.1	0.05
2275.25	Re II	0 - 43938	28.	2.2	0.33
2298.09	Re II	27628 - 71128	53.	4.2	0.62
2368.53	Re II	14930 - 57139	32.	2.7	0.43
2370.76	Re II	14883 - 57050	37.	3.1	0.49
2373.48	Re II	14930 - 57050	26.	2.2	0.35
2378.53	Re II	27746 - 69776	22.	1.9	0.28
2386.90	Re II	20976 - 62859	52.	4.4	0.65
2403.04	Re II	23341 - 64942	28.	2.4	0.39
2418.20	Re II	25988 - 67328	29.	2.6	0.41
2449.03	Re II	18846 - 59666	46.	4.1	0.61
2449.52	Re II	26237 - 67049	61.	5.5	0.74
2455.83	Re II	14352 - 55059	73.	6.6	0.82
2467.57	Re II	14930 - 55444	76.	6.9	0.84
2467.85	Re II	26768 - 67276	88.	8.1	0.91
2469.36	Re II	18846 - 59330	77.	7.1	0.85
2470.61	Re II	20463 - 60927	70.	6.4	0.81
2471.05	Re II	19140 - 59596	39.	3.6	0.56
2475.17	Re II	23894 - 64282	106.	9.7	0.99
2490.16	Re II	30982 - 71128	58.	5.4	0.73
2502.35	Re II	20976 - 60927	328.	31.	1.49
2504.60	Re II	17224 - 57139	106.	10.	1.00
2534.10	Re II	14352 - 53802	49.	4.7	0.67
2550.09	Re II	20463 - 59666	88.	8.6	0.93
2553.59	Re II	17224 - 56372	64.	6.3	0.80
2554.63	Re II	20463 - 59596	203.	20.	1.30
2568.64	Re II	14883 - 53802	183.	18.	1.26
2571.81	Re II	14930 - 53802	125.	12.	1.09
2608.50	Re II	14352 - 52677	220.	22.	1.35
2616.72	Re II	18846 - 57050	81.	8.4	0.92
2635.83	Re II	17224 - 55151	138.	14.	1.16
2637.01	Re II	19140 - 57050	99.	10.	1.02
2641.02	Re II	14824 - 52677	30.	3.1	0.49
2648.46	Re II	14930 - 52677	22.	2.3	0.37
2731.56	Re II	18846 - 55444	95.	11.	1.03
2733.04	Re II	17224 - 53802	243.	27.	1.43
2753.64	Re II	19140 - 55444	53.	6.0	0.78
2803.28	Re II	13777 - 49439	26.	3.0	0.48
2819.78	Re II	17224 - 52677	28.	3.3	0.52
2888.06	Re II	14824 - 49439	29.	3.6	0.56
2916.73	Re II	25321 - 59596	46.	5.9	0.77
2957.91	Re II	23341 - 57139	79.	10.	1.02
3103.06	Re II	17224 - 49439	36.	5.2	0.72
3303.21	Re II	14883 - 45148	30.	5.0	0.69
3379.06	Re II	14352 - 43938	22.	3.8	0.58
3580.15	Re II	17224 - 45148	82.	16.	1.20
3742.26	Re II	17224 - 43938	9.9	2.1	0.32

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2288.57	Rh I	2598 - 46280	0.82	0.064	-1.19
2309.82	Rh I	3473 - 46753	0.93	0.075	-1.13
2318.36	Rh I	5691 - 48811	0.94	0.076	-1.12
2319.10	Rh I	5691 - 48798	1.5	0.12	-0.92
2321.73	Rh I	1530 - 44588	0.50	0.040	-1.39
2322.58	Rh I	0 - 43042	1.2	0.098	-1.01
2326.47	Rh I	3310 - 46280	1.3	0.11	-0.98
2328.64	Rh I	7791 - 50721	1.9	0.15	-0.82
2352.47	Rh I	0 - 42495	0.25	0.020	-1.69
2359.18	Rh I	1530 - 43905	0.37	0.031	-1.51
2361.92	Rh I	0 - 42325	1.3	0.11	-0.95
2368.34	Rh I	3473 - 45683	1.3	0.11	-0.96
2382.89	Rh I	0 - 41953	1.5	0.13	-0.89
2384.65	Rh I	7791 - 49713	1.6	0.14	-0.86
2407.88	Rh I	1530 - 43048	0.84	0.073	-1.14
2408.19	Rh I	1530 - 43042	0.25	0.022	-1.66
2410.25	Rh I	3310 - 44787	0.41	0.036	-1.44
2419.75	Rh I	3473 - 44787	0.86	0.076	-1.12
2427.68	Rh I	2598 - 43777	2.1	0.18	-0.74
2429.52	Rh I	3473 - 44621	4.6	0.41	-0.39
2432.66	Rh I	5658 - 46753	1.5	0.14	-0.87
2437.08	Rh I	7791 - 48811	1.2	0.11	-0.98
2440.34	Rh I	1530 - 42495	4.4	0.39	-0.41
2448.84	Rh I	2598 - 43421	1.2	0.11	-0.97
2449.04	Rh I	5691 - 46511	2.3	0.21	-0.68
2470.39	Rh I	3310 - 43777	1.6	0.15	-0.84
2471.47	Rh I	2598 - 43048	1.5	0.14	-0.86
2473.09	Rh I	1530 - 41953	1.6	0.15	-0.84
2483.33	Rh I	3473 - 43729	1.0	0.097	-1.01
2492.30	Rh I	3310 - 43421	0.60	0.056	-1.25
2502.46	Rh I	3473 - 43421	2.4	0.23	-0.64
2505.67	Rh I	2598 - 42495	2.2	0.21	-0.68
2509.70	Rh I	2598 - 42431	5.1	0.49	-0.31
2515.75	Rh I	3310 - 43048	3.5	0.33	-0.48
2525.99	Rh I	9221 - 48798	1.0	0.098	-1.01
2531.74	Rh I	5691 - 45178	0.40	0.039	-1.41
2555.36	Rh I	3310 - 42431	8.2	0.81	-0.09
2565.79	Rh I	5658 - 44621	1.4	0.14	-0.86
2566.04	Rh I	3473 - 42431	0.66	0.065	-1.19
2575.75	Rh I	14788 - 53600	4.5	0.45	-0.35
2622.58	Rh I	5658 - 43777	3.4	0.35	-0.46
2625.88	Rh I	5658 - 43729	5.0	0.52	-0.29
2630.42	Rh I	2598 - 40603	0.92	0.096	-1.02
2647.28	Rh I	5658 - 43421	2.3	0.24	-0.62
2652.66	Rh I	2598 - 40285	3.4	0.36	-0.45
2659.01	Rh I	1530 - 39127	0.19	0.020	-1.69
2671.06	Rh I	3473 - 40900	0.32	0.034	-1.47
2676.11	Rh I	5691 - 43048	1.2	0.13	-0.90
2680.63	Rh I	3310 - 40603	0.94	0.10	-1.00
2681.78	Rh I	14788 - 52065	4.8	0.51	-0.29

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2694.31	Rh I	3473 - 40577	0.47	0.051	-1.29
2703.73	Rh I	3310 - 40285	3.5	0.38	-0.42
2707.23	Rh I	2598 - 39525	0.26	0.029	-1.54
2714.41	Rh I	11968 - 48798	6.6	0.73	-0.14
2717.51	Rh I	0 - 36787	0.24	0.027	-1.57
2718.54	Rh I	5658 - 42431	2.8	0.31	-0.51
2720.52	Rh I	13975 - 50721	3.9	0.44	-0.36
2728.94	Rh I	2598 - 39231	1.1	0.12	-0.93
2736.76	Rh I	2598 - 39127	0.24	0.027	-1.57
2741.75	Rh I	9221 - 45683	3.0	0.34	-0.47
2767.73	Rh I	2598 - 38718	0.28	0.033	-1.49
2771.51	Rh I	2598 - 38669	0.56	0.065	-1.19
2778.06	Rh I	7791 - 43777	1.2	0.14	-0.86
2779.54	Rh I	10313 - 46280	3.7	0.43	-0.37
2783.03	Rh I	3310 - 39231	0.83	0.096	-1.02
2791.16	Rh I	3310 - 39127	0.16	0.019	-1.73
2796.63	Rh I	11006 - 46753	4.2	0.50	-0.30
2826.43	Rh I	10313 - 45683	6.2	0.75	-0.13
2826.68	Rh I	9221 - 44588	5.3	0.64	-0.19
2827.31	Rh I	3310 - 38669	0.18	0.021	-1.67
2834.12	Rh I	11006 - 46280	3.8	0.46	-0.34
2835.44	Rh I	1530 - 36787	0.15	0.018	-1.75
2836.69	Rh I	5658 - 40900	0.81	0.098	-1.01
2856.16	Rh I	3473 - 38474	0.27	0.034	-1.47
2860.68	Rh I	5658 - 40605	0.50	0.061	-1.21
2862.94	Rh I	5658 - 40577	2.7	0.34	-0.47
2864.40	Rh I	3310 - 38211	0.32	0.039	-1.41
2878.66	Rh I	3310 - 38038	0.55	0.068	-1.17
2880.76	Rh I	3310 - 38013	0.36	0.045	-1.34
2882.37	Rh I	9221 - 43905	3.5	0.44	-0.36
2885.97	Rh I	7791 - 42431	1.3	0.16	-0.80
2889.11	Rh I	1530 - 36133	0.21	0.027	-1.57
2889.84	Rh I	5691 - 40285	0.69	0.087	-1.06
2899.96	Rh I	10313 - 44787	2.1	0.26	-0.58
2904.81	Rh I	14382 - 48798	2.3	0.30	-0.53
2907.21	Rh I	2598 - 36985	0.60	0.076	-1.12
2912.62	Rh I	5658 - 39981	0.64	0.082	-1.09
2915.42	Rh I	5691 - 39981	0.75	0.096	-1.02
2923.10	Rh I	9221 - 43421	0.71	0.091	-1.04
2924.02	Rh I	2598 - 36787	0.61	0.078	-1.11
2929.11	Rh I	5658 - 39788	1.0	0.13	-0.88
2931.94	Rh I	5691 - 39788	1.0	0.13	-0.88
2955.41	Rh I	9221 - 43048	0.64	0.084	-1.07
2968.66	Rh I	3310 - 36985	0.84	0.11	-0.95
2974.03	Rh I	11006 - 44621	0.81	0.11	-0.97
2977.68	Rh I	5658 - 39231	1.2	0.15	-0.82
2986.20	Rh I	3310 - 36787	1.6	0.21	-0.67
2986.99	Rh I	5658 - 39127	0.60	0.081	-1.09
2987.45	Rh I	10313 - 43777	1.3	0.17	-0.77
3004.46	Rh I	9221 - 42495	2.0	0.27	-0.56

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3019.54	Rh I	10313 - 43421	1.2	0.16	-0.80
3023.91	Rh I	5658 - 38718	0.78	0.11	-0.97
3028.43	Rh I	5658 - 38669	0.31	0.042	-1.37
3045.77	Rh I	3310 - 36133	0.094	0.013	-1.88
3046.76	Rh I	7791 - 40603	0.33	0.046	-1.33
3057.89	Rh I	16119 - 48811	2.5	0.35	-0.46
3067.30	Rh I	12723 - 45316	2.5	0.36	-0.45
3083.96	Rh I	1530 - 33946	0.29	0.041	-1.39
3087.42	Rh I	5658 - 38038	0.16	0.023	-1.63
3114.91	Rh I	3310 - 35404	0.19	0.027	-1.56
3121.76	Rh I	3310 - 35334	0.37	0.054	-1.27
3123.70	Rh I	0 - 32004	0.24	0.035	-1.45
3130.79	Rh I	3473 - 35404	0.095	0.014	-1.86
3137.71	Rh I	3473 - 35334	0.25	0.037	-1.44
3151.36	Rh I	14788 - 46511	3.0	0.45	-0.35
3152.60	Rh I	5658 - 37369	0.22	0.033	-1.48
3155.78	Rh I	9221 - 40900	1.7	0.25	-0.61
3179.73	Rh I	7791 - 39231	0.57	0.086	-1.07
3185.59	Rh I	9221 - 40603	0.98	0.15	-0.83
3189.05	Rh I	2598 - 33946	0.26	0.039	-1.41
3191.19	Rh I	5658 - 36985	2.0	0.31	-0.51
3197.13	Rh I	2598 - 33867	0.33	0.051	-1.29
3214.32	Rh I	0 - 31102	0.058	0.0090	-2.05
3237.66	Rh I	7791 - 38669	0.57	0.090	-1.04
3263.14	Rh I	3310 - 33946	0.96	0.15	-0.81
3271.61	Rh I	3310 - 33867	0.94	0.15	-0.82
3280.55	Rh I	1530 - 32004	2.5	0.41	-0.39
3281.70	Rh I	11968 - 42431	2.2	0.35	-0.46
3283.57	Rh I	2598 - 33044	3.4	0.55	-0.26
3289.14	Rh I	3473 - 33867	0.52	0.084	-1.08
3289.64	Rh I	14788 - 45178	2.1	0.34	-0.47
3294.28	Rh I	12723 - 43070	5.2	0.85	-0.07
3296.72	Rh I	12723 - 43048	1.2	0.19	-0.73
3300.46	Rh I	10313 - 40603	3.2	0.52	-0.28
3323.09	Rh I	1530 - 31614	4.1	0.69	-0.16
3331.09	Rh I	5658 - 35670	0.18	0.030	-1.52
3331.24	Rh I	9221 - 39231	0.40	0.066	-1.18
3338.54	Rh I	1530 - 31474	0.31	0.052	-1.28
3342.90	Rh I	9221 - 39127	0.58	0.097	-1.01
3344.20	Rh I	11006 - 40900	1.1	0.19	-0.73
3359.90	Rh I	13975 - 43729	1.8	0.30	-0.52
3360.80	Rh I	5658 - 35404	0.81	0.14	-0.86
3362.18	Rh I	3310 - 33044	0.087	0.015	-1.83
3368.38	Rh I	2598 - 32277	0.51	0.086	-1.06
3369.68	Rh I	10313 - 39981	0.49	0.084	-1.07
3372.25	Rh I	2598 - 32243	1.3	0.23	-0.65
3377.14	Rh I	12723 - 42325	2.2	0.37	-0.43
3377.71	Rh I	11006 - 40603	1.0	0.18	-0.75
3385.78	Rh I	13521 - 43048	2.7	0.46	-0.34
3396.85	Rh I	0 - 29431	3.1	0.53	-0.28

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3399.70	Rh I	2598 - 32004	0.92	0.16	-0.80
3406.55	Rh I	14382 - 43729	5.0	0.88	-0.06
3412.27	Rh I	16018 - 45316	39.	6.9	0.84
3420.16	Rh I	12723 - 41953	1.1	0.19	-0.72
3424.38	Rh I	7791 - 36985	0.54	0.095	-1.02
3434.89	Rh I	0 - 29105	4.1	0.73	-0.14
3440.53	Rh I	16121 - 45178	66.	12.	1.07
3442.63	Rh I	14382 - 43421	1.0	0.18	-0.75
3447.74	Rh I	7791 - 36787	0.51	0.092	-1.04
3448.58	Rh I	14788 - 43777	1.8	0.33	-0.48
3450.29	Rh I	13521 - 42495	2.6	0.46	-0.34
3451.15	Rh I	3310 - 32277	0.072	0.013	-1.89
3455.22	Rh I	3310 - 32243	0.49	0.087	-1.06
3455.42	Rh I	11968 - 40900	0.82	0.15	-0.83
3457.07	Rh I	10313 - 39231	1.5	0.28	-0.56
3457.93	Rh I	13521 - 42431	4.8	0.86	-0.06
3462.04	Rh I	2598 - 31474	5.8	1.0	0.02
3469.62	Rh I	10313 - 39127	1.5	0.27	-0.57
3470.66	Rh I	3473 - 32277	5.8	1.0	0.02
3472.25	Rh I	9221 - 38013	0.73	0.13	-0.88
3474.78	Rh I	3473 - 32243	5.8	1.0	0.02
3478.91	Rh I	3310 - 32046	2.5	0.44	-0.35
3484.04	Rh I	3310 - 32004	0.11	0.020	-1.71
3491.07	Rh I	11968 - 40605	1.1	0.20	-0.71
3494.44	Rh I	11968 - 40577	1.4	0.25	-0.60
3498.73	Rh I	3473 - 32046	1.4	0.25	-0.60
3502.52	Rh I	0 - 28543	2.6	0.47	-0.33
3505.41	Rh I	11006 - 39525	0.57	0.10	-0.98
3507.32	Rh I	2598 - 31102	2.5	0.47	-0.33
3511.78	Rh I	16121 - 44588	2.4	0.44	-0.36
3513.10	Rh I	13975 - 42431	1.3	0.24	-0.62
3519.54	Rh I	10313 - 38718	0.45	0.084	-1.08
3528.02	Rh I	1530 - 29866	5.6	1.0	0.02
3538.14	Rh I	5691 - 33946	1.8	0.33	-0.48
3541.91	Rh I	11006 - 39231	2.5	0.48	-0.32
3543.95	Rh I	5658 - 33867	2.3	0.44	-0.36
3549.54	Rh I	3310 - 31474	1.8	0.34	-0.47
3564.13	Rh I	14382 - 42431	5.2	1.00	-0.00
3570.18	Rh I	3473 - 31474	1.2	0.23	-0.64
3583.10	Rh I	1530 - 29431	2.7	0.52	-0.29
3583.53	Rh I	10313 - 38211	0.80	0.15	-0.81
3596.19	Rh I	2598 - 30397	3.5	0.69	-0.16
3597.15	Rh I	3310 - 31102	5.4	1.0	0.02
3605.86	Rh I	10313 - 38038	2.0	0.39	-0.41
3612.47	Rh I	3473 - 31147	2.9	0.56	-0.25
3614.78	Rh I	16121 - 43777	7.7	1.5	0.18
3620.46	Rh I	7791 - 35404	0.62	0.12	-0.91
3626.59	Rh I	9221 - 36787	8.1	1.6	0.20
3627.80	Rh I	11968 - 39525	0.94	0.18	-0.73
3639.51	Rh I	11006 - 38474	2.3	0.45	-0.35

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3654.87	Rh I	5691 - 33044	0.57	0.11	-0.94
3657.99	Rh I	1530 - 28860	4.1	0.82	-0.09
3661.86	Rh I	16121 - 43421	8.5	1.7	0.23
3666.22	Rh I	2598 - 29866	0.85	0.17	-0.76
3666.91	Rh I	11968 - 39231	1.6	0.33	-0.48
3674.76	Rh I	11006 - 38211	0.98	0.20	-0.70
3681.04	Rh I	11968 - 39127	5.1	1.0	0.02
3690.70	Rh I	3310 - 30397	1.5	0.30	-0.53
3692.36	Rh I	0 - 27075	2.8	0.58	-0.24
3694.95	Rh I	13521 - 40577	0.80	0.16	-0.78
3695.52	Rh I	16018 - 43070	26.	5.3	0.73
3698.26	Rh I	11006 - 38038	1.9	0.39	-0.41
3698.60	Rh I	16018 - 43048	10.	2.1	0.33
3700.91	Rh I	1530 - 28543	3.5	0.72	-0.14
3713.02	Rh I	3473 - 30397	0.73	0.15	-0.82
3713.43	Rh I	16121 - 43042	1.6	0.33	-0.48
3714.83	Rh I	9221 - 36133	0.18	0.038	-1.42
3724.94	Rh I	11968 - 38807	0.14	0.029	-1.54
3735.28	Rh I	13521 - 40285	8.2	1.7	0.24
3737.27	Rh I	11968 - 38718	3.5	0.72	-0.14
3744.17	Rh I	11968 - 38669	3.4	0.72	-0.14
3748.22	Rh I	10313 - 36985	5.9	1.2	0.10
3754.12	Rh I	13975 - 40605	3.3	0.69	-0.16
3754.27	Rh I	13975 - 40603	5.3	1.1	0.05
3755.58	Rh I	5658 - 32277	0.66	0.14	-0.86
3760.40	Rh I	5658 - 32243	1.3	0.28	-0.55
3765.08	Rh I	5691 - 32243	3.1	0.66	-0.18
3769.97	Rh I	14382 - 40900	7.5	1.6	0.21
3775.72	Rh I	16018 - 42495	1.7	0.36	-0.44
3778.13	Rh I	13521 - 39981	4.4	0.95	-0.02
3788.47	Rh I	5658 - 32046	1.3	0.27	-0.57
3792.18	Rh I	11006 - 37369	7.3	1.6	0.20
3793.22	Rh I	5691 - 32046	4.8	1.0	0.01
3799.31	Rh I	5691 - 32004	6.2	1.3	0.13
3805.92	Rh I	13521 - 39788	8.6	1.9	0.27
3806.76	Rh I	2598 - 28860	0.67	0.15	-0.84
3809.50	Rh I	11968 - 38211	0.34	0.074	-1.13
3812.45	Rh I	14382 - 40605	1.3	0.29	-0.54
3815.01	Rh I	16121 - 42325	11.	2.4	0.37
3816.47	Rh I	14382 - 40577	11.	2.4	0.37
3818.19	Rh I	9221 - 35404	4.2	0.93	-0.03
3822.26	Rh I	7791 - 33946	8.2	1.8	0.25
3828.48	Rh I	9221 - 35334	7.6	1.7	0.22
3833.89	Rh I	7791 - 33867	4.3	0.94	-0.03
3834.75	Rh I	11968 - 38038	0.33	0.072	-1.14
3856.52	Rh I	5691 - 31614	6.7	1.5	0.17
3870.01	Rh I	16121 - 41953	10.	2.3	0.37
3872.39	Rh I	5658 - 31474	0.077	0.017	-1.76
3877.34	Rh I	5691 - 31474	0.41	0.093	-1.03
3888.34	Rh I	13521 - 39231	0.69	0.16	-0.80

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3904.22	Rh I	13521 - 39127	0.28	0.064	-1.19
3912.83	Rh I	3310 - 28860	0.012	0.0029	-2.54
3913.51	Rh I	1530 - 27075	0.038	0.0087	-2.06
3922.19	Rh I	5658 - 31147	0.24	0.055	-1.26
3934.23	Rh I	5691 - 31102	2.0	0.47	-0.33
3934.98	Rh I	14382 - 39788	0.55	0.13	-0.90
3935.84	Rh I	11968 - 37369	0.29	0.067	-1.17
3942.72	Rh I	10313 - 35670	2.1	0.50	-0.30
3958.24	Rh I	13975 - 39231	0.94	0.22	-0.66
3958.86	Rh I	7791 - 33044	6.6	1.5	0.19
3975.31	Rh I	13521 - 38669	3.2	0.76	-0.12
3984.40	Rh I	10313 - 35404	0.80	0.19	-0.72
3995.61	Rh I	10313 - 35334	0.79	0.19	-0.72
3996.15	Rh I	11968 - 36985	2.0	0.48	-0.32
4023.14	Rh I	14382 - 39231	1.2	0.29	-0.54
4048.41	Rh I	13975 - 38669	0.51	0.13	-0.90
4049.04	Rh I	13521 - 38211	0.18	0.044	-1.35
4053.44	Rh I	11006 - 35670	0.15	0.038	-1.42
4056.34	Rh I	9221 - 33867	0.053	0.013	-1.88
4077.57	Rh I	13521 - 38038	0.52	0.13	-0.89
4082.78	Rh I	7791 - 32277	0.82	0.20	-0.69
4084.28	Rh I	2598 - 27075	0.0063	0.0016	-2.80
4087.79	Rh I	16121 - 40577	0.71	0.18	-0.75
4088.50	Rh I	7791 - 32243	0.085	0.021	-1.67
4097.52	Rh I	11006 - 35404	0.50	0.12	-0.90
4107.49	Rh I	14788 - 39127	0.47	0.12	-0.92
4116.33	Rh I	14382 - 38669	0.63	0.16	-0.80
4119.68	Rh I	16018 - 40285	1.6	0.42	-0.38
4121.68	Rh I	7791 - 32046	1.5	0.37	-0.43
4128.87	Rh I	7791 - 32004	2.1	0.53	-0.27
4135.27	Rh I	5691 - 29866	1.6	0.40	-0.39
4154.37	Rh I	12723 - 36787	1.2	0.32	-0.49
4196.50	Rh I	9221 - 33044	0.61	0.16	-0.79
4206.62	Rh I	3310 - 27075	0.024	0.0065	-2.19
4211.14	Rh I	5691 - 29431	2.2	0.59	-0.23
4230.20	Rh I	10313 - 33946	0.071	0.019	-1.72
4244.44	Rh I	10313 - 33867	0.097	0.026	-1.58
4273.43	Rh I	13975 - 37369	0.38	0.10	-0.99
4278.60	Rh I	11968 - 35334	0.21	0.058	-1.24
4288.71	Rh I	7791 - 31102	0.90	0.25	-0.60
4296.77	Rh I	13521 - 36787	0.38	0.11	-0.97
4342.44	Rh I	9221 - 32243	0.036	0.010	-1.99
4373.04	Rh I	11006 - 33867	0.11	0.033	-1.48
4374.80	Rh I	5691 - 28543	2.3	0.66	-0.18
4379.92	Rh I	9221 - 32046	0.14	0.039	-1.40
4433.32	Rh I	16119 - 38669	0.22	0.066	-1.18
4492.47	Rh I	9221 - 31474	0.045	0.014	-1.87
4503.78	Rh I	14788 - 36985	0.18	0.054	-1.27
4528.72	Rh I	7791 - 29866	0.019	0.0059	-2.23
4544.27	Rh I	14788 - 36787	0.095	0.029	-1.53

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4548.73	Rh I	11968 - 33946	0.091	0.028	-1.55
4551.64	Rh I	10313 - 32277	0.067	0.021	-1.68
4560.89	Rh I	16119 - 38038	0.15	0.048	-1.32
4565.19	Rh I	11968 - 33867	0.042	0.013	-1.88
4569.00	Rh I	9221 - 31102	0.15	0.047	-1.33
4608.12	Rh I	13975 - 35670	0.13	0.040	-1.40
4643.18	Rh I	16944 - 38474	0.22	0.072	-1.14
4675.03	Rh I	5691 - 27075	0.059	0.019	-1.72
4721.00	Rh I	9221 - 30397	0.019	0.0062	-2.21
4745.11	Rh I	7791 - 28860	0.045	0.015	-1.81
4755.58	Rh I	14382 - 35404	0.048	0.016	-1.79
4810.49	Rh I	27075 - 47857	3.2	1.1	0.04
4842.43	Rh I	9221 - 29866	0.018	0.0065	-2.19
4843.99	Rh I	27075 - 47714	6.2	2.2	0.34
4963.71	Rh I	11006 - 31147	0.075	0.028	-1.55
4977.75	Rh I	10313 - 30397	0.061	0.023	-1.64
4979.18	Rh I	11968 - 32046	0.068	0.025	-1.60
5090.63	Rh I	9221 - 28860	0.049	0.019	-1.72
5120.69	Rh I	13521 - 33044	0.053	0.021	-1.68
5130.76	Rh I	14382 - 33867	0.054	0.021	-1.67
5155.54	Rh I	11006 - 30397	0.063	0.025	-1.60
5157.09	Rh I	28543 - 47928	2.1	0.83	-0.08
5158.69	Rh I	28860 - 48239	6.5	2.6	0.41
5175.97	Rh I	28543 - 47857	8.5	3.4	0.53
5177.27	Rh I	32046 - 51356	3.3	1.3	0.12
5184.19	Rh I	7791 - 27075	0.015	0.0060	-2.22
5193.14	Rh I	28543 - 47793	13.	5.5	0.74
5211.52	Rh I	31102 - 50285	3.9	1.6	0.20
5212.73	Rh I	11968 - 31147	0.025	0.010	-1.99
5214.79	Rh I	28543 - 47714	2.3	0.95	-0.02
5222.66	Rh I	32277 - 51419	5.4	2.2	0.34
5230.62	Rh I	32243 - 51356	5.3	2.2	0.34
5237.16	Rh I	31102 - 50191	11.	4.5	0.66
5269.27	Rh I	28860 - 47832	2.1	0.86	-0.06
5280.12	Rh I	31474 - 50408	2.6	1.1	0.04
5292.14	Rh I	12723 - 31614	0.022	0.0092	-2.03
5314.79	Rh I	31474 - 50285	3.4	1.4	0.16
5329.74	Rh I	29105 - 47862	6.2	2.6	0.42
5331.08	Rh I	29105 - 47857	2.1	0.90	-0.05
5349.31	Rh I	29105 - 47794	1.4	0.60	-0.22
5354.40	Rh I	31614 - 50285	32.	14.	1.13
5356.47	Rh I	31614 - 50278	5.7	2.5	0.39
5379.10	Rh I	31614 - 50199	11.	4.9	0.69
5390.44	Rh I	10313 - 28860	0.069	0.030	-1.52
5404.73	Rh I	29431 - 47928	3.6	1.6	0.20
5424.07	Rh I	29431 - 47862	8.9	3.9	0.60
5424.72	Rh I	11968 - 30397	0.021	0.0094	-2.03
5425.45	Rh I	29431 - 47857	2.9	1.3	0.10
5439.52	Rh I	12723 - 31102	0.016	0.0072	-2.14
5441.36	Rh I	29866 - 48239	2.0	0.87	-0.06

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5444.32	Rh I	29431 - 47794	1.4	0.63	-0.20
5468.11	Rh I	29431 - 47714	3.5	1.6	0.19
5470.85	Rh I	32004 - 50278	8.8	3.9	0.60
5476.12	Rh I	14788 - 33044	0.028	0.013	-1.89
5481.42	Rh I	32046 - 50285	2.9	1.3	0.12
5484.23	Rh I	32004 - 50233	4.1	1.8	0.26
5504.65	Rh I	32046 - 50208	2.3	1.1	0.02
5535.04	Rh I	29866 - 47928	4.6	2.1	0.33
5544.58	Rh I	29866 - 47897	3.3	1.5	0.18
5599.42	Rh I	9221 - 27075	0.075	0.036	-1.45
5607.71	Rh I	33946 - 16119	0.00013	0.00006	-4.20
5608.35	Rh I	16121 - 33946	0.053	0.025	-1.61
5632.77	Rh I	16119 - 33867	0.015	0.0070	-2.15
5659.62	Rh I	14382 - 32046	0.018	0.0085	-2.07
5686.38	Rh I	13521 - 31102	0.060	0.029	-1.54
5702.47	Rh I	33946 - 51478	3.0	1.4	0.16
5727.30	Rh I	14788 - 32243	0.012	0.0058	-2.23
5792.77	Rh I	14788 - 32046	0.057	0.029	-1.54
5806.91	Rh I	14788 - 32004	0.079	0.040	-1.40
5821.84	Rh I	13975 - 31147	0.0088	0.0045	-2.35
5831.58	Rh I	12723 - 29866	0.037	0.019	-1.72
5907.31	Rh I	16121 - 33044	0.018	0.0096	-2.02
5918.54	Rh I	11968 - 28860	0.0075	0.0040	-2.40
5941.46	Rh I	31102 - 47928	1.2	0.63	-0.20
5983.60	Rh I	12723 - 29431	0.12	0.066	-1.18
5991.19	Rh I	14788 - 31474	0.016	0.0086	-2.07
6102.72	Rh I	12723 - 29105	0.031	0.017	-1.76
6116.15	Rh I	13521 - 29866	0.0065	0.0036	-2.44
6128.06	Rh I	14788 - 31102	0.013	0.0072	-2.14
6186.89	Rh I	16119 - 32277	0.018	0.010	-1.98
6199.99	Rh I	16119 - 32243	0.031	0.018	-1.75
6253.72	Rh I	16018 - 32004	0.034	0.020	-1.70
6276.66	Rh I	16119 - 32046	0.0098	0.0058	-2.24
6277.46	Rh I	16121 - 32046	0.017	0.010	-1.99
6293.38	Rh I	16119 - 32004	0.012	0.0072	-2.14
6319.53	Rh I	12723 - 28543	0.023	0.014	-1.86
6414.72	Rh I	28860 - 44445	0.83	0.51	-0.29
6510.41	Rh I	16119 - 31474	0.030	0.019	-1.71
6519.70	Rh I	16944 - 32277	0.044	0.028	-1.56
6627.80	Rh I	16018 - 31102	0.016	0.010	-1.98
6630.16	Rh I	14788 - 29866	0.022	0.015	-1.83
6752.35	Rh I	27075 - 41881	2.1	1.4	0.16
6796.65	Rh I	35334 - 50043	4.2	2.9	0.46
6827.33	Rh I	14788 - 29431	0.020	0.014	-1.84
6857.68	Rh I	29866 - 44445	1.2	0.88	-0.06
6879.94	Rh I	16944 - 31474	0.057	0.041	-1.39
6965.67	Rh I	12723 - 27075	0.054	0.039	-1.41
6972.91	Rh I	31474 - 45812	1.3	0.97	-0.01
6979.15	Rh I	31147 - 45471	2.4	1.8	0.25
7001.58	Rh I	16119 - 30397	0.034	0.025	-1.60

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
7038.76	Rh I	16944 - 31147	0.038	0.029	-1.54
7101.64	Rh I	30397 - 44475	2.8	2.1	0.32
7104.45	Rh I	14788 - 28860	0.028	0.021	-1.67
7142.55	Rh I	31474 - 45471	1.2	0.94	-0.02
7219.06	Rh I	16018 - 29866	0.024	0.019	-1.72
7268.18	Rh I	14788 - 28543	0.032	0.025	-1.60
7270.82	Rh I	28543 - 42293	3.1	2.4	0.39
7271.94	Rh I	16119 - 29866	0.031	0.024	-1.61
7273.03	Rh I	16121 - 29866	0.012	0.0098	-2.01
7375.57	Rh I	13521 - 27075	0.011	0.0093	-2.03
7386.64	Rh I	32277 - 45812	1.1	0.92	-0.04
7430.80	Rh I	16944 - 30397	0.029	0.024	-1.62
7442.39	Rh I	28860 - 42293	1.6	1.3	0.12
7446.77	Rh I	32046 - 45471	1.5	1.3	0.11
7475.74	Rh I	31102 - 44475	2.0	1.6	0.21
7495.24	Rh I	28543 - 41881	0.94	0.79	-0.10
7542.02	Rh I	36787 - 50043	5.4	4.6	0.66
7557.67	Rh I	32243 - 45471	2.4	2.0	0.30
7577.22	Rh I	32277 - 45471	1.8	1.6	0.20
7690.05	Rh I	31474 - 44475	1.8	1.6	0.20
7772.90	Rh I	29431 - 42293	1.6	1.5	0.17
7791.61	Rh I	31614 - 44445	5.0	4.6	0.66
7824.91	Rh I	29105 - 41881	4.4	4.1	0.61
7846.50	Rh I	16119 - 28860	0.031	0.029	-1.54
8029.91	Rh I	29431 - 41881	1.8	1.7	0.23
8036.11	Rh I	32004 - 44445	1.9	1.8	0.26
8045.40	Rh I	29866 - 42293	2.8	2.8	0.44
8063.50	Rh I	32046 - 44445	1.3	1.2	0.09
8136.20	Rh I	14788 - 27075	0.020	0.019	-1.71
8193.63	Rh I	32243 - 44445	1.3	1.3	0.11
8369.55	Rh I	33867 - 45812	1.3	1.3	0.13
8425.51	Rh I	33946 - 45812	2.2	2.4	0.38

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2276.21	Rh II	28835 - 71359	25.	1.9	0.28
2334.77	Rh II	16885 - 59702	44.	3.6	0.55
2415.84	Rh II	19793 - 61173	49.	4.3	0.63
2420.18	Rh II	33845 - 75152	43.	3.8	0.57
2420.98	Rh II	20647 - 61940	44.	3.9	0.59
2427.11	Rh II	18540 - 59729	45.	4.0	0.60
2431.85	Rh II	21180 - 62288	32.	2.9	0.46
2455.70	Rh II	20647 - 61356	31.	2.8	0.45
2458.90	Rh II	19792 - 60448	60.	5.4	0.73
2461.04	Rh II	18540 - 59161	78.	7.1	0.85
2475.64	Rh II	31730 - 72112	20.	1.9	0.27
2490.77	Rh II	16885 - 57021	77.	7.2	0.86
2503.84	Rh II	20647 - 60573	15.	1.4	0.14
2505.10	Rh II	19792 - 59699	35.	3.3	0.52
2510.66	Rh II	18540 - 58358	43.	4.1	0.61
2520.53	Rh II	16885 - 56547	94.	9.0	0.95
2537.04	Rh II	34243 - 73646	159.	15.	1.19
2566.92	Rh II	38687 - 77633	37.	3.6	0.56
2587.29	Rh II	27439 - 66078	47.	4.7	0.68
2603.32	Rh II	32605 - 71006	44.	4.5	0.65
2606.44	Rh II	41045 - 79399	112.	11.	1.06
2638.74	Rh II	34243 - 72128	45.	4.7	0.67
2705.63	Rh II	25377 - 62326	43.	4.8	0.68
2715.31	Rh II	25377 - 62194	115.	13.	1.11
2910.17	Rh II	25377 - 59729	68.	8.6	0.94

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2076.43	Ru I	0 - 48144	4.0	0.26	-0.58
2083.77	Ru I	1191 - 49165	6.3	0.41	-0.39
2255.52	Ru I	0 - 44322	3.5	0.27	-0.57
2259.53	Ru I	0 - 44243	1.5	0.12	-0.93
2272.09	Ru I	0 - 43999	4.3	0.33	-0.48
2278.19	Ru I	1191 - 45071	1.9	0.15	-0.82
2285.38	Ru I	0 - 43743	1.0	0.079	-1.10
2302.54	Ru I	1191 - 44608	3.0	0.24	-0.62
2317.80	Ru I	1191 - 44322	5.2	0.42	-0.38
2322.01	Ru I	1191 - 44243	1.6	0.13	-0.90
2340.69	Ru I	2092 - 44801	3.7	0.30	-0.52
2349.34	Ru I	1191 - 43743	2.4	0.20	-0.70
2351.33	Ru I	2092 - 44608	5.3	0.44	-0.36
2360.56	Ru I	2092 - 44442	2.5	0.21	-0.67
2370.17	Ru I	2713 - 44891	3.8	0.32	-0.49
2375.27	Ru I	2713 - 44801	5.6	0.48	-0.32
2392.42	Ru I	3105 - 44891	4.9	0.42	-0.38
2429.60	Ru I	8575 - 49722	6.5	0.58	-0.24
2432.93	Ru I	6545 - 47635	6.3	0.56	-0.25
2447.45	Ru I	9492 - 50339	6.4	0.58	-0.24
2450.58	Ru I	6545 - 47339	3.5	0.31	-0.51
2454.92	Ru I	8044 - 48766	9.5	0.86	-0.06
2458.62	Ru I	7483 - 48144	8.4	0.76	-0.12
2462.94	Ru I	8575 - 49165	8.9	0.81	-0.09
2464.70	Ru I	8044 - 48604	12.	1.1	0.04
2474.04	Ru I	9620 - 50028	6.1	0.56	-0.25
2475.41	Ru I	7483 - 47868	14.	1.2	0.10
2476.88	Ru I	8044 - 48405	14.	1.3	0.11
2489.91	Ru I	6545 - 46695	3.0	0.28	-0.55
2491.78	Ru I	9184 - 49304	3.1	0.29	-0.54
2494.02	Ru I	9058 - 49141	13.	1.3	0.10
2496.56	Ru I	7483 - 47526	7.4	0.69	-0.16
2500.84	Ru I	9073 - 49048	5.1	0.48	-0.32
2501.48	Ru I	9073 - 49037	12.	1.1	0.04
2501.89	Ru I	9184 - 49141	9.0	0.84	-0.07
2508.27	Ru I	7483 - 47339	14.	1.3	0.13
2509.07	Ru I	9121 - 48964	17.	1.6	0.22
2512.81	Ru I	8084 - 47868	14.	1.3	0.12
2515.28	Ru I	8044 - 47789	7.9	0.75	-0.12
2517.62	Ru I	9058 - 48766	8.4	0.80	-0.10
2521.61	Ru I	9121 - 48766	8.4	0.80	-0.10
2525.17	Ru I	8575 - 48165	3.7	0.35	-0.45
2526.83	Ru I	7483 - 47047	7.6	0.73	-0.14
2528.88	Ru I	9073 - 48604	8.1	0.78	-0.11
2530.64	Ru I	8044 - 47547	6.4	0.62	-0.21
2533.24	Ru I	7483 - 46947	4.6	0.45	-0.35
2541.28	Ru I	8771 - 48109	6.1	0.59	-0.23
2544.22	Ru I	8575 - 47868	35.	3.4	0.53
2546.67	Ru I	8084 - 47339	13.	1.3	0.11
2549.48	Ru I	7483 - 46695	26.	2.6	0.41

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2549.58	Ru I	6545 - 45756	40.	3.9	0.59
2556.00	Ru I	9492 - 48604	4.8	0.47	-0.33
2556.31	Ru I	9058 - 48165	5.0	0.49	-0.31
2558.54	Ru I	8084 - 47157	4.9	0.49	-0.31
2560.26	Ru I	8771 - 47818	16.	1.6	0.20
2563.15	Ru I	8044 - 47047	12.	1.1	0.06
2564.58	Ru I	9184 - 48165	3.8	0.37	-0.43
2566.59	Ru I	8575 - 47526	6.5	0.64	-0.19
2568.77	Ru I	7483 - 46401	14.	1.4	0.14
2569.74	Ru I	8044 - 46947	2.8	0.28	-0.55
2572.28	Ru I	8771 - 47635	3.3	0.33	-0.48
2572.41	Ru I	8084 - 46947	5.7	0.56	-0.25
2575.24	Ru I	6545 - 45365	1.8	0.18	-0.75
2578.57	Ru I	8575 - 47345	11.	1.1	0.06
2578.95	Ru I	8575 - 47339	6.2	0.62	-0.21
2579.22	Ru I	8044 - 46804	4.6	0.46	-0.34
2579.53	Ru I	8771 - 47526	12.	1.2	0.08
2580.80	Ru I	9073 - 47809	12.	1.2	0.07
2581.14	Ru I	9058 - 47789	9.3	0.93	-0.03
2581.91	Ru I	8084 - 46804	6.4	0.64	-0.19
2583.04	Ru I	8044 - 46746	5.4	0.54	-0.27
2584.14	Ru I	8575 - 47262	8.2	0.82	-0.09
2585.74	Ru I	8084 - 46746	4.5	0.45	-0.34
2589.57	Ru I	9184 - 47789	13.	1.3	0.11
2590.97	Ru I	7483 - 46067	5.3	0.53	-0.27
2591.12	Ru I	8575 - 47157	18.	1.8	0.26
2591.64	Ru I	8771 - 47345	4.2	0.42	-0.37
2592.02	Ru I	8771 - 47339	14.	1.4	0.14
2593.70	Ru I	12817 - 51360	25.	2.5	0.41
2594.85	Ru I	6545 - 45071	6.6	0.67	-0.17
2597.33	Ru I	9058 - 47547	5.5	0.56	-0.25
2605.35	Ru I	8575 - 46947	7.6	0.78	-0.11
2605.86	Ru I	9184 - 47547	7.7	0.79	-0.10
2609.06	Ru I	8084 - 46401	33.	3.4	0.53
2609.48	Ru I	10624 - 48934	7.5	0.77	-0.12
2611.05	Ru I	9058 - 47345	9.5	0.97	-0.01
2612.07	Ru I	7483 - 45756	61.	6.2	0.79
2614.07	Ru I	1191 - 39434	1.1	0.12	-0.93
2614.59	Ru I	2713 - 40949	1.0	0.11	-0.97
2615.09	Ru I	8575 - 46804	10.	1.0	0.02
2617.79	Ru I	9620 - 47809	9.4	0.97	-0.01
2619.67	Ru I	9184 - 47345	11.	1.1	0.04
2620.61	Ru I	8044 - 46191	7.1	0.73	-0.14
2623.83	Ru I	16191 - 54292	10.	1.1	0.02
2627.65	Ru I	7483 - 45529	3.8	0.40	-0.40
2631.30	Ru I	7483 - 45476	15.	1.6	0.20
2631.57	Ru I	9058 - 47047	5.9	0.62	-0.21
2632.13	Ru I	10624 - 48604	7.1	0.73	-0.13
2632.50	Ru I	8771 - 46746	4.6	0.48	-0.32
2633.46	Ru I	11447 - 49409	5.0	0.52	-0.29

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2635.86	Ru I	9620 - 47547	27.	2.8	0.45
2636.67	Ru I	12207 - 50122	34.	3.6	0.55
2638.51	Ru I	9058 - 46947	9.7	1.0	0.00
2639.12	Ru I	9620 - 47501	8.9	0.93	-0.03
2640.33	Ru I	9184 - 47047	12.	1.2	0.10
2642.96	Ru I	8575 - 46401	42.	4.4	0.64
2646.02	Ru I	10624 - 48405	4.1	0.43	-0.37
2647.32	Ru I	9184 - 46947	12.	1.2	0.09
2648.45	Ru I	8044 - 45790	2.4	0.26	-0.59
2648.78	Ru I	12207 - 49949	5.5	0.58	-0.23
2649.51	Ru I	9058 - 46789	6.5	0.69	-0.16
2651.29	Ru I	8084 - 45790	8.3	0.88	-0.06
2651.84	Ru I	6545 - 44243	16.	1.7	0.23
2656.69	Ru I	8771 - 46401	1.2	0.13	-0.90
2658.40	Ru I	9184 - 46789	4.7	0.50	-0.30
2659.62	Ru I	7483 - 45071	25.	2.7	0.42
2664.76	Ru I	1191 - 38706	2.1	0.22	-0.65
2667.97	Ru I	9058 - 46528	3.5	0.38	-0.43
2673.48	Ru I	9073 - 46466	5.2	0.56	-0.25
2673.60	Ru I	8084 - 45476	3.2	0.34	-0.46
2686.29	Ru I	8575 - 45790	17.	1.8	0.26
2688.11	Ru I	26118 - 63308	23.	2.5	0.39
2689.90	Ru I	10624 - 47789	2.4	0.26	-0.58
2693.29	Ru I	9073 - 46191	3.2	0.35	-0.45
2699.88	Ru I	8044 - 45071	5.8	0.63	-0.20
2701.34	Ru I	9184 - 46191	9.8	1.1	0.03
2702.83	Ru I	8084 - 45071	6.9	0.76	-0.12
2707.97	Ru I	2092 - 39009	0.42	0.046	-1.34
2709.20	Ru I	8575 - 45476	12.	1.3	0.11
2713.19	Ru I	9620 - 46466	7.0	0.78	-0.11
2717.40	Ru I	3105 - 39895	0.67	0.075	-1.13
2719.52	Ru I	7483 - 44243	34.	3.8	0.58
2721.56	Ru I	9058 - 45790	7.1	0.79	-0.10
2722.65	Ru I	9073 - 45790	10.0	1.1	0.04
2724.06	Ru I	9492 - 46191	6.6	0.73	-0.14
2728.83	Ru I	9121 - 45756	4.2	0.47	-0.32
2729.46	Ru I	8575 - 45202	1.5	0.17	-0.77
2730.33	Ru I	2092 - 38706	0.58	0.065	-1.19
2730.93	Ru I	9183 - 45790	7.1	0.80	-0.10
2733.59	Ru I	9620 - 46191	4.1	0.46	-0.34
2735.72	Ru I	0 - 36543	11.	1.2	0.07
2739.22	Ru I	8575 - 45071	11.	1.2	0.07
2743.94	Ru I	6545 - 42978	2.6	0.29	-0.53
2744.45	Ru I	8771 - 45197	8.5	0.96	-0.02
2762.31	Ru I	8044 - 44235	1.9	0.21	-0.67
2763.42	Ru I	1191 - 37367	1.9	0.22	-0.67
2785.65	Ru I	9184 - 45071	3.6	0.42	-0.38
2792.64	Ru I	8044 - 43842	1.7	0.20	-0.70
2802.81	Ru I	8575 - 44243	7.1	0.84	-0.08
2810.03	Ru I	2092 - 37668	2.8	0.33	-0.48

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2810.55	Ru I	1191 - 36760	11.	1.3	0.11
2817.09	Ru I	2713 - 38200	0.69	0.082	-1.08
2818.36	Ru I	0 - 35471	1.5	0.18	-0.74
2818.95	Ru I	8771 - 44235	1.9	0.23	-0.64
2822.03	Ru I	8084 - 43509	4.7	0.56	-0.25
2827.87	Ru I	1191 - 36543	1.2	0.14	-0.84
2829.16	Ru I	6545 - 41881	11.	1.3	0.11
2834.00	Ru I	2092 - 37367	0.96	0.12	-0.93
2836.57	Ru I	9058 - 44301	1.9	0.24	-0.63
2840.54	Ru I	6545 - 41739	3.8	0.46	-0.34
2843.17	Ru I	9073 - 44235	3.8	0.47	-0.33
2846.32	Ru I	9121 - 44244	1.9	0.23	-0.63
2848.58	Ru I	3105 - 38200	0.79	0.096	-1.02
2854.07	Ru I	2092 - 37119	4.5	0.55	-0.26
2860.02	Ru I	2713 - 37668	1.5	0.19	-0.73
2861.41	Ru I	6545 - 41483	10.	1.3	0.10
2866.64	Ru I	2092 - 36965	3.7	0.46	-0.34
2868.19	Ru I	9121 - 43976	4.0	0.50	-0.30
2874.98	Ru I	0 - 34773	6.7	0.83	-0.08
2879.76	Ru I	6545 - 41260	5.0	0.63	-0.20
2881.28	Ru I	3105 - 37802	0.40	0.049	-1.31
2883.60	Ru I	2092 - 36760	0.83	0.10	-0.99
2884.51	Ru I	9184 - 43842	3.0	0.38	-0.42
2886.54	Ru I	2713 - 37347	5.6	0.70	-0.16
2888.00	Ru I	1191 - 35807	0.36	0.045	-1.34
2891.65	Ru I	15550 - 50122	8.3	1.0	0.02
2896.53	Ru I	3105 - 37620	0.60	0.076	-1.12
2898.54	Ru I	8044 - 42534	1.8	0.23	-0.64
2901.94	Ru I	8084 - 42534	3.6	0.46	-0.34
2902.10	Ru I	10624 - 45071	3.7	0.47	-0.33
2903.08	Ru I	9073 - 43509	0.80	0.10	-1.00
2905.65	Ru I	2713 - 37119	0.99	0.13	-0.90
2905.83	Ru I	6545 - 40949	1.4	0.17	-0.76
2906.32	Ru I	7483 - 41881	2.0	0.26	-0.59
2908.88	Ru I	3105 - 37473	2.9	0.37	-0.43
2909.22	Ru I	8575 - 42939	1.2	0.15	-0.82
2913.17	Ru I	11786 - 46103	3.4	0.44	-0.36
2914.30	Ru I	11753 - 46056	3.4	0.43	-0.37
2916.26	Ru I	1191 - 35471	5.0	0.64	-0.20
2917.77	Ru I	8084 - 42347	0.87	0.11	-0.96
2919.61	Ru I	3105 - 37347	1.1	0.14	-0.84
2927.12	Ru I	14700 - 48854	5.0	0.64	-0.20
2939.94	Ru I	11786 - 45790	3.1	0.40	-0.40
2940.36	Ru I	7483 - 41483	1.4	0.18	-0.75
2943.92	Ru I	8575 - 42534	2.5	0.32	-0.50
2946.99	Ru I	8084 - 42007	5.3	0.69	-0.16
2949.50	Ru I	6545 - 40439	6.8	0.89	-0.05
2952.50	Ru I	3105 - 36965	0.26	0.034	-1.47
2954.49	Ru I	8043 - 41881	4.1	0.54	-0.27
2958.00	Ru I	8084 - 41881	2.1	0.27	-0.57

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2959.74	Ru I	7483 - 41260	0.65	0.085	-1.07
2961.69	Ru I	11447 - 45202	5.2	0.69	-0.16
2963.72	Ru I	6545 - 40277	0.98	0.13	-0.89
2965.16	Ru I	2092 - 35807	2.8	0.37	-0.44
2968.48	Ru I	10624 - 44301	3.1	0.40	-0.39
2968.95	Ru I	8084 - 41756	2.2	0.30	-0.53
2973.99	Ru I	9492 - 43108	1.5	0.19	-0.71
2974.34	Ru I	10624 - 44235	1.5	0.20	-0.70
2976.92	Ru I	1191 - 34773	2.1	0.28	-0.56
2979.72	Ru I	15054 - 48604	13.	1.7	0.23
2981.94	Ru I	2713 - 36239	0.32	0.042	-1.37
2988.95	Ru I	0 - 33447	3.6	0.48	-0.32
2989.66	Ru I	8044 - 41483	0.93	0.12	-0.91
2993.27	Ru I	8084 - 41483	2.8	0.37	-0.43
2994.96	Ru I	2092 - 35471	2.1	0.29	-0.54
2996.90	Ru I	9058 - 42416	1.8	0.24	-0.61
2997.43	Ru I	10624 - 43976	1.4	0.19	-0.72
3001.64	Ru I	8575 - 41881	1.6	0.21	-0.68
3006.59	Ru I	2713 - 35964	2.4	0.32	-0.49
3008.26	Ru I	9184 - 42416	1.2	0.16	-0.78
3008.80	Ru I	9121 - 42347	1.8	0.24	-0.61
3012.92	Ru I	8575 - 41756	1.5	0.21	-0.69
3013.36	Ru I	8084 - 41260	1.3	0.18	-0.75
3017.24	Ru I	3105 - 36239	1.9	0.26	-0.58
3019.37	Ru I	8771 - 41881	0.52	0.072	-1.14
3020.88	Ru I	2713 - 35807	1.6	0.22	-0.66
3033.45	Ru I	7483 - 40439	4.6	0.63	-0.20
3034.06	Ru I	9058 - 42007	1.9	0.26	-0.58
3035.47	Ru I	9073 - 42007	1.6	0.23	-0.65
3038.18	Ru I	8044 - 40949	1.2	0.17	-0.77
3040.31	Ru I	1191 - 34072	0.58	0.081	-1.09
3042.48	Ru I	3105 - 35964	1.1	0.15	-0.82
3042.83	Ru I	10655 - 43510	2.5	0.35	-0.46
3045.71	Ru I	9184 - 42007	3.0	0.42	-0.38
3048.50	Ru I	7483 - 40277	1.0	0.14	-0.85
3048.78	Ru I	2092 - 34882	0.40	0.056	-1.25
3054.94	Ru I	8044 - 40768	2.9	0.41	-0.39
3064.84	Ru I	9121 - 41739	10.	1.4	0.16
3073.34	Ru I	11447 - 43976	4.3	0.61	-0.21
3080.90	Ru I	11786 - 44235	4.7	0.67	-0.18
3086.07	Ru I	11447 - 43842	2.8	0.40	-0.40
3089.14	Ru I	9121 - 41483	4.1	0.58	-0.23
3089.80	Ru I	8084 - 40439	2.1	0.31	-0.51
3090.23	Ru I	17097 - 49448	12.	1.7	0.23
3091.87	Ru I	2713 - 35047	0.23	0.034	-1.47
3096.57	Ru I	12207 - 44492	19.	2.7	0.44
3097.60	Ru I	10624 - 42897	4.3	0.62	-0.21
3099.28	Ru I	1191 - 33447	2.1	0.31	-0.52
3100.84	Ru I	1191 - 33431	1.9	0.27	-0.57
3110.55	Ru I	9121 - 41260	2.0	0.30	-0.53

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3124.17	Ru I	2092 - 34091	0.18	0.026	-1.58
3125.96	Ru I	2092 - 34072	0.36	0.053	-1.28
3132.88	Ru I	10624 - 42534	2.9	0.43	-0.36
3136.56	Ru I	8044 - 39917	1.4	0.21	-0.68
3140.97	Ru I	9121 - 40949	1.9	0.28	-0.55
3144.26	Ru I	14700 - 46495	9.2	1.4	0.14
3150.69	Ru I	8044 - 39774	0.91	0.13	-0.87
3153.82	Ru I	8044 - 39742	1.8	0.27	-0.57
3158.89	Ru I	9121 - 40768	1.2	0.18	-0.74
3159.92	Ru I	2092 - 33729	0.83	0.12	-0.91
3168.52	Ru I	11447 - 42998	7.5	1.1	0.06
3186.04	Ru I	2713 - 34091	0.55	0.084	-1.07
3188.34	Ru I	2092 - 33447	0.62	0.094	-1.03
3189.98	Ru I	2092 - 33431	0.61	0.094	-1.03
3196.59	Ru I	3105 - 34380	0.60	0.092	-1.03
3212.97	Ru I	9121 - 40235	1.1	0.16	-0.79
3216.52	Ru I	2092 - 33172	0.14	0.022	-1.65
3223.27	Ru I	2713 - 33729	0.51	0.079	-1.10
3226.37	Ru I	3105 - 34091	0.34	0.053	-1.27
3227.88	Ru I	8771 - 39742	1.5	0.24	-0.62
3228.53	Ru I	8044 - 39009	2.7	0.43	-0.37
3238.53	Ru I	15054 - 45923	19.	3.0	0.48
3241.24	Ru I	9073 - 39917	1.9	0.31	-0.51
3243.50	Ru I	6545 - 37367	0.95	0.15	-0.83
3254.54	Ru I	2713 - 33431	0.21	0.033	-1.48
3254.71	Ru I	9058 - 39774	0.94	0.15	-0.83
3260.35	Ru I	1191 - 31853	0.47	0.075	-1.13
3264.55	Ru I	3105 - 33729	0.34	0.055	-1.26
3266.44	Ru I	10655 - 41260	2.9	0.46	-0.34
3268.21	Ru I	13646 - 44235	11.	1.8	0.25
3273.08	Ru I	8044 - 38587	2.2	0.36	-0.44
3274.71	Ru I	10655 - 41183	4.7	0.75	-0.12
3277.57	Ru I	14700 - 45202	7.3	1.2	0.07
3294.11	Ru I	0 - 30348	0.55	0.090	-1.05
3296.11	Ru I	13646 - 43976	3.1	0.51	-0.30
3297.96	Ru I	9121 - 39434	0.86	0.14	-0.85
3301.59	Ru I	0 - 30280	0.41	0.068	-1.17
3306.17	Ru I	8771 - 39009	2.8	0.46	-0.34
3315.05	Ru I	8044 - 38200	0.61	0.10	-1.00
3315.23	Ru I	1191 - 31346	0.44	0.073	-1.14
3316.39	Ru I	10624 - 40768	6.3	1.0	0.02
3317.89	Ru I	8575 - 38706	0.71	0.12	-0.93
3318.82	Ru I	14700 - 44823	4.0	0.66	-0.18
3325.00	Ru I	3105 - 33172	0.25	0.041	-1.39
3332.05	Ru I	31385 - 61388	30.	4.9	0.69
3335.69	Ru I	11786 - 41756	3.4	0.56	-0.25
3339.55	Ru I	8771 - 38706	11.	1.9	0.27
3341.66	Ru I	9121 - 39037	3.1	0.52	-0.28
3344.53	Ru I	0 - 29891	0.059	0.0099	-2.00
3361.15	Ru I	17046 - 46789	24.	4.0	0.60

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3362.00	Ru I	11447 - 41183	1.4	0.24	-0.61
3368.45	Ru I	2713 - 32392	0.76	0.13	-0.89
3371.86	Ru I	9058 - 38706	1.2	0.20	-0.69
3374.65	Ru I	8044 - 37668	1.2	0.20	-0.70
3378.02	Ru I	0 - 29595	0.11	0.019	-1.73
3379.60	Ru I	10655 - 40235	1.8	0.32	-0.50
3380.18	Ru I	8044 - 37620	1.1	0.20	-0.71
3385.14	Ru I	12207 - 41739	3.7	0.63	-0.20
3388.71	Ru I	11447 - 40949	2.9	0.51	-0.30
3389.50	Ru I	2713 - 32208	0.19	0.033	-1.48
3391.89	Ru I	14828 - 44301	3.5	0.60	-0.22
3392.54	Ru I	0 - 29468	0.34	0.058	-1.23
3401.74	Ru I	9620 - 39009	4.2	0.73	-0.14
3409.28	Ru I	8044 - 37367	2.7	0.46	-0.34
3411.64	Ru I	8044 - 37347	1.6	0.27	-0.56
3417.35	Ru I	2092 - 31346	4.9	0.85	-0.07
3420.08	Ru I	11786 - 41017	1.6	0.29	-0.54
3428.31	Ru I	0 - 29161	4.1	0.73	-0.14
3428.63	Ru I	1191 - 30348	0.15	0.026	-1.58
3429.54	Ru I	10624 - 39774	3.1	0.55	-0.26
3430.77	Ru I	2713 - 31853	0.88	0.16	-0.81
3432.21	Ru I	9073 - 38200	1.1	0.19	-0.73
3432.74	Ru I	9121 - 38243	3.4	0.60	-0.22
3433.26	Ru I	10624 - 39742	3.1	0.55	-0.26
3435.19	Ru I	3105 - 32208	0.31	0.055	-1.26
3436.74	Ru I	1191 - 30280	7.4	1.3	0.11
3438.37	Ru I	8044 - 37119	2.0	0.36	-0.44
3440.20	Ru I	7483 - 36543	1.5	0.26	-0.59
3448.95	Ru I	11447 - 40433	3.2	0.57	-0.25
3452.90	Ru I	2092 - 31044	0.14	0.025	-1.60
3456.62	Ru I	15054 - 43976	3.8	0.68	-0.17
3463.14	Ru I	2092 - 30959	0.097	0.017	-1.76
3473.75	Ru I	10655 - 39434	3.9	0.71	-0.15
3481.30	Ru I	8044 - 36760	1.7	0.31	-0.51
3483.16	Ru I	1191 - 29892	0.13	0.024	-1.61
3483.29	Ru I	1191 - 29891	0.13	0.024	-1.61
3494.25	Ru I	9058 - 37668	1.2	0.22	-0.66
3495.97	Ru I	8771 - 37367	1.1	0.20	-0.69
3498.94	Ru I	0 - 28572	6.0	1.1	0.05
3502.42	Ru I	8575 - 37119	0.56	0.10	-0.99
3514.49	Ru I	2092 - 30537	0.81	0.15	-0.82
3519.64	Ru I	1191 - 29595	0.32	0.060	-1.22
3528.68	Ru I	2713 - 31044	0.29	0.054	-1.27
3531.39	Ru I	9058 - 37367	1.1	0.21	-0.68
3532.81	Ru I	14700 - 42998	10.	1.9	0.28
3535.37	Ru I	1191 - 29468	0.093	0.017	-1.76
3535.83	Ru I	9073 - 37347	1.1	0.21	-0.68
3537.95	Ru I	2092 - 30348	0.47	0.089	-1.05
3539.37	Ru I	2713 - 30959	1.1	0.21	-0.67
3541.63	Ru I	6545 - 34773	0.83	0.16	-0.81

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3550.27	Ru I	2092 - 30250	0.15	0.028	-1.55
3553.85	Ru I	11786 - 39917	2.3	0.44	-0.36
3556.63	Ru I	11786 - 39895	1.8	0.33	-0.48
3564.56	Ru I	9073 - 37119	1.0	0.20	-0.70
3567.16	Ru I	13982 - 42007	4.2	0.80	-0.10
3570.59	Ru I	15550 - 43549	35.	6.6	0.82
3574.58	Ru I	8575 - 36543	1.4	0.26	-0.58
3579.77	Ru I	2092 - 30018	0.077	0.015	-1.83
3587.20	Ru I	16240 - 44109	23.	4.5	0.65
3589.22	Ru I	3105 - 30959	9.3	1.8	0.25
3593.02	Ru I	2713 - 30537	8.9	1.7	0.24
3596.18	Ru I	2092 - 29891	6.9	1.3	0.13
3599.76	Ru I	8771 - 36543	9.0	1.8	0.24
3605.64	Ru I	9620 - 37347	1.1	0.22	-0.66
3608.73	Ru I	9058 - 36760	0.74	0.14	-0.84
3616.95	Ru I	9121 - 36760	0.44	0.087	-1.06
3619.20	Ru I	12817 - 40439	2.1	0.41	-0.39
3620.28	Ru I	13646 - 41260	1.6	0.31	-0.51
3623.64	Ru I	10655 - 38243	0.68	0.13	-0.88
3625.20	Ru I	10624 - 38200	3.8	0.75	-0.13
3626.74	Ru I	17097 - 44662	25.	4.9	0.69
3627.29	Ru I	13699 - 41260	1.1	0.21	-0.68
3631.71	Ru I	6545 - 34072	0.59	0.12	-0.93
3633.92	Ru I	17097 - 44608	5.4	1.1	0.03
3634.93	Ru I	2092 - 29595	3.0	0.59	-0.23
3635.52	Ru I	9620 - 37119	0.99	0.20	-0.71
3637.47	Ru I	13699 - 41183	5.2	1.0	0.01
3638.02	Ru I	15054 - 42534	1.5	0.30	-0.52
3640.64	Ru I	12817 - 40277	3.8	0.76	-0.12
3646.11	Ru I	12817 - 40235	3.2	0.63	-0.20
3650.32	Ru I	8084 - 35471	1.5	0.29	-0.54
3652.32	Ru I	2713 - 30085	0.068	0.014	-1.86
3654.40	Ru I	16240 - 43597	15.	3.1	0.49
3660.81	Ru I	16240 - 43549	2.5	0.51	-0.29
3661.35	Ru I	1191 - 28495	4.4	0.88	-0.06
3663.37	Ru I	7483 - 34773	3.4	0.69	-0.16
3669.49	Ru I	12207 - 39451	9.6	1.9	0.29
3678.32	Ru I	2713 - 29892	0.24	0.048	-1.31
3685.95	Ru I	13646 - 40768	0.94	0.19	-0.72
3696.59	Ru I	10624 - 37668	2.3	0.48	-0.32
3697.76	Ru I	8771 - 35807	0.58	0.12	-0.93
3700.99	Ru I	17097 - 44109	7.2	1.5	0.17
3702.24	Ru I	8044 - 35047	0.12	0.024	-1.62
3712.30	Ru I	17046 - 43976	5.8	1.2	0.08
3715.56	Ru I	9058 - 35964	0.30	0.063	-1.20
3716.18	Ru I	6545 - 33447	0.30	0.062	-1.21
3717.00	Ru I	8575 - 35471	2.0	0.42	-0.38
3719.33	Ru I	17097 - 43976	14.	2.9	0.46
3724.97	Ru I	8044 - 34882	0.72	0.15	-0.83
3725.49	Ru I	11753 - 38587	0.64	0.13	-0.88

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3726.10	Ru I	12207 - 39037	7.3	1.5	0.18
3726.93	Ru I	1191 - 28015	5.2	1.1	0.03
3728.03	Ru I	0 - 26816	4.6	0.96	-0.02
3730.43	Ru I	2092 - 28891	5.4	1.1	0.05
3732.03	Ru I	13646 - 40433	1.7	0.36	-0.44
3733.05	Ru I	9184 - 35964	0.49	0.10	-0.99
3737.40	Ru I	9058 - 35807	1.5	0.32	-0.50
3737.74	Ru I	9492 - 36239	0.33	0.069	-1.16
3738.63	Ru I	13699 - 40439	0.86	0.18	-0.74
3738.91	Ru I	16240 - 42978	4.4	0.93	-0.03
3739.46	Ru I	13699 - 40433	8.2	1.7	0.24
3742.28	Ru I	2713 - 29427	3.1	0.65	-0.19
3742.78	Ru I	15550 - 42261	29.	6.1	0.78
3744.22	Ru I	8771 - 35471	1.4	0.29	-0.54
3744.40	Ru I	16240 - 42939	17.	3.5	0.54
3745.59	Ru I	12207 - 38898	36.	7.7	0.88
3753.54	Ru I	12817 - 39451	11.	2.4	0.39
3755.09	Ru I	9184 - 35807	1.6	0.35	-0.46
3755.93	Ru I	12817 - 39434	13.	2.8	0.44
3759.84	Ru I	7483 - 34072	4.0	0.84	-0.08
3760.03	Ru I	3105 - 29694	0.36	0.076	-1.12
3761.51	Ru I	13699 - 40277	11.	2.4	0.38
3767.35	Ru I	13699 - 40235	11.	2.4	0.38
3773.17	Ru I	10624 - 37119	0.43	0.091	-1.04
3777.59	Ru I	3105 - 29570	1.4	0.30	-0.52
3778.70	Ru I	12817 - 39273	2.2	0.47	-0.33
3781.18	Ru I	20056 - 46495	52.	11.	1.05
3782.74	Ru I	27289 - 53718	254.	54.	1.74
3786.06	Ru I	2713 - 29119	3.2	0.70	-0.16
3790.51	Ru I	2092 - 28466	4.1	0.89	-0.05
3794.92	Ru I	16191 - 42534	8.7	1.9	0.27
3795.18	Ru I	10624 - 36965	0.66	0.14	-0.85
3798.05	Ru I	3105 - 29427	0.69	0.15	-0.83
3798.90	Ru I	1191 - 27507	4.0	0.87	-0.06
3799.35	Ru I	0 - 26313	2.9	0.62	-0.21
3800.26	Ru I	8575 - 34882	1.3	0.28	-0.56
3803.20	Ru I	20242 - 46528	10.	2.2	0.34
3808.68	Ru I	14700 - 40949	7.1	1.5	0.19
3812.72	Ru I	12817 - 39037	8.2	1.8	0.25
3814.86	Ru I	15054 - 41260	3.9	0.85	-0.07
3817.27	Ru I	15550 - 41739	22.	4.9	0.69
3819.03	Ru I	2713 - 28891	0.59	0.13	-0.89
3819.77	Ru I	11447 - 37620	0.50	0.11	-0.96
3822.09	Ru I	16191 - 42347	23.	5.0	0.70
3824.93	Ru I	10624 - 36760	3.9	0.86	-0.07
3828.71	Ru I	8771 - 34882	0.55	0.12	-0.91
3831.80	Ru I	12207 - 38297	8.5	1.9	0.27
3835.05	Ru I	14700 - 40768	4.9	1.1	0.03
3838.07	Ru I	8044 - 34091	1.0	0.23	-0.64
3839.70	Ru I	12207 - 38243	10.	2.2	0.35

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3840.82	Ru I	8044 - 34072	0.52	0.11	-0.94
3843.16	Ru I	3105 - 29119	0.073	0.016	-1.79
3846.68	Ru I	9058 - 35047	2.1	0.47	-0.32
3850.43	Ru I	7483 - 33447	2.2	0.48	-0.32
3852.14	Ru I	17046 - 42998	5.5	1.2	0.09
3856.46	Ru I	2092 - 28015	0.29	0.066	-1.18
3857.55	Ru I	14700 - 40616	28.	6.3	0.80
3860.72	Ru I	15054 - 40949	5.2	1.2	0.06
3862.69	Ru I	17097 - 42978	27.	6.1	0.79
3865.40	Ru I	9184 - 35047	0.59	0.13	-0.88
3867.84	Ru I	6545 - 32392	2.8	0.62	-0.21
3873.52	Ru I	9073 - 34882	1.1	0.25	-0.60
3876.08	Ru I	13982 - 39774	0.56	0.13	-0.90
3882.01	Ru I	2713 - 28466	0.069	0.016	-1.81
3884.02	Ru I	14700 - 40439	2.7	0.61	-0.21
3884.68	Ru I	13699 - 39434	1.5	0.34	-0.46
3887.77	Ru I	15054 - 40768	2.2	0.50	-0.30
3890.20	Ru I	9184 - 34882	0.66	0.15	-0.83
3891.41	Ru I	16191 - 41881	2.0	0.46	-0.34
3892.21	Ru I	8044 - 33729	2.0	0.46	-0.34
3892.77	Ru I	20242 - 45923	3.2	0.72	-0.14
3894.24	Ru I	11447 - 37119	0.26	0.060	-1.22
3897.24	Ru I	9121 - 34773	0.41	0.093	-1.03
3898.36	Ru I	8084 - 33729	0.31	0.070	-1.16
3901.24	Ru I	1191 - 26816	0.068	0.015	-1.81
3908.76	Ru I	14700 - 40277	2.6	0.59	-0.23
3909.08	Ru I	13699 - 39273	11.	2.6	0.42
3912.11	Ru I	9492 - 35047	0.44	0.10	-0.99
3914.85	Ru I	8044 - 33580	0.46	0.11	-0.98
3920.92	Ru I	8575 - 34072	0.90	0.21	-0.68
3923.47	Ru I	12817 - 38297	17.	4.0	0.60
3924.63	Ru I	20056 - 45529	5.7	1.3	0.12
3925.92	Ru I	0 - 25465	1.00	0.23	-0.64
3931.76	Ru I	9620 - 35047	2.7	0.63	-0.20
3933.55	Ru I	2092 - 27507	0.17	0.038	-1.41
3937.90	Ru I	8044 - 33431	0.35	0.081	-1.09
3941.65	Ru I	8084 - 33447	0.19	0.044	-1.35
3942.06	Ru I	3105 - 28466	0.062	0.015	-1.84
3944.19	Ru I	8084 - 33431	0.19	0.044	-1.35
3945.57	Ru I	16240 - 41578	22.	5.1	0.71
3946.31	Ru I	11786 - 37119	0.31	0.073	-1.14
3949.42	Ru I	11447 - 36760	0.49	0.11	-0.94
3950.04	Ru I	20056 - 45365	10.	2.4	0.37
3950.21	Ru I	6545 - 31853	0.85	0.20	-0.70
3950.41	Ru I	9073 - 34380	0.58	0.14	-0.87
3951.21	Ru I	8771 - 34072	0.23	0.053	-1.27
3952.68	Ru I	16191 - 41483	8.6	2.0	0.30
3957.45	Ru I	9620 - 34882	0.17	0.039	-1.41
3964.90	Ru I	0 - 25214	0.13	0.031	-1.51
3969.79	Ru I	10624 - 35807	0.19	0.044	-1.36

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3974.50	Ru I	8575 - 33729	0.28	0.066	-1.18
3978.44	Ru I	8044 - 33172	1.6	0.39	-0.41
3979.42	Ru I	1191 - 26313	0.24	0.056	-1.25
3984.86	Ru I	8084 - 33172	2.4	0.57	-0.25
3987.80	Ru I	16191 - 41260	0.73	0.17	-0.76
3993.53	Ru I	9058 - 34091	0.19	0.046	-1.34
3995.98	Ru I	9073 - 34091	1.0	0.24	-0.62
3996.51	Ru I	9058 - 34072	0.096	0.023	-1.64
4005.64	Ru I	8771 - 33729	0.45	0.11	-0.96
4006.60	Ru I	9120 - 34073	0.31	0.074	-1.13
4007.54	Ru I	14827 - 39774	0.96	0.23	-0.64
4008.27	Ru I	13646 - 38587	1.1	0.26	-0.58
4013.50	Ru I	7483 - 32392	0.19	0.046	-1.33
4021.00	Ru I	15054 - 39917	1.0	0.24	-0.61
4022.16	Ru I	8575 - 33431	4.5	1.1	0.04
4023.83	Ru I	1191 - 26036	0.22	0.053	-1.27
4031.00	Ru I	6545 - 31346	0.14	0.035	-1.46
4032.20	Ru I	2713 - 27507	0.085	0.021	-1.68
4037.74	Ru I	9620 - 34380	0.15	0.036	-1.44
4039.21	Ru I	14700 - 39451	4.9	1.2	0.08
4040.48	Ru I	22519 - 47262	4.8	1.2	0.07
4045.76	Ru I	17046 - 41756	5.4	1.3	0.12
4049.41	Ru I	15054 - 39742	1.2	0.28	-0.55
4051.40	Ru I	8771 - 33447	4.2	1.0	0.02
4052.20	Ru I	9058 - 33729	0.56	0.14	-0.86
4054.05	Ru I	8771 - 33431	2.1	0.52	-0.28
4062.85	Ru I	20056 - 44662	3.9	0.96	-0.02
4062.99	Ru I	13982 - 38587	1.5	0.38	-0.42
4064.10	Ru I	9492 - 34091	0.39	0.097	-1.01
4064.46	Ru I	8575 - 33172	1.0	0.25	-0.59
4067.61	Ru I	16191 - 40768	4.6	1.2	0.06
4068.37	Ru I	14700 - 39273	12.	2.9	0.47
4071.40	Ru I	13646 - 38200	1.8	0.44	-0.36
4073.00	Ru I	9184 - 33729	0.64	0.16	-0.80
4076.73	Ru I	9058 - 33580	3.1	0.76	-0.12
4080.60	Ru I	6545 - 31044	9.2	2.3	0.36
4082.79	Ru I	11753 - 36239	0.51	0.13	-0.90
4085.43	Ru I	16713 - 41183	8.2	2.0	0.31
4091.06	Ru I	17046 - 41483	3.2	0.80	-0.10
4097.03	Ru I	8771 - 33172	0.30	0.077	-1.11
4097.79	Ru I	9184 - 33580	2.9	0.73	-0.14
4100.37	Ru I	2092 - 26473	0.032	0.0081	-2.09
4101.74	Ru I	9058 - 33431	1.1	0.27	-0.58
4102.28	Ru I	7483 - 31853	0.15	0.037	-1.43
4107.84	Ru I	14700 - 39037	1.9	0.49	-0.31
4109.65	Ru I	9120 - 33447	0.083	0.021	-1.68
4112.74	Ru I	8084 - 32392	4.2	1.1	0.03
4113.38	Ru I	16713 - 41017	4.2	1.1	0.03
4114.13	Ru I	8044 - 32343	0.073	0.018	-1.73
4118.50	Ru I	1191 - 25464	0.021	0.0053	-2.27

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4120.99	Ru I	8084 - 32343	0.36	0.093	-1.03
4123.06	Ru I	9184 - 33431	0.50	0.13	-0.90
4123.81	Ru I	16191 - 40433	1.4	0.36	-0.44
4127.44	Ru I	2092 - 26313	0.049	0.012	-1.90
4127.87	Ru I	13982 - 38200	1.4	0.36	-0.45
4137.23	Ru I	8044 - 32208	0.21	0.054	-1.27
4144.16	Ru I	8084 - 32208	4.2	1.1	0.04
4145.74	Ru I	9058 - 33172	1.9	0.48	-0.32
4146.77	Ru I	9620 - 33729	0.87	0.22	-0.65
4148.38	Ru I	9073 - 33172	0.25	0.064	-1.20
4150.30	Ru I	9492 - 33580	0.17	0.045	-1.35
4159.17	Ru I	16240 - 40277	0.69	0.18	-0.75
4161.66	Ru I	13646 - 37668	1.3	0.34	-0.46
4166.88	Ru I	6545 - 30537	0.15	0.038	-1.42
4167.51	Ru I	9184 - 33172	2.5	0.65	-0.19
4170.05	Ru I	13646 - 37620	1.1	0.28	-0.55
4175.43	Ru I	20056 - 43999	3.3	0.86	-0.06
4182.46	Ru I	17046 - 40949	2.8	0.73	-0.14
4182.64	Ru I	7483 - 31385	0.11	0.030	-1.53
4189.46	Ru I	7483 - 31346	0.056	0.015	-1.83
4196.87	Ru I	13982 - 37802	1.6	0.43	-0.37
4197.58	Ru I	8575 - 32392	1.3	0.33	-0.48
4198.88	Ru I	8044 - 31853	1.1	0.28	-0.55
4199.90	Ru I	6545 - 30348	9.9	2.6	0.42
4206.02	Ru I	8084 - 31853	3.0	0.80	-0.10
4207.64	Ru I	14828 - 38587	2.5	0.65	-0.19
4212.06	Ru I	6545 - 30280	6.9	1.8	0.27
4214.44	Ru I	13646 - 37367	7.2	1.9	0.28
4217.27	Ru I	6545 - 30250	1.2	0.31	-0.51
4220.68	Ru I	13982 - 37668	3.8	1.0	0.01
4225.09	Ru I	20242 - 43903	6.5	1.7	0.24
4226.66	Ru I	15054 - 38706	1.0	0.28	-0.55
4229.31	Ru I	13982 - 37620	1.9	0.50	-0.30
4230.31	Ru I	8575 - 32208	1.2	0.32	-0.49
4232.32	Ru I	8771 - 32392	0.35	0.095	-1.02
4236.67	Ru I	14700 - 38297	1.3	0.36	-0.44
4241.05	Ru I	8771 - 32343	1.7	0.47	-0.33
4243.06	Ru I	7483 - 31044	1.2	0.33	-0.48
4244.83	Ru I	9620 - 33172	0.32	0.085	-1.07
4246.33	Ru I	14700 - 38243	2.2	0.61	-0.22
4246.73	Ru I	20056 - 43597	20.	5.5	0.74
4248.14	Ru I	15054 - 38587	0.51	0.14	-0.86
4258.99	Ru I	13646 - 37119	2.7	0.74	-0.13
4260.00	Ru I	10624 - 34091	0.29	0.078	-1.11
4263.40	Ru I	10624 - 34072	0.12	0.033	-1.48
4265.61	Ru I	10655 - 34091	0.29	0.079	-1.10
4277.26	Ru I	14827 - 38200	0.39	0.11	-0.97
4278.69	Ru I	13982 - 37347	0.36	0.099	-1.00
4281.93	Ru I	15550 - 38898	0.64	0.18	-0.75
4282.22	Ru I	6545 - 29891	0.088	0.024	-1.61

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4284.33	Ru I	9058 - 32392	1.8	0.49	-0.31
4287.05	Ru I	13646 - 36965	1.6	0.44	-0.36
4293.28	Ru I	9058 - 32343	0.51	0.14	-0.85
4294.79	Ru I	8575 - 31853	0.53	0.15	-0.83
4295.93	Ru I	9121 - 32392	1.3	0.36	-0.45
4297.71	Ru I	8084 - 31346	6.5	1.8	0.26
4307.60	Ru I	9183 - 32392	2.2	0.61	-0.22
4309.21	Ru I	26036 - 49235	9.2	2.6	0.41
4314.30	Ru I	25214 - 48386	22.	6.2	0.79
4316.64	Ru I	9184 - 32343	0.18	0.050	-1.30
4318.43	Ru I	9058 - 32208	0.83	0.23	-0.63
4319.87	Ru I	8044 - 31186	0.92	0.26	-0.59
4320.58	Ru I	17097 - 40235	0.83	0.23	-0.64
4321.30	Ru I	9073 - 32208	0.074	0.021	-1.69
4322.96	Ru I	25201 - 48327	6.6	1.8	0.26
4325.05	Ru I	13646 - 36760	1.4	0.40	-0.40
4326.82	Ru I	10624 - 33729	0.60	0.17	-0.77
4327.43	Ru I	8084 - 31186	0.18	0.052	-1.29
4331.16	Ru I	8771 - 31853	0.20	0.056	-1.25
4332.50	Ru I	23453 - 46528	5.0	1.4	0.15
4336.42	Ru I	7483 - 30537	0.11	0.030	-1.52
4337.27	Ru I	6545 - 29595	0.19	0.053	-1.27
4338.68	Ru I	20934 - 43976	2.0	0.58	-0.24
4340.34	Ru I	16240 - 39273	0.72	0.20	-0.69
4341.04	Ru I	16713 - 39742	0.72	0.20	-0.69
4342.07	Ru I	9184 - 32208	1.2	0.35	-0.46
4346.48	Ru I	8044 - 31044	0.18	0.050	-1.30
4349.70	Ru I	13982 - 36965	3.0	0.86	-0.07
4354.13	Ru I	8084 - 31044	1.2	0.33	-0.48
4354.80	Ru I	10624 - 33580	0.47	0.13	-0.87
4361.21	Ru I	6545 - 29468	0.91	0.26	-0.58
4370.42	Ru I	8084 - 30959	0.052	0.015	-1.82
4371.20	Ru I	17046 - 39917	1.3	0.38	-0.43
4372.21	Ru I	7483 - 30348	3.2	0.93	-0.03
4381.27	Ru I	16191 - 39009	0.51	0.15	-0.84
4383.36	Ru I	10624 - 33431	0.32	0.091	-1.04
4385.39	Ru I	7483 - 30280	1.2	0.33	-0.48
4385.65	Ru I	9058 - 31853	2.7	0.78	-0.11
4386.27	Ru I	14827 - 37620	1.0	0.30	-0.53
4388.99	Ru I	22419 - 45197	2.4	0.70	-0.15
4390.44	Ru I	8575 - 31346	3.1	0.90	-0.04
4391.03	Ru I	7483 - 30250	0.11	0.033	-1.48
4394.96	Ru I	15550 - 38297	0.42	0.12	-0.92
4397.80	Ru I	9121 - 31853	0.36	0.10	-0.98
4399.59	Ru I	9620 - 32343	0.091	0.026	-1.58
4404.82	Ru I	17046 - 39742	0.63	0.18	-0.74
4410.03	Ru I	9184 - 31853	3.4	0.99	-0.00
4420.84	Ru I	8771 - 31385	0.12	0.035	-1.46
4421.46	Ru I	8575 - 31186	0.28	0.083	-1.08
4424.78	Ru I	11786 - 34380	0.16	0.048	-1.32

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4428.46	Ru I	8771 - 31346	0.59	0.17	-0.76
4439.76	Ru I	10655 - 33172	1.4	0.41	-0.39
4444.51	Ru I	8044 - 30537	0.13	0.037	-1.43
4449.34	Ru I	8575 - 31044	0.73	0.22	-0.67
4460.04	Ru I	8771 - 31186	1.9	0.57	-0.25
4467.26	Ru I	20242 - 42621	0.96	0.29	-0.54
4473.93	Ru I	6545 - 28891	0.17	0.051	-1.29
4479.41	Ru I	13646 - 35964	0.18	0.055	-1.26
4480.45	Ru I	15054 - 37367	1.5	0.46	-0.34
4482.03	Ru I	11786 - 34091	0.13	0.039	-1.41
4488.39	Ru I	8771 - 31044	0.15	0.044	-1.35
4490.24	Ru I	8084 - 30348	0.075	0.023	-1.64
4491.68	Ru I	13982 - 36239	0.32	0.096	-1.02
4498.14	Ru I	9121 - 31346	0.64	0.19	-0.71
4510.10	Ru I	8084 - 30250	0.16	0.049	-1.31
4511.20	Ru I	13646 - 35807	0.56	0.17	-0.76
4516.89	Ru I	11447 - 33580	0.75	0.23	-0.64
4517.82	Ru I	9058 - 31186	0.38	0.12	-0.93
4520.95	Ru I	9073 - 31186	0.19	0.059	-1.23
4530.85	Ru I	15054 - 37119	0.62	0.19	-0.72
4543.69	Ru I	9184 - 31186	0.048	0.015	-1.83
4547.33	Ru I	7483 - 29468	0.19	0.059	-1.23
4547.85	Ru I	13982 - 35964	0.74	0.23	-0.64
4549.43	Ru I	8044 - 30018	0.035	0.011	-1.97
4549.96	Ru I	23393 - 45365	4.2	1.3	0.12
4552.11	Ru I	8575 - 30537	0.064	0.020	-1.70
4554.51	Ru I	6545 - 28495	4.5	1.4	0.15
4559.98	Ru I	9121 - 31044	0.19	0.058	-1.24
4562.60	Ru I	15054 - 36965	0.20	0.062	-1.21
4564.69	Ru I	9058 - 30959	0.064	0.020	-1.70
4580.07	Ru I	11753 - 33580	0.23	0.072	-1.14
4584.44	Ru I	8084 - 29891	2.2	0.68	-0.17
4587.10	Ru I	11786 - 33580	0.15	0.048	-1.32
4591.10	Ru I	9184 - 30959	0.18	0.058	-1.24
4592.52	Ru I	10624 - 32392	0.38	0.12	-0.92
4596.71	Ru I	23453 - 45022	5.8	1.8	0.27
4599.08	Ru I	10655 - 32392	0.82	0.26	-0.58
4601.76	Ru I	11447 - 33172	0.17	0.054	-1.26
4605.66	Ru I	15054 - 36760	0.33	0.11	-0.98
4612.32	Ru I	8575 - 30250	0.030	0.0096	-2.02
4635.69	Ru I	9620 - 31186	0.28	0.089	-1.05
4645.09	Ru I	20056 - 41578	6.3	2.0	0.31
4647.61	Ru I	8084 - 29595	0.76	0.25	-0.61
4654.32	Ru I	9058 - 30537	0.40	0.13	-0.89
4669.14	Ru I	14827 - 36239	0.17	0.054	-1.27
4669.98	Ru I	7483 - 28891	0.062	0.020	-1.69
4674.65	Ru I	11786 - 33172	0.28	0.091	-1.04
4681.79	Ru I	9184 - 30537	0.40	0.13	-0.88
4684.02	Ru I	8084 - 29427	0.19	0.064	-1.20
4690.11	Ru I	8575 - 29891	0.33	0.11	-0.96

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4709.48	Ru I	9121 - 30348	1.9	0.63	-0.20
4720.92	Ru I	16191 - 37367	0.29	0.096	-1.02
4731.33	Ru I	9121 - 30250	0.19	0.062	-1.21
4733.52	Ru I	8771 - 29891	0.14	0.047	-1.33
4743.02	Ru I	22519 - 43597	2.0	0.68	-0.17
4756.23	Ru I	8575 - 29595	0.077	0.026	-1.58
4757.84	Ru I	7483 - 28495	0.40	0.13	-0.87
4764.40	Ru I	27507 - 48490	4.5	1.5	0.18
4769.30	Ru I	6545 - 27507	0.057	0.020	-1.71
4773.15	Ru I	11447 - 32392	0.051	0.018	-1.76
4774.00	Ru I	20242 - 41183	1.0	0.35	-0.46
4784.27	Ru I	11447 - 32343	0.11	0.039	-1.41
4794.38	Ru I	8575 - 29427	0.037	0.013	-1.89
4795.57	Ru I	8044 - 28891	0.032	0.011	-1.96
4798.44	Ru I	9058 - 29892	0.057	0.020	-1.71
4804.88	Ru I	8084 - 28891	0.053	0.019	-1.73
4815.52	Ru I	11447 - 32208	0.60	0.21	-0.68
4817.34	Ru I	15054 - 35807	0.12	0.042	-1.38
4839.01	Ru I	26313 - 46972	7.1	2.5	0.40
4839.77	Ru I	8771 - 29427	0.020	0.0070	-2.15
4844.56	Ru I	9058 - 29694	0.14	0.048	-1.32
4854.56	Ru I	26313 - 46906	3.5	1.2	0.10
4861.87	Ru I	10624 - 31186	0.14	0.051	-1.29
4869.15	Ru I	7483 - 28015	0.39	0.14	-0.86
4895.32	Ru I	8044 - 28466	0.058	0.021	-1.68
4895.60	Ru I	10624 - 31044	0.24	0.086	-1.06
4899.25	Ru I	11447 - 31853	0.15	0.054	-1.27
4903.05	Ru I	10655 - 31044	0.72	0.26	-0.59
4905.02	Ru I	8084 - 28466	0.029	0.010	-1.98
4907.89	Ru I	9058 - 29427	0.11	0.041	-1.38
4921.07	Ru I	8575 - 28891	0.22	0.080	-1.10
4938.43	Ru I	9184 - 29427	0.18	0.065	-1.18
4955.26	Ru I	26816 - 46991	13.	4.7	0.68
4959.86	Ru I	26816 - 46972	6.4	2.4	0.37
4968.90	Ru I	8771 - 28891	0.13	0.049	-1.31
4974.12	Ru I	22162 - 42261	1.2	0.45	-0.35
4976.20	Ru I	26816 - 46906	13.	4.7	0.67
4980.35	Ru I	9620 - 29694	0.17	0.062	-1.21
4983.45	Ru I	9058 - 29119	0.047	0.018	-1.75
4987.26	Ru I	9073 - 29119	0.047	0.018	-1.75
4992.74	Ru I	7483 - 27507	0.068	0.025	-1.60
5011.23	Ru I	9620 - 29570	0.16	0.061	-1.21
5014.95	Ru I	9184 - 29119	0.083	0.031	-1.50
5026.18	Ru I	8575 - 28466	0.069	0.026	-1.58
5028.16	Ru I	10655 - 30537	0.089	0.034	-1.47
5040.35	Ru I	20934 - 40768	0.80	0.30	-0.52
5040.74	Ru I	9058 - 28891	0.028	0.011	-1.97
5047.31	Ru I	9620 - 29427	0.065	0.025	-1.60
5057.33	Ru I	6545 - 26313	0.18	0.071	-1.15
5062.64	Ru I	13982 - 33729	0.071	0.027	-1.57

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5072.97	Ru I	9184 - 28891	0.079	0.030	-1.52
5076.32	Ru I	10655 - 30348	0.15	0.059	-1.23
5093.83	Ru I	9492 - 29119	0.18	0.071	-1.15
5107.07	Ru I	12817 - 32392	0.18	0.072	-1.15
5123.73	Ru I	11447 - 30959	0.037	0.014	-1.84
5127.26	Ru I	9620 - 29119	0.049	0.019	-1.72
5133.89	Ru I	13699 - 33172	0.19	0.076	-1.12
5136.55	Ru I	8044 - 27507	0.31	0.12	-0.91
5142.76	Ru I	8575 - 28015	0.12	0.046	-1.34
5147.24	Ru I	8084 - 27507	0.15	0.059	-1.23
5151.07	Ru I	9058 - 28466	0.081	0.032	-1.49
5153.20	Ru I	11786 - 31186	0.088	0.035	-1.46
5155.14	Ru I	9073 - 28466	0.39	0.15	-0.81
5160.00	Ru I	9121 - 28495	0.041	0.016	-1.79
5171.03	Ru I	7483 - 26816	0.45	0.18	-0.75
5195.02	Ru I	8771 - 28015	0.13	0.051	-1.29
5199.87	Ru I	29160 - 48386	16.	6.5	0.81
5202.12	Ru I	20056 - 39273	0.76	0.31	-0.51
5213.43	Ru I	28495 - 47671	8.0	3.2	0.51
5223.55	Ru I	12207 - 31346	0.12	0.048	-1.32
5242.38	Ru I	10624 - 29694	0.044	0.018	-1.74
5251.67	Ru I	12817 - 31853	0.11	0.045	-1.35
5257.07	Ru I	30537 - 49554	10.	4.2	0.63
5266.47	Ru I	20934 - 39917	0.79	0.33	-0.48
5266.83	Ru I	20056 - 39037	0.62	0.26	-0.59
5280.82	Ru I	8575 - 27507	0.024	0.0100	-2.00
5284.08	Ru I	6545 - 25465	0.045	0.019	-1.73
5291.16	Ru I	9121 - 28015	0.028	0.012	-1.94
5304.86	Ru I	9620 - 28466	0.063	0.027	-1.58
5309.27	Ru I	7483 - 26313	0.11	0.048	-1.32
5315.33	Ru I	20934 - 39742	0.25	0.11	-0.97
5332.93	Ru I	13646 - 32392	0.096	0.041	-1.39
5335.93	Ru I	8771 - 27507	0.064	0.027	-1.56
5377.84	Ru I	28495 - 47085	10.	4.4	0.65
5385.88	Ru I	13646 - 32208	0.15	0.066	-1.18
5401.39	Ru I	13699 - 32208	0.092	0.040	-1.40
5418.86	Ru I	9058 - 27507	0.024	0.011	-1.97
5427.59	Ru I	28572 - 46991	8.1	3.6	0.55
5452.71	Ru I	28572 - 46906	2.0	0.88	-0.05
5454.82	Ru I	31186 - 49513	21.	9.4	0.97
5456.13	Ru I	9184 - 27507	0.057	0.026	-1.59
5475.18	Ru I	31346 - 49605	3.6	1.6	0.21
5479.40	Ru I	31346 - 49591	14.	6.4	0.81
5480.30	Ru I	30280 - 48522	5.8	2.6	0.42
5484.32	Ru I	8084 - 26313	0.035	0.016	-1.80
5484.64	Ru I	12817 - 31044	0.031	0.014	-1.85
5496.69	Ru I	20056 - 38243	0.34	0.16	-0.81
5501.02	Ru I	30348 - 48522	2.9	1.3	0.12
5510.71	Ru I	12207 - 30348	0.18	0.084	-1.07
5512.37	Ru I	30250 - 48386	4.2	1.9	0.29

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5517.86	Ru I	15054 - 33172	0.025	0.011	-1.95
5521.78	Ru I	31186 - 49291	3.1	1.4	0.15
5530.99	Ru I	20934 - 39009	0.19	0.088	-1.05
5540.66	Ru I	12207 - 30250	0.033	0.015	-1.82
5556.52	Ru I	8044 - 26036	0.0050	0.0023	-2.64
5559.75	Ru I	7483 - 25465	0.033	0.015	-1.82
5569.03	Ru I	8084 - 26036	0.0044	0.0021	-2.69
5603.14	Ru I	10624 - 28466	0.018	0.0083	-2.08
5606.73	Ru I	29160 - 46991	2.1	0.98	-0.01
5629.79	Ru I	22519 - 40277	0.25	0.12	-0.93
5636.24	Ru I	8575 - 26313	0.13	0.064	-1.20
5641.66	Ru I	12817 - 30537	0.016	0.0076	-2.12
5649.56	Ru I	9121 - 26816	0.0035	0.0017	-2.78
5653.30	Ru I	12207 - 29891	0.0083	0.0040	-2.40
5665.20	Ru I	13699 - 31346	0.020	0.0097	-2.01
5679.63	Ru I	22293 - 39894	0.34	0.16	-0.79
5699.05	Ru I	8771 - 26313	0.086	0.042	-1.38
5724.82	Ru I	12817 - 30280	0.019	0.0093	-2.03
5725.73	Ru I	8575 - 26036	0.0057	0.0028	-2.55
5745.99	Ru I	13646 - 31044	0.028	0.014	-1.86
5747.47	Ru I	21643 - 39037	0.27	0.13	-0.88
5752.02	Ru I	8084 - 25465	0.0039	0.0019	-2.71
5756.83	Ru I	11753 - 29119	0.011	0.0054	-2.27
5767.92	Ru I	11786 - 29119	0.011	0.0055	-2.26
5804.39	Ru I	23393 - 40616	0.42	0.21	-0.67
5814.98	Ru I	9121 - 26313	0.031	0.016	-1.80
5828.06	Ru I	15054 - 32208	0.020	0.010	-2.00
5833.21	Ru I	30348 - 47487	2.9	1.5	0.17
5919.34	Ru I	8575 - 25465	0.020	0.011	-1.98
5921.45	Ru I	10624 - 27507	0.053	0.028	-1.55
5926.87	Ru I	16713 - 33580	0.079	0.042	-1.38
5932.38	Ru I	9184 - 26036	0.012	0.0062	-2.21
5936.65	Ru I	30348 - 47188	1.4	0.73	-0.13
5951.15	Ru I	15054 - 31853	0.018	0.0097	-2.01
5973.38	Ru I	30348 - 47085	3.6	1.9	0.29
5974.17	Ru I	20934 - 37668	0.095	0.051	-1.29
5988.67	Ru I	8771 - 25465	0.0061	0.0033	-2.49
5993.65	Ru I	11786 - 28466	0.030	0.016	-1.80
6116.77	Ru I	9121 - 25465	0.0072	0.0041	-2.39
6199.42	Ru I	17046 - 33172	0.092	0.053	-1.27
6225.20	Ru I	11447 - 27507	0.019	0.011	-1.96
6284.49	Ru I	22293 - 38200	0.14	0.080	-1.10
6295.22	Ru I	23393 - 39273	0.37	0.22	-0.66
6330.62	Ru I	25465 - 41256	0.46	0.28	-0.56
6336.12	Ru I	22519 - 38297	0.14	0.084	-1.07
6363.41	Ru I	28466 - 44176	0.74	0.45	-0.35
6376.45	Ru I	12817 - 28495	0.0089	0.0054	-2.27
6390.23	Ru I	23393 - 39037	0.30	0.18	-0.74
6417.57	Ru I	34773 - 50351	2.9	1.8	0.25
6444.84	Ru I	27507 - 43019	1.5	0.96	-0.02

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6496.44	Ru I	27507 - 42895	0.45	0.29	-0.54
6560.45	Ru I	23005 - 38243	0.061	0.040	-1.40
6593.74	Ru I	17046 - 32208	0.011	0.0073	-2.14
6618.20	Ru I	16240 - 31346	0.021	0.014	-1.87
6663.14	Ru I	28015 - 43019	1.6	1.1	0.03
6690.00	Ru I	26313 - 41256	2.4	1.6	0.21
6707.52	Ru I	23393 - 38297	0.21	0.14	-0.84
6718.30	Ru I	28015 - 42895	1.1	0.74	-0.13
6730.45	Ru I	16191 -- 31044	0.038	0.026	-1.58
6756.54	Ru I	32392 - 47188	1.8	1.3	0.10
6766.95	Ru I	29119 - 43892	2.1	1.4	0.15
6775.02	Ru I	17097 - 31853	0.10	0.072	-1.14
6787.23	Ru I	15550 - 30280	0.027	0.019	-1.73
6813.51	Ru I	22293 - 36965	0.12	0.082	-1.08
6823.88	Ru I	29694 - 44344	1.7	1.2	0.06
6824.17	Ru I	28466 - 43116	1.7	1.2	0.07
6831.52	Ru I	25643 - 40277	0.26	0.18	-0.73
6911.48	Ru I	29427 - 43892	3.2	2.3	0.36
6923.23	Ru I	26816 - 41256	6.0	4.3	0.64
6982.01	Ru I	27507 - 41825	1.8	1.3	0.12
7027.98	Ru I	28891 - 43116	2.6	1.9	0.28
7086.06	Ru I	16240 -- 30348	0.024	0.018	-1.75
7087.35	Ru I	12207 - 26313	0.011	0.0080	-2.10
7141.72	Ru I	17046 - 31044	0.012	0.0089	-2.05
7219.26	Ru I	25603 - 39451	0.22	0.17	-0.76
7238.92	Ru I	28015 - 41825	2.5	1.9	0.29
7323.56	Ru I	16240 - 29891	0.019	0.016	-1.81
7393.93	Ru I	29595 - 43116	1.6	1.3	0.13
7468.91	Ru I	30959 - 44344	2.6	2.2	0.34
7485.79	Ru I	30537 - 43892	3.4	2.9	0.46
7499.75	Ru I	28495 - 41825	5.1	4.3	0.64
7532.07	Ru I	24927 - 38200	0.19	0.16	-0.80
7559.61	Ru I	29891 - 43116	2.8	2.4	0.38
7612.94	Ru I	31044 - 44176	0.76	0.66	-0.18
7621.50	Ru I	31853 - 44970	3.2	2.8	0.44
7722.87	Ru I	15550 - 28495	0.031	0.027	-1.56
7729.91	Ru I	30959 - 43892	0.71	0.64	-0.20
7791.86	Ru I	31346 - 44176	3.2	2.9	0.47
7806.82	Ru I	37367 - 50173	2.8	2.6	0.41
7813.43	Ru I	20934 - 33729	0.020	0.019	-1.73
7829.81	Ru I	30250 - 43019	0.47	0.43	-0.37
7833.39	Ru I	32208 - 44970	0.98	0.90	-0.05
7841.90	Ru I	36543 - 49291	3.4	3.1	0.49
7847.80	Ru I	30280 - 43019	3.3	3.0	0.48
7881.49	Ru I	28572 - 41256	5.2	4.8	0.68
7890.37	Ru I	30348 - 43019	1.7	1.6	0.20
7924.43	Ru I	30280 - 42896	1.6	1.6	0.19
7948.15	Ru I	32392 - 44970	0.99	0.94	-0.03
7967.84	Ru I	30348 - 42895	0.92	0.88	-0.06
8112.47	Ru I	31853 - 44176	1.3	1.3	0.12

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
8264.96	Ru I	29161 - 41256	1.2	1.2	0.09
8348.98	Ru I	31044 - 43019	1.2	1.3	0.10
8352.94	Ru I	32208 - 44176	0.97	1.0	0.01
8435.77	Ru I	31044 - 42895	0.39	0.42	-0.38
8473.64	Ru I	33172 - 44970	2.1	2.3	0.36
8483.56	Ru I	32392 - 44176	1.7	1.8	0.26
8710.84	Ru I	30348 - 41825	1.9	2.1	0.33
8724.98	Ru I	20934 - 32392	0.083	0.095	-1.02
8777.36	Ru I	33580 - 44970	1.8	2.1	0.32

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2334.96	Ru II	10151 - 52964	27.	2.2	0.34
2342.85	Ru II	10151 - 52820	46.	3.8	0.58
2357.91	Ru II	9152 - 51549	38.	3.2	0.51
2375.63	Ru II	11604 - 53685	30.	2.5	0.40
2396.71	Ru II	9152 - 50863	30.	2.6	0.41
2402.72	Ru II	9152 - 50758	247.	21.	1.33
2407.92	Ru II	11304 - 52820	67.	5.8	0.77
2414.82	Ru II	10151 - 51549	23.	2.0	0.29
2455.53	Ru II	10151 - 50863	103.	9.3	0.97
2456.44	Ru II	10852 - 51549	92.	8.3	0.92
2456.57	Ru II	10151 - 50845	205.	19.	1.27
2478.93	Ru II	10852 - 51179	164.	15.	1.18
2481.11	Ru II	29019 - 69311	54.	5.0	0.70
2493.69	Ru II	26109 - 66199	119.	11.	1.04
2494.48	Ru II	11304 - 51380	28.	2.6	0.42
2495.69	Ru II	27545 - 67602	158.	15.	1.17
2498.42	Ru II	11304 - 51317	84.	7.9	0.90
2498.57	Ru II	10852 - 50863	78.	7.3	0.87
2507.01	Ru II	11304 - 51179	154.	15.	1.16
2513.32	Ru II	11604 - 51380	68.	6.5	0.81
2517.32	Ru II	11604 - 51317	68.	6.5	0.81
2535.59	Ru II	26911 - 66338	277.	27.	1.43
2543.25	Ru II	25952 - 65260	118.	11.	1.06
2656.25	Ru II	25952 - 63588	50.	5.3	0.72
2661.17	Ru II	25952 - 63518	41.	4.4	0.64
2661.61	Ru II	9152 - 46711	85.	9.0	0.95
2667.40	Ru II	26109 - 63588	58.	6.2	0.79
2678.76	Ru II	9152 - 46471	167.	18.	1.25
2687.50	Ru II	26109 - 63308	50.	5.4	0.73
2692.06	Ru II	10151 - 47285	99.	11.	1.03
2712.41	Ru II	10852 - 47708	67.	7.4	0.87
2725.47	Ru II	11304 - 47984	49.	5.5	0.74
2734.35	Ru II	10151 - 46711	82.	9.2	0.96
2747.97	Ru II	11604 - 47984	13.	1.5	0.17
2752.45	Ru II	10151 - 46471	18.	2.1	0.32
2752.77	Ru II	19379 - 55695	85.	9.6	0.98
2765.44	Ru II	20515 - 56665	46.	5.3	0.73
2768.93	Ru II	11604 - 47708	31.	3.6	0.56
2778.38	Ru II	11304 - 47285	31.	3.6	0.56
2787.83	Ru II	10852 - 46711	30.	3.5	0.54
2806.74	Ru II	21646 - 57263	49.	5.8	0.77
2841.68	Ru II	20515 - 55695	44.	5.3	0.72
2882.12	Ru II	19379 - 54065	56.	7.0	0.85
2927.54	Ru II	20515 - 54663	41.	5.2	0.72
2945.67	Ru II	19379 - 53317	175.	23.	1.36
2963.40	Ru II	21246 - 54981	21.	2.8	0.45
2965.55	Ru II	20515 - 54225	177.	23.	1.37
2976.59	Ru II	19379 - 52964	127.	17.	1.23
2977.23	Ru II	21646 - 55224	55.	7.3	0.86
2979.96	Ru II	21246 - 54794	84.	11.	1.05

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2991.62	Ru II	21246 - 54663	42.	5.6	0.75
3177.05	Ru II	19379 - 50845	40.	6.0	0.78

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2029.49	Sb I	16396 - 65653	1.5	0.090	-1.05
2039.77	Sb I	9854 - 58863	2.2	0.13	-0.87
2049.57	Sb I	8512 - 57287	5.4	0.34	-0.47
2068.33	Sb I	0 - 48332	6.3	0.41	-0.39
2098.41	Sb I	8512 - 56152	3.6	0.24	-0.62
2118.48	Sb I	18464 - 65653	1.5	0.10	-0.99
2127.39	Sb I	0 - 46991	0.43	0.029	-1.53
2139.69	Sb I	8512 - 55233	3.4	0.23	-0.63
2144.86	Sb I	8512 - 55121	3.4	0.23	-0.64
2175.81	Sb I	0 - 45945	2.5	0.18	-0.75
2179.19	Sb I	9854 - 55728	2.5	0.18	-0.74
2201.32	Sb I	16396 - 61809	1.4	0.100	-1.00
2208.45	Sb I	9854 - 55121	2.4	0.18	-0.75
2220.73	Sb I	8512 - 53528	1.5	0.11	-0.97
2224.93	Sb I	8512 - 53443	0.72	0.054	-1.27
2262.51	Sb I	16396 - 60581	3.7	0.29	-0.54
2288.98	Sb I	9854 - 53528	0.60	0.047	-1.33
2293.44	Sb I	9854 - 53443	2.1	0.16	-0.78
2306.46	Sb I	16396 - 59738	2.1	0.16	-0.78
2311.47	Sb I	0 - 43249	1.5	0.12	-0.93
2360.50	Sb I	16396 - 58747	0.99	0.083	-1.08
2373.67	Sb I	18464 - 60581	2.2	0.19	-0.73
2383.64	Sb I	18464 - 60404	2.2	0.19	-0.72
2422.13	Sb I	18464 - 59738	2.2	0.19	-0.72
2426.35	Sb I	16396 - 57597	2.8	0.25	-0.60
2445.51	Sb I	8512 - 49391	3.0	0.27	-0.56
2474.57	Sb I	18464 - 58863	0.94	0.087	-1.06
2478.32	Sb I	16396 - 56733	8.1	0.74	-0.13
2480.44	Sb I	16396 - 56699	1.6	0.14	-0.84
2510.54	Sb I	8512 - 48332	0.42	0.040	-1.40
2528.52	Sb I	9854 - 49391	56.	5.4	0.73
2554.64	Sb I	18464 - 57597	0.59	0.058	-1.23
2574.06	Sb I	16396 - 55233	3.3	0.32	-0.49
2598.05	Sb I	8512 - 46991	64.	6.4	0.81
2612.31	Sb I	18464 - 56733	16.	1.6	0.22
2652.60	Sb I	18464 - 56152	15.	1.5	0.19
2670.64	Sb I	8512 - 45945	3.0	0.33	-0.49
2682.76	Sb I	18464 - 55728	6.2	0.67	-0.17
2692.25	Sb I	16396 - 53528	1.8	0.19	-0.72
2718.90	Sb I	18464 - 55233	7.3	0.81	-0.09
2727.23	Sb I	18464 - 55121	2.1	0.24	-0.62
2769.95	Sb I	9854 - 45945	7.5	0.86	-0.06
2851.11	Sb I	18464 - 53528	2.6	0.32	-0.50
2877.92	Sb I	8512 - 43249	5.7	0.70	-0.15
3029.83	Sb I	16396 - 49391	10.	1.4	0.16
3232.52	Sb I	18464 - 49391	22.	3.5	0.54
3267.51	Sb I	16396 - 46991	11.	1.8	0.26
3383.15	Sb I	16396 - 45945	1.0	0.17	-0.76
3637.83	Sb I	18464 - 45945	1.1	0.22	-0.66
3722.79	Sb I	16396 - 43249	0.26	0.054	-1.27

Wavelength A	Spectrum	Energy Levels K	$\frac{gA}{10^8/\text{sec}}$	gf	Log gf
4033.55	Sb I	18464 - 43249	0.23	0.055	-1.26

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2692.78	Sc I	0 - 37126	1.2	0.13	-0.89
2706.77	Sc I	0 - 36934	3.4	0.37	-0.43
2707.95	Sc I	168 - 37086	2.0	0.22	-0.66
2711.35	Sc I	168 - 37040	5.6	0.62	-0.21
2965.86	Sc I	0 - 33707	1.4	0.18	-0.73
2974.01	Sc I	0 - 33615	4.9	0.65	-0.19
2980.75	Sc I	168 - 33707	6.0	0.80	-0.10
2988.95	Sc I	168 - 33615	1.4	0.18	-0.74
3015.36	Sc I	0 - 33154	7.8	1.1	0.03
3019.34	Sc I	168 - 33279	9.9	1.4	0.13
3030.76	Sc I	168 - 33154	1.3	0.18	-0.74
3255.69	Sc I	0 - 30707	3.3	0.52	-0.28
3269.91	Sc I	0 - 30573	9.1	1.5	0.16
3273.63	Sc I	168 - 30707	12.	1.9	0.28
3416.68	Sc I	15757 - 45016	11.	2.0	0.29
3418.51	Sc I	15882 - 45126	17.	3.0	0.48
3419.36	Sc I	15673 - 44910	8.1	1.4	0.15
3429.21	Sc I	15757 - 44910	25.	4.3	0.64
3429.48	Sc I	15673 - 44823	24.	4.2	0.63
3431.36	Sc I	15882 - 45016	34.	5.9	0.77
3435.56	Sc I	16027 - 45126	70.	12.	1.09
3439.41	Sc I	15757 - 44823	11.	1.9	0.28
3448.49	Sc I	16027 - 45016	8.5	1.5	0.18
3457.45	Sc I	16211 - 45126	35.	6.3	0.80
3462.19	Sc I	16141 - 45016	23.	4.1	0.61
3469.65	Sc I	16010 - 44823	16.	2.9	0.46
3471.13	Sc I	16022 - 44823	13.	2.4	0.39
3498.91	Sc I	16027 - 44599	23.	4.2	0.62
3907.49	Sc I	0 - 25585	12.	2.7	0.44
3911.81	Sc I	168 - 25725	15.	3.3	0.52
3933.38	Sc I	168 - 25585	2.7	0.62	-0.21
3996.61	Sc I	0 - 25014	2.9	0.69	-0.16
4020.40	Sc I	0 - 24866	10.	2.4	0.39
4023.69	Sc I	168 - 25014	10.	2.5	0.41
4030.67	Sc I	16023 - 40826	10.	2.5	0.39
4031.39	Sc I	15757 - 40555	6.1	1.5	0.17
4034.23	Sc I	16022 - 40803	4.5	1.1	0.04
4043.80	Sc I	15882 - 40604	9.5	2.3	0.37
4046.48	Sc I	16097 - 40803	9.1	2.2	0.35
4047.79	Sc I	168 - 24866	1.4	0.33	-0.48
4049.95	Sc I	16141 - 40826	5.6	1.4	0.14
4054.55	Sc I	0 - 24657	2.7	0.66	-0.18
4056.59	Sc I	16027 - 40671	9.7	2.4	0.38
4074.97	Sc I	16022 - 40555	6.6	1.7	0.22
4078.57	Sc I	16010 - 40521	6.6	1.6	0.21
4082.40	Sc I	168 - 24657	2.9	0.74	-0.13
4086.67	Sc I	16141 - 40604	8.7	2.2	0.34
4087.16	Sc I	16211 - 40671	18.	4.4	0.65
4093.13	Sc I	16097 - 40521	1.6	0.41	-0.38
4094.85	Sc I	16141 - 40555	2.9	0.72	-0.14

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4098.35	Sc I	16211 - 40604	2.4	0.61	-0.22
4100.33	Sc I	15042 - 39424	2.1	0.52	-0.28
4133.00	Sc I	15673 - 39861	16.	4.0	0.61
4140.30	Sc I	15757 - 39903	19.	4.9	0.69
4147.40	Sc I	15757 - 39861	2.4	0.61	-0.21
4152.36	Sc I	15882 - 39958	27.	6.9	0.84
4161.88	Sc I	15882 - 39903	3.2	0.84	-0.08
4165.19	Sc I	16027 - 40028	42.	11.	1.04
4171.56	Sc I	15757 - 39722	2.3	0.60	-0.22
4187.62	Sc I	15882 - 39755	2.3	0.61	-0.21
4205.20	Sc I	16027 - 39800	2.8	0.73	-0.13
4212.34	Sc I	16022 - 39755	2.3	0.62	-0.21
4212.49	Sc I	16023 - 39755	1.6	0.42	-0.38
4216.10	Sc I	16010 - 39722	2.7	0.72	-0.14
4218.26	Sc I	16022 - 39722	3.9	1.0	0.01
4219.73	Sc I	16010 - 39701	3.9	1.0	0.01
4221.88	Sc I	16022 - 39701	1.3	0.36	-0.44
4225.59	Sc I	16141 - 39800	3.2	0.85	-0.07
4233.61	Sc I	16141 - 39755	7.1	1.9	0.28
4238.05	Sc I	16211 - 39800	14.	3.9	0.59
4239.57	Sc I	16141 - 39722	3.1	0.84	-0.08
4246.12	Sc I	16211 - 39755	3.5	0.96	-0.02
4348.53	Sc I	15882 - 38872	0.79	0.22	-0.65
4358.64	Sc I	16023 - 38959	3.2	0.92	-0.04
4389.60	Sc I	16097 - 38872	1.3	0.37	-0.44
4542.55	Sc I	14926 - 36934	1.1	0.35	-0.45
4544.68	Sc I	15042 - 37040	1.6	0.49	-0.31
4557.24	Sc I	21400 - 43337	13.	4.0	0.60
4573.99	Sc I	21480 - 43337	16.	5.1	0.71
4592.94	Sc I	21400 - 43167	6.7	2.1	0.33
4598.45	Sc I	21480 - 43221	6.8	2.2	0.33
4609.95	Sc I	21480 - 43167	4.5	1.4	0.15
4706.97	Sc I	18516 - 39755	5.2	1.7	0.24
4709.34	Sc I	18571 - 39800	5.3	1.8	0.25
4728.77	Sc I	11610 - 32752	1.2	0.41	-0.39
4729.23	Sc I	11558 - 32697	3.0	1.0	0.00
4732.30	Sc I	16023 - 37148	0.84	0.28	-0.55
4734.10	Sc I	11520 - 32637	3.5	1.2	0.08
4737.65	Sc I	11558 - 32659	4.2	1.4	0.15
4741.02	Sc I	11610 - 32697	4.8	1.6	0.21
4743.81	Sc I	11677 - 32752	7.3	2.5	0.39
4753.16	Sc I	0 - 21033	0.045	0.015	-1.82
4779.35	Sc I	168 - 21086	0.050	0.017	-1.76
4791.50	Sc I	168 - 21033	0.020	0.0070	-2.15
4827.28	Sc I	17948 - 38658	3.3	1.1	0.06
4833.67	Sc I	17919 - 38602	3.2	1.1	0.05
4839.44	Sc I	18000 - 38658	5.6	2.0	0.29
4840.47	Sc I	17948 - 38602	1.3	0.46	-0.34
4847.68	Sc I	17948 - 38571	2.6	0.91	-0.04
4852.68	Sc I	18000 - 38602	2.6	0.92	-0.04

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4906.67	Sc I	16141 - 36516	1.5	0.53	-0.28
4909.76	Sc I	16211 - 36573	1.7	0.60	-0.22
4922.84	Sc I	16023 - 36330	1.7	0.63	-0.20
4934.25	Sc I	17919 - 38180	2.9	1.1	0.03
4935.74	Sc I	16022 - 36277	0.86	0.31	-0.50
4941.33	Sc I	17948 - 38180	2.4	0.86	-0.07
4954.06	Sc I	18000 - 38180	5.6	2.1	0.31
4973.66	Sc I	17025 - 37126	3.1	1.1	0.06
4980.37	Sc I	17013 - 37086	3.7	1.4	0.14
4983.45	Sc I	17025 - 37086	2.0	0.73	-0.14
4991.92	Sc I	17013 - 37040	3.4	1.3	0.11
5018.39	Sc I	17013 - 36934	1.9	0.71	-0.15
5021.51	Sc I	17025 - 36934	1.9	0.72	-0.15
5064.32	Sc I	11610 - 31351	1.2	0.47	-0.33
5070.23	Sc I	11558 - 31275	2.6	0.99	-0.00
5075.81	Sc I	11520 - 31216	1.2	0.46	-0.34
5081.56	Sc I	11677 - 31351	11.	4.1	0.61
5083.72	Sc I	11610 - 31275	6.0	2.3	0.37
5085.55	Sc I	11558 - 31216	5.1	2.0	0.30
5086.95	Sc I	11520 - 31173	3.6	1.4	0.14
5087.14	Sc I	20237 - 39889	22.	8.4	0.92
5089.89	Sc I	20240 - 39881	15.	5.7	0.76
5096.73	Sc I	11558 - 31173	1.8	0.72	-0.14
5099.23	Sc I	11610 - 31216	3.0	1.2	0.06
5101.12	Sc I	11677 - 31275	1.8	0.71	-0.15
5210.52	Sc I	20237 - 39424	19.	7.9	0.90
5219.67	Sc I	20240 - 39392	14.	5.7	0.76
5258.33	Sc I	20237 - 39249	14.	5.6	0.75
5284.97	Sc I	20237 - 39153	1.7	0.69	-0.16
5285.76	Sc I	20240 - 39153	9.9	4.2	0.62
5301.94	Sc I	0 - 18856	0.0054	0.0023	-2.64
5331.77	Sc I	15673 - 34423	0.88	0.37	-0.43
5339.41	Sc I	15757 - 34480	1.2	0.53	-0.28
5341.05	Sc I	15673 - 34390	1.5	0.65	-0.19
5342.96	Sc I	0 - 18711	0.014	0.0062	-2.21
5349.30	Sc I	14926 - 33615	3.5	1.5	0.18
5349.71	Sc I	168 - 18856	0.018	0.0076	-2.12
5350.30	Sc I	15882 - 34567	0.80	0.35	-0.46
5355.75	Sc I	15757 - 34423	2.6	1.1	0.06
5356.10	Sc I	15042 - 33707	5.4	2.3	0.37
5375.35	Sc I	15882 - 34480	3.4	1.5	0.17
5392.08	Sc I	16027 - 34567	4.9	2.1	0.33
5416.12	Sc I	16022 - 34480	0.57	0.25	-0.60
5425.57	Sc I	16141 - 34567	0.58	0.26	-0.59
5429.41	Sc I	16010 - 34423	0.56	0.25	-0.61
5432.94	Sc I	16022 - 34423	0.45	0.20	-0.70
5433.23	Sc I	16023 - 34423	0.67	0.30	-0.53
5438.22	Sc I	16097 - 34480	0.57	0.25	-0.60
5439.03	Sc I	16010 - 34390	0.67	0.30	-0.53
5442.60	Sc I	16022 - 34390	0.67	0.30	-0.53

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5446.20	Sc I	16211 - 34567	3.5	1.6	0.19
5447.39	Sc I	14926 - 33279	0.16	0.072	-1.14
5451.34	Sc I	16141 - 34480	1.5	0.66	-0.18
5455.21	Sc I	16097 - 34423	0.39	0.18	-0.76
5465.20	Sc I	18856 - 37148	0.49	0.22	-0.66
5468.40	Sc I	16141 - 34423	0.68	0.30	-0.52
5472.19	Sc I	16211 - 34480	0.80	0.36	-0.44
5481.99	Sc I	15042 - 33279	7.0	3.1	0.50
5484.62	Sc I	14926 - 33154	4.7	2.1	0.33
5514.22	Sc I	14926 - 33056	5.0	2.3	0.36
5515.39	Sc I	15673 - 33799	0.17	0.078	-1.11
5520.50	Sc I	15042 - 33151	6.0	2.7	0.44
5526.06	Sc I	15673 - 33764	0.47	0.22	-0.66
5541.04	Sc I	15757 - 33799	0.57	0.26	-0.58
5546.40	Sc I	15882 - 33906	0.35	0.16	-0.80
5550.40	Sc I	18504 - 36516	0.41	0.19	-0.72
5553.59	Sc I	18571 - 36573	0.84	0.39	-0.41
5561.10	Sc I	18516 - 36493	0.37	0.17	-0.77
5564.86	Sc I	15882 - 33847	0.78	0.36	-0.44
5571.24	Sc I	18571 - 36516	0.41	0.19	-0.71
5579.76	Sc I	15882 - 33799	0.15	0.072	-1.14
5591.33	Sc I	16027 - 33906	1.2	0.56	-0.25
5593.38	Sc I	21086 - 38959	1.7	0.78	-0.11
5604.19	Sc I	21033 - 38872	1.0	0.48	-0.32
5631.02	Sc I	16010 - 33764	0.24	0.11	-0.94
5646.36	Sc I	16141 - 33847	0.49	0.24	-0.63
5647.60	Sc I	16097 - 33799	0.18	0.084	-1.08
5649.56	Sc I	16211 - 33906	0.60	0.29	-0.54
5671.81	Sc I	11677 - 29304	4.7	2.3	0.35
5686.84	Sc I	11610 - 29190	3.7	1.8	0.26
5700.21	Sc I	11558 - 29096	3.1	1.5	0.18
5708.61	Sc I	11677 - 29190	0.59	0.29	-0.54
5711.75	Sc I	11520 - 29023	2.6	1.3	0.10
5717.28	Sc I	11610 - 29096	0.68	0.33	-0.48
5724.08	Sc I	11558 - 29023	0.51	0.25	-0.60
5919.11	Sc I	18856 - 35746	0.62	0.33	-0.49
5961.49	Sc I	21086 - 37856	1.3	0.69	-0.16
5969.19	Sc I	21033 - 37781	1.3	0.68	-0.17
5988.42	Sc I	17013 - 33707	1.0	0.54	-0.27
6026.18	Sc I	17025 - 33615	0.69	0.38	-0.42
6210.68	Sc I	0 - 16097	0.046	0.027	-1.58
6239.41	Sc I	0 - 16023	0.0064	0.0037	-2.43
6239.78	Sc I	0 - 16022	0.023	0.013	-1.87
6249.96	Sc I	18571 - 34567	1.6	0.94	-0.03
6258.96	Sc I	168 - 16141	0.019	0.011	-1.96
6262.25	Sc I	18516 - 34480	0.92	0.54	-0.27
6276.31	Sc I	168 - 16097	0.0040	0.0023	-2.63
6305.67	Sc I	168 - 16023	0.055	0.033	-1.49
6344.83	Sc I	0 - 15757	0.0017	0.0010	-2.98
6378.82	Sc I	0 - 15673	0.0039	0.0024	-2.62

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6413.35	Sc I	168 - 15757	0.0058	0.0036	-2.44
6819.52	Sc I	21086 - 35746	1.2	0.85	-0.07
6829.54	Sc I	21033 - 35671	0.70	0.49	-0.31
7138.14	Sc I	24866 - 38872	0.83	0.63	-0.20
7169.13	Sc I	25014 - 38959	0.96	0.74	-0.13
7257.57	Sc I	31351 - 45126	4.9	3.9	0.59
7275.57	Sc I	31275 - 45016	3.0	2.4	0.37
7300.62	Sc I	31216 - 44910	1.2	0.93	-0.03
7524.13	Sc I	25585 - 38872	0.87	0.74	-0.13
7553.96	Sc I	25725 - 38959	1.0	0.86	-0.06
7574.44	Sc I	24657 - 37856	0.82	0.71	-0.15
7617.45	Sc I	24657 - 37781	0.57	0.49	-0.31
7665.72	Sc I	20237 - 33279	0.21	0.18	-0.74
7697.73	Sc I	25585 - 38572	2.0	1.8	0.26
7729.72	Sc I	25725 - 38658	1.3	1.1	0.05
7741.17	Sc I	20237 - 33151	0.78	0.70	-0.15
7750.37	Sc I	29023 - 41922	0.93	0.84	-0.08
7752.72	Sc I	29190 - 42085	0.97	0.88	-0.06
7771.06	Sc I	29096 - 41961	1.1	0.97	-0.01
7785.17	Sc I	25014 - 37856	0.84	0.77	-0.11
7794.68	Sc I	29190 - 42016	1.4	1.2	0.10
7800.44	Sc I	20240 - 33056	0.44	0.40	-0.40
7821.64	Sc I	29304 - 42085	2.0	1.8	0.25
8196.98	Sc I	25585 - 37781	0.61	0.61	-0.21
8241.13	Sc I	25725 - 37856	0.89	0.91	-0.04
8761.40	Sc I	24866 - 36277	0.76	0.88	-0.06
8794.72	Sc I	29304 - 40671	2.1	2.5	0.39
8834.45	Sc I	25014 - 36330	1.2	1.5	0.16

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2545.22	Sc II	68 - 39345	3.4	0.33	-0.48
2552.37	Sc II	178 - 39345	18.	1.8	0.25
2555.82	Sc II	0 - 39114	3.2	0.32	-0.50
2560.25	Sc II	68 - 39114	13.	1.3	0.11
2563.21	Sc II	0 - 39002	6.4	0.63	-0.20
2611.22	Sc II	26081 - 64366	15.	1.5	0.18
2684.23	Sc II	39345 - 76588	8.8	0.96	-0.02
2819.54	Sc II	27918 - 63374	13.	1.5	0.19
2822.15	Sc II	28021 - 63444	16.	1.9	0.27
2826.68	Sc II	28161 - 63528	26.	3.1	0.50
3039.93	Sc II	32350 - 65236	15.	2.1	0.31
3045.72	Sc II	27444 - 60267	29.	4.1	0.61
3052.93	Sc II	27602 - 60348	34.	4.8	0.68
3065.11	Sc II	27841 - 60457	54.	7.6	0.88
3139.75	Sc II	28161 - 60002	20.	2.9	0.46
3251.32	Sc II	68 - 30816	0.85	0.13	-0.87
3343.28	Sc II	27841 - 57743	45.	7.6	0.88
3352.05	Sc II	0 - 29824	0.18	0.030	-1.53
3353.73	Sc II	2541 - 32350	14.	2.3	0.36
3359.68	Sc II	68 - 29824	1.3	0.23	-0.65
3361.27	Sc II	0 - 29742	1.1	0.18	-0.74
3361.94	Sc II	0 - 29736	1.1	0.18	-0.74
3368.95	Sc II	68 - 29742	2.6	0.44	-0.35
3372.15	Sc II	178 - 29824	4.4	0.76	-0.12
3535.73	Sc II	2541 - 30816	2.5	0.46	-0.33
3558.55	Sc II	68 - 28161	2.9	0.56	-0.25
3567.70	Sc II	0 - 28021	2.6	0.50	-0.31
3572.53	Sc II	178 - 28161	5.9	1.1	0.05
3576.35	Sc II	68 - 28021	4.3	0.82	-0.09
3580.94	Sc II	0 - 27918	3.2	0.62	-0.21
3589.64	Sc II	68 - 27918	1.7	0.32	-0.49
3590.48	Sc II	178 - 28021	1.7	0.33	-0.48
3613.84	Sc II	178 - 27841	11.	2.2	0.35
3630.75	Sc II	68 - 27602	7.7	1.5	0.18
3642.79	Sc II	0 - 27444	4.9	0.98	-0.01
3645.31	Sc II	178 - 27602	2.6	0.51	-0.29
3651.80	Sc II	68 - 27444	2.0	0.39	-0.40
3664.25	Sc II	2541 - 29824	0.081	0.016	-1.79
3666.54	Sc II	178 - 27444	0.11	0.022	-1.67
3675.26	Sc II	2541 - 29742	0.039	0.0080	-2.10
3678.35	Sc II	32350 - 59528	20.	4.0	0.60
3833.07	Sc II	0 - 26081	0.070	0.016	-1.81
3843.03	Sc II	68 - 26081	0.16	0.036	-1.45
3923.51	Sc II	2541 - 28021	0.021	0.0048	-2.32
3989.06	Sc II	2541 - 27602	0.019	0.0045	-2.35
4014.49	Sc II	2541 - 27444	0.22	0.052	-1.28
4246.83	Sc II	2541 - 26081	4.5	1.2	0.09
4294.77	Sc II	4883 - 28161	0.15	0.042	-1.37
4305.71	Sc II	4803 - 28021	0.18	0.051	-1.30
4314.09	Sc II	4988 - 28161	2.3	0.63	-0.20

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4320.74	Sc II	4883 - 28021	1.7	0.48	-0.32
4325.01	Sc II	4803 - 27918	1.2	0.34	-0.47
4354.61	Sc II	4883 - 27841	0.088	0.025	-1.60
4374.46	Sc II	4988 - 27841.	0.99	0.28	-0.55
4384.81	Sc II	4803 - 27602	0.062	0.018	-1.75
4400.37	Sc II	4883 - 27602	0.52	0.15	-0.82
4415.56	Sc II	4803 - 27444	0.40	0.12	-0.94
4420.66	Sc II	4988 - 27602	0.013	0.0038	-2.42
4431.36	Sc II	4883 - 27444	0.020	0.0059	-2.23
4670.40	Sc II	10945 - 32350	0.75	0.25	-0.61
4698.29	Sc II	4803 - 26081	0.018	0.0059	-2.23
5031.02	Sc II	10945 - 30816	0.88	0.33	-0.48
5068.86	Sc II	16023 - 35746	0.53	0.21	-0.69
5239.82	Sc II	11736 - 30816	0.61	0.25	-0.60
5318.35	Sc II	10945 - 29742	0.029	0.012	-1.92
5334.23	Sc II	12074 - 30816	0.025	0.011	-1.98
5357.19	Sc II	12154 - 30816	0.025	0.011	-1.97
5526.82	Sc II	14261 - 32350	1.9	0.85	-0.07
5552.25	Sc II	11736 - 29742	0.0072	0.0033	-2.48
5640.98	Sc II	12101 - 29824	0.11	0.053	-1.27
5657.88	Sc II	12154 - 29824	0.35	0.17	-0.78
5658.34	Sc II	12074 - 29742	0.085	0.041	-1.39
5667.16	Sc II	12101 - 29742	0.073	0.035	-1.45
5669.04	Sc II	12101 - 29736	0.097	0.047	-1.33
5684.20	Sc II	12154 - 29742	0.13	0.065	-1.19
6245.63	Sc II	12154 - 28161	0.12	0.070	-1.15
6279.76	Sc II	12101 - 28021	0.041	0.025	-1.61
6300.70	Sc II	12154 - 28021	0.017	0.0099	-2.00
6309.90	Sc II	12074 - 27918	0.024	0.015	-1.84
6320.85	Sc II	12101 - 27918	0.015	0.0088	-2.06
6604.60	Sc II	10945 - 26081	0.035	0.023	-1.64

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
1960.26	Se I	0 - 50997	10.	0.59	-0.23
2039.85	Se I	1989 - 50997	13.	0.78	-0.11
2062.79	Se I	2534 - 50997	4.8	0.30	-0.52
2074.79	Se I	0 - 48182	0.56	0.036	-1.44
8918.80	Se I	48182 - 59391	16.	20.	1.29

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2124.11	Si I	6299 - 53362	4.4	0.30	-0.53
2207.97	Si I	0 - 45276	0.30	0.022	-1.67
2210.88	Si I	77 - 45294	0.30	0.022	-1.66
2216.67	Si I	223 - 45322	0.53	0.039	-1.41
2435.16	Si I	6299 - 47352	7.6	0.67	-0.17
2506.90	Si I	77 - 39955	6.3	0.60	-0.22
2514.32	Si I	0 - 39760	5.7	0.54	-0.27
2516.11	Si I	223 - 39955	13.	1.3	0.11
2519.21	Si I	77 - 39760	4.3	0.41	-0.39
2524.11	Si I	77 - 39683	8.4	0.80	-0.10
2528.51	Si I	223 - 39760	7.1	0.68	-0.17
2631.28	Si I	15394 - 53387	22.	2.3	0.36
2881.60	Si I	6299 - 40992	15.	1.9	0.27
2987.65	Si I	6299 - 39760	0.63	0.085	-1.07
3905.53	Si I	15394 - 40992	0.86	0.20	-0.71

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3245.80	Sm I	1490 - 32290	4.1	0.64	-0.19
3680.98	Sm I	3125 - 30284	4.1	0.84	-0.08
3690.08	Sm I	2273 - 29365	2.0	0.41	-0.38
3721.03	Sm I	1490 - 28356	1.5	0.32	-0.50
3730.74	Sm I	2273 - 29070	1.1	0.23	-0.65
3745.46	Sm I	1490 - 28181	15.	3.1	0.49
3748.52	Sm I	293 - 26962	1.8	0.38	-0.42
3756.41	Sm I	812 - 27426	10.	2.2	0.34
3803.94	Sm I	0 - 26281	1.5	0.33	-0.49
3806.47	Sm I	4021 - 30284	5.4	1.2	0.07
3813.83	Sm I	4021 - 30234	3.1	0.67	-0.18
3818.36	Sm I	1490 - 27671	0.65	0.14	-0.85
3832.81	Sm I	2273 - 28356	1.8	0.40	-0.40
3834.48	Sm I	4021 - 30093	16.	3.4	0.53
3846.76	Sm I	293 - 26281	1.5	0.34	-0.47
3853.30	Sm I	3125 - 29070	11.	2.5	0.39
3854.56	Sm I	1490 - 27426	6.3	1.4	0.15
3858.52	Sm I	1490 - 27399	2.4	0.54	-0.26
3858.74	Sm I	2273 - 28181	6.5	1.5	0.16
3877.49	Sm I	4021 - 29803	6.2	1.4	0.15
3909.95	Sm I	3125 - 28694	1.5	0.35	-0.46
3925.22	Sm I	812 - 26281	2.6	0.60	-0.22
3949.85	Sm I	2273 - 27583	0.66	0.15	-0.81
3974.66	Sm I	2273 - 27426	7.6	1.8	0.25
4079.83	Sm I	2273 - 26777	1.1	0.27	-0.57
4135.50	Sm I	1490 - 25664	0.34	0.088	-1.06
4183.33	Sm I	1490 - 25387	1.5	0.39	-0.41
4219.31	Sm I	293 - 23986	0.25	0.068	-1.17
4226.18	Sm I	812 - 24467	0.83	0.22	-0.65
4230.73	Sm I	0 - 23630	0.23	0.062	-1.21
4240.45	Sm I	1490 - 25065	0.30	0.080	-1.10
4266.31	Sm I	812 - 24245	0.63	0.17	-0.76
4271.86	Sm I	2273 - 25676	0.41	0.11	-0.94
4282.21	Sm I	3125 - 26471	7.1	2.0	0.29
4282.83	Sm I	2273 - 25616	3.7	1.0	0.01
4283.50	Sm I	812 - 24151	1.2	0.34	-0.47
4296.74	Sm I	4021 - 27288	21.	5.7	0.76
4299.14	Sm I	293 - 23547	0.39	0.11	-0.96
4301.28	Sm I	812 - 24054	0.23	0.063	-1.20
4312.85	Sm I	2273 - 25453	1.8	0.50	-0.30
4319.53	Sm I	1490 - 24634	2.9	0.80	-0.10
4324.46	Sm I	2273 - 25391	1.8	0.50	-0.30
4330.02	Sm I	293 - 23381	1.9	0.53	-0.28
4336.14	Sm I	3125 - 26182	8.3	2.3	0.37
4338.96	Sm I	812 - 23852	0.43	0.12	-0.91
4339.92	Sm I	812 - 23847	0.18	0.051	-1.29
4350.82	Sm I	1490 - 24467	0.14	0.039	-1.41
4357.90	Sm I	3125 - 26066	0.22	0.062	-1.21
4362.91	Sm I	0 - 22914	1.7	0.48	-0.32
4365.95	Sm I	812 - 23710	0.21	0.060	-1.22

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4380.42	Sm I	1490 - 24312	3.0	0.86	-0.07
4386.22	Sm I	2273 - 25065	0.82	0.24	-0.63
4393.35	Sm I	1490 - 24245	1.1	0.33	-0.48
4397.34	Sm I	812 - 23547	1.3	0.39	-0.41
4401.17	Sm I	3125 - 25840	3.6	1.0	0.02
4411.58	Sm I	1490 - 24151	1.6	0.46	-0.33
4419.33	Sm I	293 - 22914	1.8	0.53	-0.28
4423.38	Sm I	293 - 22893	0.28	0.082	-1.09
4429.66	Sm I	812 - 23381	2.1	0.61	-0.22
4433.08	Sm I	293 - 22844	0.44	0.13	-0.88
4441.81	Sm I	1490 - 23997	2.8	0.82	-0.09
4442.28	Sm I	812 - 23317	1.9	0.56	-0.25
4443.27	Sm I	2273 - 24773	0.33	0.099	-1.00
4445.15	Sm I	3125 - 25616	5.8	1.7	0.24
4452.95	Sm I	4021 - 26471	2.6	0.78	-0.11
4459.29	Sm I	812 - 23231	1.1	0.31	-0.50
4463.90	Sm I	2273 - 24669	0.19	0.056	-1.25
4470.89	Sm I	2273 - 24634	5.1	1.5	0.18
4477.50	Sm I	3125 - 25453	0.41	0.12	-0.91
4480.32	Sm I	0 - 22314	0.39	0.12	-0.94
4490.02	Sm I	3125 - 25391	0.21	0.063	-1.20
4499.11	Sm I	1490 - 23710	1.8	0.54	-0.26
4503.38	Sm I	293 - 22492	0.81	0.25	-0.61
4511.33	Sm I	4021 - 26182	1.2	0.35	-0.45
4522.55	Sm I	1490 - 23595	0.28	0.086	-1.07
4527.42	Sm I	812 - 22893	0.23	0.070	-1.15
4532.44	Sm I	1490 - 23547	0.34	0.11	-0.97
4533.80	Sm I	2273 - 24324	1.7	0.53	-0.28
4550.03	Sm I	2273 - 24245	0.25	0.079	-1.10
4566.77	Sm I	1490 - 23381	0.27	0.083	-1.08
4569.58	Sm I	2273 - 24151	0.21	0.065	-1.19
4581.58	Sm I	812 - 22632	1.1	0.34	-0.47
4581.73	Sm I	4021 - 25840	4.0	1.3	0.10
4611.25	Sm I	812 - 22492	0.26	0.083	-1.08
4629.43	Sm I	4021 - 25616	0.25	0.081	-1.09
4645.40	Sm I	293 - 21813	0.87	0.28	-0.55
4649.49	Sm I	812 - 22314	1.3	0.42	-0.38
4663.56	Sm I	2273 - 23710	1.5	0.48	-0.31
4670.75	Sm I	1490 - 22894	1.9	0.62	-0.21
4681.55	Sm I	1490 - 22844	1.3	0.42	-0.37
4688.73	Sm I	2273 - 23595	2.7	0.91	-0.04
4716.10	Sm I	3125 - 24324	6.7	2.2	0.35
4717.07	Sm I	0 - 21194	1.0	0.35	-0.46
4718.64	Sm I	3125 - 24312	0.27	0.089	-1.05
4728.42	Sm I	1490 - 22632	4.4	1.5	0.17
4750.72	Sm I	2273 - 23317	1.0	0.34	-0.46
4760.27	Sm I	812 - 21813	3.3	1.1	0.05
4770.20	Sm I	2273 - 23231	0.73	0.25	-0.60
4783.10	Sm I	293 - 21194	2.2	0.77	-0.11
4785.86	Sm I	812 - 21701	1.6	0.54	-0.27

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4789.96	Sm I	3125 - 23997	1.3	0.46	-0.34
4841.70	Sm I	4021 - 24669	10.	3.6	0.55
4848.32	Sm I	2273 - 22893	1.7	0.61	-0.22
4883.77	Sm I	293 - 20763	0.75	0.27	-0.57
4883.97	Sm I	3125 - 23595	5.6	2.0	0.31
4904.97	Sm I	812 - 21194	0.69	0.25	-0.60
4910.40	Sm I	2273 - 22632	3.8	1.4	0.13
4918.99	Sm I	1490 - 21813	2.0	0.73	-0.13
4924.04	Sm I	4021 - 24324	1.0	0.37	-0.43
4946.32	Sm I	1490 - 21701	0.58	0.21	-0.67
4975.98	Sm I	0 - 20091	0.69	0.25	-0.59
5044.28	Sm I	1490 - 21308	2.2	0.86	-0.07
5049.51	Sm I	293 - 20091	0.17	0.067	-1.18
5060.93	Sm I	1490 - 21243	0.40	0.15	-0.81
5088.32	Sm I	812 - 20459	0.26	0.10	-1.00
5122.14	Sm I	3125 - 22643	2.9	1.1	0.06
5172.74	Sm I	2273 - 21600	1.5	0.62	-0.21
5187.09	Sm I	1490 - 20763	0.22	0.087	-1.06
5200.59	Sm I	1490 - 20713	1.2	0.49	-0.31
5251.92	Sm I	2273 - 21308	1.5	0.63	-0.20
5265.67	Sm I	0 - 18986	0.077	0.032	-1.49
5271.40	Sm I	812 - 19777	1.5	0.63	-0.20
5282.91	Sm I	1490 - 20413	1.1	0.47	-0.33
5320.60	Sm I	2273 - 21063	1.0	0.44	-0.35
5341.29	Sm I	293 - 19010	0.34	0.15	-0.84
5348.08	Sm I	293 - 18986	0.090	0.039	-1.41
5349.14	Sm I	812 - 19501	0.13	0.056	-1.25
5368.36	Sm I	4021 - 22643	1.3	0.55	-0.26
5403.70	Sm I	1490 - 19990	0.39	0.17	-0.77
5405.23	Sm I	293 - 18788	0.39	0.17	-0.77
5411.39	Sm I	3125 - 21600	0.38	0.17	-0.78
5421.57	Sm I	2273 - 20713	0.22	0.098	-1.01
5433.82	Sm I	812 - 19210	0.061	0.027	-1.57
5453.00	Sm I	3125 - 21459	1.4	0.62	-0.21
5466.72	Sm I	1490 - 19777	0.55	0.24	-0.61
5485.42	Sm I	0 - 18225	0.17	0.076	-1.12
5493.72	Sm I	812 - 19010	0.74	0.34	-0.47
5498.21	Sm I	293 - 18475	0.22	0.100	-1.00
5511.09	Sm I	2273 - 20413	0.14	0.063	-1.20
5512.10	Sm I	812 - 18949	0.25	0.11	-0.94
5516.09	Sm I	2273 - 20397	1.1	0.50	-0.30
5550.40	Sm I	1490 - 19501	0.54	0.25	-0.60
5561.37	Sm I	812 - 18788	0.044	0.021	-1.69
5573.42	Sm I	3125 - 21063	0.25	0.12	-0.93
5574.89	Sm I	293 - 18225	0.076	0.035	-1.45
5588.20	Sm I	2273 - 20163	0.16	0.077	-1.12
5621.79	Sm I	293 - 18076	0.13	0.061	-1.22
5626.01	Sm I	0 - 17770	0.17	0.081	-1.09
5659.86	Sm I	812 - 18475	0.41	0.20	-0.70
5686.98	Sm I	4021 - 21600	0.100	0.048	-1.31

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
5706.20	Sm I	1490 - 19010	0.29	0.14	-0.85
5711.45	Sm I	2273 - 19777	0.060	0.029	-1.53
5720.19	Sm I	293 - 17770	0.069	0.034	-1.47
5732.95	Sm I	4021 - 21459	0.34	0.17	-0.78
5741.19	Sm I	812 - 18225	0.027	0.013	-1.87
5779.24	Sm I	1490 - 18788	0.14	0.069	-1.16
5788.38	Sm I	3125 - 20397	0.29	0.15	-0.84
5802.84	Sm I	2273 - 19501	0.25	0.13	-0.89
5860.78	Sm I	3125 - 20183	0.17	0.089	-1.05
5867.79	Sm I	3125 - 20163	0.31	0.16	-0.80
5868.61	Sm I	4021 - 21056	0.27	0.14	-0.86
5871.06	Sm I	3125 - 20153	0.17	0.089	-1.05
5874.24	Sm I	812 - 17831	0.13	0.065	-1.18
5875.92	Sm I	1490 - 18503	0.039	0.020	-1.70
5902.60	Sm I	2273 - 19210	0.11	0.055	-1.26
5906.05	Sm I	1490 - 18417	0.053	0.028	-1.56
5916.36	Sm I	293 - 17190	0.030	0.016	-1.80
5979.38	Sm I	1490 - 18210	0.071	0.038	-1.42
5995.09	Sm I	2273 - 18949	0.100	0.054	-1.27
6004.18	Sm I	812 - 17462	0.050	0.027	-1.57
6027.16	Sm I	3125 - 19712	0.11	0.059	-1.23
6045.00	Sm I	2273 - 18811	0.17	0.093	-1.03
6070.06	Sm I	1490 - 17959	0.13	0.074	-1.13
6084.12	Sm I	812 - 17244	0.095	0.053	-1.28
6099.90	Sm I	293 - 16682	0.026	0.014	-1.84
6159.56	Sm I	2273 - 18503	0.14	0.077	-1.11
6174.45	Sm I	812 - 17003	0.037	0.021	-1.67
6194.39	Sm I	3125 - 19265	0.070	0.041	-1.39
6226.70	Sm I	2273 - 18329	0.054	0.032	-1.50
6367.41	Sm I	1490 - 17190	0.033	0.020	-1.70
6371.01	Sm I	4021 - 19712	0.026	0.016	-1.80
6509.44	Sm I	293 - 15651	0.036	0.023	-1.64
6528.02	Sm I	2273 - 17587	0.047	0.030	-1.52
6532.25	Sm I	812 - 16116	0.028	0.018	-1.75
6551.80	Sm I	1490 - 16748	0.026	0.017	-1.78
6588.91	Sm I	3125 - 18298	0.091	0.059	-1.23
6671.51	Sm I	4021 - 19006	0.20	0.13	-0.88
6703.61	Sm I	17655 - 32568	2.6	1.8	0.24
6724.73	Sm I	16859 - 31726	4.1	2.8	0.45
6725.88	Sm I	0 - 14864	0.019	0.013	-1.89
6759.25	Sm I	4021 - 18811	0.068	0.046	-1.33
6802.96	Sm I	812 - 15507	0.026	0.018	-1.74
6808.31	Sm I	15507 - 30191	2.0	1.4	0.15
6820.91	Sm I	14380 - 29037	0.98	0.68	-0.17
6830.54	Sm I	14916 - 29552	1.4	0.99	-0.00
6841.75	Sm I	15579 - 30191	2.0	1.4	0.16
6858.12	Sm I	16345 - 30922	1.2	0.83	-0.08
6860.93	Sm I	293 - 14864	0.11	0.078	-1.11
6879.50	Sm I	17194 - 31726	2.1	1.5	0.17
7088.30	Sm I	812 - 14916	0.027	0.021	-1.68

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7091.16	Sm I	4021 - 18119	0.058	0.044	-1.36
7095.50	Sm I	1490 - 15579	0.047	0.036	-1.45
7096.33	Sm I	293 - 14380	0.013	0.0099	-2.01
7104.54	Sm I	2273 - 16345	0.066	0.050	-1.30
7106.23	Sm I	3125 - 17194	0.055	0.041	-1.38
7131.80	Sm I	1490 - 15507	0.018	0.014	-1.85
7172.67	Sm I	2273 - 16211	0.020	0.016	-1.81
7213.82	Sm I	2273 - 16132	0.043	0.033	-1.48
7220.07	Sm I	16345 - 30191	1.4	1.1	0.05
7279.25	Sm I	3125 - 16859	0.033	0.026	-1.58
7282.21	Sm I	17194 - 30922	1.1	0.85	-0.07
7332.65	Sm I	4021 - 17655	0.043	0.035	-1.46
7347.30	Sm I	18119 - 31726	4.5	3.6	0.56
7794.50	Sm I	16211 - 29037	0.89	0.81	-0.09
7801.54	Sm I	19753 - 32568	2.4	2.2	0.34
7859.53	Sm I	19006 - 31726	1.2	1.1	0.05
7895.96	Sm I	16891 - 29552	1.6	1.5	0.18
7931.92	Sm I	17587 - 30191	1.1	1.0	0.02

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3065.78	Sm II	327 - 32935	0.16	0.023	-1.64
3096.68	Sm II	1489 - 33773	0.21	0.030	-1.52
3106.52	Sm II	2238 - 34419	0.72	0.10	-0.98
3115.05	Sm II	2238 - 34331	0.17	0.024	-1.62
3147.19	Sm II	2689 - 34454	0.52	0.077	-1.11
3152.10	Sm II	3053 - 34768	0.71	0.11	-0.98
3162.15	Sm II	2238 - 33853	0.26	0.038	-1.42
3169.88	Sm II	2238 - 33776	1.1	0.16	-0.79
3170.21	Sm II	2238 - 33773	0.25	0.038	-1.42
3178.12	Sm II	1489 - 32945	0.43	0.065	-1.19
3187.01	Sm II	1489 - 32858	0.72	0.11	-0.96
3187.22	Sm II	3053 - 34419	1.6	0.24	-0.62
3187.79	Sm II	2238 - 33599	1.0	0.16	-0.80
3188.72	Sm II	2689 - 34040	0.27	0.042	-1.38
3196.18	Sm II	3053 - 34331	1.3	0.19	-0.71
3204.90	Sm II	2689 - 33882	0.45	0.069	-1.16
3207.18	Sm II	0 - 31171	0.52	0.081	-1.09
3214.12	Sm II	2003 - 33107	0.36	0.056	-1.25
3215.26	Sm II	3053 - 34145	0.89	0.14	-0.86
3216.85	Sm II	838 - 31916	0.95	0.15	-0.83
3228.78	Sm II	4386 - 35349	1.3	0.20	-0.71
3230.56	Sm II	1489 - 32435	1.5	0.24	-0.63
3231.53	Sm II	838 - 31775	0.62	0.098	-1.01
3231.95	Sm II	2003 - 32935	0.35	0.054	-1.27
3237.89	Sm II	3499 - 34375	0.52	0.082	-1.09
3239.66	Sm II	3910 - 34768	2.9	0.46	-0.34
3241.16	Sm II	327 - 31171	0.77	0.12	-0.91
3241.59	Sm II	1518 - 32359	0.37	0.058	-1.24
3250.37	Sm II	0 - 30757	0.94	0.15	-0.83
3253.94	Sm II	3053 - 33776	0.81	0.13	-0.89
3254.38	Sm II	327 - 31045	1.2	0.19	-0.72
3255.63	Sm II	2238 - 32945	0.26	0.042	-1.38
3258.25	Sm II	2003 - 32686	0.19	0.030	-1.52
3262.28	Sm II	2689 - 33333	0.98	0.16	-0.81
3264.94	Sm II	2238 - 32858	1.0	0.16	-0.78
3272.81	Sm II	3052 - 33599	1.3	0.20	-0.69
3273.32	Sm II	3499 - 34040	0.28	0.045	-1.35
3275.87	Sm II	1489 - 32007	0.16	0.025	-1.60
3276.75	Sm II	3910 - 34419	1.6	0.26	-0.59
3285.66	Sm II	1489 - 31916	0.33	0.053	-1.27
3286.23	Sm II	3910 - 34331	1.6	0.25	-0.60
3286.54	Sm II	2689 - 33107	0.22	0.035	-1.46
3293.37	Sm II	2003 - 32359	0.50	0.081	-1.09
3295.81	Sm II	838 - 31171	0.64	0.10	-0.98
3300.98	Sm II	1489 - 31775	0.30	0.049	-1.31
3301.68	Sm II	3910 - 34189	1.2	0.19	-0.72
3304.52	Sm II	0 - 30253	0.39	0.064	-1.20
3305.18	Sm II	2689 - 32935	0.83	0.14	-0.87
3306.39	Sm II	3910 - 34145	5.8	0.95	-0.02
3309.52	Sm II	838 - 31045	0.49	0.080	-1.10

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3310.66	Sm II	2238 - 32435	1.8	0.30	-0.53
3312.42	Sm II	1489 - 31670	1.0	0.17	-0.77
3320.16	Sm II	1489 - 31600	0.73	0.12	-0.92
3321.18	Sm II	3053 - 33154	3.2	0.52	-0.28
3329.62	Sm II	3910 - 33935	0.28	0.046	-1.34
3332.70	Sm II	2689 - 32686	0.19	0.032	-1.49
3333.64	Sm II	4386 - 34375	0.63	0.10	-0.98
3336.12	Sm II	2238 - 32204	0.34	0.057	-1.25
3340.58	Sm II	327 - 30253	0.98	0.16	-0.78
3341.43	Sm II	838 - 30757	0.11	0.019	-1.72
3344.35	Sm II	3053 - 32945	0.60	0.10	-1.00
3346.35	Sm II	5318 - 35192	0.40	0.066	-1.18
3347.30	Sm II	3910 - 33776	0.53	0.089	-1.05
3354.18	Sm II	3053 - 32858	1.00	0.17	-0.77
3367.27	Sm II	3910 - 33599	0.44	0.074	-1.13
3368.57	Sm II	2238 - 31916	0.63	0.11	-0.97
3369.46	Sm II	2689 - 32359	0.72	0.12	-0.91
3370.59	Sm II	327 - 29986	0.18	0.031	-1.50
3371.21	Sm II	4386 - 34040	1.2	0.20	-0.71
3376.48	Sm II	3499 - 33107	0.38	0.065	-1.19
3377.81	Sm II	2003 - 31600	0.12	0.021	-1.67
3382.40	Sm II	1489 - 31045	1.8	0.30	-0.52
3384.66	Sm II	3053 - 32589	1.2	0.20	-0.70
3385.39	Sm II	2238 - 31768	0.11	0.019	-1.73
3389.32	Sm II	4386 - 33882	1.3	0.23	-0.64
3391.11	Sm II	1489 - 30969	0.21	0.036	-1.44
3396.19	Sm II	3499 - 32935	1.0	0.18	-0.75
3402.46	Sm II	3053 - 32435	1.3	0.23	-0.64
3413.90	Sm II	2238 - 31522	0.14	0.025	-1.60
3418.51	Sm II	3910 - 33154	1.2	0.20	-0.69
3429.75	Sm II	838 - 29986	0.11	0.019	-1.73
3435.27	Sm II	5318 - 34419	0.23	0.041	-1.38
3437.10	Sm II	2689 - 31775	0.27	0.047	-1.33
3438.06	Sm II	3053 - 32131	0.34	0.061	-1.22
3440.50	Sm II	5318 - 34375	0.92	0.16	-0.79
3449.56	Sm II	2689 - 31670	0.13	0.023	-1.64
3452.78	Sm II	3053 - 32007	0.17	0.030	-1.53
3454.97	Sm II	3499 - 32435	0.19	0.034	-1.47
3462.69	Sm II	5318 - 34189	0.31	0.055	-1.26
3464.43	Sm II	1489 - 30346	0.089	0.016	-1.79
3467.87	Sm II	5318 - 34145	0.61	0.11	-0.96
3473.96	Sm II	3053 - 31830	0.25	0.045	-1.34
3479.53	Sm II	2238 - 30969	0.20	0.036	-1.45
3492.62	Sm II	1489 - 30113	0.099	0.018	-1.74
3500.54	Sm II	4386 - 32945	0.44	0.081	-1.09
3506.85	Sm II	3499 - 32007	0.24	0.044	-1.35
3511.23	Sm II	838 - 29310	0.32	0.058	-1.23
3512.93	Sm II	5318 - 33776	0.56	0.10	-0.99
3525.51	Sm II	2689 - 31045	0.13	0.024	-1.62
3530.60	Sm II	1489 - 29805	0.34	0.063	-1.20

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3535.65	Sm II	3499 - 31775	0.50	0.094	-1.03
3542.46	Sm II	3910 - 32131	0.18	0.033	-1.48
3552.30	Sm II	0 - 28143	0.082	0.016	-1.81
3554.15	Sm II	2689 - 30817	0.35	0.066	-1.18
3556.74	Sm II	2238 - 30346	0.21	0.041	-1.39
3557.38	Sm II	327 - 28429	0.12	0.024	-1.63
3568.27	Sm II	3910 - 31926	8.4	1.6	0.20
3577.79	Sm II	0 - 27942	0.17	0.033	-1.48
3583.39	Sm II	1489 - 29388	0.31	0.059	-1.23
3584.26	Sm II	838 - 28730	0.14	0.026	-1.58
3591.74	Sm II	838 - 28672	0.067	0.013	-1.88
3592.60	Sm II	3053 - 30880	6.3	1.2	0.09
3593.73	Sm II	4386 - 32204	0.18	0.035	-1.45
3601.69	Sm II	1489 - 29246	0.32	0.062	-1.21
3604.28	Sm II	3910 - 31646	3.1	0.61	-0.21
3609.49	Sm II	2238 - 29935	3.9	0.76	-0.12
3615.24	Sm II	2003 - 29656	0.14	0.028	-1.56
3620.10	Sm II	327 - 27942	0.11	0.022	-1.66
3620.58	Sm II	3910 - 31522	0.43	0.085	-1.07
3621.23	Sm II	838 - 28445	1.3	0.25	-0.60
3622.50	Sm II	327 - 27924	0.11	0.022	-1.66
3623.32	Sm II	838 - 28429	0.18	0.036	-1.45
3627.01	Sm II	2238 - 29801	0.94	0.18	-0.73
3627.97	Sm II	838 - 28394	0.13	0.025	-1.60
3634.29	Sm II	1489 - 28997	3.0	0.59	-0.23
3634.93	Sm II	327 - 27830	0.15	0.030	-1.52
3642.76	Sm II	4386 - 31830	0.33	0.066	-1.18
3645.29	Sm II	1489 - 28914	0.31	0.063	-1.20
3645.39	Sm II	2689 - 30113	0.37	0.073	-1.14
3645.90	Sm II	1518 - 28939	0.15	0.029	-1.53
3649.53	Sm II	3053 - 30446	0.89	0.18	-0.75
3650.19	Sm II	2003 - 29391	0.34	0.067	-1.17
3651.00	Sm II	4386 - 31768	0.33	0.066	-1.18
3654.86	Sm II	2238 - 29591	0.14	0.028	-1.55
3659.62	Sm II	3499 - 30817	0.25	0.051	-1.30
3661.36	Sm II	327 - 27631	1.3	0.27	-0.58
3662.27	Sm II	2689 - 29986	0.20	0.040	-1.40
3662.90	Sm II	3053 - 30346	0.22	0.044	-1.35
3667.93	Sm II	2238 - 29494	0.35	0.070	-1.15
3670.84	Sm II	838 - 28073	1.5	0.30	-0.52
3674.07	Sm II	0 - 27210	0.091	0.019	-1.73
3688.42	Sm II	838 - 27942	0.18	0.036	-1.44
3690.93	Sm II	838 - 27924	0.056	0.011	-1.94
3692.22	Sm II	2238 - 29314	0.26	0.053	-1.27
3693.99	Sm II	0 - 27063	0.54	0.11	-0.96
3700.60	Sm II	3499 - 30514	0.37	0.075	-1.12
3701.56	Sm II	2238 - 29246	0.093	0.019	-1.72
3706.75	Sm II	3910 - 30880	0.67	0.14	-0.86
3707.17	Sm II	2689 - 29656	0.11	0.022	-1.66
3708.41	Sm II	327 - 27285	0.24	0.050	-1.30

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3708.65	Sm II	1489 - 28445	0.65	0.13	-0.87
3710.87	Sm II	1489 - 28429	0.11	0.023	-1.64
3711.54	Sm II	2003 - 28939	0.39	0.080	-1.10
3712.76	Sm II	2003 - 28930	0.28	0.058	-1.24
3718.88	Sm II	3053 - 29935	1.00	0.21	-0.68
3724.90	Sm II	327 - 27165	0.21	0.044	-1.36
3726.80	Sm II	1489 - 28314	0.13	0.026	-1.58
3727.38	Sm II	2689 - 29510	0.051	0.011	-1.98
3728.47	Sm II	5318 - 32131	3.2	0.66	-0.18
3731.26	Sm II	838 - 27631	1.2	0.25	-0.60
3735.98	Sm II	2238 - 28997	1.3	0.28	-0.56
3737.48	Sm II	3053 - 29801	0.33	0.069	-1.16
3743.87	Sm II	2689 - 29391	1.1	0.23	-0.63
3747.62	Sm II	2238 - 28914	0.39	0.082	-1.09
3751.57	Sm II	327 - 26974	0.075	0.016	-1.80
3754.86	Sm II	1518 - 28143	0.10	0.022	-1.66
3755.28	Sm II	2689 - 29310	0.72	0.15	-0.81
3758.45	Sm II	0 - 26599	0.19	0.040	-1.39
3760.04	Sm II	3053 - 29641	0.34	0.073	-1.14
3760.69	Sm II	1489 - 28072	1.2	0.25	-0.60
3762.59	Sm II	2003 - 28513	0.48	0.10	-0.99
3764.37	Sm II	2689 - 29246	1.0	0.21	-0.67
3767.36	Sm II	3910 - 30446	0.60	0.13	-0.89
3770.73	Sm II	5318 - 31830	0.25	0.053	-1.28
3774.29	Sm II	2238 - 28726	0.23	0.048	-1.32
3774.68	Sm II	0 - 26485	0.077	0.016	-1.79
3779.56	Sm II	5318 - 31768	0.24	0.052	-1.28
3780.93	Sm II	3053 - 29494	0.41	0.088	-1.06
3782.42	Sm II	4386 - 30817	0.13	0.028	-1.55
3783.06	Sm II	2003 - 28429	0.066	0.014	-1.85
3783.36	Sm II	1518 - 27942	0.083	0.018	-1.75
3787.20	Sm II	327 - 26724	0.14	0.030	-1.52
3788.12	Sm II	2003 - 28394	1.0	0.22	-0.65
3792.02	Sm II	327 - 26690	0.12	0.025	-1.60
3793.97	Sm II	838 - 27188	0.80	0.17	-0.76
3797.28	Sm II	838 - 27165	0.21	0.046	-1.34
3799.54	Sm II	1518 - 27830	0.31	0.066	-1.18
3800.37	Sm II	3499 - 29805	0.28	0.061	-1.22
3800.89	Sm II	2238 - 28540	0.59	0.13	-0.89
3805.63	Sm II	838 - 27108	0.16	0.034	-1.47
3806.77	Sm II	3053 - 29314	0.12	0.027	-1.57
3807.92	Sm II	0 - 26254	0.072	0.016	-1.80
3808.46	Sm II	2689 - 28939	0.35	0.077	-1.12
3809.75	Sm II	2689 - 28930	0.26	0.057	-1.24
3809.88	Sm II	838 - 27078	0.16	0.034	-1.47
3812.07	Sm II	838 - 27063	0.25	0.054	-1.27
3814.63	Sm II	2238 - 28445	0.31	0.067	-1.17
3824.18	Sm II	1489 - 27631	0.31	0.067	-1.17
3826.20	Sm II	4386 - 30514	2.1	0.45	-0.34
3830.29	Sm II	838 - 26938	0.25	0.055	-1.26

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3831.50	Sm II	3499 - 29591	1.1	0.25	-0.60
3833.83	Sm II	2238 - 28314	0.37	0.082	-1.09
3835.72	Sm II	1489 - 27553	0.21	0.046	-1.33
3838.94	Sm II	2689 - 28730	0.40	0.088	-1.06
3840.45	Sm II	327 - 26358	0.16	0.036	-1.45
3842.36	Sm II	2238 - 28256	0.18	0.041	-1.39
3843.50	Sm II	3499 - 29510	1.6	0.35	-0.46
3843.77	Sm II	2003 - 28012	0.17	0.038	-1.42
3844.50	Sm II	1489 - 27493	0.059	0.013	-1.88
3847.51	Sm II	2689 - 28672	0.41	0.092	-1.04
3851.88	Sm II	2238 - 28192	0.29	0.064	-1.19
3855.90	Sm II	327 - 26254	0.31	0.070	-1.15
3857.91	Sm II	2238 - 28151	0.32	0.072	-1.14
3862.05	Sm II	838 - 26724	0.30	0.067	-1.17
3862.23	Sm II	2689 - 28573	0.26	0.059	-1.23
3865.24	Sm II	327 - 26191	0.12	0.028	-1.56
3865.69	Sm II	3053 - 28914	0.067	0.015	-1.83
3871.78	Sm II	1489 - 27310	0.42	0.095	-1.02
3873.22	Sm II	3499 - 29310	0.12	0.028	-1.55
3875.54	Sm II	1489 - 27285	0.30	0.067	-1.18
3880.77	Sm II	838 - 26599	0.35	0.079	-1.10
3881.38	Sm II	2689 - 28445	0.33	0.075	-1.12
3883.80	Sm II	2689 - 28429	0.019	0.0044	-2.36
3885.29	Sm II	3910 - 29641	3.8	0.87	-0.06
3885.91	Sm II	4386 - 30113	0.28	0.064	-1.19
3889.16	Sm II	2689 - 28394	0.48	0.11	-0.96
3890.08	Sm II	1489 - 27188	0.32	0.072	-1.14
3891.21	Sm II	1518 - 27210	0.17	0.038	-1.42
3894.05	Sm II	3053 - 28726	0.32	0.072	-1.14
3896.98	Sm II	327 - 25980	0.59	0.13	-0.87
3897.26	Sm II	5318 - 30969	0.070	0.016	-1.80
3900.89	Sm II	2003 - 27631	0.16	0.036	-1.45
3902.32	Sm II	1489 - 27108	0.034	0.0077	-2.11
3906.81	Sm II	1489 - 27078	0.027	0.0061	-2.21
3910.09	Sm II	2689 - 28256	0.056	0.013	-1.89
3910.92	Sm II	5318 - 30880	0.068	0.016	-1.80
3912.98	Sm II	4386 - 29935	0.12	0.028	-1.56
3917.44	Sm II	838 - 26358	0.23	0.053	-1.28
3918.62	Sm II	1489 - 27001	0.085	0.020	-1.71
3922.05	Sm II	2003 - 27493	0.098	0.023	-1.65
3922.40	Sm II	3053 - 28540	1.7	0.40	-0.40
3922.70	Sm II	1489 - 26974	0.039	0.0090	-2.04
3928.28	Sm II	1489 - 26938	0.84	0.19	-0.71
3931.16	Sm II	3499 - 28930	0.028	0.0066	-2.18
3932.97	Sm II	4386 - 29805	0.087	0.020	-1.69
3933.58	Sm II	4386 - 29801	0.29	0.067	-1.17
3935.18	Sm II	3910 - 29314	0.044	0.010	-1.99
3935.76	Sm II	2238 - 27638	0.25	0.059	-1.23
3938.43	Sm II	2689 - 28073	0.018	0.0042	-2.38
3939.64	Sm II	838 - 26214	0.018	0.0043	-2.37

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3941.87	Sm II	0 - 25361	0.35	0.082	-1.08
3943.24	Sm II	838 - 26191	0.22	0.051	-1.29
3946.51	Sm II	1489 - 26821	0.21	0.050	-1.30
3947.84	Sm II	2689 - 28012	0.18	0.041	-1.39
3948.11	Sm II	838 - 26160	0.26	0.061	-1.21
3954.20	Sm II	1489 - 26772	0.050	0.012	-1.93
3958.72	Sm II	2689 - 27942	0.069	0.016	-1.79
3962.24	Sm II	3499 - 28730	0.065	0.015	-1.82
3966.04	Sm II	2003 - 27210	0.30	0.070	-1.16
3966.34	Sm II	4386 - 29591	0.083	0.020	-1.71
3967.68	Sm II	5318 - 30514	0.57	0.14	-0.87
3970.53	Sm II	0 - 25178	0.20	0.047	-1.33
3971.40	Sm II	3499 - 28672	1.1	0.25	-0.60
3975.22	Sm II	2238 - 27387	0.082	0.019	-1.71
3976.27	Sm II	838 - 25980	0.32	0.077	-1.11
3976.43	Sm II	2689 - 27830	0.59	0.14	-0.85
3979.20	Sm II	4386 - 29510	0.88	0.21	-0.68
3983.14	Sm II	3053 - 28151	0.46	0.11	-0.96
3986.00	Sm II	1518 - 26599	0.060	0.014	-1.85
3986.68	Sm II	1489 - 26566	0.30	0.070	-1.15
3987.43	Sm II	2238 - 27310	0.18	0.043	-1.36
3990.00	Sm II	0 - 25056	0.39	0.092	-1.04
3993.31	Sm II	327 - 25361	0.21	0.050	-1.30
4003.46	Sm II	2003 - 26974	0.13	0.030	-1.52
4004.26	Sm II	1518 - 26485	0.020	0.0049	-2.31
4006.60	Sm II	838 - 25790	0.062	0.015	-1.83
4006.82	Sm II	2238 - 27188	0.042	0.010	-1.99
4007.48	Sm II	3499 - 28445	0.32	0.078	-1.11
4008.10	Sm II	2689 - 27631	0.080	0.019	-1.71
4011.73	Sm II	0 - 24920	0.022	0.0054	-2.27
4015.77	Sm II	3499 - 28394	0.040	0.0096	-2.02
4019.84	Sm II	2238 - 27108	0.056	0.013	-1.87
4019.98	Sm II	1489 - 26358	0.11	0.026	-1.59
4022.73	Sm II	327 - 25178	0.024	0.0059	-2.23
4023.23	Sm II	327 - 25175	0.24	0.059	-1.23
4035.11	Sm II	2689 -- 27464	0.39	0.094	-1.03
4037.10	Sm II	2238 - 27001	0.081	0.020	-1.70
4038.10	Sm II	3499 - 28256	0.096	0.024	-1.63
4041.68	Sm II	1518 - 26254	0.22	0.054	-1.27
4042.72	Sm II	327 - 25056	0.20	0.048	-1.32
4042.90	Sm II	838 - 25566	0.27	0.066	-1.18
4045.05	Sm II	838 - 25553	0.17	0.042	-1.38
4046.16	Sm II	838 - 25546	0.13	0.033	-1.48
4047.16	Sm II	1489 - 26191	0.27	0.066	-1.18
4047.35	Sm II	2238 - 26938	0.047	0.011	-1.94
4048.62	Sm II	3499 - 28192	0.13	0.033	-1.49
4049.58	Sm II	2003 - 26690	0.031	0.0076	-2.12
4049.81	Sm II	0 - 24686	0.14	0.035	-1.46
4058.87	Sm II	3910 - 28540	0.31	0.078	-1.11
4063.54	Sm II	327 - 24929	0.14	0.036	-1.45

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4064.58	Sm II	2689 - 27285	0.70	0.17	-0.76
4066.74	Sm II	2238 - 26821	0.36	0.088	-1.05
4068.33	Sm II	3499 - 28073	0.44	0.11	-0.96
4075.84	Sm II	4386 - 28914	0.64	0.16	-0.79
4076.65	Sm II	838 - 25361	0.082	0.020	-1.69
4076.86	Sm II	327 - 24848	0.022	0.0056	-2.25
4080.56	Sm II	2689 - 27188	0.12	0.029	-1.54
4081.97	Sm II	1489 - 25980	0.046	0.012	-1.94
4082.60	Sm II	5318 - 29805	0.42	0.11	-0.98
4083.24	Sm II	5318 - 29801	0.090	0.023	-1.65
4083.58	Sm II	2003 - 26485	0.11	0.028	-1.55
4084.40	Sm II	2689 - 27165	0.11	0.027	-1.57
4092.27	Sm II	0 - 24430	0.23	0.058	-1.23
4093.04	Sm II	3499 - 27924	0.031	0.0078	-2.11
4094.05	Sm II	2689 - 27108	0.14	0.036	-1.45
4098.97	Sm II	2689 - 27078	0.056	0.014	-1.85
4104.13	Sm II	327 - 24686	0.057	0.014	-1.84
4106.62	Sm II	4386 - 28730	0.067	0.017	-1.77
4107.28	Sm II	838 - 25178	0.23	0.057	-1.24
4107.80	Sm II	838 - 25175	0.016	0.0042	-2.38
4108.32	Sm II	3053 - 27387	0.069	0.017	-1.76
4109.40	Sm II	2238 - 26566	0.17	0.043	-1.36
4110.19	Sm II	5318 - 29641	0.28	0.070	-1.16
4113.90	Sm II	1489 - 25790	0.14	0.035	-1.46
4116.46	Sm II	2689 - 26974	0.089	0.023	-1.65
4118.55	Sm II	5318 - 29591	1.9	0.47	-0.32
4119.57	Sm II	2238 - 26506	0.060	0.015	-1.82
4121.36	Sm II	3053 - 27310	0.21	0.054	-1.27
4121.54	Sm II	327 - 24583	0.028	0.0071	-2.15
4122.51	Sm II	2003 - 26254	0.11	0.027	-1.57
4123.96	Sm II	3910 - 28151	0.46	0.12	-0.93
4129.23	Sm II	2003 - 26214	0.11	0.027	-1.57
4133.19	Sm II	2003 - 26191	0.039	0.0099	-2.01
4135.14	Sm II	5318 - 29494	0.24	0.061	-1.21
4138.97	Sm II	4386 - 28540	0.037	0.0096	-2.02
4146.75	Sm II	1489 - 25598	0.051	0.013	-1.88
4147.71	Sm II	327 - 24430	0.074	0.019	-1.72
4149.83	Sm II	838 - 24929	0.21	0.055	-1.26
4152.21	Sm II	1489 - 25566	0.37	0.096	-1.02
4153.33	Sm II	5318 - 29388	0.49	0.13	-0.90
4155.22	Sm II	4386 - 28445	0.40	0.10	-0.99
4156.25	Sm II	3499 - 27553	0.073	0.019	-1.72
4159.40	Sm II	1518 - 25553	0.032	0.0084	-2.08
4159.51	Sm II	2689 - 26724	0.045	0.012	-1.93
4163.72	Sm II	838 - 24848	0.027	0.0069	-2.16
4169.48	Sm II	2003 - 25980	0.29	0.075	-1.12
4171.57	Sm II	3499 - 27464	0.22	0.058	-1.24
4174.43	Sm II	3053 - 27001	0.091	0.024	-1.62
4178.02	Sm II	4386 - 28314	0.30	0.080	-1.10
4181.10	Sm II	2689 - 26599	0.23	0.059	-1.23

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4183.76	Sm II	327 - 24222	0.12	0.030	-1.52
4188.13	Sm II	4386 - 28256	0.70	0.18	-0.74
4192.16	Sm II	838 - 24686	0.040	0.011	-1.97
4197.90	Sm II	1489 - 25304	0.013	0.0035	-2.46
4199.45	Sm II	4386 - 28192	0.18	0.047	-1.33
4201.22	Sm II	2689 - 26485	0.011	0.0029	-2.54
4202.92	Sm II	3910 - 27696	0.38	0.100	-1.00
4203.05	Sm II	3499 - 27285	0.57	0.15	-0.82
4204.82	Sm II	3053 - 26828	0.023	0.0062	-2.21
4206.13	Sm II	3053 - 26821	0.30	0.080	-1.10
4206.62	Sm II	4386 - 28151	0.18	0.047	-1.33
4210.35	Sm II	838 - 24583	0.16	0.043	-1.37
4213.05	Sm II	3910 - 27639	0.059	0.016	-1.80
4220.14	Sm II	3499 - 27188	0.089	0.024	-1.62
4220.66	Sm II	4386 - 28072	0.48	0.13	-0.89
4223.70	Sm II	2689 - 26358	0.059	0.016	-1.80
4224.23	Sm II	3499 - 27165	0.026	0.0069	-2.16
4225.33	Sm II	1518 - 25178	0.30	0.079	-1.10
4229.70	Sm II	327 - 23962	0.15	0.040	-1.39
4234.57	Sm II	3499 - 27108	0.31	0.083	-1.08
4236.74	Sm II	5318 - 28914	0.97	0.26	-0.58
4237.66	Sm II	838 - 24430	0.12	0.031	-1.50
4244.70	Sm II	2238 - 25790	0.21	0.057	-1.24
4245.18	Sm II	2003 - 25553	0.038	0.010	-1.99
4247.39	Sm II	1518 - 25056	0.014	0.0039	-2.41
4249.55	Sm II	2689 - 26214	0.080	0.022	-1.67
4251.78	Sm II	3053 - 26566	0.11	0.029	-1.54
4253.72	Sm II	3499 - 27001	0.028	0.0077	-2.11
4256.39	Sm II	3053 - 26540	0.88	0.24	-0.62
4258.58	Sm II	3499 - 26974	0.099	0.027	-1.57
4259.39	Sm II	2689 - 26160	0.020	0.0054	-2.27
4262.68	Sm II	3053 - 26506	0.53	0.14	-0.84
4265.08	Sm II	1489 - 24930	0.14	0.037	-1.43
4269.77	Sm II	2003 - 25417	0.011	0.0031	-2.50
4270.73	Sm II	1489 - 24898	0.014	0.0038	-2.42
4270.84	Sm II	5318 - 28726	0.12	0.032	-1.50
4272.01	Sm II	1518 - 24920	0.014	0.0038	-2.42
4279.68	Sm II	2238 - 25598	0.39	0.11	-0.97
4279.94	Sm II	2003 - 25361	0.072	0.020	-1.70
4280.32	Sm II	838 - 24194	0.019	0.0054	-2.27
4280.79	Sm II	3910 - 27263	1.2	0.32	-0.50
4285.50	Sm II	2238 - 25566	0.017	0.0046	-2.34
4286.64	Sm II	3499 - 26821	0.16	0.045	-1.35
4292.18	Sm II	2689 - 25980	0.13	0.036	-1.45
4295.74	Sm II	3499 - 26772	0.027	0.0075	-2.13
4299.34	Sm II	4386 - 27639	0.052	0.014	-1.84
4304.94	Sm II	5318 - 28540	0.24	0.068	-1.17
4309.01	Sm II	1489 - 24690	0.23	0.063	-1.20
4313.73	Sm II	2003 - 25178	0.052	0.014	-1.84
4318.94	Sm II	2238 - 25385	0.60	0.17	-0.78

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4323.28	Sm II	838 - 23962	0.12	0.034	-1.46
4327.51	Sm II	2689 - 25790	0.015	0.0043	-2.36
4329.02	Sm II	1489 - 24583	0.44	0.12	-0.91
4334.15	Sm II	2238 - 25304	0.40	0.11	-0.94
4345.86	Sm II	838 - 23842	0.11	0.032	-1.49
4346.49	Sm II	4386 - 27387	0.049	0.014	-1.86
4347.80	Sm II	3053 - 26046	0.42	0.12	-0.93
4350.46	Sm II	3910 - 26889	0.27	0.076	-1.12
4360.72	Sm II	2003 - 24929	0.15	0.044	-1.36
4361.07	Sm II	4386 - 27310	0.12	0.034	-1.47
4362.04	Sm II	3910 - 26828	0.38	0.11	-0.96
4363.45	Sm II	1518 - 24430	0.053	0.015	-1.82
4368.03	Sm II	3053 - 25940	0.18	0.053	-1.28
4369.92	Sm II	2689 - 25566	0.068	0.020	-1.71
4370.48	Sm II	5318 - 28192	0.031	0.0088	-2.06
4373.46	Sm II	3499 - 26358	0.18	0.053	-1.28
4374.98	Sm II	327 - 23177	0.055	0.016	-1.80
4378.24	Sm II	5318 - 28151	0.61	0.17	-0.76
4384.29	Sm II	4386 - 27188	0.15	0.045	-1.35
4390.86	Sm II	1489 - 24257	0.37	0.11	-0.97
4392.60	Sm II	0 - 22759	0.0031	0.00090	-3.05
4399.88	Sm II	4386 - 27108	0.046	0.013	-1.88
4403.06	Sm II	1489 - 24194	0.18	0.053	-1.27
4403.36	Sm II	1518 - 24222	0.094	0.027	-1.56
4405.67	Sm II	3499 - 26191	0.015	0.0043	-2.37
4407.52	Sm II	2003 - 24686	0.015	0.0045	-2.35
4409.33	Sm II	2689 - 25361	0.16	0.047	-1.32
4411.83	Sm II	2238 - 24898	0.033	0.0095	-2.02
4417.58	Sm II	3910 - 26540	0.17	0.049	-1.31
4420.53	Sm II	2689 - 25304	0.46	0.13	-0.87
4421.14	Sm II	3053 - 25665	0.33	0.097	-1.01
4424.34	Sm II	3910 - 26506	1.3	0.38	-0.42
4427.58	Sm II	2003 - 24583	0.045	0.013	-1.88
4427.81	Sm II	2238 - 24816	0.020	0.0059	-2.23
4433.88	Sm II	3499 - 26046	0.62	0.18	-0.74
4434.32	Sm II	3053 - 25598	0.60	0.18	-0.75
4446.96	Sm II	3499 - 25980	0.017	0.0050	-2.30
4452.73	Sm II	2238 - 24690	0.35	0.10	-0.98
4454.63	Sm II	4386 - 26828	0.57	0.17	-0.77
4456.11	Sm II	4386 - 26821	0.043	0.013	-1.90
4458.52	Sm II	838 - 23261	0.18	0.054	-1.27
4467.34	Sm II	5318 - 27696	1.4	0.41	-0.39
4472.43	Sm II	1489 - 23842	0.098	0.030	-1.53
4473.02	Sm II	2238 - 24588	0.16	0.048	-1.32
4475.18	Sm II	838 - 23177	0.013	0.0038	-2.42
4495.14	Sm II	2689 - 24929	0.0067	0.0020	-2.69
4499.48	Sm II	2003 - 24222	0.086	0.026	-1.58
4501.38	Sm II	2689 - 24898	0.017	0.0051	-2.30
4505.05	Sm II	2003 - 24194	0.041	0.012	-1.90
4511.83	Sm II	1489 - 23647	0.11	0.034	-1.47

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4519.63	Sm II	4386 - 26506	0.40	0.12	-0.92
4523.04	Sm II	327 - 22429	0.063	0.019	-1.72
4523.91	Sm II	3499 - 25598	0.22	0.069	-1.16
4536.51	Sm II	838 - 22875	0.043	0.013	-1.88
4537.95	Sm II	3910 - 25940	0.27	0.084	-1.08
4540.19	Sm II	2238 - 24257	0.070	0.022	-1.66
4543.95	Sm II	2689 - 24690	0.22	0.068	-1.17
4544.83	Sm II	2689 - 24686	0.028	0.0086	-2.07
4545.81	Sm II	5318 - 27310	0.017	0.0051	-2.29
4552.66	Sm II	2003 - 23962	0.091	0.028	-1.55
4554.45	Sm II	838 - 22789	0.042	0.013	-1.89
4560.43	Sm II	327 - 22248	0.032	0.0100	-2.00
4561.19	Sm II	3499 - 25417	0.0059	0.0018	-2.74
4564.10	Sm II	0 - 21904	0.0073	0.0023	-2.64
4566.21	Sm II	2689 - 24583	0.12	0.039	-1.41
4577.69	Sm II	2003 - 23842	0.13	0.040	-1.40
4584.83	Sm II	3499 - 25304	0.18	0.057	-1.24
4591.82	Sm II	1489 - 23261	0.054	0.017	-1.77
4593.54	Sm II	3053 - 24816	0.11	0.034	-1.47
4595.29	Sm II	3910 - 25665	0.20	0.064	-1.20
4598.35	Sm II	2689 - 24430	0.022	0.0071	-2.15
4604.18	Sm II	327 - 22040	0.029	0.0091	-2.04
4606.51	Sm II	0 - 21702	0.035	0.011	-1.96
4613.50	Sm II	2689 - 24358	0.018	0.0059	-2.23
4615.44	Sm II	4386 - 26046	0.12	0.038	-1.42
4615.69	Sm II	1518 - 23177	0.084	0.027	-1.57
4616.49	Sm II	0 - 21655	0.0034	0.0011	-2.96
4624.97	Sm II	10214 - 31830	0.048	0.016	-1.81
4630.21	Sm II	838 - 22429	0.021	0.0069	-2.16
4642.24	Sm II	3053 - 24588	0.24	0.076	-1.12
4646.68	Sm II	2238 - 23753	0.062	0.020	-1.70
4647.53	Sm II	5318 - 26828	0.044	0.014	-1.84
4648.16	Sm II	0 - 21508	0.026	0.0086	-2.07
4655.13	Sm II	3910 - 25385	0.049	0.016	-1.79
4665.13	Sm II	3499 - 24929	0.022	0.0071	-2.15
4669.40	Sm II	838 - 22248	0.10	0.033	-1.48
4669.65	Sm II	2238 - 23647	0.13	0.042	-1.38
4674.60	Sm II	1489 - 22875	0.27	0.088	-1.05
4676.91	Sm II	327 - 21702	0.12	0.040	-1.39
4682.69	Sm II	3499 - 24848	0.034	0.011	-1.95
4687.18	Sm II	327 - 21655	0.066	0.022	-1.66
4689.57	Sm II	327 - 21645	0.0069	0.0023	-2.64
4693.63	Sm II	1489 - 22789	0.031	0.010	-1.99
4699.34	Sm II	2689 - 23962	0.040	0.013	-1.88
4704.40	Sm II	0 - 21251	0.086	0.028	-1.55
4710.64	Sm II	5318 - 26540	0.042	0.014	-1.86
4713.06	Sm II	4386 - 25598	0.15	0.050	-1.30
4714.62	Sm II	3053 - 24257	0.029	0.0097	-2.01
4715.26	Sm II	838 - 22040	0.025	0.0084	-2.07
4717.72	Sm II	3499 - 24690	0.091	0.030	-1.52

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4718.33	Sm II	5318 - 26506	0.14	0.046	-1.34
4719.84	Sm II	327 - 21508	0.047	0.016	-1.80
4720.12	Sm II	4386 - 25566	0.018	0.0062	-2.21
4721.39	Sm II	2003 - 23177	0.0081	0.0027	-2.57
4726.02	Sm II	2689 - 23842	0.042	0.014	-1.85
4741.72	Sm II	3499 - 24583	0.020	0.0068	-2.17
4745.68	Sm II	838 - 21904	0.091	0.031	-1.51
4755.37	Sm II	2238 - 23261	0.011	0.0038	-2.42
4774.15	Sm II	1489 - 22429	0.024	0.0083	-2.08
4777.85	Sm II	327 - 21251	0.032	0.011	-1.97
4781.84	Sm II	3910 - 24816	0.030	0.010	-1.98
4791.58	Sm II	838 - 21702	0.043	0.015	-1.83
4804.90	Sm II	838 - 21645	0.0028	0.00098	-3.01
4815.81	Sm II	1489 - 22248	0.093	0.032	-1.49
4816.01	Sm II	3499 - 24257	0.033	0.012	-1.93
4829.57	Sm II	3053 - 23753	0.042	0.015	-1.83
4833.32	Sm II	8046 - 28730	0.053	0.018	-1.73
4834.62	Sm II	3910 - 24588	0.033	0.011	-1.94
4836.67	Sm II	838 - 21508	0.0060	0.0021	-2.68
4837.65	Sm II	10214 - 30880	0.097	0.034	-1.47
4844.21	Sm II	2238 - 22875	0.081	0.029	-1.54
4847.76	Sm II	5318 - 25940	0.084	0.030	-1.53
4854.36	Sm II	3053 - 23647	0.038	0.013	-1.87
4859.55	Sm II	2689 - 23261	0.026	0.0090	-2.04
4869.98	Sm II	9407 - 29935	0.15	0.053	-1.27
4893.35	Sm II	4386 - 24816	0.035	0.013	-1.90
4894.30	Sm II	2003 - 22429	0.0079	0.0028	-2.55
4900.73	Sm II	8046 - 28445	0.049	0.018	-1.75
4901.90	Sm II	9407 - 29801	0.045	0.016	-1.79
4913.25	Sm II	5318 - 25665	0.20	0.074	-1.13
4914.30	Sm II	3499 - 23842	0.0047	0.0017	-2.77
4920.38	Sm II	8679 - 28997	0.12	0.042	-1.38
4923.83	Sm II	4386 - 24690	0.026	0.0094	-2.03
4929.56	Sm II	5318 - 25598	0.017	0.0061	-2.22
4936.03	Sm II	3499 - 23753	0.020	0.0073	-2.14
4938.10	Sm II	2003 - 22248	0.035	0.013	-1.90
4948.63	Sm II	4386 - 24588	0.10	0.037	-1.43
4952.37	Sm II	2689 - 22875	0.041	0.015	-1.82
4953.03	Sm II	1518 - 21702	0.011	0.0041	-2.39
4961.94	Sm II	3499 - 23647	0.077	0.029	-1.54
4964.56	Sm II	1518 - 21655	0.011	0.0041	-2.39
4972.16	Sm II	7525 - 27631	0.080	0.030	-1.53
4973.74	Sm II	2689 - 22789	0.013	0.0047	-2.33
4981.73	Sm II	5318 - 25385	0.032	0.012	-1.93
4989.44	Sm II	2003 - 22040	0.010	0.0038	-2.41
4992.02	Sm II	8046 - 28072	0.11	0.042	-1.37
5001.22	Sm II	1518 - 21508	0.011	0.0040	-2.40
5016.61	Sm II	7135 - 27063	0.051	0.019	-1.71
5023.50	Sm II	2003 - 21904	0.016	0.0060	-2.22
5028.44	Sm II	12045 - 31926	0.68	0.26	-0.59

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5031.18	Sm II	12045 - 31916	0.13	0.051	-1.29
5052.76	Sm II	11094 - 30880	0.71	0.27	-0.57
5057.74	Sm II	8679 - 28445	0.11	0.044	-1.36
5064.24	Sm II	2689 - 22429	0.0093	0.0036	-2.44
5066.86	Sm II	11791 - 31522	0.091	0.035	-1.45
5069.46	Sm II	10214 - 29935	0.47	0.18	-0.75
5087.08	Sm II	2003 - 21655	0.0075	0.0029	-2.53
5088.97	Sm II	12790 - 32435	0.12	0.046	-1.34
5100.22	Sm II	12045 - 31646	0.76	0.30	-0.53
5103.09	Sm II	9407 - 28997	0.54	0.21	-0.68
5104.48	Sm II	8046 - 27631	0.20	0.080	-1.10
5116.70	Sm II	7525 - 27063	0.17	0.065	-1.19
5155.03	Sm II	8679 - 28072	0.58	0.23	-0.63
5157.07	Sm II	10960 - 30346	0.20	0.080	-1.10
5166.06	Sm II	11094 - 30446	0.25	0.10	-1.00
5202.73	Sm II	2689 - 21904	0.017	0.0067	-2.17
5252.77	Sm II	8046 - 27078	0.045	0.019	-1.73
5312.23	Sm II	2689 - 21508	0.0094	0.0040	-2.40
5478.29	Sm II	10181 - 28429	0.048	0.022	-1.66
5537.07	Sm II	13466 - 31522	0.13	0.061	-1.21
5600.86	Sm II	11791 - 29641	0.14	0.065	-1.19
5738.01	Sm II	14504 - 31926	0.15	0.076	-1.12
5743.35	Sm II	14115 - 31522	0.24	0.12	-0.92
5759.52	Sm II	12988 - 30346	0.15	0.074	-1.13
5786.98	Sm II	13604 - 30880	0.29	0.15	-0.84
5801.66	Sm II	10960 - 28192	0.016	0.0082	-2.08
5831.02	Sm II	12790 - 29935	0.13	0.068	-1.17
5831.74	Sm II	14504 - 31646	0.11	0.055	-1.26
5836.37	Sm II	8046 - 25175	0.035	0.018	-1.75
5842.60	Sm II	8679 - 25790	0.021	0.011	-1.97
5848.67	Sm II	12842 - 29935	0.067	0.035	-1.46
5860.42	Sm II	7135 - 24194	0.0089	0.0046	-2.34
5878.11	Sm II	10181 - 27188	0.019	0.0097	-2.01
5897.39	Sm II	12045 - 28997	0.10	0.054	-1.27
5932.90	Sm II	12790 - 29641	0.073	0.039	-1.41
5938.90	Sm II	7525 - 24358	0.024	0.012	-1.90
5957.52	Sm II	9410 - 26191	0.024	0.013	-1.90
5963.22	Sm II	12232 - 28997	0.061	0.033	-1.48
5965.71	Sm II	10874 - 27631	0.11	0.057	-1.24
5968.82	Sm II	11791 - 28540	0.077	0.041	-1.38
5994.64	Sm II	11395 - 28072	0.048	0.026	-1.59
6011.22	Sm II	11799 - 28429	0.053	0.029	-1.54
6017.39	Sm II	10214 - 26828	0.024	0.013	-1.88
6033.23	Sm II	9410 - 25980	0.019	0.010	-1.99
6110.66	Sm II	11791 - 28151	0.085	0.048	-1.32
6114.58	Sm II	10960 - 27310	0.028	0.016	-1.81
6123.60	Sm II	10214 - 26540	0.027	0.015	-1.82
6124.88	Sm II	12988 - 29310	0.039	0.022	-1.65
6149.10	Sm II	12988 - 29246	0.078	0.044	-1.36
6157.55	Sm II	11395 - 27631	0.025	0.014	-1.85

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
6160.42	Sm II	10960 - 27188	0.033	0.019	-1.73
6168.33	Sm II	12790 - 28997	0.029	0.017	-1.78
6179.82	Sm II	10181 - 26358	0.026	0.015	-1.83
6181.05	Sm II	13466 - 29641	0.055	0.031	-1.51
6182.89	Sm II	11094 - 27263	0.045	0.026	-1.59
6188.00	Sm II	9410 - 25566	0.021	0.012	-1.92
6237.66	Sm II	12045 - 28072	0.057	0.033	-1.48
6244.21	Sm II	8679 - 24690	0.019	0.011	-1.95
6246.76	Sm II	8579 - 24583	0.032	0.019	-1.73
6256.66	Sm II	9407 - 25385	0.040	0.023	-1.63
6267.28	Sm II	9410 - 25361	0.093	0.055	-1.26
6289.90	Sm II	9410 - 25304	0.023	0.014	-1.87
6291.82	Sm II	11395 - 27285	0.080	0.047	-1.32
6301.12	Sm II	10181 - 26046	0.024	0.014	-1.84
6302.40	Sm II	12567 - 28429	0.039	0.024	-1.63
6307.06	Sm II	8579 - 24430	0.026	0.015	-1.82
6327.47	Sm II	10181 - 25980	0.079	0.048	-1.32
6368.28	Sm II	12842 - 28540	0.049	0.030	-1.52
6389.85	Sm II	9410 - 25056	0.025	0.015	-1.82
6390.81	Sm II	8579 - 24222	0.017	0.010	-1.98
6406.24	Sm II	10960 - 26566	0.015	0.0093	-2.03
6417.50	Sm II	8679 - 24257	0.020	0.012	-1.91
6426.64	Sm II	14085 - 29641	0.14	0.084	-1.07
6431.00	Sm II	10960 - 26506	0.028	0.017	-1.76
6431.96	Sm II	11395 - 26938	0.015	0.0092	-2.04
6455.60	Sm II	11799 - 27285	0.023	0.015	-1.83
6470.46	Sm II	10214 - 25665	0.019	0.012	-1.93
6472.34	Sm II	11094 - 26540	0.057	0.036	-1.45
6484.52	Sm II	10181 - 25598	0.037	0.023	-1.64
6487.62	Sm II	9407 - 24816	0.023	0.015	-1.83
6490.82	Sm II	12790 - 28192	0.061	0.038	-1.42
6498.67	Sm II	8579 - 23962	0.023	0.015	-1.83
6502.00	Sm II	12567 - 27942	0.017	0.011	-1.97
6542.76	Sm II	11799 - 27078	0.078	0.050	-1.30
6544.57	Sm II	9410 - 24686	0.014	0.0092	-2.04
6549.77	Sm II	8579 - 23842	0.011	0.0072	-2.14
6569.31	Sm II	12045 - 27263	0.24	0.15	-0.81
6570.67	Sm II	8046 - 23261	0.019	0.012	-1.91
6585.21	Sm II	9407 - 24588	0.034	0.022	-1.66
6589.72	Sm II	10214 - 25385	0.11	0.073	-1.14
6601.83	Sm II	12045 - 27188	0.070	0.046	-1.34
6604.56	Sm II	14504 - 29640	0.33	0.21	-0.67
6630.61	Sm II	12232 - 27310	0.024	0.016	-1.80
6632.28	Sm II	8679 - 23753	0.027	0.018	-1.75
6651.61	Sm II	11791 - 26821	0.032	0.021	-1.68
6656.19	Sm II	9410 - 24430	0.022	0.014	-1.84
6667.22	Sm II	10181 - 25175	0.017	0.011	-1.95
6679.21	Sm II	8679 - 23647	0.043	0.029	-1.54
6681.53	Sm II	11395 - 26358	0.023	0.016	-1.81
6693.55	Sm II	13604 - 28540	0.17	0.12	-0.93

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
6694.69	Sm II	12232 - 27165	0.019	0.013	-1.90
6707.45	Sm II	7525 - 22429	0.0093	0.0063	-2.20
6712.62	Sm II	12045 - 26938	0.022	0.015	-1.83
6731.84	Sm II	9407 - 24257	0.088	0.060	-1.22
6734.06	Sm II	11094 - 25940	0.084	0.057	-1.25
6734.81	Sm II	12045 - 26889	0.066	0.045	-1.35
6741.47	Sm II	8046 - 22875	0.028	0.019	-1.72
6754.68	Sm II	11799 - 26599	0.025	0.017	-1.76
6766.52	Sm II	11791 - 26566	0.020	0.014	-1.86
6778.19	Sm II	11791 - 26540	0.030	0.021	-1.69
6778.61	Sm II	10181 - 24929	0.038	0.026	-1.58
6781.17	Sm II	8046 - 22789	0.0087	0.0060	-2.22
6790.00	Sm II	7525 - 22248	0.027	0.019	-1.73
6792.55	Sm II	12567 - 27285	0.025	0.017	-1.77
6794.20	Sm II	11791 - 26506	0.14	0.096	-1.02
6829.86	Sm II	10960 - 25598	0.031	0.022	-1.67
6844.71	Sm II	10960 - 25566	0.061	0.043	-1.37
6846.54	Sm II	10214 - 24816	0.025	0.017	-1.76
6848.16	Sm II	12567 - 27165	0.024	0.017	-1.77
6854.50	Sm II	11395 - 25980	0.017	0.012	-1.92
6856.03	Sm II	8679 - 23261	0.044	0.031	-1.51
6862.82	Sm II	7135 - 21702	0.015	0.011	-1.96
6872.43	Sm II	13604 - 28151	0.064	0.045	-1.35
6875.27	Sm II	12567 - 27108	0.017	0.012	-1.93
6885.16	Sm II	12790 - 27310	0.050	0.036	-1.45
6900.28	Sm II	10874 - 25361	0.010	0.0073	-2.14
6909.81	Sm II	12842 - 27310	0.025	0.018	-1.74
6927.03	Sm II	9410 - 23842	0.012	0.0086	-2.07
6930.41	Sm II	10960 - 25385	0.018	0.013	-1.88
6941.56	Sm II	10181 - 24583	0.015	0.011	-1.97
6950.51	Sm II	8046 - 22429	0.016	0.012	-1.94
6955.29	Sm II	10214 - 24588	0.11	0.077	-1.11
6968.65	Sm II	9407 - 23753	0.012	0.0085	-2.07
7020.44	Sm II	9407 - 23647	0.064	0.047	-1.33
7039.22	Sm II	8046 - 22248	0.043	0.032	-1.49
7042.24	Sm II	8679 - 22875	0.052	0.038	-1.42
7051.52	Sm II	7525 - 21702	0.037	0.028	-1.56
7054.97	Sm II	11395 - 25566	0.020	0.015	-1.83
7082.37	Sm II	7135 - 21251	0.033	0.025	-1.61
7085.52	Sm II	8679 - 22789	0.022	0.016	-1.79
7122.40	Sm II	14115 - 28151	0.030	0.023	-1.65
7125.11	Sm II	12790 - 26821	0.040	0.030	-1.52
7143.98	Sm II	8046 - 22040	0.018	0.014	-1.87
7149.60	Sm II	7525 - 21508	0.033	0.025	-1.60
7218.09	Sm II	8579 - 22429	0.013	0.010	-1.98
7237.02	Sm II	12232 - 26046	0.019	0.015	-1.84
7240.90	Sm II	11791 - 25598	0.073	0.058	-1.24
7257.11	Sm II	12790 - 26566	0.015	0.012	-1.92
7261.45	Sm II	9410 - 23177	0.0058	0.0046	-2.34
7281.47	Sm II	10960 - 24690	0.025	0.020	-1.69

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
7288.92	Sm II	12790 - 26506	0.027	0.021	-1.67
7376.69	Sm II	12045 - 25598	0.033	0.027	-1.57
7453.03	Sm II	12567 - 25980	0.037	0.031	-1.51
7481.99	Sm II	13466 - 26828	0.048	0.040	-1.40
7502.39	Sm II	8579 - 21904	0.010	0.0088	-2.05
7541.42	Sm II	12790 - 26046	0.034	0.029	-1.54
7560.15	Sm II	13604 - 26828	0.022	0.019	-1.73
7570.95	Sm II	12842 - 26046	0.034	0.029	-1.54
7578.09	Sm II	14504 - 27696	0.046	0.040	-1.40
7585.77	Sm II	14085 - 27263	0.068	0.059	-1.23
7613.94	Sm II	11799 - 24929	0.013	0.011	-1.95
7631.77	Sm II	11799 - 24898	0.011	0.0099	-2.01
7637.94	Sm II	10874 - 23962	0.019	0.017	-1.78
7645.09	Sm II	8579 - 21655	0.020	0.017	-1.76
7648.02	Sm II	12232 - 25304	0.024	0.021	-1.68
7655.78	Sm II	12988 - 26046	0.016	0.014	-1.86
7667.20	Sm II	13466 - 26506	0.034	0.030	-1.53
7678.79	Sm II	9410 - 22429	0.0057	0.0050	-2.30
7712.04	Sm II	14115 - 27078	0.046	0.041	-1.38
7728.56	Sm II	13604 - 26540	0.057	0.051	-1.29
7749.30	Sm II	13604 - 26506	0.056	0.051	-1.29
7755.20	Sm II	11799 - 24690	0.024	0.021	-1.67
7820.15	Sm II	11799 - 24583	0.017	0.015	-1.82
7835.08	Sm II	14504 - 27263	0.085	0.078	-1.11
7837.27	Sm II	12842 - 25598	0.035	0.033	-1.49
7844.82	Sm II	14085 - 26828	0.020	0.018	-1.73
7863.65	Sm II	14115 - 26828	0.038	0.035	-1.46
7880.07	Sm II	10960 - 23647	0.0082	0.0076	-2.12
7914.96	Sm II	11799 - 24430	0.026	0.024	-1.62
7928.14	Sm II	12988 - 25598	0.13	0.12	-0.93
7937.09	Sm II	12790 - 25385	0.025	0.024	-1.62
7948.12	Sm II	12988 - 25566	0.022	0.021	-1.68
8001.61	Sm II	9410 - 21904	0.0095	0.0092	-2.04
8014.92	Sm II	13466 - 25940	0.030	0.029	-1.54
8025.12	Sm II	12232 - 24690	0.025	0.024	-1.63
8026.32	Sm II	14085 - 26540	0.041	0.040	-1.40
8032.03	Sm II	11395 - 23842	0.014	0.013	-1.87
8048.70	Sm II	14085 - 26506	0.070	0.068	-1.17
8068.46	Sm II	14115 - 26506	0.082	0.080	-1.10
8117.16	Sm II	12988 - 25304	0.012	0.012	-1.93
8125.12	Sm II	10874 - 23177	0.0065	0.0064	-2.19
8161.90	Sm II	10181 - 22429	0.015	0.015	-1.82
8195.50	Sm II	13466 - 25665	0.028	0.028	-1.55
8218.76	Sm II	11799 - 23962	0.023	0.024	-1.63
8240.98	Sm II	13466 - 25598	0.023	0.024	-1.63
8289.26	Sm II	13604 - 25665	0.029	0.029	-1.53
8300.88	Sm II	11799 - 23842	0.0091	0.0094	-2.03
8305.79	Sm II	14504 - 26540	0.073	0.076	-1.12
8348.68	Sm II	12842 - 24816	0.023	0.024	-1.63
8387.77	Sm II	13466 - 25385	0.027	0.028	-1.55

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
8432.64	Sm II	14085 – 25940	0.052	0.056	-1.25
8473.54	Sm II	12790 – 24588	0.022	0.023	-1.63
8485.99	Sm II	13604 – 25385	0.063	0.068	-1.17
8510.90	Sm II	12842 – 24588	0.036	0.039	-1.41
8543.22	Sm II	12988 – 24690	0.026	0.029	-1.54
8617.03	Sm II	12045 – 23647	0.020	0.022	-1.66
8632.82	Sm II	14085 – 25665	0.035	0.039	-1.41
8706.32	Sm II	14115 – 25598	0.020	0.022	-1.65
8708.43	Sm II	11395 – 22875	0.032	0.036	-1.44
8717.89	Sm II	12790 – 24257	0.034	0.038	-1.42
8758.28	Sm II	12232 – 23647	0.028	0.033	-1.48
8788.83	Sm II	10874 – 22248	0.013	0.016	-1.81
8913.66	Sm II	12045 – 23261	0.078	0.093	-1.03

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
1970.80	Sn I	1692 - 52416	3.4	0.20	-0.70
1983.55	Sn I	3428 - 53826	3.0	0.18	-0.76
2040.66	Sn I	3428 - 52416	2.6	0.16	-0.80
2073.08	Sn I	0 - 48222	1.1	0.070	-1.15
2091.58	Sn I	1692 - 49487	2.0	0.13	-0.88
2096.39	Sn I	8613 - 56299	1.3	0.083	-1.08
2100.93	Sn I	3428 - 51010	0.80	0.053	-1.28
2113.93	Sn I	1692 - 48982	2.2	0.15	-0.83
2148.73	Sn I	1692 - 48216	0.32	0.022	-1.65
2151.43	Sn I	3428 - 49894	1.1	0.078	-1.11
2194.49	Sn I	3428 - 48982	1.7	0.13	-0.90
2199.34	Sn I	1692 - 47146	1.7	0.12	-0.92
2209.65	Sn I	3428 - 48670	4.0	0.29	-0.53
2211.05	Sn I	8613 - 53826	0.83	0.061	-1.22
2231.72	Sn I	3428 - 48222	0.67	0.050	-1.30
2246.05	Sn I	0 - 44509	2.6	0.20	-0.71
2251.17	Sn I	8613 - 53021	0.76	0.058	-1.24
2267.19	Sn I	8613 - 52707	2.2	0.17	-0.77
2268.91	Sn I	3428 - 47488	6.0	0.47	-0.33
2286.68	Sn I	3428 - 47146	1.3	0.10	-0.98
2317.23	Sn I	8613 - 51754	16.	1.3	0.12
2334.80	Sn I	1692 - 44509	2.4	0.20	-0.70
2354.84	Sn I	1692 - 44145	11.	0.93	-0.03
2357.90	Sn I	8613 - 51010	0.60	0.050	-1.30
2380.72	Sn I	1692 - 43683	0.47	0.040	-1.40
2408.15	Sn I	8613 - 50126	4.2	0.37	-0.44
2421.70	Sn I	8613 - 49894	66.	5.8	0.76
2429.49	Sn I	3428 - 44576	29.	2.5	0.41
2433.47	Sn I	3428 - 44509	0.20	0.018	-1.75
2455.24	Sn I	3428 - 44145	0.31	0.028	-1.56
2483.39	Sn I	3428 - 43683	6.0	0.55	-0.26
2495.70	Sn I	8613 - 48670	23.	2.1	0.33
2523.92	Sn I	8613 - 48222	2.8	0.27	-0.57
2546.55	Sn I	0 - 39257	3.8	0.37	-0.43
2571.58	Sn I	8613 - 47488	16.	1.6	0.21
2594.42	Sn I	8613 - 47146	8.3	0.84	-0.08
2661.24	Sn I	1692 - 39257	2.3	0.25	-0.60
2706.51	Sn I	1692 - 38629	10.0	1.1	0.04
2761.78	Sn I	3428 - 39626	0.21	0.024	-1.62
2779.81	Sn I	8613 - 44576	7.8	0.91	-0.04
2785.03	Sn I	8613 - 44509	2.5	0.29	-0.54
2812.59	Sn I	17163 - 52707	5.5	0.65	-0.19
2813.58	Sn I	8613 - 44145	4.2	0.50	-0.30
2839.99	Sn I	3428 - 38629	21.	2.5	0.40
2850.62	Sn I	8613 - 43683	11.	1.3	0.11
2863.33	Sn I	0 - 34914	5.3	0.65	-0.19
2913.54	Sn I	17163 - 51475	9.5	1.2	0.08
3009.14	Sn I	1692 - 34914	3.9	0.53	-0.28
3032.80	Sn I	17163 - 50126	13.	1.8	0.26
3034.12	Sn I	1692 - 34641	4.4	0.61	-0.22

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3141.84	Sn I	17163 - 48982	1.1	0.16	-0.79
3175.05	Sn I	3428 - 34914	3.2	0.49	-0.31
3262.34	Sn I	8613 - 39257	11.	1.8	0.25
3330.62	Sn I	8613 - 38629	1.9	0.32	-0.49
3655.78	Sn I	17163 - 44509	4.0	0.81	-0.09
3801.02	Sn I	8613 - 34914	2.0	0.43	-0.37
4524.74	Sn I	17163 - 39257	1.1	0.35	-0.46
5631.71	Sn I	17163 - 34914	0.042	0.020	-1.70
8552.60	Sn I	34914 - 46603	0.35	0.38	-0.42

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2428.10	Sr I	0 - 41172	0.20	0.018	-1.75
2569.47	Sr I	0 - 38907	0.11	0.011	-1.96
2931.83	Sr I	0 - 34098	0.055	0.0071	-2.15
3301.73	Sr I	14318 - 44596	1.8	0.29	-0.53
3329.99	Sr I	14504 - 44526	1.8	0.29	-0.53
3351.25	Sr I	14899 - 44730	2.5	0.42	-0.37
3366.33	Sr I	14899 - 44596	1.8	0.31	-0.51
3940.80	Sr I	14318 - 39686	0.53	0.12	-0.91
3969.26	Sr I	14504 - 39691	1.1	0.25	-0.59
3970.04	Sr I	14504 - 39686	0.54	0.13	-0.90
4030.38	Sr I	14899 - 39703	2.4	0.58	-0.24
4032.38	Sr I	14899 - 39691	0.55	0.13	-0.87
4438.04	Sr I	14899 - 37425	0.37	0.11	-0.96
4607.33	Sr I	0 - 21698	0.85	0.27	-0.57
4722.28	Sr I	14504 - 35675	2.2	0.74	-0.13
4741.92	Sr I	14318 - 35400	1.4	0.47	-0.32
4784.32	Sr I	14504 - 35400	0.90	0.31	-0.51
4811.88	Sr I	14899 - 35675	3.4	1.2	0.07
4832.08	Sr I	14504 - 35194	2.2	0.78	-0.11
4855.04	Sr I	18159 - 38750	0.84	0.30	-0.53
4868.70	Sr I	18219 - 38752	1.0	0.36	-0.44
4872.49	Sr I	14504 - 35022	1.8	0.63	-0.20
4876.06	Sr I	14504 - 35007	0.35	0.13	-0.90
4876.32	Sr I	14899 - 35400	1.3	0.47	-0.33
4891.98	Sr I	18319 - 38755	1.7	0.61	-0.21
4962.26	Sr I	14899 - 35045	4.8	1.8	0.25
4967.94	Sr I	14899 - 35022	0.78	0.29	-0.54
5156.07	Sr I	20150 - 39539	1.8	0.71	-0.15
5222.20	Sr I	18159 - 37302	1.7	0.69	-0.16
5225.11	Sr I	18159 - 37292	2.4	0.98	-0.01
5229.27	Sr I	18219 - 37336	2.4	1.00	-0.00
5238.55	Sr I	18219 - 37302	3.4	1.4	0.14
5256.90	Sr I	18319 - 37336	5.9	2.4	0.39
5329.82	Sr I	20150 - 38907	0.68	0.29	-0.54
5450.84	Sr I	18219 - 36560	1.5	0.68	-0.17
5480.84	Sr I	18319 - 36560	7.2	3.2	0.51
5486.12	Sr I	18159 - 36382	1.1	0.48	-0.31
5504.17	Sr I	18219 - 36382	3.4	1.6	0.19
5521.83	Sr I	18159 - 36264	2.5	1.1	0.05
5534.81	Sr I	18319 - 36382	2.0	0.90	-0.04
5540.05	Sr I	18219 - 36264	1.9	0.88	-0.06
5543.36	Sr I	21698 - 39733	0.63	0.29	-0.53
5970.10	Sr I	21698 - 38444	0.38	0.20	-0.69
6345.75	Sr I	18219 - 33973	0.14	0.086	-1.06
6363.94	Sr I	18159 - 33868	0.14	0.085	-1.07
6369.96	Sr I	18159 - 33853	0.19	0.12	-0.93
6380.75	Sr I	18159 - 33827	0.55	0.34	-0.47
6386.50	Sr I	18319 - 33973	0.52	0.32	-0.50
6388.24	Sr I	18219 - 33868	0.34	0.21	-0.69
6408.47	Sr I	18319 - 33919	5.1	3.2	0.50

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6446.68	Sr I	18319 - 33827	0.14	0.087	-1.06
6465.79	Sr I	21698 - 37160	0.36	0.22	-0.65
6504.00	Sr I	18219 - 33590	2.9	1.8	0.26
6546.79	Sr I	18319 - 33590	0.53	0.34	-0.47
6550.26	Sr I	21698 - 36961	2.3	1.5	0.18
6617.26	Sr I	18159 - 33267	1.5	0.96	-0.02
6643.54	Sr I	18219 - 33267	0.39	0.26	-0.59
6791.05	Sr I	14318 - 29039	0.27	0.19	-0.72
6878.38	Sr I	14504 - 29039	0.74	0.53	-0.28
6892.59	Sr I	0 - 14503	0.0020	0.0014	-2.84
7070.10	Sr I	14899 - 29039	0.87	0.65	-0.18
7153.09	Sr I	21698 - 35675	0.063	0.048	-1.32
7167.24	Sr I	20150 - 34098	0.17	0.13	-0.89
7232.27	Sr I	20150 - 33973	0.13	0.10	-0.99
7309.41	Sr I	20150 - 33827	1.6	1.3	0.10
7621.50	Sr I	20150 - 33267	0.28	0.25	-0.61
7673.06	Sr I	21698 - 34727	0.34	0.30	-0.52

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2152.84	Sr II	14556 - 60992	1.3	0.089	-1.05
2165.96	Sr II	14836 - 60992	1.5	0.11	-0.96
3380.71	Sr II	23715 - 53286	14.	2.4	0.38
3464.46	Sr II	24517 - 53373	21.	3.8	0.58
3474.89	Sr II	24517 - 53286	2.6	0.48	-0.32
4077.71	Sr II	0 - 24517	0.66	0.17	-0.78
4161.80	Sr II	23715 - 47737	2.0	0.52	-0.28
4215.52	Sr II	0 - 23715	0.38	0.10	-0.99
4305.45	Sr II	24517 - 47737	3.5	0.99	-0.01

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2357.30	Ta I	0 - 42408	0.87	0.073	-1.14
2361.09	Ta I	2010 - 44350	1.7	0.14	-0.85
2371.58	Ta I	3964 - 46117	3.7	0.31	-0.50
2396.30	Ta I	5621 - 47340	1.6	0.14	-0.87
2406.55	Ta I	2010 - 43551	1.1	0.095	-1.02
2407.57	Ta I	2010 - 43553	0.34	0.030	-1.53
2414.32	Ta I	9253 - 50660	6.2	0.55	-0.26
2421.03	Ta I	3964 - 45256	2.2	0.20	-0.71
2427.64	Ta I	0 - 41180	2.0	0.18	-0.76
2437.67	Ta I	0 - 41010	0.54	0.048	-1.32
2439.91	Ta I	2010 - 42983	2.1	0.19	-0.72
2442.39	Ta I	5621 - 46552	4.0	0.36	-0.45
2447.17	Ta I	0 - 40852	0.65	0.058	-1.23
2454.48	Ta I	3964 - 44693	1.9	0.17	-0.76
2460.55	Ta I	9253 - 49882	6.9	0.63	-0.20
2465.26	Ta I	5621 - 46172	2.4	0.22	-0.66
2472.13	Ta I	3964 - 44403	2.1	0.20	-0.71
2473.13	Ta I	3964 - 44386	2.7	0.25	-0.61
2474.62	Ta I	2010 - 42408	6.1	0.56	-0.25
2475.33	Ta I	9759 - 50146	8.8	0.81	-0.09
2478.22	Ta I	0 - 40339	0.85	0.079	-1.10
2484.95	Ta I	0 - 40230	2.8	0.26	-0.59
2486.70	Ta I	3964 - 44166	2.0	0.19	-0.73
2496.24	Ta I	6069 - 46117	1.5	0.14	-0.85
2504.45	Ta I	3964 - 43881	9.4	0.88	-0.05
2507.45	Ta I	2010 - 41879	5.3	0.50	-0.30
2512.65	Ta I	0 - 39787	1.2	0.11	-0.95
2519.78	Ta I	6049 - 45724	2.6	0.25	-0.60
2526.35	Ta I	2010 - 41581	9.9	0.95	-0.02
2531.29	Ta I	5621 - 45115	1.1	0.11	-0.97
2534.47	Ta I	9705 - 49149	3.1	0.30	-0.52
2534.97	Ta I	5621 - 45058	2.6	0.26	-0.59
2546.80	Ta I	0 - 39253	1.0	0.10	-1.00
2549.38	Ta I	3964 - 43177	1.8	0.18	-0.75
2551.07	Ta I	2010 - 41198	3.4	0.34	-0.47
2555.05	Ta I	3964 - 43090	3.1	0.30	-0.52
2559.43	Ta I	0 - 39060	4.9	0.48	-0.32
2562.10	Ta I	3964 - 42983	5.7	0.56	-0.25
2563.33	Ta I	2010 - 41010	0.57	0.056	-1.25
2563.70	Ta I	0 - 38994	0.56	0.056	-1.25
2573.54	Ta I	0 - 38845	1.9	0.19	-0.71
2573.79	Ta I	2010 - 40852	3.1	0.31	-0.51
2574.38	Ta I	9976 - 48809	11.	1.1	0.02
2575.47	Ta I	9253 - 48070	9.1	0.90	-0.04
2577.78	Ta I	5621 - 44403	7.5	0.74	-0.13
2579.62	Ta I	0 - 38754	0.46	0.045	-1.34
2580.16	Ta I	2010 - 40756	1.6	0.16	-0.80
2584.69	Ta I	9253 - 47931	8.3	0.84	-0.08
2585.61	Ta I	9705 - 48369	6.5	0.65	-0.19
2593.08	Ta I	5621 - 44174	8.8	0.89	-0.05

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2595.26	Ta I	5621 - 44141	11.	1.1	0.06
2596.12	Ta I	0 - 38508	0.36	0.036	-1.44
2596.61	Ta I	2010 - 40510	0.44	0.044	-1.35
2598.75	Ta I	6049 - 44518	0.97	0.098	-1.01
2600.14	Ta I	0 - 38448	0.91	0.092	-1.03
2601.06	Ta I	6049 - 44484	3.1	0.31	-0.50
2602.38	Ta I	6069 - 44484	1.9	0.20	-0.71
2603.82	Ta I	9976 - 48369	3.8	0.39	-0.41
2605.32	Ta I	9253 - 47625	3.2	0.33	-0.48
2608.20	Ta I	2010 - 40339	0.36	0.037	-1.44
2608.63	Ta I	2010 - 40333	9.6	0.98	-0.01
2609.00	Ta I	6069 - 44386	4.5	0.46	-0.34
2610.13	Ta I	6049 - 44350	0.74	0.076	-1.12
2611.34	Ta I	3964 - 42247	3.7	0.38	-0.42
2615.25	Ta I	9705 - 47931	4.0	0.41	-0.39
2615.46	Ta I	9705 - 47928	20.	2.0	0.31
2615.66	Ta I	2010 - 40230	2.1	0.22	-0.67
2624.12	Ta I	6049 - 44146	3.5	0.36	-0.44
2625.46	Ta I	6069 - 44146	1.8	0.18	-0.74
2635.93	Ta I	2010 - 39936	0.43	0.045	-1.35
2636.37	Ta I	9705 - 47625	2.8	0.29	-0.54
2636.67	Ta I	3964 - 41879	5.1	0.54	-0.27
2636.90	Ta I	5621 - 43533	15.	1.6	0.19
2643.89	Ta I	6069 - 43880	3.3	0.35	-0.46
2646.37	Ta I	2010 - 39787	3.6	0.38	-0.42
2647.47	Ta I	0 - 37761	8.2	0.87	-0.06
2650.28	Ta I	9253 - 46974	3.2	0.34	-0.47
2652.32	Ta I	9705 - 47397	2.2	0.23	-0.63
2653.27	Ta I	2010 - 39688	15.	1.6	0.21
2656.61	Ta I	0 - 37630	6.3	0.66	-0.18
2657.30	Ta I	3964 - 41585	0.69	0.074	-1.13
2661.34	Ta I	5621 - 43185	25.	2.6	0.42
2661.89	Ta I	5621 - 43177	2.5	0.26	-0.58
2667.17	Ta I	6069 - 43551	0.91	0.097	-1.01
2668.07	Ta I	5621 - 43090	3.5	0.37	-0.43
2668.62	Ta I	0 - 37461	1.9	0.20	-0.69
2671.63	Ta I	10950 - 48369	6.7	0.72	-0.14
2674.49	Ta I	10690 - 48070	2.1	0.22	-0.65
2684.28	Ta I	2010 - 39253	3.2	0.34	-0.46
2686.29	Ta I	9759 - 46974	1.6	0.18	-0.76
2690.54	Ta I	9253 - 46410	1.4	0.15	-0.82
2691.31	Ta I	0 - 37146	1.0	0.11	-0.96
2692.40	Ta I	5621 - 42752	3.7	0.40	-0.40
2693.34	Ta I	6049 - 43167	1.5	0.16	-0.78
2693.50	Ta I	5621 - 42737	0.73	0.080	-1.10
2694.76	Ta I	6069 - 43167	2.3	0.25	-0.59
2696.81	Ta I	9253 - 46323	9.6	1.1	0.02
2698.30	Ta I	2010 - 39060	5.2	0.57	-0.25
2700.70	Ta I	12866 - 49882	4.6	0.50	-0.30
2703.06	Ta I	2010 - 38994	0.43	0.047	-1.33

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2706.69	Ta I	10690 - 47625	26.	2.9	0.46
2710.13	Ta I	3964 - 40851	10.	1.1	0.05
2714.67	Ta I	0 - 36826	7.0	0.77	-0.11
2717.18	Ta I	3964 - 40756	2.0	0.22	-0.66
2718.38	Ta I	6069 - 42845	2.2	0.24	-0.62
2720.76	Ta I	2010 - 38754	2.2	0.24	-0.61
2721.83	Ta I	6049 - 42779	2.5	0.28	-0.56
2726.32	Ta I	2010 - 38679	0.12	0.013	-1.88
2727.78	Ta I	10690 - 47340	22.	2.4	0.38
2732.92	Ta I	0 - 36580	0.17	0.020	-1.71
2741.17	Ta I	9253 - 45724	4.9	0.55	-0.26
2743.59	Ta I	2010 - 38448	0.89	0.10	-1.00
2746.68	Ta I	5621 - 42018	6.1	0.69	-0.16
2747.85	Ta I	11244 - 47625	1.7	0.19	-0.72
2748.78	Ta I	3964 - 40333	8.8	1.0	0.00
2749.83	Ta I	9705 - 46061	33.	3.7	0.57
2752.30	Ta I	10690 - 47013	7.6	0.86	-0.07
2758.31	Ta I	2010 - 38253	4.2	0.48	-0.32
2774.88	Ta I	15391 - 51418	12.	1.4	0.15
2775.88	Ta I	0 - 36014	1.7	0.20	-0.71
2779.10	Ta I	3964 - 39936	0.68	0.079	-1.10
2779.70	Ta I	9759 - 45724	1.8	0.20	-0.69
2781.37	Ta I	9705 - 45648	3.4	0.40	-0.40
2781.79	Ta I	10950 - 46888	1.2	0.14	-0.84
2787.69	Ta I	9253 - 45115	11.	1.3	0.12
2789.77	Ta I	12235 - 48070	3.3	0.38	-0.42
2790.71	Ta I	3964 - 39787	0.66	0.077	-1.11
2791.67	Ta I	6069 - 41879	1.4	0.16	-0.79
2796.34	Ta I	2010 - 37761	2.5	0.29	-0.54
2796.56	Ta I	9976 - 45724	2.6	0.31	-0.51
2800.57	Ta I	12235 - 47931	3.2	0.37	-0.43
2802.07	Ta I	3964 - 39641	2.3	0.27	-0.56
2804.76	Ta I	6049 - 41693	0.57	0.067	-1.17
2806.30	Ta I	6069 - 41693	4.7	0.56	-0.25
2806.58	Ta I	2010 - 37630	1.8	0.21	-0.67
2810.92	Ta I	12235 - 47800	8.3	0.98	-0.01
2814.80	Ta I	6069 - 41585	1.0	0.12	-0.92
2815.01	Ta I	2010 - 37524	0.32	0.038	-1.42
2815.12	Ta I	6069 - 41581	1.0	0.12	-0.92
2817.50	Ta I	10690 - 46172	2.1	0.25	-0.61
2819.37	Ta I	3964 - 39422	0.55	0.066	-1.18
2824.81	Ta I	12235 - 47625	2.5	0.30	-0.52
2826.18	Ta I	10950 - 46323	2.9	0.35	-0.46
2826.42	Ta I	10690 - 46061	1.3	0.16	-0.79
2827.18	Ta I	5621 - 40982	0.86	0.10	-0.99
2833.64	Ta I	9976 - 45256	5.2	0.63	-0.20
2834.41	Ta I	9976 - 45246	2.1	0.25	-0.60
2836.62	Ta I	0 - 35243	0.062	0.0075	-2.13
2837.94	Ta I	10950 - 46177	2.1	0.25	-0.60
2842.82	Ta I	11244 - 46410	11.	1.4	0.13

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2844.25	Ta I	6049 - 41198	6.2	0.76	-0.12
2845.35	Ta I	5621 - 40756	2.5	0.30	-0.52
2845.84	Ta I	6069 - 41198	0.33	0.041	-1.39
2848.05	Ta I	9705 - 44807	3.9	0.48	-0.32
2848.52	Ta I	3964 - 39060	3.0	0.36	-0.44
2849.82	Ta I	11244 - 46323	4.4	0.53	-0.27
2850.98	Ta I	5621 - 40686	16.	1.9	0.29
2861.12	Ta I	6069 - 41010	0.48	0.059	-1.23
2861.98	Ta I	9759 - 44689	9.4	1.2	0.06
2868.65	Ta I	3964 - 38813	1.5	0.19	-0.72
2871.42	Ta I	2010 - 36826	1.3	0.17	-0.78
2873.36	Ta I	0 - 34792	0.44	0.055	-1.26
2873.56	Ta I	3964 - 38754	1.3	0.16	-0.80
2874.17	Ta I	6069 - 40852	1.8	0.23	-0.64
2876.11	Ta I	9759 - 44518	3.4	0.43	-0.37
2879.52	Ta I	13352 - 48070	2.3	0.28	-0.55
2879.74	Ta I	3964 - 38679	0.58	0.072	-1.14
2880.02	Ta I	5621 - 40333	2.9	0.36	-0.44
2881.23	Ta I	9705 - 44403	0.83	0.10	-0.98
2891.04	Ta I	13352 - 47931	5.5	0.69	-0.16
2891.84	Ta I	2010 - 36580	2.1	0.26	-0.59
2894.15	Ta I	9976 - 44518	2.6	0.33	-0.49
2895.10	Ta I	12866 - 47397	7.8	0.98	-0.01
2898.42	Ta I	15391 - 49882	3.3	0.41	-0.39
2899.04	Ta I	3964 - 38448	1.2	0.15	-0.83
2900.36	Ta I	9705 - 44174	3.9	0.50	-0.30
2901.05	Ta I	9705 - 44166	0.98	0.12	-0.91
2902.05	Ta I	13352 - 47800	35.	4.4	0.64
2904.07	Ta I	10690 - 45115	4.6	0.58	-0.23
2908.91	Ta I	10690 - 45058	5.1	0.64	-0.19
2913.32	Ta I	5621 - 39936	0.24	0.030	-1.52
2914.12	Ta I	10950 - 45256	6.4	0.82	-0.09
2914.94	Ta I	10950 - 45246	0.80	0.10	-0.99
2915.49	Ta I	3964 - 38253	1.3	0.17	-0.77
2917.12	Ta I	6069 - 40339	0.27	0.034	-1.47
2925.19	Ta I	6069 - 40245	3.1	0.40	-0.39
2925.66	Ta I	9976 - 44146	0.79	0.10	-1.00
2926.46	Ta I	6069 - 40230	0.78	0.10	-1.00
2930.99	Ta I	12866 - 46974	1.8	0.23	-0.64
2932.70	Ta I	12235 - 46323	13.	1.7	0.24
2933.55	Ta I	0 - 34078	2.3	0.30	-0.53
2934.85	Ta I	9705 - 43769	1.4	0.18	-0.74
2938.43	Ta I	12866 - 46888	1.7	0.23	-0.65
2939.28	Ta I	11244 - 45256	4.9	0.63	-0.20
2940.06	Ta I	10690 - 44693	13.	1.6	0.22
2940.22	Ta I	0 - 34001	1.6	0.21	-0.69
2941.37	Ta I	13352 - 47340	8.8	1.1	0.06
2942.14	Ta I	3964 - 37943	0.96	0.13	-0.90
2945.69	Ta I	12235 - 46172	1.4	0.19	-0.73
2946.91	Ta I	9253 - 43177	2.7	0.35	-0.45

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2951.92	Ta I	2010 - 35877	1.2	0.15	-0.82
2957.60	Ta I	5621 - 39422	1.1	0.14	-0.86
2963.06	Ta I	10950 - 44689	0.93	0.12	-0.91
2963.32	Ta I	2010 - 35746	3.4	0.44	-0.35
2963.91	Ta I	9253 - 42983	2.0	0.27	-0.58
2965.54	Ta I	2010 - 35721	1.7	0.22	-0.66
2969.47	Ta I	3964 - 37630	1.3	0.17	-0.77
2969.90	Ta I	13352 - 47013	3.6	0.48	-0.32
2975.56	Ta I	3964 - 37561	1.6	0.21	-0.68
2976.10	Ta I	9253 - 42845	1.4	0.18	-0.73
2981.19	Ta I	9705 - 43239	1.1	0.14	-0.84
2984.36	Ta I	9253 - 42752	0.95	0.13	-0.90
2988.58	Ta I	10690 - 44141	4.4	0.59	-0.23
2989.50	Ta I	6049 - 39490	1.2	0.16	-0.80
2991.25	Ta I	6069 - 39490	0.65	0.087	-1.06
3001.54	Ta I	12866 - 46172	2.2	0.30	-0.53
3004.15	Ta I	9705 - 42983	1.2	0.16	-0.80
3011.12	Ta I	13352 - 46552	9.8	1.3	0.13
3011.88	Ta I	5621 - 38813	1.3	0.17	-0.77
3016.37	Ta I	11244 - 44386	2.0	0.27	-0.57
3019.67	Ta I	11244 - 44350	1.7	0.24	-0.63
3024.09	Ta I	5621 - 38679	0.52	0.072	-1.14
3025.16	Ta I	9705 - 42752	3.3	0.45	-0.34
3027.51	Ta I	12235 - 45256	11.	1.5	0.16
3028.78	Ta I	9976 - 42983	1.8	0.24	-0.62
3030.29	Ta I	6069 - 39059	0.68	0.094	-1.03
3043.92	Ta I	10690 - 43533	1.7	0.24	-0.62
3045.96	Ta I	13352 - 46172	5.2	0.73	-0.14
3048.86	Ta I	2010 - 34800	0.35	0.049	-1.31
3049.56	Ta I	2010 - 34792	1.0	0.14	-0.84
3050.10	Ta I	6069 - 38845	0.64	0.090	-1.05
3058.64	Ta I	6069 - 38754	0.85	0.12	-0.92
3060.29	Ta I	3964 - 36631	0.47	0.066	-1.18
3063.56	Ta I	5621 - 38253	0.94	0.13	-0.88
3069.24	Ta I	12235 - 44807	17.	2.5	0.39
3076.38	Ta I	6049 - 38546	0.21	0.030	-1.52
3077.24	Ta I	10690 - 43177	7.6	1.1	0.03
3078.23	Ta I	6069 - 38546	0.81	0.12	-0.94
3079.96	Ta I	12235 - 44693	3.4	0.48	-0.32
3081.85	Ta I	6069 - 38508	1.0	0.14	-0.84
3085.54	Ta I	10690 - 43090	3.4	0.48	-0.31
3087.53	Ta I	6069 - 38448	0.79	0.11	-0.95
3092.06	Ta I	9253 - 41585	0.40	0.058	-1.24
3092.44	Ta I	9253 - 41581	2.4	0.35	-0.46
3092.99	Ta I	5621 - 37943	0.18	0.026	-1.59
3093.87	Ta I	9705 - 42018	2.3	0.33	-0.48
3095.39	Ta I	13352 - 45648	7.6	1.1	0.04
3103.25	Ta I	0 - 32215	0.54	0.078	-1.11
3107.21	Ta I	9705 - 41879	1.1	0.16	-0.80
3115.86	Ta I	2010 - 34095	0.12	0.018	-1.75

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3117.44	Ta I	2010 - 34078	0.25	0.036	-1.45
3119.59	Ta I	10690 - 42737	1.4	0.21	-0.69
3120.92	Ta I	10950 - 42983	0.76	0.11	-0.96
3124.97	Ta I	2010 - 34001	0.60	0.088	-1.06
3129.55	Ta I	9253 - 41198	0.73	0.11	-0.97
3129.95	Ta I	5621 - 37561	0.49	0.072	-1.14
3130.58	Ta I	11244 - 43177	8.0	1.2	0.07
3132.64	Ta I	3964 - 35877	0.74	0.11	-0.96
3133.55	Ta I	9976 - 41879	0.56	0.082	-1.09
3135.89	Ta I	9705 - 41585	2.5	0.36	-0.44
3147.37	Ta I	13352 - 45115	2.8	0.41	-0.38
3148.04	Ta I	9253 - 41010	1.6	0.23	-0.63
3150.85	Ta I	9253 - 40982	0.43	0.065	-1.19
3159.05	Ta I	12235 - 43881	0.99	0.15	-0.83
3162.72	Ta I	9976 - 41585	1.0	0.16	-0.81
3163.13	Ta I	9976 - 41581	2.0	0.29	-0.53
3163.82	Ta I	9253 - 40852	0.76	0.11	-0.94
3167.53	Ta I	6068 - 37630	0.34	0.051	-1.29
3170.29	Ta I	12235 - 43769	8.1	1.2	0.08
3172.87	Ta I	11244 - 42752	1.4	0.22	-0.66
3173.59	Ta I	0 - 31501	0.22	0.033	-1.48
3176.29	Ta I	6049 - 37524	0.86	0.13	-0.89
3178.16	Ta I	5621 - 37077	0.55	0.084	-1.08
3180.95	Ta I	0 - 31428	0.47	0.072	-1.14
3181.69	Ta I	9759 - 41180	1.3	0.20	-0.71
3182.57	Ta I	6049 - 37461	0.49	0.074	-1.13
3184.55	Ta I	6069 - 37461	1.0	0.16	-0.80
3191.16	Ta I	10690 - 42018	1.9	0.29	-0.54
3198.67	Ta I	3964 - 35218	0.45	0.069	-1.16
3201.98	Ta I	9976 - 41198	0.47	0.072	-1.14
3206.39	Ta I	5621 - 36800	0.54	0.084	-1.08
3207.85	Ta I	11244 - 42408	0.79	0.12	-0.91
3216.93	Ta I	6069 - 37146	0.60	0.093	-1.03
3221.32	Ta I	9976 - 41010	0.89	0.14	-0.86
3223.83	Ta I	5621 - 36631	1.0	0.16	-0.79
3227.32	Ta I	9253 - 40230	1.7	0.27	-0.57
3230.86	Ta I	12235 - 43177	2.6	0.41	-0.38
3239.99	Ta I	12235 - 43090	1.5	0.23	-0.64
3242.05	Ta I	3964 - 34800	0.41	0.064	-1.19
3242.83	Ta I	3964 - 34792	0.41	0.064	-1.19
3248.52	Ta I	11244 - 42018	0.60	0.095	-1.02
3250.36	Ta I	6069 - 36826	0.14	0.022	-1.66
3260.18	Ta I	0 - 30665	0.044	0.0070	-2.15
3279.29	Ta I	9759 - 40245	0.66	0.11	-0.97
3280.87	Ta I	9759 - 40230	0.66	0.11	-0.97
3292.48	Ta I	9976 - 40339	0.30	0.049	-1.31
3295.33	Ta I	11244 - 41581	1.9	0.32	-0.50
3299.77	Ta I	6049 - 36346	0.39	0.064	-1.19
3304.38	Ta I	9976 - 40230	0.66	0.11	-0.96
3309.78	Ta I	2010 - 32215	0.077	0.013	-1.90

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3311.16	Ta I	5621 - 35813	3.0	0.49	-0.31
3317.93	Ta I	3964 - 34095	0.37	0.061	-1.22
3318.53	Ta I	5621 - 35746	0.19	0.031	-1.51
3318.84	Ta I	2010 - 32132	0.68	0.11	-0.95
3332.41	Ta I	9253 - 39253	0.62	0.10	-0.99
3337.80	Ta I	2010 - 31961	0.065	0.011	-1.96
3338.49	Ta I	6069 - 36014	0.25	0.042	-1.38
3343.47	Ta I	11792 - 41693	0.45	0.076	-1.12
3350.96	Ta I	13352 - 43185	2.1	0.35	-0.46
3351.51	Ta I	9759 - 39588	1.1	0.18	-0.75
3358.47	Ta I	11244 - 41010	2.8	0.47	-0.32
3361.64	Ta I	13352 - 43090	3.9	0.65	-0.18
3362.53	Ta I	9759 - 39490	0.30	0.052	-1.29
3369.28	Ta I	6049 - 35721	0.32	0.054	-1.27
3371.54	Ta I	3964 - 33615	0.99	0.17	-0.77
3376.05	Ta I	9976 - 39588	1.1	0.18	-0.74
3385.05	Ta I	3964 - 33497	0.54	0.093	-1.03
3387.46	Ta I	11244 - 40756	0.44	0.075	-1.12
3388.82	Ta I	9253 - 38754	0.25	0.043	-1.37
3398.33	Ta I	2010 - 31428	0.19	0.033	-1.48
3406.94	Ta I	0 - 29344	0.21	0.037	-1.43
3412.89	Ta I	9253 - 38546	0.57	0.099	-1.00
3419.75	Ta I	3964 - 33198	0.10	0.018	-1.74
3424.45	Ta I	6049 - 35243	0.36	0.062	-1.20
3426.73	Ta I	6069 - 35243	0.22	0.040	-1.40
3434.50	Ta I	9705 - 38813	0.51	0.091	-1.04
3436.00	Ta I	11244 - 40339	1.5	0.27	-0.58
3445.15	Ta I	9976 - 38994	0.33	0.058	-1.24
3447.29	Ta I	9253 - 38253	0.53	0.094	-1.03
3463.97	Ta I	0 - 28862	0.097	0.017	-1.76
3472.52	Ta I	17383 - 46172	2.6	0.46	-0.34
3473.90	Ta I	9976 - 38754	0.31	0.055	-1.26
3477.22	Ta I	15391 - 44141	1.4	0.25	-0.59
3477.45	Ta I	9759 - 38508	0.62	0.11	-0.95
3480.52	Ta I	6069 - 34792	1.1	0.20	-0.70
3484.62	Ta I	0 - 28689	0.018	0.0033	-2.49
3490.93	Ta I	10950 - 39588	0.65	0.12	-0.93
3497.85	Ta I	2010 - 30591	0.26	0.047	-1.33
3502.50	Ta I	11244 - 39787	0.69	0.13	-0.90
3502.87	Ta I	10950 - 39490	1.1	0.20	-0.70
3503.87	Ta I	9976 - 38508	1.5	0.28	-0.55
3504.98	Ta I	3964 - 32487	0.15	0.028	-1.56
3505.18	Ta I	12235 - 40756	0.91	0.17	-0.78
3511.04	Ta I	5621 - 34095	0.90	0.17	-0.78
3513.61	Ta I	11792 - 40245	2.0	0.38	-0.42
3527.06	Ta I	11244 - 39588	0.46	0.086	-1.07
3528.61	Ta I	12866 - 41198	1.0	0.19	-0.71
3531.58	Ta I	9253 - 37561	0.74	0.14	-0.86
3532.21	Ta I	10950 - 39253	0.30	0.056	-1.25
3536.30	Ta I	9253 - 37524	0.37	0.069	-1.16

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3549.05	Ta I	3964 - 32132	0.13	0.024	-1.61
3553.42	Ta I	0 - 28134	0.018	0.0035	-2.46
3557.98	Ta I	12235 - 40333	0.57	0.11	-0.96
3564.79	Ta I	10950 - 38994	0.39	0.075	-1.13
3566.72	Ta I	6049 - 34078	0.34	0.064	-1.19
3571.85	Ta I	10690 - 38679	1.0	0.20	-0.71
3584.21	Ta I	9253 - 37146	0.47	0.090	-1.04
3584.51	Ta I	12866 - 40756	1.0	0.20	-0.71
3586.29	Ta I	5621 - 33497	0.24	0.046	-1.34
3595.64	Ta I	10950 - 38754	1.1	0.21	-0.69
3602.48	Ta I	11244 - 38994	0.40	0.077	-1.11
3607.41	Ta I	2010 - 29723	0.42	0.081	-1.09
3625.24	Ta I	5621 - 33198	0.078	0.015	-1.81
3626.62	Ta I	3964 - 31530	0.90	0.18	-0.75
3642.06	Ta I	5621 - 33070	0.65	0.13	-0.89
3653.39	Ta I	12866 - 40230	0.41	0.082	-1.09
3653.83	Ta I	15391 - 42752	0.41	0.083	-1.08
3657.27	Ta I	13352 - 40686	0.65	0.13	-0.89
3657.49	Ta I	2010 - 29344	0.026	0.0053	-2.27
3658.78	Ta I	19658 - 46982	5.5	1.1	0.05
3661.69	Ta I	11244 - 38546	0.41	0.082	-1.09
3674.83	Ta I	11244 - 38448	0.40	0.080	-1.10
3675.12	Ta I	11792 - 38994	0.23	0.047	-1.33
3681.04	Ta I	13352 - 40510	0.44	0.090	-1.04
3686.18	Ta I	9705 - 36826	0.38	0.077	-1.11
3689.73	Ta I	9705 - 36800	0.38	0.077	-1.12
3693.05	Ta I	12866 - 39936	0.68	0.14	-0.86
3695.38	Ta I	11792 - 38845	0.39	0.080	-1.10
3701.34	Ta I	11244 - 38253	0.12	0.024	-1.61
3723.07	Ta I	2010 - 28862	0.017	0.0035	-2.46
3731.02	Ta I	0 - 26795	0.030	0.0063	-2.20
3736.76	Ta I	11792 - 38546	0.88	0.18	-0.73
3754.52	Ta I	3964 - 30591	0.072	0.015	-1.82
3755.11	Ta I	9253 - 35877	0.22	0.047	-1.33
3757.75	Ta I	9976 - 36580	0.075	0.016	-1.80
3759.75	Ta I	0 - 26590	0.0089	0.0019	-2.72
3760.21	Ta I	9759 - 36346	0.070	0.015	-1.83
3762.11	Ta I	10950 - 37524	0.20	0.041	-1.38
3770.93	Ta I	5621 - 32132	0.043	0.0091	-2.04
3777.10	Ta I	9253 - 35721	0.28	0.061	-1.22
3784.25	Ta I	6069 - 32487	0.019	0.0041	-2.39
3792.02	Ta I	0 - 26364	0.020	0.0044	-2.36
3823.60	Ta I	6069 - 32215	0.089	0.019	-1.71
3826.17	Ta I	12866 - 38994	0.24	0.053	-1.28
3826.85	Ta I	2010 - 28134	0.025	0.0056	-2.25
3828.95	Ta I	10690 - 36800	0.32	0.071	-1.15
3836.60	Ta I	3964 - 30021	0.034	0.0074	-2.13
3839.03	Ta I	9705 - 35746	0.22	0.048	-1.32
3846.64	Ta I	9253 - 35243	0.084	0.019	-1.73
3848.05	Ta I	5621 - 31601	0.083	0.018	-1.74

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3859.80	Ta I	9976 - 35877	0.10	0.023	-1.65
3885.20	Ta I	11792 - 37524	0.44	0.10	-1.00
3893.03	Ta I	12866 - 38546	0.11	0.025	-1.61
3912.13	Ta I	17224 - 42779	0.72	0.16	-0.78
3918.51	Ta I	0 - 25513	0.030	0.0070	-2.16
3922.78	Ta I	6069 - 31554	0.11	0.026	-1.58
3922.92	Ta I	9759 - 35243	0.32	0.074	-1.13
3930.94	Ta I	6069 - 31501	0.052	0.012	-1.92
3936.55	Ta I	12235 - 37630	0.17	0.039	-1.41
3937.84	Ta I	12866 - 38253	0.45	0.11	-0.98
3942.24	Ta I	6069 - 31428	0.015	0.0034	-2.47
3952.16	Ta I	15391 - 40686	0.70	0.16	-0.78
3956.57	Ta I	9976 - 35243	0.15	0.036	-1.45
3970.10	Ta I	0 - 25181	0.028	0.0066	-2.18
3979.28	Ta I	10690 - 35813	0.18	0.042	-1.37
3981.95	Ta I	15904 - 41010	1.00	0.24	-0.63
3983.82	Ta I	9705 - 34800	0.038	0.0091	-2.04
3984.98	Ta I	9705 - 34792	0.034	0.0082	-2.09
3988.70	Ta I	10950 - 36014	0.24	0.058	-1.24
3996.17	Ta I	6049 - 31066	0.15	0.035	-1.45
3999.28	Ta I	6069 - 31066	0.074	0.018	-1.75
4003.70	Ta I	5621 - 30591	0.041	0.0099	-2.00
4006.84	Ta I	2010 - 26960	0.042	0.010	-1.99
4007.23	Ta I	15904 - 40852	0.37	0.090	-1.05
4013.19	Ta I	12235 - 37146	0.26	0.063	-1.20
4026.94	Ta I	6069 - 30895	0.13	0.031	-1.50
4033.07	Ta I	11792 - 36580	0.29	0.071	-1.15
4033.63	Ta I	2010 - 26795	0.0037	0.00089	-3.05
4035.89	Ta I	10950 - 35721	0.18	0.043	-1.37
4040.87	Ta I	5621 - 30361	0.072	0.018	-1.75
4041.06	Ta I	0 - 24739	0.010	0.0025	-2.60
4058.46	Ta I	11244 - 35876	0.19	0.046	-1.34
4061.40	Ta I	6049 - 30665	0.27	0.066	-1.18
4064.63	Ta I	6069 - 30665	0.13	0.033	-1.48
4067.24	Ta I	2010 - 26590	0.021	0.0053	-2.28
4067.91	Ta I	2010 - 26586	0.064	0.016	-1.80
4073.00	Ta I	15391 - 39936	0.33	0.083	-1.08
4085.80	Ta I	17224 - 41693	0.55	0.14	-0.86
4091.26	Ta I	15904 - 40339	0.38	0.094	-1.02
4097.19	Ta I	5621 - 30021	0.021	0.0052	-2.29
4105.02	Ta I	2010 - 26364	0.024	0.0060	-2.22
4114.77	Ta I	9705 - 34001	0.032	0.0080	-2.09
4127.88	Ta I	3964 - 28183	0.028	0.0071	-2.15
4129.38	Ta I	2010 - 26220	0.039	0.0100	-2.00
4136.20	Ta I	3964 - 28134	0.073	0.019	-1.73
4147.89	Ta I	5621 - 29723	0.11	0.030	-1.53
4175.21	Ta I	9253 - 33198	0.28	0.074	-1.13
4177.92	Ta I	11792 - 35721	0.29	0.075	-1.12
4181.15	Ta I	9705 - 33615	0.20	0.053	-1.28
4193.10	Ta I	10950 - 34792	0.12	0.032	-1.50

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4205.88	Ta I	3964 - 27734	0.088	0.023	-1.63
4228.61	Ta I	12235 - 35877	0.28	0.074	-1.13
4243.99	Ta I	11244 - 34800	0.061	0.017	-1.78
4245.35	Ta I	11244 - 34792	0.29	0.077	-1.11
4268.26	Ta I	15391 - 38813	0.89	0.24	-0.61
4271.51	Ta I	10690 - 34095	0.12	0.032	-1.49
4279.06	Ta I	0 - 23363	0.0082	0.0022	-2.65
4286.38	Ta I	19178 - 42502	1.3	0.35	-0.46
4294.36	Ta I	13352 - 36631	0.21	0.058	-1.24
4302.98	Ta I	9253 - 32487	0.18	0.051	-1.29
4314.52	Ta I	2010 - 25181	0.014	0.0038	-2.41
4318.81	Ta I	12866 - 36014	0.21	0.057	-1.24
4322.68	Ta I	17383 - 40510	0.73	0.20	-0.69
4329.57	Ta I	15904 - 38994	0.61	0.17	-0.76
4336.20	Ta I	23927 - 46982	2.3	0.65	-0.19
4355.14	Ta I	22682 - 45637	5.4	1.5	0.18
4360.83	Ta I	10690 - 33615	0.075	0.021	-1.67
4369.35	Ta I	12866 - 35746	0.16	0.047	-1.33
4374.21	Ta I	12866 - 35721	0.082	0.024	-1.63
4375.14	Ta I	15904 - 38754	0.32	0.092	-1.03
4377.98	Ta I	24982 - 47817	2.4	0.70	-0.16
4378.82	Ta I	3964 - 26795	0.024	0.0070	-2.16
4381.88	Ta I	21168 - 43982	0.70	0.20	-0.69
4386.07	Ta I	6069 - 28862	0.063	0.018	-1.74
4398.45	Ta I	2010 - 24739	0.015	0.0043	-2.36
4402.50	Ta I	9253 - 31961	0.18	0.053	-1.28
4415.74	Ta I	6049 - 28689	0.053	0.016	-1.81
4419.55	Ta I	6069 - 28689	0.019	0.0056	-2.25
4424.96	Ta I	20647 - 43239	0.81	0.24	-0.63
4430.41	Ta I	12235 - 34800	0.15	0.044	-1.36
4431.09	Ta I	5621 - 28183	0.012	0.0034	-2.47
4432.98	Ta I	15391 - 37943	0.21	0.061	-1.21
4441.03	Ta I	9976 - 32487	0.067	0.020	-1.70
4441.68	Ta I	10690 - 33198	0.11	0.032	-1.49
4450.72	Ta I	13352 - 35813	0.23	0.068	-1.17
4451.87	Ta I	9759 - 32215	0.021	0.0062	-2.21
4459.76	Ta I	19178 - 41595	1.5	0.44	-0.36
4473.52	Ta I	9253 - 31601	0.087	0.026	-1.58
4480.93	Ta I	25009 - 47319	3.7	1.1	0.05
4496.50	Ta I	2010 - 24243	0.0044	0.0013	-2.87
4510.98	Ta I	5621 - 27783	0.11	0.035	-1.46
4511.50	Ta I	5621 - 27781	0.024	0.0073	-2.13
4521.09	Ta I	5621 - 27734	0.018	0.0055	-2.26
4530.85	Ta I	6069 - 28134	0.067	0.021	-1.69
4547.15	Ta I	9976 - 31961	0.030	0.0092	-2.04
4551.95	Ta I	3964 - 25926	0.025	0.0078	-2.11
4553.69	Ta I	11244 - 33198	0.070	0.022	-1.66
4556.35	Ta I	11244 - 33185	0.13	0.039	-1.41
4559.46	Ta I	12866 - 34792	0.11	0.034	-1.47
4561.48	Ta I	2010 - 23927	0.0018	0.00057	-3.24

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4565.85	Ta I	9705 - 31601	0.16	0.050	-1.30
4566.86	Ta I	25926 - 47817	2.5	0.79	-0.10
4573.29	Ta I	12235 - 34095	0.090	0.028	-1.55
4574.31	Ta I	0 - 21855	0.021	0.0065	-2.19
4580.69	Ta I	9705 - 31530	0.026	0.0083	-2.08
4583.17	Ta I	9253 - 31066	0.015	0.0049	-2.31
4601.42	Ta I	15904 - 37630	0.20	0.063	-1.20
4602.19	Ta I	9705 - 31428	0.043	0.014	-1.87
4604.28	Ta I	22429 - 44141	0.56	0.18	-0.75
4604.85	Ta I	23927 - 45637	1.7	0.53	-0.28
4619.51	Ta I	9253 - 30895	0.21	0.066	-1.18
4622.96	Ta I	9976 - 31601	0.027	0.0087	-2.06
4633.06	Ta I	9976 - 31554	0.036	0.012	-1.94
4661.12	Ta I	13352 - 34800	0.18	0.059	-1.23
4669.14	Ta I	9253 - 30665	0.084	0.027	-1.56
4681.88	Ta I	2010 - 23363	0.038	0.012	-1.91
4684.87	Ta I	5621 - 26960	0.0099	0.0033	-2.49
4685.27	Ta I	9253 - 30591	0.024	0.0079	-2.10
4688.84	Ta I	17224 - 38546	0.12	0.039	-1.41
4691.90	Ta I	9759 - 31066	0.095	0.031	-1.51
4693.35	Ta I	22682 - 43982	2.4	0.80	-0.10
4701.32	Ta I	10950 - 32215	0.066	0.022	-1.66
4706.09	Ta I	11244 - 32487	0.071	0.024	-1.63
4722.88	Ta I	0 - 21168	0.0019	0.00065	-3.19
4730.12	Ta I	12866 - 34001	0.15	0.049	-1.31
4740.16	Ta I	9976 - 31066	0.11	0.038	-1.42
4745.93	Ta I	17383 - 38448	0.22	0.076	-1.12
4756.51	Ta I	3964 - 24982	0.029	0.0098	-2.01
4758.03	Ta I	10950 - 31961	0.041	0.014	-1.85
4768.98	Ta I	12235 - 33198	0.16	0.055	-1.26
4780.94	Ta I	10690 - 31601	0.075	0.026	-1.59
4786.64	Ta I	9705 - 30591	0.014	0.0048	-2.32
4812.75	Ta I	0 - 20772	0.0089	0.0031	-2.51
4819.53	Ta I	13352 - 34095	0.15	0.053	-1.28
4825.43	Ta I	11244 - 31961	0.084	0.029	-1.54
4832.18	Ta I	9976 - 30665	0.036	0.013	-1.90
4846.45	Ta I	25009 - 45637	3.0	1.0	0.02
4852.17	Ta I	10950 - 31554	0.028	0.0099	-2.00
4871.70	Ta I	6069 - 26590	0.0042	0.0015	-2.83
4879.14	Ta I	23913 - 44403	0.42	0.15	-0.82
4881.94	Ta I	10950 - 31428	0.0091	0.0032	-2.49
4883.95	Ta I	9253 - 29723	0.039	0.014	-1.85
4907.73	Ta I	2010 - 22380	0.0021	0.00077	-3.11
4914.96	Ta I	0 - 20340	0.0010	0.00036	-3.44
4920.11	Ta I	12866 - 33185	0.14	0.049	-1.31
4921.27	Ta I	6049 - 26364	0.018	0.0064	-2.20
4923.47	Ta I	5621 - 25926	0.0031	0.0011	-2.95
4924.96	Ta I	17224 - 37524	0.10	0.037	-1.43
4926.00	Ta I	6069 - 26364	0.020	0.0072	-2.14
4936.42	Ta I	12235 - 32487	0.15	0.054	-1.26

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4937.63	Ta I	17383 - 37630	0.21	0.077	-1.11
4968.53	Ta I	22380 - 42502	0.42	0.16	-0.81
4969.69	Ta I	10950 - 31066	0.029	0.011	-1.97
4976.20	Ta I	9253 - 29344	0.010	0.0038	-2.42
5012.52	Ta I	10950 - 30895	0.048	0.018	-1.74
5037.37	Ta I	13352 - 33198	0.25	0.094	-1.03
5037.66	Ta I	2010 - 21855	0.0044	0.0017	-2.78
5043.32	Ta I	11244 - 31066	0.059	0.023	-1.65
5058.70	Ta I	17383 - 37146	0.095	0.036	-1.44
5067.87	Ta I	12235 - 31961	0.088	0.034	-1.47
5076.37	Ta I	17383 - 37077	0.16	0.063	-1.20
5082.25	Ta I	10690 - 30361	0.018	0.0068	-2.17
5087.37	Ta I	11244 - 30895	0.041	0.016	-1.80
5090.71	Ta I	9705 - 29344	0.037	0.014	-1.84
5095.27	Ta I	12866 - 32487	0.038	0.015	-1.83
5109.77	Ta I	5621 - 25186	0.0026	0.0010	-2.99
5117.25	Ta I	27783 - 47319	2.5	0.99	-0.00
5136.47	Ta I	6049 - 25513	0.0045	0.0018	-2.75
5141.62	Ta I	6069 - 25513	0.014	0.0057	-2.24
5143.69	Ta I	9253 - 28689	0.035	0.014	-1.85
5147.62	Ta I	11244 - 30665	0.046	0.018	-1.73
5148.78	Ta I	17383 - 36800	0.087	0.035	-1.46
5150.85	Ta I	15391 - 34800	0.050	0.020	-1.70
5153.42	Ta I	3964 - 23363	0.0059	0.0024	-2.63
5156.56	Ta I	5621 - 25009	0.041	0.016	-1.79
5161.81	Ta I	9976 - 29344	0.032	0.013	-1.89
5163.65	Ta I	5621 - 24982	0.0078	0.0031	-2.51
5166.79	Ta I	12866 - 32215	0.024	0.0096	-2.02
5171.63	Ta I	10690 - 30021	0.010	0.0042	-2.38
5180.98	Ta I	21855 - 41151	0.45	0.18	-0.74
5188.93	Ta I	12866 - 32132	0.019	0.0076	-2.12
5193.99	Ta I	17383 - 36631	0.067	0.027	-1.57
5212.74	Ta I	0 - 19178	0.0028	0.0011	-2.95
5218.45	Ta I	2010 - 21168	0.0048	0.0020	-2.70
5230.80	Ta I	6069 - 25181	0.0050	0.0021	-2.69
5235.39	Ta I	12866 - 31961	0.028	0.012	-1.93
5244.78	Ta I	9705 - 28767	0.0065	0.0027	-2.57
5281.02	Ta I	9759 - 28689	0.0064	0.0027	-2.58
5295.01	Ta I	9253 - 28134	0.027	0.011	-1.94
5318.67	Ta I	25186 - 43983	1.0	0.44	-0.36
5328.38	Ta I	2010 - 20772	0.0029	0.0013	-2.90
5336.13	Ta I	12866 - 31601	0.026	0.011	-1.95
5341.05	Ta I	3964 - 22682	0.0093	0.0040	-2.40
5342.25	Ta I	9976 - 28689	0.0092	0.0039	-2.41
5349.09	Ta I	6049 - 24739	0.0060	0.0026	-2.59
5349.57	Ta I	12866 - 31554	0.041	0.018	-1.75
5354.68	Ta I	6069 - 24739	0.0076	0.0032	-2.49
5365.95	Ta I	17383 - 36014	0.044	0.019	-1.72
5388.51	Ta I	28767 - 47319	1.8	0.77	-0.11
5395.99	Ta I	9253 - 27781	0.011	0.0047	-2.33

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
5397.56	Ta I	17224 – 35746	0.068	0.030	-1.53
5402.51	Ta I	0 – 18505	0.0042	0.0018	-2.74
5403.54	Ta I	15114 – 33615	0.019	0.0082	-2.09
5404.96	Ta I	17224 – 35721	0.12	0.052	-1.29
5405.80	Ta I	17383 – 35877	0.035	0.015	-1.81
5410.55	Ta I	9705 – 28183	0.0056	0.0025	-2.61
5413.48	Ta I	6049 – 24517	0.0029	0.0013	-2.90
5419.13	Ta I	6069 – 24517	0.014	0.0063	-2.20
5435.27	Ta I	10950 – 29344	0.028	0.012	-1.90
5461.29	Ta I	5621 – 23927	0.0086	0.0038	-2.42
5475.54	Ta I	24243 – 42502	0.58	0.26	-0.58
5481.16	Ta I	23355 – 41595	0.22	0.097	-1.01
5483.43	Ta I	23363 – 41595	0.29	0.13	-0.89
5494.78	Ta I	6049 – 24243	0.0022	0.00098	-3.01
5499.44	Ta I	13352 – 31530	0.042	0.019	-1.72
5500.68	Ta I	6069 – 24243	0.0019	0.00086	-3.07
5505.66	Ta I	9976 – 28134	0.0065	0.0029	-2.53
5518.91	Ta I	17383 – 35498	0.23	0.10	-0.98
5521.15	Ta I	20647 – 38754	0.057	0.026	-1.59
5528.36	Ta I	3964 – 22047	0.00073	0.00033	-3.48
5545.14	Ta I	12866 – 30895	0.0071	0.0033	-2.48
5548.32	Ta I	17224 – 35243	0.048	0.022	-1.65
5584.02	Ta I	27734 – 45637	1.4	0.67	-0.17
5598.75	Ta I	27781 – 45637	0.69	0.32	-0.49
5599.52	Ta I	27783 – 45637	1.4	0.67	-0.17
5605.50	Ta I	17383 – 35218	0.021	0.010	-2.00
5617.71	Ta I	23355 – 41151	0.11	0.054	-1.27
5620.68	Ta I	12235 – 30021	0.021	0.010	-2.00
5635.71	Ta I	10950 – 28689	0.0078	0.0037	-2.43
5640.18	Ta I	12866 – 30591	0.025	0.012	-1.93
5645.91	Ta I	9253 – 26960	0.036	0.017	-1.77
5664.90	Ta I	2010 – 19658	0.0038	0.0018	-2.74
5688.25	Ta I	17224 – 34800	0.069	0.033	-1.48
5699.24	Ta I	9253 – 26795	0.0086	0.0042	-2.38
5704.31	Ta I	21153 – 38679	0.099	0.048	-1.32
5706.28	Ta I	24982 – 42502	0.48	0.24	-0.63
5715.24	Ta I	10690 – 28183	0.011	0.0052	-2.28
5716.53	Ta I	12235 – 29723	0.0039	0.0019	-2.71
5746.71	Ta I	26586 – 43983	0.66	0.33	-0.48
5761.61	Ta I	24243 – 41595	0.23	0.11	-0.95
5766.56	Ta I	9253 – 26590	0.0055	0.0027	-2.56
5767.91	Ta I	9253 – 26586	0.0068	0.0034	-2.47
5771.93	Ta I	25181 – 42502	0.20	0.098	-1.01
5776.77	Ta I	6049 – 23355	0.011	0.0055	-2.26
5780.02	Ta I	20647 – 37943	0.14	0.068	-1.17
5780.71	Ta I	6069 – 23363	0.0077	0.0039	-2.41
5811.10	Ta I	3964 – 21168	0.0060	0.0030	-2.52
5816.51	Ta I	26795 – 43983	0.75	0.38	-0.42
5843.94	Ta I	9759 – 26866	0.011	0.0054	-2.27
5849.68	Ta I	10690 – 27781	0.0039	0.0020	-2.70

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5877.36	Ta I	13352 - 30361	0.15	0.080	-1.10
5882.30	Ta I	23515 - 40510	1.4	0.74	-0.13
5901.91	Ta I	11244 - 28183	0.031	0.016	-1.79
5916.51	Ta I	11792 - 28689	0.013	0.0067	-2.18
5918.95	Ta I	9976 - 26866	0.021	0.011	-1.95
5925.90	Ta I	17224 - 34095	0.028	0.015	-1.83
5930.62	Ta I	12866 - 29723	0.0082	0.0043	-2.36
5931.05	Ta I	24739 - 41595	0.35	0.18	-0.73
5931.68	Ta I	17224 - 34078	0.037	0.020	-1.71
5935.54	Ta I	23913 - 40756	0.21	0.11	-0.94
5939.76	Ta I	9759 - 26590	0.028	0.015	-1.83
5944.02	Ta I	9976 - 26795	0.057	0.030	-1.52
5960.13	Ta I	23913 - 40686	0.21	0.11	-0.95
5997.23	Ta I	13352 - 30021	0.11	0.061	-1.22
6009.89	Ta I	24517 - 41151	0.35	0.19	-0.73
6015.90	Ta I	17383 - 34001	0.046	0.025	-1.60
6020.72	Ta I	9759 - 26364	0.021	0.012	-1.93
6045.39	Ta I	11244 - 27781	0.080	0.044	-1.36
6047.25	Ta I	12235 - 28767	0.043	0.023	-1.63
6053.64	Ta I	9705 - 26220	0.0052	0.0029	-2.55
6090.82	Ta I	25181 - 41595	0.50	0.28	-0.56
6101.58	Ta I	22429 - 38813	0.73	0.41	-0.39
6140.07	Ta I	26220 - 42502	0.52	0.29	-0.53
6144.56	Ta I	10690 - 26960	0.016	0.0092	-2.04
6152.54	Ta I	27734 - 43983	0.99	0.56	-0.25
6154.50	Ta I	9976 - 26220	0.026	0.015	-1.82
6158.84	Ta I	17383 - 33615	0.064	0.036	-1.44
6170.46	Ta I	27781 - 43983	0.48	0.27	-0.57
6208.37	Ta I	25478 - 41581	0.41	0.23	-0.63
6249.79	Ta I	12866 - 28862	0.017	0.0099	-2.00
6256.68	Ta I	6069 - 22047	0.0099	0.0058	-2.24
6268.70	Ta I	12235 - 28183	0.056	0.033	-1.48
6281.33	Ta I	10950 - 26866	0.016	0.0096	-2.02
6287.91	Ta I	12235 - 28134	0.014	0.0082	-2.09
6289.34	Ta I	10690 - 26586	0.0090	0.0053	-2.27
6309.58	Ta I	10950 - 26795	0.038	0.023	-1.64
6325.08	Ta I	6049 - 21855	0.0047	0.0028	-2.55
6332.91	Ta I	6069 - 21855	0.0032	0.0019	-2.72
6346.02	Ta I	9759 - 25513	0.0056	0.0034	-2.47
6356.14	Ta I	9253 - 24982	0.012	0.0070	-2.16
6360.84	Ta I	11244 - 26960	0.017	0.010	-1.99
6373.06	Ta I	22761 - 38448	0.26	0.16	-0.80
6389.45	Ta I	21153 - 36800	0.38	0.23	-0.63
6392.21	Ta I	10950 - 26590	0.0055	0.0034	-2.47
6428.60	Ta I	11244 - 26795	0.016	0.010	-2.00
6430.79	Ta I	12235 - 27781	0.086	0.053	-1.28
6450.36	Ta I	12235 - 27734	0.068	0.042	-1.37
6455.83	Ta I	9253 - 24739	0.0029	0.0018	-2.74
6459.92	Ta I	9705 - 25181	0.0052	0.0032	-2.49
6485.37	Ta I	13352 - 28767	0.17	0.11	-0.97

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6514.39	Ta I	11244 - 26590	0.025	0.016	-1.80
6516.10	Ta I	11244 - 26586	0.025	0.016	-1.80
6561.60	Ta I	10690 - 25926	0.0052	0.0033	-2.48
6574.84	Ta I	9976 - 25181	0.017	0.011	-1.96
6585.13	Ta I	22761 - 37943	0.062	0.040	-1.40
6611.95	Ta I	11244 - 26364	0.027	0.017	-1.76
6621.30	Ta I	6069 - 21168	0.0041	0.0027	-2.57
6673.73	Ta I	9759 - 24739	0.015	0.010	-2.00
6675.53	Ta I	11244 - 26220	0.040	0.027	-1.57
6706.46	Ta I	15114 - 30021	0.010	0.0068	-2.17
6709.39	Ta I	23913 - 38813	0.20	0.14	-0.87
6740.73	Ta I	13352 - 28183	0.030	0.021	-1.69
6754.91	Ta I	26795 - 41595	0.66	0.45	-0.34
6755.85	Ta I	11792 - 26590	0.0032	0.0022	-2.66
6770.37	Ta I	23913 - 38679	0.097	0.067	-1.17
6771.74	Ta I	9976 - 24739	0.011	0.0079	-2.10
6774.25	Ta I	9759 - 24517	0.0054	0.0037	-2.43
6788.99	Ta I	12235 - 26960	0.011	0.0074	-2.13
6790.06	Ta I	6049 - 20772	0.00063	0.00043	-3.36
6799.27	Ta I	6069 - 20772	0.00063	0.00043	-3.36
6813.25	Ta I	9253 - 23927	0.020	0.014	-1.86
6865.13	Ta I	10950 - 25513	0.0029	0.0020	-2.69
6866.23	Ta I	12235 - 26795	0.059	0.042	-1.38
6875.27	Ta I	9976 - 24517	0.026	0.018	-1.74
6896.77	Ta I	10690 - 25186	0.0026	0.0019	-2.72
6900.55	Ta I	26022 - 40510	0.50	0.36	-0.45
6902.10	Ta I	9759 - 24243	0.020	0.015	-1.84
6927.38	Ta I	13352 - 27783	0.051	0.037	-1.44
6928.54	Ta I	13352 - 27781	0.051	0.037	-1.44
6951.26	Ta I	13352 - 27734	0.023	0.017	-1.78
6953.88	Ta I	17224 - 31601	0.048	0.035	-1.46
6966.13	Ta I	12235 - 26586	0.046	0.034	-1.47
6971.53	Ta I	23913 - 38253	0.062	0.045	-1.34
6983.52	Ta I	22761 - 37077	0.12	0.084	-1.07
6995.22	Ta I	10690 - 24982	0.019	0.014	-1.86
7005.07	Ta I	6069 - 20340	0.0017	0.0013	-2.90
7006.96	Ta I	9976 - 24243	0.010	0.0076	-2.12
7025.03	Ta I	10950 - 25181	0.0090	0.0066	-2.18
7031.51	Ta I	17383 - 31601	0.014	0.010	-1.99
7039.07	Ta I	22429 - 36631	0.17	0.13	-0.90
7085.40	Ta I	9253 - 23363	0.0022	0.0016	-2.79
7093.02	Ta I	12866 - 26960	0.0067	0.0051	-2.29
7108.05	Ta I	22761 - 36826	0.036	0.028	-1.56
7121.27	Ta I	22761 - 36800	0.097	0.073	-1.13
7148.63	Ta I	12235 - 26220	0.037	0.028	-1.55
7172.90	Ta I	11244 - 25181	0.021	0.016	-1.80
7250.27	Ta I	10950 - 24739	0.0051	0.0040	-2.39
7276.96	Ta I	11244 - 24982	0.0055	0.0044	-2.36
7286.36	Ta I	11792 - 25513	0.0018	0.0014	-2.85
7301.74	Ta I	12235 - 25926	0.032	0.025	-1.60

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7319.84	Ta I	9705 - 23363	0.0022	0.0018	-2.74
7322.72	Ta I	15114 - 28767	0.0058	0.0047	-2.33
7346.41	Ta I	6049 - 19658	0.0064	0.0052	-2.28
7352.86	Ta I	9759 - 23355	0.015	0.013	-1.90
7356.96	Ta I	6069 - 19658	0.0040	0.0032	-2.49
7369.09	Ta I	10950 - 24517	0.014	0.011	-1.95
7407.89	Ta I	11244 - 24739	0.027	0.022	-1.65
7467.75	Ta I	9976 - 23363	0.0036	0.0030	-2.52
7520.56	Ta I	10950 - 24243	0.0046	0.0039	-2.41
7569.23	Ta I	17383 - 30591	0.0056	0.0048	-2.32
7722.02	Ta I	12235 - 25181	0.0022	0.0020	-2.70
7842.76	Ta I	12235 - 24982	0.0038	0.0035	-2.46
7882.37	Ta I	11244 - 23927	0.014	0.013	-1.88
7950.19	Ta I	13352 - 25926	0.0078	0.0074	-2.13
7998.75	Ta I	17224 - 29723	0.0046	0.0044	-2.35
8022.09	Ta I	28689 - 41151	0.12	0.11	-0.95
8026.50	Ta I	6049 - 18505	0.0023	0.0023	-2.65
8029.04	Ta I	11792 - 24243	0.00079	0.00076	-3.12
8039.08	Ta I	6069 - 18505	0.00047	0.00045	-3.34
8053.93	Ta I	10950 - 23363	0.00092	0.00090	-3.05
8068.98	Ta I	15391 - 27781	0.0064	0.0063	-2.20
8100.11	Ta I	9705 - 22047	0.00043	0.00042	-3.38
8248.95	Ta I	11244 - 23363	0.0016	0.0016	-2.79
8264.85	Ta I	9759 - 21855	0.0017	0.0017	-2.77
8281.62	Ta I	9976 - 22047	0.0066	0.0067	-2.17
8415.73	Ta I	9976 - 21855	0.00042	0.00045	-3.35
8447.62	Ta I	13352 - 25186	0.0054	0.0058	-2.24
8550.49	Ta I	12235 - 23927	0.0017	0.0019	-2.72
8575.92	Ta I	13352 - 25009	0.0031	0.0035	-2.46
8595.84	Ta I	13352 - 24982	0.0021	0.0023	-2.64

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2146.87	Ta II	1031 - 47596	16.	1.1	0.03
2150.62	Ta II	1031 - 47515	7.7	0.53	-0.27
2165.01	Ta II	0 - 46175	5.5	0.39	-0.41
2178.03	Ta II	3180 - 49080	15.	1.1	0.04
2182.71	Ta II	1031 - 46831	16.	1.1	0.05
2193.20	Ta II	2642 - 48223	11.	0.80	-0.10
2193.88	Ta II	6187 - 51754	42.	3.0	0.48
2196.03	Ta II	4416 - 49938	47.	3.4	0.53
2199.67	Ta II	0 - 45447	16.	1.2	0.06
2210.03	Ta II	0 - 45234	15.	1.1	0.04
2215.60	Ta II	4416 - 49536	15.	1.1	0.03
2239.48	Ta II	2642 - 47281	39.	3.0	0.47
2248.48	Ta II	9746 - 54207	25.	1.9	0.27
2249.79	Ta II	0 - 44435	6.8	0.52	-0.29
2250.76	Ta II	1031 - 45447	24.	1.8	0.25
2254.86	Ta II	3180 - 47515	9.6	0.74	-0.13
2255.77	Ta II	12436 - 56753	63.	4.8	0.68
2256.51	Ta II	9746 - 54048	39.	3.0	0.47
2258.71	Ta II	0 - 44259	7.8	0.60	-0.22
2261.42	Ta II	0 - 44206	13.	0.98	-0.01
2261.62	Ta II	1031 - 45234	5.1	0.39	-0.40
2262.30	Ta II	2642 - 46831	35.	2.7	0.44
2269.56	Ta II	12705 - 56753	38.	2.9	0.47
2271.85	Ta II	2642 - 46646	26.	2.0	0.31
2272.59	Ta II	3180 - 47169	39.	3.0	0.48
2282.19	Ta II	1031 - 44835	7.7	0.60	-0.22
2285.02	Ta II	5331 - 49080	9.2	0.72	-0.14
2285.25	Ta II	2642 - 46387	29.	2.3	0.36
2286.59	Ta II	9746 - 53466	82.	6.5	0.81
2287.27	Ta II	12436 - 56142	49.	3.8	0.58
2289.16	Ta II	3180 - 46851	44.	3.5	0.54
2292.54	Ta II	0 - 43606	3.3	0.26	-0.59
2301.47	Ta II	12705 - 56142	37.	2.9	0.46
2302.24	Ta II	5658 - 49080	42.	3.3	0.52
2302.93	Ta II	4416 - 47825	32.	2.5	0.40
2303.49	Ta II	1031 - 44430	8.3	0.66	-0.18
2308.46	Ta II	5658 - 48963	9.0	0.72	-0.14
2312.60	Ta II	1031 - 44259	12.	0.96	-0.02
2315.46	Ta II	1031 - 44206	12.	0.95	-0.02
2319.16	Ta II	12436 - 55543	70.	5.6	0.75
2331.29	Ta II	11767 - 54649	27.	2.2	0.34
2332.19	Ta II	4416 - 47281	47.	3.8	0.59
2334.88	Ta II	6831 - 49647	26.	2.1	0.33
2335.75	Ta II	12705 - 55505	47.	3.8	0.58
2338.28	Ta II	6988 - 49741	48.	3.9	0.59
2340.94	Ta II	6831 - 49536	31.	2.5	0.40
2341.61	Ta II	12436 - 55128	68.	5.6	0.75
2353.86	Ta II	5331 - 47801	22.	1.8	0.25
2356.05	Ta II	9690 - 52121	47.	3.9	0.60
2356.90	Ta II	4416 - 46831	14.	1.2	0.07

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2359.16	Ta II	9746 - 52121	47.	4.0	0.60
2364.24	Ta II	6187 - 48470	100.	8.4	0.92
2367.24	Ta II	4416 - 46646	5.4	0.46	-0.34
2369.32	Ta II	2642 - 44835	9.6	0.81	-0.09
2370.76	Ta II	5658 - 47825	44.	3.7	0.57
2372.80	Ta II	6831 - 48963	14.	1.2	0.07
2373.94	Ta II	10713 - 52825	35.	3.0	0.47
2378.31	Ta II	1031 - 43065	6.8	0.58	-0.24
2381.13	Ta II	2642 - 44626	30.	2.6	0.41
2381.52	Ta II	0 - 41977	7.9	0.67	-0.17
2383.72	Ta II	5658 - 47596	28.	2.4	0.37
2384.28	Ta II	1031 - 42960	10.	0.89	-0.05
2387.06	Ta II	4416 - 46295	175.	15.	1.18
2388.37	Ta II	5658 - 47515	14.	1.2	0.07
2389.11	Ta II	9690 - 51534	59.	5.0	0.70
2399.92	Ta II	3180 - 44835	4.9	0.42	-0.38
2400.63	Ta II	6187 - 47830	516.	45.	1.65
2402.13	Ta II	2642 - 44259	11.	0.96	-0.02
2403.68	Ta II	11875 - 53466	58.	5.0	0.70
2408.26	Ta II	5658 - 47169	25.	2.2	0.34
2412.53	Ta II	14581 - 56019	32.	2.8	0.44
2415.21	Ta II	6831 - 48223	65.	5.7	0.75
2416.89	Ta II	2642 - 44005	28.	2.5	0.40
2417.33	Ta II	0 - 41355	3.1	0.27	-0.57
2421.85	Ta II	14581 - 55859	138.	12.	1.08
2423.48	Ta II	3180 - 44430	19.	1.7	0.22
2425.91	Ta II	12436 - 53645	99.	8.8	0.94
2428.00	Ta II	5658 - 46831	15.	1.3	0.11
2429.71	Ta II	0 - 41145	16.	1.4	0.16
2431.06	Ta II	1031 - 42153	11.	0.96	-0.02
2432.70	Ta II	6187 - 47281	131.	12.	1.07
2433.59	Ta II	3180 - 44259	15.	1.4	0.14
2436.51	Ta II	12436 - 53466	107.	9.6	0.98
2438.64	Ta II	6831 - 47825	37.	3.3	0.52
2444.13	Ta II	2642 - 43544	11.	1.0	0.01
2449.44	Ta II	6988 - 47801	30.	2.7	0.43
2454.70	Ta II	11767 - 52493	43.	3.9	0.59
2461.06	Ta II	10713 - 51334	59.	5.3	0.73
2463.82	Ta II	12436 - 53011	149.	14.	1.13
2466.99	Ta II	1031 - 41555	8.6	0.79	-0.11
2467.37	Ta II	5658 - 46175	33.	3.0	0.47
2468.41	Ta II	15851 - 56351	67.	6.1	0.79
2470.90	Ta II	6187 - 46646	108.	9.9	1.00
2473.31	Ta II	4416 - 44835	20.	1.8	0.27
2476.67	Ta II	3180 - 43544	23.	2.1	0.33
2479.58	Ta II	2642 - 42960	7.9	0.73	-0.14
2481.86	Ta II	11875 - 52156	100.	9.3	0.97
2484.72	Ta II	0 - 40234	3.7	0.34	-0.47
2488.70	Ta II	4416 - 44585	94.	8.7	0.94
2497.77	Ta II	0 - 40024	2.2	0.20	-0.69

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2498.33	Ta II	4416 - 44430	14.	1.3	0.10
2501.98	Ta II	9690 - 49647	78.	7.4	0.87
2505.32	Ta II	5331 - 45234	19.	1.8	0.25
2508.92	Ta II	9690 - 49536	55.	5.2	0.71
2510.71	Ta II	15726 - 55544	126.	12.	1.08
2513.10	Ta II	3180 - 42960	10.	0.95	-0.02
2513.88	Ta II	11767 - 51534	54.	5.1	0.71
2526.02	Ta II	5658 - 45234	27.	2.6	0.41
2532.12	Ta II	2642 - 42123	48.	4.6	0.66
2537.94	Ta II	9690 - 49080	81.	7.9	0.90
2545.49	Ta II	1031 - 40305	12.	1.1	0.05
2551.73	Ta II	5658 - 44835	24.	2.4	0.37
2554.62	Ta II	2642 - 41775	34.	3.3	0.52
2554.91	Ta II	4416 - 43544	14.	1.4	0.15
2556.51	Ta II	5331 - 44435	22.	2.1	0.33
2557.71	Ta II	9690 - 48776	87.	8.5	0.93
2569.13	Ta II	2642 - 41555	9.6	0.96	-0.02
2571.51	Ta II	5331 - 44206	58.	5.8	0.76
2577.37	Ta II	11099 - 49887	422.	42.	1.62
2578.24	Ta II	12705 - 51480	63.	6.3	0.80
2581.60	Ta II	9746 - 48470	18.	1.8	0.26
2584.49	Ta II	13475 - 52156	139.	14.	1.15
2588.88	Ta II	6831 - 45447	8.3	0.84	-0.08
2589.81	Ta II	5658 - 44259	13.	1.3	0.13
2590.20	Ta II	13560 - 52156	22.	2.2	0.34
2593.66	Ta II	4416 - 42960	50.	5.0	0.70
2594.25	Ta II	0 - 38535	11.	1.1	0.03
2595.59	Ta II	0 - 38516	4.1	0.42	-0.38
2596.45	Ta II	2642 - 41145	22.	2.3	0.35
2600.73	Ta II	6187 - 44626	13.	1.3	0.13
2603.49	Ta II	6187 - 44585	115.	12.	1.07
2606.43	Ta II	15851 - 54206	91.	9.3	0.97
2612.61	Ta II	1031 - 39296	4.8	0.49	-0.31
2628.85	Ta II	18494 - 56522	115.	12.	1.08
2630.53	Ta II	6831 - 44835	16.	1.7	0.22
2633.79	Ta II	18494 - 56451	144.	15.	1.17
2635.58	Ta II	1031 - 38962	48.	5.0	0.70
2637.93	Ta II	0 - 37897	1.5	0.16	-0.80
2638.67	Ta II	5658 - 43544	12.	1.3	0.11
2639.19	Ta II	11767 - 49647	35.	3.7	0.57
2644.60	Ta II	2642 - 40444	7.3	0.76	-0.12
2645.10	Ta II	6831 - 44626	24.	2.5	0.39
2646.74	Ta II	11875 - 49647	107.	11.	1.05
2651.22	Ta II	4416 - 42123	27.	2.8	0.45
2658.86	Ta II	6831 - 44430	22.	2.4	0.38
2659.41	Ta II	2642 - 40234	4.9	0.52	-0.28
2663.88	Ta II	14628 - 52156	27.	2.9	0.46
2664.24	Ta II	17982 - 55505	80.	8.5	0.93
2665.60	Ta II	1031 - 38535	7.9	0.85	-0.07
2667.00	Ta II	1031 - 38516	1.5	0.16	-0.79

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2669.58	Ta II	24870 - 62318	377.	40.	1.61
2672.50	Ta II	5658 - 43065	13.	1.4	0.15
2674.18	Ta II	15851 - 53235	62.	6.7	0.83
2675.90	Ta II	4416 - 41775	69.	7.4	0.87
2676.48	Ta II	10713 - 48064	26.	2.8	0.45
2678.80	Ta II	18186 - 55505	107.	12.	1.06
2680.06	Ta II	5658 - 42960	34.	3.7	0.57
2680.66	Ta II	4416 - 41709	20.	2.1	0.32
2685.17	Ta II	4125 - 41355	123.	13.	1.12
2689.24	Ta II	6831 - 44005	17.	1.9	0.27
2691.80	Ta II	4416 - 41555	4.3	0.47	-0.33
2692.83	Ta II	3180 - 40305	2.5	0.28	-0.56
2694.52	Ta II	2642 - 39744	24.	2.6	0.41
2695.54	Ta II	10713 - 47801	21.	2.2	0.35
2695.71	Ta II	9746 - 46831	9.8	1.1	0.03
2702.80	Ta II	0 - 36988	2.8	0.31	-0.51
2709.27	Ta II	9746 - 46646	112.	12.	1.09
2710.72	Ta II	24226 - 61106	60.	6.7	0.82
2727.44	Ta II	5331 - 41984	45.	5.1	0.70
2730.73	Ta II	28044 - 64653	141.	16.	1.20
2733.34	Ta II	18554 - 55128	46.	5.2	0.71
2735.26	Ta II	9746 - 46295	34.	3.9	0.59
2739.26	Ta II	5658 - 42153	21.	2.3	0.37
2740.70	Ta II	17168 - 53645	39.	4.4	0.65
2746.83	Ta II	15726 - 52121	129.	15.	1.16
2750.41	Ta II	11875 - 48223	37.	4.2	0.62
2752.49	Ta II	2642 - 38962	17.	1.9	0.29
2757.26	Ta II	12705 - 48963	43.	4.9	0.69
2759.06	Ta II	6831 - 43065	9.1	1.0	0.01
2761.68	Ta II	1031 - 37231	11.	1.3	0.10
2763.37	Ta II	0 - 36177	2.1	0.24	-0.62
2768.09	Ta II	3180 - 39296	2.4	0.27	-0.57
2775.11	Ta II	5331 - 41355	11.	1.2	0.09
2775.35	Ta II	18186 - 54207	48.	5.6	0.75
2776.71	Ta II	17231 - 53235	32.	3.8	0.57
2778.82	Ta II	13560 - 49536	37.	4.2	0.63
2780.34	Ta II	1031 - 36988	2.5	0.29	-0.54
2784.97	Ta II	5658 - 41555	13.	1.6	0.19
2786.77	Ta II	2642 - 38516	2.2	0.26	-0.59
2789.15	Ta II	17168 - 53011	63.	7.4	0.87
2791.37	Ta II	5331 - 41145	11.	1.2	0.10
2793.86	Ta II	3180 - 38962	2.2	0.25	-0.60
2795.20	Ta II	12705 - 48470	30.	3.5	0.54
2797.76	Ta II	1031 - 36764	16.	1.8	0.26
2814.31	Ta II	6187 - 41709	9.5	1.1	0.05
2817.10	Ta II	5658 - 41145	20.	2.4	0.38
2819.14	Ta II	10713 - 46175	14.	1.7	0.23
2827.48	Ta II	14581 - 49938	73.	8.8	0.94
2828.58	Ta II	31267 - 66610	463.	56.	1.74
2829.79	Ta II	4416 - 39744	1.8	0.22	-0.66

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2832.70	Ta II	6831 - 42123	7.1	0.86	-0.07
2838.24	Ta II	15851 - 51074	81.	9.8	0.99
2843.51	Ta II	18186 - 53344	90.	11.	1.04
2844.46	Ta II	1031 - 36177	5.7	0.69	-0.16
2852.36	Ta II	18186 - 53235	78.	9.5	0.98
2856.69	Ta II	12601 - 47596	33.	4.1	0.61
2857.28	Ta II	9705 - 44693	22.	2.7	0.44
2858.44	Ta II	5331 - 40305	14.	1.7	0.23
2860.88	Ta II	6831 - 41775	5.7	0.70	-0.15
2865.32	Ta II	17231 - 52121	86.	11.	1.03
2867.41	Ta II	17982 - 52846	127.	16.	1.20
2877.05	Ta II	13475 - 48223	48.	6.0	0.78
2877.69	Ta II	9690 - 44430	21.	2.6	0.41
2879.05	Ta II	6831 - 41555	6.2	0.77	-0.11
2882.33	Ta II	9746 - 44430	7.0	0.87	-0.06
2885.40	Ta II	5658 - 40305	5.4	0.68	-0.17
2890.25	Ta II	2642 - 37231	2.1	0.26	-0.59
2900.75	Ta II	12705 - 47169	27.	3.4	0.53
2905.24	Ta II	4125 - 38535	6.6	0.84	-0.07
2913.45	Ta II	6831 - 41145	2.8	0.35	-0.45
2917.56	Ta II	13560 - 47825	18.	2.3	0.36
2918.96	Ta II	17231 - 51480	98.	13.	1.10
2922.11	Ta II	15726 - 49938	28.	3.5	0.55
2938.00	Ta II	18554 - 52580	42.	5.4	0.74
2949.92	Ta II	14581 - 48470	21.	2.7	0.43
2952.99	Ta II	9690 - 43544	17.	2.2	0.34
2956.84	Ta II	15726 - 49536	91.	12.	1.07
2957.88	Ta II	9746 - 43544	5.6	0.73	-0.14
2965.13	Ta II	0 - 33715	7.8	1.0	0.01
2965.92	Ta II	0 - 33706	0.96	0.13	-0.90
2968.28	Ta II	11767 - 45447	9.5	1.3	0.10
2976.26	Ta II	12705 - 46295	31.	4.2	0.62
2978.18	Ta II	18554 - 52121	120.	16.	1.20
2986.81	Ta II	2642 - 36113	2.4	0.32	-0.49
2999.37	Ta II	14495 - 47825	37.	5.0	0.70
3002.98	Ta II	13560 - 46851	15.	2.0	0.29
3004.92	Ta II	9690 - 42960	11.	1.5	0.16
3010.84	Ta II	5331 - 38535	4.8	0.66	-0.18
3012.54	Ta II	5331 - 38516	82.	11.	1.05
3037.50	Ta II	6831 - 39744	6.8	0.95	-0.02
3040.70	Ta II	5658 - 38535	1.7	0.24	-0.62
3042.06	Ta II	4125 - 36988	8.5	1.2	0.07
3042.44	Ta II	11767 - 44626	27.	3.8	0.58
3056.62	Ta II	17231 - 49938	72.	10.	1.00
3057.22	Ta II	14581 - 47281	58.	8.1	0.91
3087.76	Ta II	9746 - 42123	7.8	1.1	0.05
3101.03	Ta II	11767 - 44005	17.	2.4	0.38
3127.76	Ta II	9746 - 41709	18.	2.6	0.41
3133.89	Ta II	5331 - 37231	2.5	0.37	-0.44
3137.44	Ta II	9690 - 41555	6.7	0.99	-0.00

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3142.96	Ta II	9746 - 41555	6.7	1.00	-0.00
3155.25	Ta II	6831 - 38516	1.8	0.27	-0.57
3156.76	Ta II	11875 - 43544	7.4	1.1	0.04
3157.96	Ta II	5331 - 36988	2.3	0.35	-0.46
3168.18	Ta II	15726 - 47281	38.	5.8	0.76
3213.91	Ta II	5658 - 36764	5.8	0.90	-0.05
3229.88	Ta II	14495 - 45447	29.	4.5	0.65
3240.94	Ta II	5331 - 36177	3.1	0.48	-0.32
3274.95	Ta II	3180 - 33706	2.7	0.43	-0.36
3275.68	Ta II	5658 - 36177	2.1	0.34	-0.47
3339.91	Ta II	6831 - 36764	3.9	0.66	-0.18
3349.21	Ta II	14581 - 44430	34.	5.8	0.76
3379.52	Ta II	4125 - 33706	1.8	0.31	-0.52
3406.66	Ta II	6831 - 36177	4.4	0.77	-0.11
3414.14	Ta II	6831 - 36113	3.6	0.62	-0.21
3417.03	Ta II	0 - 29257	0.17	0.030	-1.52
3440.24	Ta II	14495 - 43554	19.	3.5	0.54
3446.91	Ta II	12705 - 41709	9.7	1.7	0.24
3541.88	Ta II	1031 - 29257	0.38	0.072	-1.14
3573.44	Ta II	11767 - 39744	12.	2.2	0.34
3662.34	Ta II	9690 - 36988	2.2	0.44	-0.36
3694.52	Ta II	14495 - 41555	6.9	1.4	0.15
3830.00	Ta II	5658 - 31760	0.23	0.050	-1.30
3833.74	Ta II	3180 - 29257	0.70	0.16	-0.81
3922.42	Ta II	6831 - 32318	0.47	0.11	-0.97
3981.01	Ta II	11875 - 36988	0.59	0.14	-0.85
4095.55	Ta II	11767 - 36177	0.48	0.12	-0.92
4176.90	Ta II	14581 - 38516	3.8	1.00	-0.00
4235.94	Ta II	24870 - 48470	45.	12.	1.08
5109.37	Ta II	9690 - 29257	0.085	0.033	-1.48
5237.53	Ta II	14628 - 33715	0.38	0.16	-0.80

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4318.85	Tb I	0 - 23148	5.2	1.5	0.16
4326.47	Tb I	0 - 23107	7.2	2.0	0.31
4338.45	Tb I	0 - 23043	4.1	1.1	0.06

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
1994.20	Te I	4751 - 54877	3.2	0.19	-0.72
2002.00	Te I	4751 - 54685	6.3	0.38	-0.42
2081.03	Te I	10559 - 58596	5.7	0.37	-0.43
2142.75	Te I	0 - 46653	5.8	0.40	-0.40
2147.19	Te I	10559 - 57116	5.8	0.40	-0.40
2159.79	Te I	10559 - 56845	0.72	0.051	-1.29
2259.04	Te I	0 - 44253	0.33	0.025	-1.60
2383.25	Te I	4707 - 46653	6.4	0.55	-0.26
2385.76	Te I	4751 - 46653	8.2	0.70	-0.16
2530.70	Te I	4751 - 44253	0.74	0.071	-1.15
3175.11	Te I	23199 - 54685	6.2	0.94	-0.03

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2987.68	Th I	3688 - 37149	0.96	0.13	-0.89
3060.44	Th I	0 - 32666	0.66	0.093	-1.03
3120.88	Th I	2558 - 34591	0.68	0.099	-1.00
3136.22	Th I	4962 - 36838	2.6	0.38	-0.42
3136.83	Th I	0 - 31870	0.32	0.047	-1.33
3140.27	Th I	2869 - 34704	1.4	0.21	-0.68
3145.63	Th I	0 - 31781	0.31	0.046	-1.34
3171.26	Th I	0 - 31524	0.33	0.050	-1.30
3173.43	Th I	2869 - 34372	0.74	0.11	-0.95
3192.57	Th I	2869 - 34183	0.71	0.11	-0.96
3195.69	Th I	0 - 31283	0.31	0.048	-1.32
3211.20	Th I	2869 - 34001	0.68	0.10	-0.98
3214.08	Th I	2558 - 33662	0.62	0.096	-1.02
3214.38	Th I	4962 - 36063	1.2	0.19	-0.73
3232.31	Th I	0 - 30929	0.22	0.034	-1.47
3235.00	Th I	3688 - 34591	0.81	0.13	-0.90
3244.46	Th I	0 - 30813	0.56	0.088	-1.06
3249.87	Th I	0 - 30762	0.48	0.076	-1.12
3272.05	Th I	0 - 30553	0.52	0.084	-1.08
3304.24	Th I	0 - 30255	2.1	0.34	-0.47
3309.36	Th I	0 - 30209	0.54	0.089	-1.05
3322.09	Th I	2558 - 32651	0.48	0.079	-1.10
3330.48	Th I	0 - 30017	1.0	0.17	-0.77
3333.13	Th I	2869 - 32863	1.5	0.26	-0.59
3348.77	Th I	0 - 29853	1.2	0.20	-0.69
3365.33	Th I	2869 - 32575	1.1	0.18	-0.74
3380.86	Th I	2869 - 32439	1.0	0.18	-0.75
3389.46	Th I	8111 - 37606	4.4	0.77	-0.12
3396.73	Th I	3865 - 33297	2.1	0.36	-0.45
3402.02	Th I	8460 - 37846	7.4	1.3	0.11
3405.56	Th I	3688 - 33043	1.9	0.33	-0.48
3421.21	Th I	2869 - 32090	2.9	0.52	-0.29
3423.99	Th I	0 - 29197	0.89	0.16	-0.81
3429.00	Th I	2558 - 31713	1.3	0.23	-0.63
3437.31	Th I	2869 - 31953	2.4	0.43	-0.36
3442.58	Th I	4962 - 34001	1.5	0.26	-0.59
3461.02	Th I	0 - 28885	0.60	0.11	-0.96
3461.22	Th I	4962 - 33845	3.3	0.60	-0.22
3466.52	Th I	4962 - 33801	3.3	0.59	-0.23
3471.21	Th I	3865 - 32666	1.5	0.27	-0.56
3471.95	Th I	7280 - 36074	1.6	0.30	-0.53
3480.05	Th I	8111 - 36838	2.0	0.37	-0.43
3496.81	Th I	0 - 28589	0.20	0.037	-1.43
3498.95	Th I	7502 - 36074	3.0	0.55	-0.26
3518.40	Th I	2869 - 31283	0.86	0.16	-0.80
3526.64	Th I	0 - 28348	0.19	0.035	-1.45
3531.44	Th I	4962 - 33271	1.5	0.28	-0.55
3544.02	Th I	8800 - 37009	5.7	1.1	0.03
3547.34	Th I	3688 - 31870	1.0	0.19	-0.71
3549.60	Th I	8111 - 36275	4.3	0.81	-0.09

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3555.02	Th I	2869 - 30991	1.1	0.21	-0.67
3567.26	Th I	0 - 28025	0.42	0.080	-1.10
3569.82	Th I	3865 - 31870	1.0	0.20	-0.70
3584.18	Th I	2869 - 30762	0.61	0.12	-0.93
3589.75	Th I	7502 - 35351	3.3	0.64	-0.19
3591.46	Th I	3688 - 31524	0.94	0.18	-0.74
3598.12	Th I	0 - 27784	0.62	0.12	-0.92
3604.68	Th I	5563 - 33297	1.2	0.24	-0.61
3612.43	Th I	0 - 27674	0.45	0.088	-1.06
3612.87	Th I	0 - 27671	0.16	0.031	-1.50
3618.36	Th I	7502 - 35131	2.1	0.41	-0.38
3622.33	Th I	5563 - 33162	1.5	0.30	-0.53
3622.80	Th I	3688 - 31283	0.71	0.14	-0.85
3638.64	Th I	8800 - 36275	1.8	0.36	-0.44
3642.25	Th I	0 - 27448	0.67	0.13	-0.88
3643.51	Th I	6362 - 33801	1.5	0.29	-0.54
3649.73	Th I	5563 - 32955	1.7	0.34	-0.46
3666.98	Th I	8800 - 36063	3.1	0.63	-0.20
3669.96	Th I	8111 - 35351	5.7	1.1	0.06
3671.54	Th I	6362 - 33591	1.2	0.24	-0.61
3692.57	Th I	3688 - 30762	0.94	0.19	-0.72
3698.11	Th I	9805 - 36838	5.6	1.2	0.06
3700.98	Th I	5563 - 32575	0.39	0.080	-1.09
3703.78	Th I	4962 - 31953	0.66	0.14	-0.87
3704.87	Th I	2869 - 29853	0.36	0.075	-1.13
3706.77	Th I	8111 - 35081	6.4	1.3	0.12
3711.62	Th I	6362 - 33297	0.96	0.20	-0.70
3719.44	Th I	0 - 26878	1.1	0.23	-0.64
3727.90	Th I	2869 - 29686	0.47	0.097	-1.01
3730.37	Th I	6362 - 33162	1.4	0.29	-0.53
3758.46	Th I	2558 - 29157	0.46	0.096	-1.02
3765.24	Th I	8800 - 35351	2.3	0.49	-0.31
3770.05	Th I	5563 - 32080	1.5	0.32	-0.49
3771.37	Th I	0 - 26508	0.34	0.072	-1.14
3796.72	Th I	8800 - 35131	1.1	0.24	-0.62
3798.10	Th I	4962 - 31283	0.37	0.081	-1.09
3801.44	Th I	7502 - 33801	1.7	0.37	-0.43
3803.07	Th I	0 - 26287	0.96	0.21	-0.68
3803.98	Th I	8800 - 35081	1.6	0.35	-0.45
3828.38	Th I	0 - 26113	0.70	0.15	-0.81
3830.77	Th I	0 - 26097	0.17	0.038	-1.42
3837.87	Th I	2869 - 28918	0.87	0.19	-0.72
3840.80	Th I	4962 - 30991	0.52	0.12	-0.94
3852.14	Th I	3688 - 29640	0.36	0.079	-1.10
3874.86	Th I	4962 - 30762	1.5	0.33	-0.48
3875.37	Th I	2869 - 28666	0.68	0.15	-0.81
3875.64	Th I	7502 - 33297	0.34	0.076	-1.12
3879.64	Th I	7502 - 33271	1.7	0.38	-0.42
3885.77	Th I	6362 - 32090	0.48	0.11	-0.97
3886.91	Th I	2869 - 28589	0.31	0.071	-1.15

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3916.42	Th I	0 - 25526	0.066	0.015	-1.82
3919.02	Th I	3688 - 29197	0.43	0.098	-1.01
3923.80	Th I	2869 - 28347	0.084	0.019	-1.71
3925.09	Th I	3688 - 29158	0.53	0.12	-0.91
3947.33	Th I	9805 - 35131	2.3	0.54	-0.27
3948.03	Th I	0 - 25322	0.090	0.021	-1.68
3952.76	Th I	3865 - 29157	0.19	0.044	-1.36
3955.17	Th I	9805 - 35081	2.3	0.53	-0.27
3959.30	Th I	5563 - 30813	0.68	0.16	-0.80
3962.42	Th I	3688 - 28918	0.20	0.047	-1.33
3973.20	Th I	6362 - 31524	1.1	0.27	-0.57
3987.22	Th I	7502 - 32575	0.84	0.20	-0.70
3990.49	Th I	3865 - 28918	0.40	0.096	-1.02
3991.73	Th I	8800 - 33845	1.6	0.39	-0.41
4005.09	Th I	3688 - 28649	0.19	0.045	-1.35
4009.05	Th I	7502 - 32439	2.2	0.53	-0.28
4009.72	Th I	8111 - 33043	0.65	0.16	-0.81
4011.59	Th I	6362 - 31283	0.39	0.095	-1.02
4012.50	Th I	2869 - 27784	0.73	0.18	-0.75
4030.84	Th I	2869 - 27671	0.64	0.16	-0.81
4036.05	Th I	0 - 24770	0.28	0.069	-1.16
4043.40	Th I	4962 - 29686	0.51	0.12	-0.91
4059.25	Th I	6362 - 30991	0.92	0.23	-0.65
4067.45	Th I	2869 - 27448	0.14	0.034	-1.47
4075.50	Th I	2558 - 27088	0.12	0.030	-1.52
4083.47	Th I	3865 - 28348	0.22	0.055	-1.26
4085.43	Th I	8800 - 33271	1.1	0.26	-0.58
4088.72	Th I	6362 - 30813	0.44	0.11	-0.96
4089.14	Th I	2869 - 27317	0.13	0.033	-1.48
4097.74	Th I	2869 - 27266	0.26	0.065	-1.19
4100.34	Th I	0 - 24381	0.16	0.040	-1.40
4102.62	Th I	7502 - 31870	0.47	0.12	-0.92
4107.86	Th I	3688 - 28025	0.16	0.041	-1.39
4109.32	Th I	8111 - 32439	0.56	0.14	-0.85
4112.75	Th I	0 - 24308	0.24	0.061	-1.22
4134.06	Th I	0 - 24182	0.19	0.049	-1.31
4158.54	Th I	9805 - 33845	1.7	0.44	-0.36
4192.36	Th I	6362 - 30209	0.15	0.040	-1.40
4193.02	Th I	8111 - 31953	1.1	0.29	-0.53
4213.07	Th I	2558 - 26287	0.10	0.027	-1.57
4227.39	Th I	7280 - 30929	0.37	0.10	-1.00
4235.46	Th I	0 - 23604	0.071	0.019	-1.72
4256.25	Th I	7502 - 30991	0.48	0.13	-0.88
4257.50	Th I	0 - 23481	0.081	0.022	-1.66
4260.34	Th I	9805 - 33271	1.5	0.40	-0.40
4269.94	Th I	8111 - 31524	0.22	0.061	-1.21
4272.86	Th I	8800 - 32197	0.54	0.15	-0.83
4280.57	Th I	5563 - 28918	0.11	0.030	-1.53
4288.66	Th I	7502 - 30813	0.18	0.051	-1.29
4312.99	Th I	2869 - 26049	0.24	0.067	-1.17

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4315.25	Th I	2869 - 26036	0.096	0.027	-1.57
4330.84	Th I	8111 - 31195	0.21	0.058	-1.23
4337.28	Th I	0 - 23049	0.094	0.026	-1.58
4349.07	Th I	4962 - 27949	0.17	0.047	-1.33
4374.13	Th I	0 - 22855	0.060	0.017	-1.77
4378.18	Th I	2869 - 25703	0.089	0.026	-1.59
4393.76	Th I	7502 - 30255	0.16	0.047	-1.33
4401.58	Th I	4962 - 27674	0.16	0.045	-1.34
4408.88	Th I	3688 - 26363	0.16	0.047	-1.33
4416.84	Th I	9805 - 32439	0.30	0.088	-1.06
4432.25	Th I	6362 - 28918	0.11	0.033	-1.48
4452.56	Th I	2869 - 25322	0.037	0.011	-1.96
4458.00	Th I	3688 - 26113	0.15	0.045	-1.34
4482.17	Th I	4962 - 27266	0.11	0.032	-1.50
4486.90	Th I	2558 - 24839	0.032	0.0097	-2.01
4493.33	Th I	0 - 22249	0.10	0.031	-1.50
4498.96	Th I	5563 - 27784	0.33	0.100	-1.00
4505.22	Th I	8800 - 30991	0.41	0.12	-0.91
4506.49	Th I	7502 - 29686	0.12	0.036	-1.44
4513.69	Th I	9805 - 31953	0.53	0.16	-0.79
4515.12	Th I	0 - 22142	0.025	0.0077	-2.11
4519.26	Th I	3688 - 25809	0.038	0.012	-1.94
4521.22	Th I	2869 - 24981	0.094	0.029	-1.54
4552.16	Th I	8800 - 30762	0.24	0.075	-1.13
4555.81	Th I	3865 - 25809	0.12	0.037	-1.43
4561.36	Th I	7280 - 29197	0.31	0.097	-1.01
4563.66	Th I	8111 - 30017	0.23	0.073	-1.13
4595.42	Th I	3688 - 25443	0.13	0.041	-1.39
4663.20	Th I	2869 - 24308	0.029	0.0094	-2.03
4666.79	Th I	6362 - 27784	0.17	0.056	-1.25
4668.17	Th I	7502 - 28918	0.41	0.13	-0.87
4686.19	Th I	2869 - 24203	0.019	0.0062	-2.21
4691.64	Th I	6362 - 27671	0.050	0.016	-1.78
4703.99	Th I	0 - 21253	0.027	0.0090	-2.04
4723.78	Th I	7502 - 28666	0.50	0.17	-0.78
4741.31	Th I	6362 - 27448	0.039	0.013	-1.88
4749.95	Th I	8111 - 29158	0.10	0.035	-1.46
4766.60	Th I	3865 - 24839	0.019	0.0065	-2.19
4778.30	Th I	0 - 20922	0.013	0.0043	-2.37
4789.39	Th I	3688 - 24562	0.053	0.018	-1.74
4823.61	Th I	6362 - 27088	0.090	0.032	-1.50
4826.71	Th I	13088 - 33801	0.72	0.25	-0.60
4831.12	Th I	3688 - 24381	0.059	0.021	-1.68
4840.84	Th I	2869 - 23521	0.053	0.019	-1.73
4848.36	Th I	3688 - 24308	0.042	0.015	-1.83
4865.48	Th I	13297 - 33845	0.86	0.31	-0.52
4872.91	Th I	6362 - 26878	0.10	0.037	-1.43
4878.73	Th I	2558 - 23049	0.023	0.0084	-2.08
4894.95	Th I	0 - 20424	0.020	0.0071	-2.15
4936.77	Th I	8800 - 29051	0.19	0.071	-1.15

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4943.07	Th I	2869 - 23094	0.017	0.0062	-2.21
4945.47	Th I	0 - 20215	0.0075	0.0027	-2.56
4985.38	Th I	3688 - 23741	0.029	0.011	-1.96
4989.31	Th I	7280 - 27317	0.064	0.024	-1.62
5039.24	Th I	2558 - 22397	0.020	0.0077	-2.12
5044.73	Th I	0 - 19817	0.019	0.0074	-2.13
5045.25	Th I	7502 - 27317	0.065	0.025	-1.61
5047.05	Th I	4962 - 24770	0.032	0.012	-1.92
5050.80	Th I	3688 - 23481	0.027	0.010	-1.98
5059.86	Th I	7502 - 27260	0.080	0.031	-1.51
5064.61	Th I	4962 - 24701	0.031	0.012	-1.92
5100.62	Th I	4962 - 24562	0.034	0.013	-1.88
5140.77	Th I	6362 - 25809	0.054	0.021	-1.67
5158.60	Th I	2869 - 22249	0.069	0.028	-1.56
5163.46	Th I	3688 - 23049	0.025	0.0099	-2.00
5195.82	Th I	4962 - 24203	0.069	0.028	-1.55
5199.16	Th I	3865 - 23094	0.10	0.041	-1.39
5211.23	Th I	3865 - 23049	0.050	0.020	-1.69
5219.10	Th I	8111 - 27266	0.12	0.050	-1.30
5231.16	Th I	2558 - 21669	0.077	0.031	-1.50
5258.36	Th I	3865 - 22878	0.036	0.015	-1.82
5266.70	Th I	3688 - 22670	0.011	0.0047	-2.33
5297.74	Th I	8800 - 27671	0.12	0.049	-1.31
5312.00	Th I	3688 - 22508	0.033	0.014	-1.86
5312.53	Th I	5563 - 24381	0.056	0.024	-1.63
5326.98	Th I	8111 - 26878	0.15	0.064	-1.19
5343.58	Th I	3688 - 22397	0.053	0.023	-1.64
5386.62	Th I	4962 - 23521	0.044	0.019	-1.71
5394.76	Th I	3865 - 22397	0.011	0.0047	-2.33
5398.91	Th I	8800 - 27318	0.086	0.038	-1.42
5410.76	Th I	6362 - 24839	0.039	0.017	-1.77
5417.49	Th I	3688 - 22142	0.020	0.0089	-2.05
5431.11	Th I	6362 - 24770	0.021	0.0094	-2.03
5496.13	Th I	5563 - 23753	0.013	0.0058	-2.23
5499.26	Th I	2558 - 20737	0.017	0.0078	-2.11
5504.30	Th I	7280 - 25443	0.042	0.019	-1.72
5509.99	Th I	9805 - 27949	0.16	0.072	-1.14
5539.26	Th I	9805 - 27853	0.21	0.095	-1.02
5548.18	Th I	6362 - 24381	0.058	0.027	-1.57
5557.04	Th I	8800 - 26790	0.077	0.036	-1.45
5558.35	Th I	8111 - 26097	0.13	0.058	-1.23
5559.88	Th I	3688 - 21669	0.0054	0.0025	-2.60
5572.47	Th I	7502 - 25443	0.037	0.017	-1.77
5573.35	Th I	8111 - 26049	0.11	0.051	-1.29
5579.36	Th I	5563 - 23481	0.045	0.021	-1.67
5587.03	Th I	4962 - 22855	0.064	0.030	-1.53
5610.25	Th I	7502 - 25322	0.026	0.012	-1.92
5610.67	Th I	11601 - 29419	0.13	0.061	-1.21
5615.32	Th I	3865 - 21669	0.027	0.013	-1.89
5674.98	Th I	11803 - 29419	0.099	0.048	-1.32

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5719.63	Th I	7502 - 24981	0.038	0.019	-1.73
5720.20	Th I	3688 - 21165	0.032	0.016	-1.80
5748.76	Th I	6362 - 23753	0.013	0.0067	-2.18
5753.04	Th I	4962 - 22339	0.0090	0.0045	-2.35
5760.55	Th I	0 - 17355	0.017	0.0084	-2.07
5763.54	Th I	2869 - 20215	0.0050	0.0025	-2.61
5804.14	Th I	0 - 17224	0.0082	0.0041	-2.38
5885.70	Th I	9805 - 26790	0.049	0.025	-1.60
5914.68	Th I	7280 - 24182	0.027	0.014	-1.84
5938.83	Th I	5563 - 22397	0.017	0.0088	-2.06
5973.67	Th I	3688 - 20424	0.017	0.0092	-2.04
5975.06	Th I	6362 - 23094	0.036	0.019	-1.71
5991.03	Th I	6362 - 23049	0.017	0.0093	-2.03
6001.22	Th I	8111 - 24770	0.014	0.0076	-2.12
6007.07	Th I	8800 - 25443	0.051	0.028	-1.56
6010.18	Th I	2869 - 19503	0.0048	0.0026	-2.59
6037.70	Th I	3865 - 20424	0.0097	0.0053	-2.28
6151.99	Th I	7502 - 23753	0.022	0.012	-1.91
6169.82	Th I	4962 - 21165	0.044	0.025	-1.60
6182.62	Th I	2869 - 19039	0.019	0.011	-1.96
6184.77	Th I	13089 - 29253	0.085	0.049	-1.31
6191.89	Th I	6362 - 22508	0.013	0.0073	-2.13
6198.24	Th I	3688 - 19817	0.0048	0.0028	-2.56
6207.22	Th I	5563 - 21669	0.016	0.0093	-2.03
6224.53	Th I	2869 - 18930	0.0047	0.0027	-2.57
6234.85	Th I	6362 - 22396	0.025	0.015	-1.84
6342.86	Th I	8800 - 24562	0.070	0.042	-1.37
6411.90	Th I	7502 - 23094	0.039	0.024	-1.62
6413.61	Th I	13297 - 28885	0.16	0.099	-1.01
6490.74	Th I	8800 - 24203	0.026	0.016	-1.79
6531.34	Th I	6362 - 21669	0.043	0.027	-1.57
6554.16	Th I	4962 - 20215	0.0035	0.0023	-2.64
6588.54	Th I	3865 - 19039	0.010	0.0066	-2.18
6591.48	Th I	0 - 15167	0.0013	0.00085	-3.07
6662.27	Th I	7502 - 22508	0.034	0.023	-1.64
6678.71	Th I	7280 - 22249	0.0038	0.0026	-2.59
6713.98	Th I	6362 - 21253	0.0097	0.0066	-2.18
6727.46	Th I	5563 - 20424	0.015	0.010	-1.98
6742.87	Th I	12848 - 27674	0.048	0.033	-1.49
6756.45	Th I	2558 - 17355	0.0083	0.0057	-2.25
6772.17	Th I	15493 - 30255	0.12	0.085	-1.07
6778.31	Th I	3865 - 18614	0.0037	0.0026	-2.59
6780.41	Th I	8111 - 22855	0.022	0.015	-1.83
6791.23	Th I	8800 - 23521	0.015	0.010	-1.99
6829.04	Th I	7502 - 22142	0.018	0.012	-1.91
6854.11	Th I	13089 - 27674	0.055	0.038	-1.41
6868.45	Th I	13297 - 27853	0.045	0.032	-1.50
6874.75	Th I	2869 - 17411	0.0034	0.0024	-2.61
6943.61	Th I	9805 - 24203	0.14	0.10	-1.00
7036.28	Th I	11601 - 25809	0.044	0.033	-1.48

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7124.56	Th I	0 - 14032	0.0014	0.0011	-2.97
7150.28	Th I	3865 - 17847	0.0036	0.0028	-2.56
7154.94	Th I	7280 - 21253	0.017	0.013	-1.90
7156.94	Th I	4962 - 18930	0.0043	0.0033	-2.48
7159.93	Th I	13297 - 27260	0.051	0.039	-1.41
7200.04	Th I	7280 - 21165	0.012	0.0095	-2.02
7208.01	Th I	8800 - 22670	0.093	0.073	-1.14
7218.05	Th I	9805 - 23655	0.037	0.029	-1.54
7284.90	Th I	3688 - 17411	0.0044	0.0035	-2.46
7328.28	Th I	7280 - 20922	0.012	0.0093	-2.03
7385.50	Th I	3688 - 17224	0.010	0.0085	-2.07
7428.94	Th I	7280 - 20737	0.033	0.027	-1.57
7430.25	Th I	6362 - 19817	0.011	0.0095	-2.02
7549.31	Th I	7280 - 20523	0.011	0.0091	-2.04
7625.70	Th I	8800 - 21910	0.016	0.014	-1.86
7658.32	Th I	8111 - 21165	0.0065	0.0057	-2.24
7678.12	Th I	7502 - 20523	0.0054	0.0048	-2.32
7848.45	Th I	8800 - 21540	0.0074	0.0068	-2.17
7886.28	Th I	6362 - 19039	0.0061	0.0057	-2.24
7978.97	Th I	3688 - 16218	0.010	0.0098	-2.01
8032.43	Th I	7502 - 19948	0.014	0.014	-1.85
8075.65	Th I	11803 - 24182	0.024	0.024	-1.63
8085.22	Th I	8800 - 21165	0.010	0.010	-2.00
8093.60	Th I	3865 - 16218	0.0021	0.0020	-2.69
8138.46	Th I	5563 - 17847	0.0082	0.0082	-2.09
8159.75	Th I	6362 - 18614	0.011	0.011	-1.95
8169.81	Th I	7280 - 19517	0.0087	0.0087	-2.06
8320.86	Th I	7502 - 19517	0.018	0.019	-1.72
8330.47	Th I	7502 - 19503	0.037	0.038	-1.42
8445.49	Th I	8111 - 19948	0.012	0.013	-1.90
8478.37	Th I	5563 - 17355	0.012	0.013	-1.87
8573.14	Th I	5563 - 17224	0.0073	0.0080	-2.10
8645.31	Th I	13962 - 25526	0.025	0.028	-1.55
8665.50	Th I	7502 - 19039	0.011	0.012	-1.92
8668.11	Th I	12848 - 24381	0.021	0.024	-1.62
8709.24	Th I	3688 - 15167	0.0016	0.0018	-2.75
8748.03	Th I	7502 - 18930	0.020	0.023	-1.65
8758.24	Th I	8800 - 20215	0.024	0.027	-1.57
8775.58	Th I	8111 - 19503	0.011	0.013	-1.90
8967.61	Th I	8800 - 19948	0.063	0.076	-1.12

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2326.93	Th II	1860 - 44822	1.1	0.086	-1.07
2356.75	Th II	0 - 42418	0.54	0.045	-1.34
2368.05	Th II	4490 - 46706	1.1	0.094	-1.03
2373.84	Th II	0 - 42113	1.0	0.085	-1.07
2377.84	Th II	4113 - 46156	4.9	0.41	-0.38
2388.14	Th II	1522 - 43383	0.72	0.062	-1.21
2393.11	Th II	4490 - 46264	1.7	0.14	-0.84
2404.51	Th II	4113 - 45689	2.3	0.20	-0.69
2413.41	Th II	1522 - 42944	1.3	0.11	-0.95
2431.15	Th II	4490 - 45611	0.92	0.082	-1.09
2444.46	Th II	1522 - 42418	0.47	0.042	-1.37
2456.30	Th II	4490 - 45190	3.3	0.30	-0.52
2459.01	Th II	0 - 40655	0.29	0.026	-1.58
2466.13	Th II	4113 - 44651	2.9	0.26	-0.58
2468.15	Th II	4147 - 44651	1.8	0.16	-0.79
2476.95	Th II	1860 - 42220	0.54	0.050	-1.30
2485.05	Th II	9061 - 49289	1.4	0.13	-0.89
2489.62	Th II	6214 - 46368	3.6	0.33	-0.48
2495.35	Th II	4490 - 44553	2.1	0.20	-0.71
2498.40	Th II	4490 - 44504	1.7	0.16	-0.79
2498.86	Th II	6700 - 46706	3.3	0.31	-0.51
2505.60	Th II	4490 - 44389	1.2	0.11	-0.96
2507.91	Th II	0 - 39862	0.47	0.044	-1.35
2509.96	Th II	9585 - 49415	3.0	0.29	-0.54
2525.93	Th II	9712 - 49289	1.4	0.14	-0.87
2532.43	Th II	6214 - 45689	2.0	0.19	-0.72
2535.87	Th II	7001 - 46424	2.5	0.24	-0.62
2542.65	Th II	4490 - 43808	0.87	0.084	-1.07
2545.34	Th II	6214 - 45489	2.3	0.23	-0.64
2545.74	Th II	4113 - 43383	0.77	0.075	-1.12
2547.90	Th II	4147 - 43383	3.3	0.33	-0.49
2548.14	Th II	9585 - 48818	3.3	0.32	-0.50
2551.24	Th II	1522 - 40707	0.15	0.014	-1.85
2561.94	Th II	6168 - 45190	3.0	0.30	-0.53
2565.60	Th II	1860 - 40826	5.5	0.55	-0.26
2566.59	Th II	1522 - 40472	2.7	0.27	-0.57
2574.48	Th II	4113 - 42944	1.4	0.14	-0.86
2576.69	Th II	4147 - 42944	4.1	0.41	-0.38
2580.70	Th II	4490 - 43228	1.2	0.12	-0.90
2589.06	Th II	1860 - 40472	2.3	0.23	-0.64
2595.03	Th II	8379 - 46903	3.6	0.36	-0.44
2597.05	Th II	0 - 38494	1.3	0.13	-0.87
2600.89	Th II	6214 - 44651	7.5	0.76	-0.12
2607.48	Th II	1522 - 39862	0.24	0.025	-1.60
2608.32	Th II	8379 - 46706	1.4	0.14	-0.85
2609.86	Th II	4113 - 42418	1.8	0.18	-0.73
2618.90	Th II	4147 - 42319	3.9	0.40	-0.39
2623.45	Th II	4113 - 42220	4.6	0.47	-0.32
2625.74	Th II	4147 - 42220	4.6	0.47	-0.32
2628.81	Th II	4490 - 42519	1.0	0.11	-0.97

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2633.33	Th II	8460 - 46424	2.6	0.27	-0.57
2639.51	Th II	1522 - 39397	0.30	0.032	-1.50
2640.40	Th II	4490 - 42352	0.24	0.025	-1.60
2641.49	Th II	0 - 37846	1.3	0.14	-0.85
2643.27	Th II	7001 - 44822	0.48	0.050	-1.30
2650.58	Th II	0 - 37716	0.81	0.086	-1.07
2658.66	Th II	0 - 37602	0.68	0.073	-1.14
2662.34	Th II	8606 - 46156	3.0	0.32	-0.49
2665.89	Th II	6244 - 43744	0.48	0.051	-1.29
2675.67	Th II	9061 - 46424	2.0	0.21	-0.68
2678.93	Th II	9585 - 46903	1.2	0.13	-0.89
2687.13	Th II	8018 - 45221	5.0	0.54	-0.26
2688.34	Th II	4490 - 41677	0.27	0.029	-1.54
2692.42	Th II	0 - 37130	2.0	0.21	-0.67
2695.21	Th II	11726 - 48818	8.1	0.88	-0.06
2695.81	Th II	8606 - 45689	1.3	0.14	-0.85
2696.83	Th II	12220 - 49289	4.4	0.48	-0.32
2697.54	Th II	1522 - 38582	0.28	0.031	-1.51
2698.74	Th II	6244 - 43288	1.6	0.17	-0.76
2700.60	Th II	9585 - 46603	1.1	0.12	-0.92
2703.96	Th II	1522 - 38494	1.7	0.18	-0.74
2708.18	Th II	1522 - 38436	1.0	0.11	-0.95
2716.32	Th II	8018 - 44822	3.3	0.36	-0.44
2719.45	Th II	8460 - 45221	1.4	0.15	-0.81
2719.93	Th II	9401 - 46156	3.1	0.34	-0.46
2721.70	Th II	6214 - 42944	4.9	0.54	-0.27
2722.38	Th II	1860 - 38582	1.1	0.12	-0.93
2724.89	Th II	0 - 36688	0.25	0.028	-1.56
2727.25	Th II	9712 - 46368	1.6	0.18	-0.74
2728.91	Th II	1860 - 38494	0.28	0.031	-1.51
2729.33	Th II	9061 - 45689	12.	1.3	0.11
2730.27	Th II	8606 - 45221	4.2	0.47	-0.33
2732.82	Th II	0 - 36582	0.89	0.100	-1.00
2734.42	Th II	4147 - 40707	1.8	0.20	-0.69
2735.83	Th II	4113 - 40655	0.32	0.036	-1.44
2737.43	Th II	8379 - 44899	2.5	0.29	-0.54
2738.33	Th II	4147 - 40655	0.51	0.058	-1.24
2743.07	Th II	0 - 36445	0.63	0.071	-1.15
2747.16	Th II	0 - 36390	1.8	0.20	-0.70
2747.85	Th II	7001 - 43383	1.1	0.13	-0.90
2749.53	Th II	4113 - 40472	1.1	0.12	-0.90
2752.17	Th II	1522 - 37846	2.1	0.24	-0.62
2760.40	Th II	8606 - 44822	4.6	0.53	-0.28
2763.62	Th II	6244 - 42418	2.8	0.32	-0.50
2764.64	Th II	9061 - 45221	4.2	0.48	-0.31
2765.12	Th II	4490 - 40644	1.2	0.13	-0.88
2768.85	Th II	6214 - 42319	5.0	0.57	-0.24
2770.82	Th II	1522 - 37602	0.99	0.11	-0.94
2773.96	Th II	13251 - 49289	16.	1.8	0.26
2778.04	Th II	1860 - 37846	0.21	0.024	-1.62

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2778.71	Th II	9712 - 45689	3.2	0.37	-0.43
2783.06	Th II	4490 - 40412	1.2	0.14	-0.85
2783.49	Th II	7829 - 43744	1.9	0.22	-0.66
2784.98	Th II	7332 - 43228	1.6	0.19	-0.73
2787.13	Th II	6244 - 42113	1.8	0.21	-0.68
2791.01	Th II	6700 - 42519	1.3	0.16	-0.81
2794.26	Th II	9712 - 45489	4.1	0.48	-0.32
2797.02	Th II	1860 - 37602	0.33	0.039	-1.41
2797.74	Th II	4490 - 40223	0.70	0.082	-1.09
2798.27	Th II	8018 - 43744	1.6	0.18	-0.74
2799.11	Th II	4147 - 39862	0.52	0.062	-1.21
2800.57	Th II	9202 - 44899	2.6	0.31	-0.51
2803.37	Th II	6691 - 42352	0.64	0.075	-1.13
2807.83	Th II	9585 - 45190	4.7	0.56	-0.25
2808.99	Th II	9061 - 44651	6.5	0.77	-0.11
2817.14	Th II	11117 - 46603	1.2	0.14	-0.86
2819.33	Th II	7829 - 43288	2.5	0.30	-0.53
2822.02	Th II	8379 - 43804	2.9	0.35	-0.46
2822.38	Th II	9401 - 44822	1.3	0.15	-0.81
2826.86	Th II	8018 - 43383	4.3	0.51	-0.29
2827.99	Th II	9202 - 44553	1.6	0.19	-0.72
2829.94	Th II	11576 - 46903	1.4	0.17	-0.77
2830.45	Th II	6168 - 41488	1.0	0.12	-0.92
2832.31	Th II	4147 - 39443	6.6	0.79	-0.10
2833.33	Th II	8460 - 43744	1.6	0.19	-0.72
2834.49	Th II	8018 - 43288	3.9	0.47	-0.33
2836.05	Th II	4147 - 39397	1.0	0.12	-0.91
2839.24	Th II	4490 - 39701	0.81	0.098	-1.01
2840.15	Th II	0 - 35199	0.17	0.021	-1.68
2841.16	Th II	9202 - 44389	3.1	0.37	-0.43
2841.81	Th II	9720 - 44899	0.79	0.096	-1.02
2842.82	Th II	1522 - 36688	1.2	0.15	-0.83
2847.36	Th II	9712 - 44822	3.5	0.42	-0.38
2851.26	Th II	1522 - 36584	1.0	0.12	-0.91
2851.43	Th II	1522 - 36582	0.30	0.036	-1.44
2857.49	Th II	6691 - 41677	0.89	0.11	-0.96
2861.34	Th II	9712 - 44651	12.	1.4	0.15
2866.40	Th II	4490 - 39367	0.28	0.035	-1.46
2868.45	Th II	12472 - 47324	2.6	0.33	-0.49
2868.68	Th II	8379 - 43228	1.1	0.14	-0.86
2870.40	Th II	1860 - 36688	2.1	0.26	-0.58
2876.41	Th II	6168 - 40924	0.87	0.11	-0.97
2879.19	Th II	1860 - 36582	0.15	0.019	-1.73
2879.53	Th II	8379 - 43097	0.54	0.067	-1.18
2882.00	Th II	11576 - 46264	2.7	0.34	-0.47
2882.51	Th II	8606 - 43288	0.99	0.12	-0.91
2883.61	Th II	9720 - 44389	0.77	0.097	-1.02
2884.29	Th II	4490 - 39151	2.5	0.31	-0.51
2886.23	Th II	6691 - 41328	0.65	0.082	-1.09
2892.17	Th II	9238 - 43804	1.2	0.14	-0.84

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2895.13	Th II	1860 - 36390	0.45	0.056	-1.25
2899.72	Th II	6168 - 40644	3.0	0.38	-0.43
2903.16	Th II	4147 - 38582	0.30	0.038	-1.42
2904.26	Th II	12902 - 47324	1.8	0.23	-0.65
2906.12	Th II	8018 - 42418	0.56	0.071	-1.15
2908.36	Th II	4490 - 38864	0.58	0.073	-1.14
2909.77	Th II	7332 - 41688	0.36	0.046	-1.33
2910.59	Th II	4147 - 38494	1.3	0.17	-0.77
2911.32	Th II	8606 - 42944	2.1	0.26	-0.58
2912.01	Th II	0 - 34330	0.18	0.023	-1.63
2912.66	Th II	4113 - 38436	0.58	0.074	-1.13
2917.41	Th II	4490 - 38758	1.1	0.14	-0.84
2919.83	Th II	4490 - 38729	0.95	0.12	-0.91
2920.36	Th II	6691 - 40924	0.59	0.076	-1.12
2920.94	Th II	10673 - 44899	1.8	0.23	-0.63
2922.79	Th II	12220 - 46424	2.9	0.37	-0.44
2922.99	Th II	8018 - 42220	0.43	0.055	-1.26
2928.25	Th II	8379 - 42519	5.1	0.66	-0.18
2933.09	Th II	9720 - 43804	1.7	0.22	-0.67
2937.43	Th II	12902 - 46936	4.9	0.64	-0.20
2938.10	Th II	9202 - 43228	0.71	0.092	-1.04
2940.58	Th II	7332 - 41328	1.00	0.13	-0.89
2941.89	Th II	9401 - 43383	0.59	0.077	-1.11
2942.62	Th II	8379 - 42352	2.4	0.32	-0.50
2946.25	Th II	10572 - 44504	1.0	0.13	-0.88
2949.06	Th II	4490 - 38389	0.95	0.12	-0.91
2950.43	Th II	9061 - 42944	1.8	0.24	-0.62
2955.03	Th II	10673 - 44504	2.0	0.27	-0.57
2955.60	Th II	7001 - 40826	0.73	0.095	-1.02
2957.58	Th II	4490 - 38292	1.1	0.14	-0.85
2963.61	Th II	4113 - 37846	0.16	0.021	-1.68
2964.11	Th II	6168 - 39895	0.56	0.074	-1.13
2965.49	Th II	6700 - 40412	1.3	0.17	-0.77
2968.69	Th II	4490 - 38165	1.7	0.22	-0.66
2971.48	Th II	4113 - 37757	0.61	0.081	-1.09
2972.22	Th II	1522 - 35157	0.21	0.027	-1.56
2974.01	Th II	4490 - 38105	1.3	0.17	-0.77
2976.02	Th II	7332 - 40924	1.5	0.20	-0.70
2980.32	Th II	9401 - 42944	1.3	0.18	-0.75
2981.33	Th II	6168 - 39701	1.5	0.20	-0.70
2985.24	Th II	4113 - 37602	0.83	0.11	-0.96
2986.77	Th II	7001 - 40472	0.93	0.12	-0.91
2988.23	Th II	4490 - 37945	2.1	0.28	-0.55
2993.82	Th II	6214 - 39606	1.5	0.20	-0.71
2995.27	Th II	9720 - 43097	0.70	0.094	-1.03
2996.99	Th II	9061 - 42418	2.3	0.31	-0.51
2997.19	Th II	0 - 33355	0.045	0.0060	-2.22
3001.27	Th II	8379 - 41688	2.4	0.33	-0.48
3002.39	Th II	1860 - 35157	0.48	0.065	-1.19
3006.00	Th II	6691 - 39949	0.29	0.039	-1.41

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3008.27	Th II	9712 - 42944	1.3	0.18	-0.74
3008.50	Th II	6214 - 39443	1.3	0.18	-0.75
3009.76	Th II	0 - 33216	0.086	0.012	-1.93
3011.59	Th II	6700 - 39895	0.46	0.062	-1.21
3012.70	Th II	6214 - 39397	0.59	0.081	-1.09
3014.92	Th II	9061 - 42220	0.66	0.090	-1.05
3017.13	Th II	10673 - 43808	2.1	0.28	-0.55
3018.49	Th II	13249 - 46368	5.8	0.80	-0.10
3019.41	Th II	8379 - 41488	1.4	0.20	-0.71
3022.09	Th II	7332 - 40412	1.1	0.14	-0.84
3024.68	Th II	9061 - 42113	0.64	0.088	-1.06
3028.57	Th II	6691 - 39701	0.98	0.13	-0.87
3031.70	Th II	4490 - 37465	0.17	0.024	-1.62
3034.06	Th II	8379 - 41328	4.5	0.62	-0.21
3035.53	Th II	0 - 32933	0.048	0.0067	-2.18
3038.60	Th II	6168 - 39069	0.55	0.076	-1.12
3043.06	Th II	2210 - 35062	0.26	0.037	-1.43
3045.55	Th II	10189 - 43014	2.5	0.35	-0.46
3049.09	Th II	4490 - 37277	1.7	0.23	-0.64
3050.98	Th II	9585 - 42352	1.4	0.19	-0.71
3051.78	Th II	6700 - 39458	0.61	0.085	-1.07
3057.63	Th II	6168 - 38864	0.26	0.036	-1.44
3065.93	Th II	9712 - 42319	1.4	0.19	-0.71
3066.41	Th II	12220 - 44822	1.4	0.20	-0.71
3072.11	Th II	4147 - 36688	1.2	0.17	-0.76
3077.34	Th II	9202 - 41688	1.2	0.16	-0.78
3078.82	Th II	4113 - 36584	2.2	0.31	-0.51
3081.65	Th II	13249 - 45689	2.1	0.30	-0.53
3081.98	Th II	4147 - 36584	0.64	0.091	-1.04
3083.00	Th II	12472 - 44899	4.8	0.68	-0.17
3083.29	Th II	10673 - 43097	2.9	0.41	-0.39
3088.47	Th II	7332 - 39701	1.9	0.27	-0.57
3090.08	Th II	1860 - 34212	0.21	0.030	-1.52
3096.43	Th II	9202 - 41488	1.3	0.18	-0.73
3097.27	Th II	4113 - 36390	0.44	0.063	-1.20
3101.68	Th II	11576 - 43808	1.2	0.18	-0.75
3102.66	Th II	6168 - 38389	1.1	0.16	-0.81
3107.03	Th II	6691 - 38867	1.2	0.18	-0.75
3110.02	Th II	6691 - 38836	1.6	0.23	-0.64
3112.08	Th II	6168 - 38292	0.26	0.038	-1.42
3114.06	Th II	9585 - 41688	0.68	0.099	-1.00
3114.26	Th II	8606 - 40707	0.52	0.075	-1.12
3117.68	Th II	6691 - 38758	0.86	0.12	-0.90
3119.51	Th II	4147 - 36194	1.5	0.22	-0.66
3122.96	Th II	6168 - 38180	2.6	0.38	-0.42
3124.38	Th II	6168 - 38165	1.9	0.28	-0.56
3127.21	Th II	9720 - 41688	1.2	0.17	-0.76
3131.07	Th II	0 - 31929	0.14	0.020	-1.69
3133.62	Th II	9585 - 41488	1.1	0.16	-0.78
3141.84	Th II	7332 - 39151	1.4	0.21	-0.67

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3146.04	Th II	6168 - 37945	1.5	0.22	-0.65
3154.30	Th II	1522 - 33216	0.40	0.059	-1.23
3154.77	Th II	6700 - 38389	1.7	0.26	-0.59
3159.07	Th II	9061 - 40707	0.53	0.079	-1.10
3162.83	Th II	9720 - 41328	1.4	0.22	-0.67
3164.48	Th II	6700 - 38292	0.61	0.091	-1.04
3165.62	Th II	7001 - 38582	0.33	0.050	-1.30
3166.09	Th II	4490 - 36066	0.41	0.061	-1.21
3169.32	Th II	6214 - 37757	0.52	0.079	-1.10
3170.42	Th II	7331 - 38864	0.36	0.054	-1.27
3171.68	Th II	11576 - 43097	0.89	0.13	-0.87
3174.19	Th II	1860 - 33355	0.15	0.023	-1.64
3175.72	Th II	6700 - 38180	2.2	0.34	-0.47
3176.50	Th II	6244 - 37716	0.26	0.039	-1.41
3177.17	Th II	6700 - 38165	0.29	0.045	-1.35
3180.20	Th II	1522 - 32957	1.3	0.19	-0.71
3181.18	Th II	7332 - 38758	0.70	0.11	-0.97
3182.40	Th II	6691 - 38105	0.44	0.066	-1.18
3182.64	Th II	9061 - 40472	1.1	0.17	-0.76
3183.79	Th II	13251 - 44651	1.8	0.28	-0.55
3184.94	Th II	4490 - 35879	0.85	0.13	-0.89
3188.23	Th II	1860 - 33216	1.0	0.15	-0.81
3190.07	Th II	9585 - 40924	3.1	0.47	-0.33
3191.08	Th II	1522 - 32850	0.13	0.020	-1.69
3198.71	Th II	6691 - 37945	0.56	0.086	-1.07
3203.23	Th II	9202 - 40412	0.56	0.086	-1.06
3203.88	Th II	9720 - 40924	0.65	0.100	-1.00
3206.94	Th II	8379 - 39552	0.44	0.068	-1.17
3208.03	Th II	12220 - 43383	1.3	0.20	-0.70
3213.57	Th II	6168 - 37277	0.70	0.11	-0.97
3217.45	Th II	9401 - 40472	1.7	0.27	-0.57
3220.35	Th II	4113 - 35157	0.38	0.060	-1.22
3225.42	Th II	9712 - 40707	3.1	0.48	-0.32
3226.12	Th II	8379 - 39367	0.42	0.066	-1.18
3227.78	Th II	0 - 30972	0.079	0.012	-1.91
3229.01	Th II	7332 - 38292	3.1	0.49	-0.31
3230.86	Th II	9712 - 40655	1.2	0.19	-0.72
3235.85	Th II	6168 - 37063	1.9	0.29	-0.53
3240.48	Th II	6691 - 37542	0.50	0.079	-1.10
3241.12	Th II	7001 - 37846	1.2	0.18	-0.73
3245.78	Th II	9061 - 39862	2.4	0.38	-0.42
3248.53	Th II	6691 - 37465	0.49	0.078	-1.11
3254.82	Th II	7001 - 37716	0.67	0.11	-0.98
3257.16	Th II	9585 - 40278	1.8	0.28	-0.55
3260.92	Th II	9238 - 39895	0.99	0.16	-0.80
3262.67	Th II	6168 - 36809	3.4	0.54	-0.27
3263.03	Th II	9585 - 40223	1.1	0.17	-0.76
3264.44	Th II	12472 - 43097	2.4	0.39	-0.41
3265.58	Th II	7332 - 37945	0.57	0.091	-1.04
3267.00	Th II	7001 - 37602	0.84	0.13	-0.87

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3269.48	Th II	6700 - 37277	0.47	0.076	-1.12
3270.83	Th II	0 - 30565	0.071	0.011	-1.94
3280.37	Th II	8018 - 38494	1.8	0.30	-0.53
3286.58	Th II	8018 - 38436	1.8	0.29	-0.53
3287.79	Th II	1522 - 31929	0.58	0.094	-1.03
3291.74	Th II	6214 - 36584	3.2	0.52	-0.29
3292.52	Th II	6700 - 37063	2.5	0.40	-0.40
3293.94	Th II	9202 - 39552	1.9	0.31	-0.50
3295.32	Th II	6244 - 36582	0.64	0.10	-0.98
3295.52	Th II	9061 - 39397	0.97	0.16	-0.80
3296.60	Th II	12902 - 43228	3.5	0.57	-0.24
3297.83	Th II	9238 - 39552	1.9	0.31	-0.50
3300.61	Th II	1522 - 31811	0.051	0.0083	-2.08
3309.14	Th II	7332 - 37542	0.58	0.095	-1.02
3310.24	Th II	6244 - 36445	0.61	0.10	-1.00
3317.73	Th II	13251 - 43383	1.3	0.22	-0.65
3318.97	Th II	6691 - 36813	0.21	0.035	-1.46
3320.29	Th II	6700 - 36809	1.1	0.17	-0.76
3321.44	Th II	4113 - 34212	0.91	0.15	-0.82
3324.75	Th II	1860 - 31929	0.37	0.062	-1.21
3325.12	Th II	4147 - 34212	1.5	0.25	-0.60
3326.45	Th II	4490 - 34544	0.19	0.032	-1.49
3327.18	Th II	12472 - 42519	2.4	0.39	-0.40
3328.25	Th II	13251 - 43288	1.3	0.22	-0.66
3332.40	Th II	12220 - 42220	1.7	0.28	-0.55
3334.61	Th II	6214 - 36194	2.0	0.33	-0.49
3335.06	Th II	8606 - 38582	0.78	0.13	-0.88
3337.87	Th II	1860 - 31811	0.57	0.095	-1.02
3338.39	Th II	7332 - 37277	0.54	0.091	-1.04
3344.87	Th II	7829 - 37716	0.62	0.10	-0.99
3346.55	Th II	9585 - 39458	1.5	0.24	-0.61
3351.23	Th II	1522 - 31353	0.80	0.13	-0.87
3353.95	Th II	11117 - 40924	1.5	0.26	-0.59
3354.61	Th II	8379 - 38180	1.1	0.18	-0.73
3358.60	Th II	1860 - 31626	0.54	0.092	-1.04
3360.15	Th II	11576 - 41328	1.7	0.29	-0.54
3362.50	Th II	9712 - 39443	1.0	0.17	-0.77
3363.06	Th II	8379 - 38105	0.69	0.12	-0.93
3363.70	Th II	0 - 29720	0.065	0.011	-1.96
3366.52	Th II	13249 - 42944	5.4	0.92	-0.04
3367.81	Th II	4490 - 34175	0.71	0.12	-0.92
3376.84	Th II	10673 - 40278	0.71	0.12	-0.92
3378.58	Th II	8018 - 37608	1.9	0.32	-0.49
3381.35	Th II	9585 - 39151	0.93	0.16	-0.80
3385.53	Th II	4490 - 34019	0.54	0.092	-1.04
3386.50	Th II	9061 - 38582	1.9	0.33	-0.48
3389.65	Th II	1860 - 31353	0.25	0.044	-1.36
3392.03	Th II	1522 - 30994	0.94	0.16	-0.79
3395.37	Th II	7001 - 36445	0.39	0.067	-1.17
3401.68	Th II	7001 - 36390	0.67	0.12	-0.93

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3403.28	Th II	9061 - 38436	1.2	0.21	-0.68
3404.63	Th II	10189 - 39552	1.4	0.24	-0.61
3406.23	Th II	6691 - 36041	0.39	0.068	-1.17
3409.26	Th II	10572 - 39895	1.8	0.31	-0.50
3411.77	Th II	7829 - 37130	0.71	0.12	-0.91
3414.51	Th II	9585 - 38864	0.87	0.15	-0.82
3418.77	Th II	4113 - 33355	0.29	0.050	-1.30
3418.94	Th II	4490 - 33731	0.32	0.056	-1.25
3422.65	Th II	4147 - 33355	0.29	0.050	-1.30
3423.11	Th II	12472 - 41677	1.9	0.34	-0.47
3425.15	Th II	9202 - 38389	0.76	0.13	-0.87
3425.94	Th II	9401 - 38582	0.80	0.14	-0.85
3429.39	Th II	9238 - 38389	0.68	0.12	-0.92
3429.88	Th II	4490 - 33637	0.20	0.035	-1.45
3434.00	Th II	1860 - 30972	0.73	0.13	-0.89
3435.98	Th II	0 - 29095	0.34	0.060	-1.22
3436.71	Th II	9202 - 38292	1.6	0.28	-0.56
3437.02	Th II	8379 - 37465	0.59	0.10	-0.98
3438.95	Th II	13249 - 42319	6.2	1.1	0.04
3441.36	Th II	6691 - 35741	0.36	0.064	-1.19
3443.11	Th II	9401 - 38436	0.43	0.077	-1.12
3444.00	Th II	10673 - 39701	0.62	0.11	-0.96
3445.38	Th II	12472 - 41488	1.0	0.18	-0.74
3445.73	Th II	14791 - 43804	5.5	0.98	-0.01
3449.65	Th II	10572 - 39552	1.4	0.25	-0.60
3450.94	Th II	13251 - 42220	2.0	0.36	-0.44
3451.70	Th II	9202 - 38165	0.72	0.13	-0.89
3452.68	Th II	6244 - 35199	0.66	0.12	-0.93
3454.20	Th II	9238 - 38180	0.56	0.10	-1.00
3462.85	Th II	9712 - 38582	2.2	0.39	-0.41
3463.72	Th II	13251 - 42113	4.7	0.84	-0.08
3465.77	Th II	6700 - 35546	1.2	0.22	-0.65
3465.92	Th II	4113 - 32957	0.17	0.030	-1.52
3469.92	Th II	4147 - 32957	1.8	0.32	-0.50
3473.03	Th II	9061 - 37846	0.66	0.12	-0.92
3473.41	Th II	9712 - 38494	0.62	0.11	-0.95
3476.53	Th II	6700 - 35456	0.45	0.082	-1.09
3478.12	Th II	9202 - 37945	0.68	0.12	-0.91
3479.17	Th II	6691 - 35426	0.67	0.12	-0.91
3482.55	Th II	9585 - 38292	0.75	0.14	-0.86
3482.76	Th II	1860 - 30565	0.085	0.016	-1.81
3485.20	Th II	8379 - 37063	0.83	0.15	-0.82
3493.52	Th II	7829 - 36445	0.95	0.17	-0.76
3499.98	Th II	8018 - 36582	0.73	0.13	-0.87
3501.94	Th II	7332 - 35879	0.21	0.039	-1.41
3502.77	Th II	9061 - 37602	0.97	0.18	-0.75
3506.85	Th II	15237 - 43744	2.0	0.36	-0.44
3511.56	Th II	4490 - 32960	0.90	0.17	-0.78
3512.74	Th II	9720 - 38180	0.82	0.15	-0.82
3514.52	Th II	9401 - 37846	1.0	0.19	-0.71

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3516.36	Th II	8379 - 36809	0.56	0.10	-0.99
3516.83	Th II	8018 - 36445	0.50	0.093	-1.03
3518.89	Th II	7332 - 35741	0.21	0.038	-1.42
3523.53	Th II	8018 - 36390	0.25	0.046	-1.34
3537.15	Th II	9202 - 37465	0.94	0.18	-0.75
3539.32	Th II	4490 - 32736	0.43	0.080	-1.10
3539.59	Th II	0 - 28244	0.24	0.045	-1.35
3541.62	Th II	8460 - 36688	0.54	0.10	-0.99
3553.38	Th II	9712 - 37846	0.38	0.071	-1.15
3557.47	Th II	6168 - 34270	0.33	0.063	-1.20
3559.45	Th II	6244 - 34330	1.1	0.20	-0.69
3559.95	Th II	8606 - 36688	1.0	0.20	-0.71
3567.06	Th II	6700 - 34727	0.16	0.030	-1.52
3567.69	Th II	12902 - 40924	0.90	0.17	-0.76
3569.62	Th II	6168 - 34175	0.13	0.026	-1.59
3571.57	Th II	10189 - 38180	0.67	0.13	-0.89
3572.39	Th II	8460 - 36445	1.2	0.23	-0.63
3573.22	Th II	8606 - 36584	0.74	0.14	-0.85
3575.32	Th II	6700 - 34662	1.2	0.22	-0.65
3576.56	Th II	15145 - 43097	4.7	0.90	-0.05
3579.35	Th II	8460 - 36390	1.2	0.23	-0.63
3585.76	Th II	9585 - 37465	1.3	0.25	-0.60
3588.22	Th II	1860 - 29720	0.092	0.018	-1.75
3589.15	Th II	6700 - 34554	0.24	0.046	-1.33
3589.36	Th II	6691 - 34544	0.42	0.081	-1.09
3591.06	Th II	8606 - 36445	0.41	0.079	-1.10
3593.88	Th II	10572 - 38389	0.89	0.17	-0.76
3595.33	Th II	12472 - 40278	0.76	0.15	-0.83
3603.21	Th II	9720 - 37465	1.6	0.32	-0.49
3609.44	Th II	4113 - 31811	0.98	0.19	-0.72
3610.79	Th II	4113 - 31800	0.19	0.038	-1.42
3613.78	Th II	4147 - 31811	0.14	0.027	-1.56
3615.13	Th II	4147 - 31800	0.47	0.093	-1.03
3617.02	Th II	15305 - 42944	16.	3.0	0.48
3619.71	Th II	10673 - 38292	0.26	0.051	-1.29
3621.12	Th II	10572 - 38180	1.6	0.32	-0.50
3624.90	Th II	6700 - 34279	0.53	0.11	-0.98
3625.63	Th II	1522 - 29095	0.18	0.036	-1.44
3632.62	Th II	9061 - 36582	0.43	0.085	-1.07
3637.57	Th II	6691 - 34175	0.22	0.043	-1.36
3639.45	Th II	6168 - 33637	0.56	0.11	-0.95
3644.35	Th II	10673 - 38105	0.42	0.083	-1.08
3648.17	Th II	0 - 27403	0.033	0.0065	-2.19
3649.25	Th II	7332 - 34727	0.71	0.14	-0.85
3650.77	Th II	9061 - 36445	0.63	0.13	-0.90
3652.54	Th II	7829 - 35199	0.37	0.073	-1.13
3656.20	Th II	9720 - 37063	0.44	0.087	-1.06
3658.06	Th II	7001 - 34330	0.86	0.17	-0.76
3663.20	Th II	11576 - 38867	1.7	0.33	-0.48
3663.70	Th II	9401 - 36688	1.3	0.27	-0.57

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3673.79	Th II	7332 - 34544	0.43	0.087	-1.06
3675.57	Th II	1522 - 28721	0.30	0.060	-1.22
3678.04	Th II	8018 - 35199	1.0	0.21	-0.68
3681.88	Th II	11576 - 38729	0.60	0.12	-0.91
3690.49	Th II	9720 - 36809	0.88	0.18	-0.75
3695.98	Th II	11117 - 38165	0.94	0.19	-0.71
3696.65	Th II	9401 - 36445	0.26	0.054	-1.27
3697.03	Th II	6168 - 33209	0.11	0.022	-1.66
3698.30	Th II	11726 - 38758	0.41	0.083	-1.08
3700.77	Th II	15305 - 42319	2.2	0.46	-0.34
3711.30	Th II	6700 - 33637	0.48	0.099	-1.00
3718.17	Th II	9238 - 36125	0.15	0.030	-1.52
3719.96	Th II	10189 - 37063	2.0	0.42	-0.38
3720.31	Th II	9712 - 36584	1.0	0.22	-0.66
3721.82	Th II	1860 - 28721	0.33	0.069	-1.16
3722.11	Th II	4113 - 30972	0.27	0.057	-1.25
3723.66	Th II	4147 - 30994	0.046	0.0095	-2.02
3726.72	Th II	4147 - 30972	0.18	0.038	-1.42
3734.59	Th II	4490 - 31259	0.086	0.018	-1.74
3738.84	Th II	8460 - 35199	0.45	0.095	-1.02
3741.19	Th II	1522 - 28244	0.48	0.100	-1.00
3743.51	Th II	10572 - 37277	0.20	0.043	-1.37
3744.74	Th II	8460 - 35157	0.15	0.031	-1.50
3745.98	Th II	7332 - 34019	0.65	0.14	-0.87
3747.54	Th II	9202 - 35879	1.0	0.21	-0.67
3752.57	Th II	9238 - 35879	2.1	0.44	-0.35
3754.59	Th II	0 - 26626	0.030	0.0064	-2.19
3762.88	Th II	6168 - 32736	0.68	0.14	-0.84
3772.24	Th II	7829 - 34330	0.21	0.044	-1.35
3773.74	Th II	10572 - 37063	0.77	0.16	-0.78
3775.91	Th II	14349 - 40826	0.93	0.20	-0.70
3783.29	Th II	0 - 26425	0.032	0.0069	-2.16
3785.60	Th II	6168 - 32577	0.44	0.094	-1.03
3786.88	Th II	7332 - 33731	0.13	0.027	-1.57
3789.11	Th II	1860 - 28244	0.12	0.025	-1.60
3791.29	Th II	11576 - 37945	0.41	0.089	-1.05
3794.15	Th II	11117 - 37465	0.51	0.11	-0.96
3802.14	Th II	9585 - 35879	0.093	0.020	-1.70
3805.81	Th II	6691 - 32960	0.16	0.035	-1.45
3807.87	Th II	9202 - 35456	1.1	0.23	-0.63
3813.07	Th II	9238 - 35456	0.99	0.22	-0.67
3821.42	Th II	11117 - 37277	0.83	0.18	-0.74
3822.15	Th II	9585 - 35741	0.54	0.12	-0.93
3823.58	Th II	13251 - 39397	0.75	0.17	-0.78
3826.94	Th II	14349 - 40472	1.4	0.30	-0.52
3839.74	Th II	6700 - 32736	1.2	0.26	-0.59
3841.96	Th II	9720 - 35741	0.90	0.20	-0.70
3854.50	Th II	10189 - 36125	1.4	0.31	-0.50
3859.85	Th II	8379 - 34279	0.30	0.067	-1.17
3863.41	Th II	6700 - 32577	0.59	0.13	-0.88

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3884.52	Th II	9720 - 35456	0.17	0.038	-1.42
3891.05	Th II	11117 - 36809	0.37	0.084	-1.08
3892.30	Th II	6244 - 31929	0.054	0.012	-1.91
3900.12	Th II	12472 - 38105	0.18	0.041	-1.39
3900.88	Th II	7332 - 32960	0.50	0.11	-0.94
3901.14	Th II	12220 - 37846	0.33	0.076	-1.12
3902.12	Th II	14276 - 39895	0.52	0.12	-0.93
3904.08	Th II	4113 - 29720	0.084	0.019	-1.72
3912.28	Th II	10572 - 36125	0.41	0.094	-1.03
3913.82	Th II	1860 - 27403	0.017	0.0040	-2.40
3916.79	Th II	9202 - 34727	0.34	0.079	-1.10
3922.22	Th II	9238 - 34727	0.14	0.032	-1.50
3929.67	Th II	0 - 25440	0.11	0.024	-1.61
3932.23	Th II	9238 - 34662	0.20	0.047	-1.33
3937.04	Th II	10673 - 36066	0.51	0.12	-0.93
3937.92	Th II	7828 - 33216	0.18	0.042	-1.38
3942.64	Th II	10189 - 35546	0.22	0.051	-1.29
3943.39	Th II	8379 - 33731	0.29	0.067	-1.17
3950.39	Th II	10572 - 35879	0.67	0.16	-0.80
3956.59	Th II	10189 - 35456	1.2	0.28	-0.55
3960.33	Th II	13251 - 38494	0.50	0.12	-0.93
3969.00	Th II	0 - 25188	0.012	0.0028	-2.55
3976.42	Th II	9585 - 34727	0.52	0.12	-0.91
3988.01	Th II	9202 - 34270	0.43	0.10	-0.99
3988.85	Th II	6691 - 31754	0.076	0.018	-1.74
3992.28	Th II	9238 - 34279	0.12	0.030	-1.53
3997.47	Th II	11117 - 36125	0.21	0.050	-1.30
3997.87	Th II	9720 - 34727	0.39	0.093	-1.03
4001.73	Th II	4113 - 29095	0.029	0.0069	-2.16
4003.11	Th II	10572 - 35546	0.35	0.085	-1.07
4003.31	Th II	9202 - 34175	0.51	0.12	-0.91
4005.53	Th II	9585 - 34544	0.33	0.081	-1.09
4007.02	Th II	11117 - 36066	0.93	0.22	-0.65
4014.51	Th II	1522 - 26425	0.014	0.0033	-2.48
4019.13	Th II	0 - 24874	0.66	0.16	-0.80
4025.66	Th II	9720 - 34554	0.51	0.12	-0.91
4026.16	Th II	8379 - 33209	0.28	0.067	-1.17
4034.25	Th II	6214 - 30994	0.12	0.030	-1.52
4036.56	Th II	1860 - 26626	0.061	0.015	-1.82
4048.43	Th II	9585 - 34279	0.13	0.031	-1.51
4063.40	Th II	11726 - 36329	1.0	0.25	-0.60
4069.20	Th II	6691 - 31259	0.87	0.22	-0.66
4082.26	Th II	11576 - 36066	0.42	0.10	-0.98
4085.04	Th II	10189 - 34662	1.8	0.44	-0.35
4086.52	Th II	0 - 24464	0.099	0.025	-1.60
4091.34	Th II	9202 - 33637	0.093	0.023	-1.63
4093.39	Th II	7332 - 31754	0.093	0.023	-1.63
4094.75	Th II	0 - 24415	0.098	0.025	-1.61
4097.33	Th II	9238 - 33637	0.11	0.027	-1.57
4098.94	Th II	8460 - 32850	0.25	0.064	-1.19

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4103.65	Th II	12220 - 36582	0.21	0.054	-1.27
4104.38	Th II	8379 - 32736	0.21	0.052	-1.28
4105.34	Th II	7001 - 31353	0.26	0.067	-1.17
4107.37	Th II	11117 - 35456	0.18	0.045	-1.35
4108.42	Th II	4490 - 28824	0.41	0.10	-0.98
4116.71	Th II	6168 - 30453	0.81	0.21	-0.68
4123.53	Th II	8606 - 32850	0.17	0.044	-1.36
4131.42	Th II	8379 - 32577	0.16	0.041	-1.39
4141.63	Th II	15305 - 39443	1.5	0.39	-0.41
4142.70	Th II	0 - 24132	0.033	0.0085	-2.07
4148.18	Th II	7829 - 31929	0.27	0.068	-1.16
4149.99	Th II	10572 - 34662	1.1	0.30	-0.53
4156.23	Th II	10673 - 34727	0.33	0.085	-1.07
4156.52	Th II	9585 - 33637	0.65	0.17	-0.78
4162.68	Th II	14276 - 38292	1.0	0.26	-0.58
4163.64	Th II	9720 - 33731	0.33	0.086	-1.06
4164.25	Th II	9202 - 33209	0.19	0.050	-1.30
4170.47	Th II	9238 - 33209	0.38	0.100	-1.00
4176.33	Th II	14791 - 38729	0.40	0.10	-0.98
4178.06	Th II	7332 - 31259	0.61	0.16	-0.80
4179.71	Th II	1522 - 25440	0.048	0.013	-1.90
4179.96	Th II	9720 - 33637	0.30	0.078	-1.11
4182.16	Th II	14276 - 38180	0.78	0.20	-0.69
4183.56	Th II	9061 - 32957	0.089	0.023	-1.63
4184.71	Th II	14276 - 38165	0.34	0.089	-1.05
4191.82	Th II	11576 - 35426	0.18	0.047	-1.32
4201.85	Th II	8018 - 31811	0.19	0.052	-1.29
4208.89	Th II	6700 - 30453	0.49	0.13	-0.89
4218.19	Th II	11726 - 35426	0.18	0.048	-1.32
4218.54	Th II	10572 - 34270	0.13	0.035	-1.46
4224.25	Th II	1522 - 25188	0.010	0.0027	-2.57
4243.93	Th II	9401 - 32957	0.14	0.037	-1.43
4248.00	Th II	9202 - 32736	0.21	0.058	-1.24
4249.68	Th II	7829 - 31353	0.058	0.016	-1.81
4250.31	Th II	4490 - 28011	0.067	0.018	-1.74
4256.09	Th II	9720 - 33209	0.12	0.033	-1.48
4263.36	Th II	9401 - 32850	0.088	0.024	-1.62
4271.09	Th II	1860 - 25267	0.0091	0.0025	-2.60
4273.36	Th II	8379 - 31773	0.33	0.090	-1.05
4276.81	Th II	8379 - 31754	0.11	0.031	-1.51
4276.96	Th II	9202 - 32577	0.082	0.023	-1.65
4277.31	Th II	0 - 23373	0.052	0.014	-1.85
4281.07	Th II	1522 - 24874	0.021	0.0058	-2.24
4281.41	Th II	8460 - 31811	0.13	0.036	-1.44
4282.04	Th II	6168 - 29515	0.43	0.12	-0.92
4283.52	Th II	9238 - 32577	0.16	0.045	-1.34
4288.05	Th II	14791 - 38105	0.39	0.11	-0.97
4318.29	Th II	9585 - 32736	0.17	0.048	-1.31
4320.12	Th II	4490 - 27631	0.051	0.014	-1.84
4320.58	Th II	12902 - 36041	0.33	0.093	-1.03

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4335.70	Th II	11117 - 34175	0.39	0.11	-0.96
4343.94	Th II	1860 - 24874	0.017	0.0047	-2.33
4344.32	Th II	0 - 23012	0.013	0.0036	-2.45
4353.39	Th II	10673 - 33637	0.17	0.048	-1.32
4355.32	Th II	8018 - 30972	0.11	0.030	-1.52
4357.61	Th II	1522 - 24464	0.0085	0.0024	-2.62
4369.30	Th II	8379 - 31259	0.087	0.025	-1.61
4373.90	Th II	9720 - 32577	0.13	0.036	-1.44
4381.86	Th II	6700 - 29515	0.80	0.23	-0.64
4384.65	Th II	15145 - 37945	0.19	0.055	-1.26
4391.11	Th II	4490 - 27257	0.38	0.11	-0.96
4394.90	Th II	8606 - 31353	0.090	0.026	-1.59
4396.48	Th II	9061 - 31800	0.085	0.025	-1.61
4412.74	Th II	6168 - 28824	0.11	0.032	-1.49
4416.23	Th II	10572 - 33209	0.15	0.044	-1.35
4421.54	Th II	1522 - 24132	0.0069	0.0020	-2.70
4436.06	Th II	10673 - 33209	0.041	0.012	-1.92
4436.28	Th II	9238 - 31773	0.034	0.010	-2.00
4436.55	Th II	14276 - 36809	0.21	0.062	-1.21
4439.12	Th II	11117 - 33637	0.29	0.085	-1.07
4440.86	Th II	8460 - 30972	0.14	0.040	-1.40
4445.89	Th II	14791 - 37277	0.16	0.048	-1.32
4447.83	Th II	6244 - 28721	0.058	0.017	-1.77
4454.51	Th II	11576 - 34019	0.058	0.017	-1.76
4461.08	Th II	9401 - 31811	0.10	0.031	-1.51
4465.34	Th II	8606 - 30994	0.22	0.066	-1.18
4480.82	Th II	4113 - 26425	0.023	0.0068	-2.16
4485.78	Th II	10673 - 32960	0.072	0.022	-1.66
4487.50	Th II	4147 - 26425	0.030	0.0092	-2.04
4488.68	Th II	1860 - 24132	0.020	0.0060	-2.22
4492.24	Th II	12472 - 34727	0.12	0.036	-1.45
4510.53	Th II	10572 - 32736	0.45	0.14	-0.86
4512.50	Th II	11576 - 33731	0.090	0.027	-1.56
4517.04	Th II	6691 - 28824	0.012	0.0037	-2.43
4524.85	Th II	7001 - 29095	0.024	0.0075	-2.13
4525.10	Th II	11117 - 33209	0.052	0.016	-1.80
4529.50	Th II	12472 - 34544	0.053	0.016	-1.79
4533.29	Th II	9720 - 31773	0.21	0.064	-1.19
4534.12	Th II	10572 - 32621	0.11	0.034	-1.47
4537.08	Th II	14276 - 36310	0.31	0.096	-1.02
4540.41	Th II	14791 - 36809	0.29	0.089	-1.05
4544.52	Th II	4490 - 26489	0.020	0.0061	-2.22
4564.19	Th II	10673 - 32577	0.035	0.011	-1.96
4566.66	Th II	7829 - 29720	0.024	0.0077	-2.12
4575.27	Th II	1522 - 23373	0.0026	0.00082	-3.09
4575.43	Th II	14276 - 36125	0.096	0.030	-1.52
4584.37	Th II	12472 - 34279	0.089	0.028	-1.55
4602.90	Th II	7001 - 28721	0.026	0.0083	-2.08
4606.52	Th II	8018 - 29720	0.020	0.0063	-2.20
4612.56	Th II	9585 - 31259	0.031	0.0097	-2.01

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4624.14	Th II	11117 - 32736	0.046	0.015	-1.83
4631.76	Th II	10189 - 31773	0.19	0.063	-1.20
4639.71	Th II	12472 - 34019	0.17	0.054	-1.27
4651.56	Th II	7332 - 28824	0.085	0.028	-1.56
4651.99	Th II	1522 - 23012	0.0038	0.0012	-2.91
4689.20	Th II	6691 - 28011	0.050	0.016	-1.79
4694.09	Th II	0 - 21297	0.010	0.0034	-2.47
4694.90	Th II	4147 - 25440	0.012	0.0040	-2.40
4700.14	Th II	14276 - 35546	0.21	0.069	-1.16
4702.32	Th II	9712 - 30972	0.017	0.0057	-2.24
4706.25	Th II	7001 - 28244	0.020	0.0066	-2.18
4708.10	Th II	11726 - 32960	0.030	0.010	-2.00
4712.44	Th II	9238 - 30453	0.062	0.021	-1.68
4715.43	Th II	10572 - 31773	0.036	0.012	-1.92
4719.98	Th II	14276 - 35456	0.15	0.051	-1.29
4723.44	Th II	12472 - 33637	0.21	0.072	-1.15
4726.32	Th II	1860 - 23012	0.0038	0.0013	-2.89
4729.87	Th II	8379 - 29515	0.033	0.011	-1.95
4740.53	Th II	6168 - 27257	0.076	0.026	-1.59
4742.26	Th II	10673 - 31754	0.036	0.012	-1.91
4743.68	Th II	4113 - 25188	0.0099	0.0033	-2.48
4774.27	Th II	6691 - 27631	0.028	0.0097	-2.01
4823.20	Th II	4147 - 24874	0.0047	0.0017	-2.78
4844.17	Th II	11117 - 31754	0.064	0.023	-1.64
4863.17	Th II	6700 - 27257	0.11	0.041	-1.39
4912.52	Th II	4113 - 24464	0.0072	0.0026	-2.59
4919.82	Th II	6168 - 26489	0.080	0.029	-1.53
4921.62	Th II	9202 - 29515	0.050	0.018	-1.74
4924.42	Th II	4113 - 24415	0.0047	0.0017	-2.76
4954.57	Th II	11576 - 31754	0.15	0.055	-1.26
4963.20	Th II	11117 - 31259	0.033	0.012	-1.92
4999.95	Th II	14276 - 34270	0.062	0.023	-1.63
5017.26	Th II	7332 - 27257	0.12	0.045	-1.35
5028.66	Th II	10572 - 30453	0.15	0.055	-1.26
5049.80	Th II	6691 - 26489	0.087	0.033	-1.48
5055.36	Th II	1522 - 21297	0.0070	0.0027	-2.57
5061.23	Th II	14791 - 34544	0.15	0.057	-1.25
5090.75	Th II	8606 - 28244	0.014	0.0056	-2.25
5095.06	Th II	9202 - 28824	0.030	0.012	-1.94
5107.24	Th II	7829 - 27403	0.011	0.0045	-2.35
5143.28	Th II	1860 - 21297	0.0082	0.0032	-2.49
5151.62	Th II	12220 - 31626	0.076	0.030	-1.52
5170.23	Th II	11117 - 30453	0.027	0.011	-1.96
5190.88	Th II	4113 - 23373	0.0074	0.0030	-2.52
5193.84	Th II	0 - 19248	0.0020	0.00082	-3.09
5218.52	Th II	7332 - 26489	0.018	0.0073	-2.13
5233.21	Th II	9720 - 28824	0.061	0.025	-1.60
5247.65	Th II	0 - 19051	0.0044	0.0018	-2.74
5277.50	Th II	10572 - 29515	0.064	0.027	-1.57
5280.08	Th II	14276 - 33209	0.030	0.013	-1.90

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
5303.04	Th II	12902 - 31754	0.020	0.0085	-2.07
5304.63	Th II	14791 - 33637	0.034	0.014	-1.84
5305.57	Th II	9401 - 28244	0.010	0.0044	-2.35
5415.46	Th II	14276 - 32736	0.16	0.072	-1.14
5421.84	Th II	7001 - 25440	0.0056	0.0025	-2.61
5425.68	Th II	9585 - 28011	0.036	0.016	-1.80
5433.69	Th II	11117 - 29515	0.0088	0.0039	-2.41
5449.47	Th II	14276 - 32621	0.093	0.041	-1.38
5462.61	Th II	14276 - 32577	0.066	0.029	-1.53
5488.63	Th II	0 - 18214	0.00092	0.00041	-3.38
5501.93	Th II	6244 - 24415	0.0026	0.0012	-2.92
5537.12	Th II	9202 - 27257	0.0059	0.0027	-2.56
5539.90	Th II	9585 - 27631	0.040	0.018	-1.74
5593.62	Th II	7001 - 24874	0.0061	0.0029	-2.54
5639.75	Th II	1522 - 19248	0.0038	0.0018	-2.74
5645.88	Th II	11117 - 28824	0.038	0.018	-1.75
5700.69	Th II	9720 - 27257	0.049	0.024	-1.62
5707.10	Th II	6214 - 23731	0.018	0.0088	-2.05
5738.29	Th II	8018 - 25440	0.0022	0.0011	-2.96
5741.18	Th II	7001 - 24415	0.0044	0.0022	-2.66
5749.40	Th II	1860 - 19248	0.0016	0.00080	-3.10
5796.42	Th II	11576 - 28824	0.017	0.0087	-2.06
5815.43	Th II	1860 - 19051	0.00098	0.00050	-3.30
5838.94	Th II	0 - 17122	0.00029	0.00015	-3.83
5914.39	Th II	9585 - 26489	0.018	0.0094	-2.03
5989.07	Th II	1522 - 18214	0.0035	0.0019	-2.73
6019.00	Th II	15145 - 31754	0.023	0.012	-1.91
6085.26	Th II	6214 - 22642	0.0018	0.00098	-3.01
6104.57	Th II	8606 - 24982	0.0086	0.0048	-2.32
6112.83	Th II	1860 - 18214	0.0018	0.0010	-3.00
6193.86	Th II	11117 - 27257	0.013	0.0076	-2.12
6232.98	Th II	9401 - 25440	0.0040	0.0023	-2.63
6261.06	Th II	4113 - 20081	0.0016	0.00094	-3.03
6266.17	Th II	8460 - 24415	0.0027	0.0016	-2.80
6274.13	Th II	4147 - 20081	0.0035	0.0021	-2.68
6277.23	Th II	6214 - 22140	0.0014	0.00084	-3.07
6279.16	Th II	12902 - 28824	0.026	0.015	-1.81
6285.28	Th II	11726 - 27631	0.010	0.0062	-2.21
6304.25	Th II	8606 - 24464	0.0028	0.0016	-2.78
6408.60	Th II	1522 - 17122	0.00063	0.00039	-3.41
6416.10	Th II	9401 - 24982	0.0051	0.0031	-2.51
6503.50	Th II	11117 - 26489	0.0056	0.0036	-2.45
6511.35	Th II	9061 - 24415	0.0019	0.0012	-2.92
6560.07	Th II	14276 - 29515	0.016	0.010	-1.99
6605.42	Th II	4113 - 19248	0.0015	0.00097	-3.02
6617.06	Th II	12902 - 28011	0.0070	0.0046	-2.34
6619.95	Th II	4147 - 19248	0.0015	0.00097	-3.01
6658.68	Th II	9401 - 24415	0.0016	0.0011	-2.97
6692.71	Th II	4113 - 19051	0.00071	0.00047	-3.32
6704.04	Th II	8460 - 23373	0.0024	0.0016	-2.79

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6993.04	Th II	7001 - 21297	0.0056	0.0041	-2.39
7900.32	Th II	12220 - 24874	0.0078	0.0073	-2.14
8143.16	Th II	14349 - 26626	0.022	0.022	-1.66
8784.57	Th II	1522 - 12902	0.00009	0.00011	-3.97
8816.16	Th II	4113 - 15453	0.00038	0.00045	-3.35
8842.08	Th II	4147 - 15453	0.00082	0.00096	-3.02

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2272.61	Ti I	387 - 44376	2.3	0.18	-0.76
2273.28	Ti I	0 - 43976	2.5	0.20	-0.71
2276.70	Ti I	170 - 44079	2.1	0.16	-0.79
2279.96	Ti I	387 - 44233	3.3	0.25	-0.59
2299.85	Ti I	0 - 43468	2.7	0.21	-0.68
2302.73	Ti I	170 - 43583	2.7	0.22	-0.66
2305.67	Ti I	387 - 43745	3.8	0.31	-0.51
2380.81	Ti I	387 - 42377	2.0	0.17	-0.77
2384.52	Ti I	387 - 42311	1.1	0.090	-1.04
2418.36	Ti I	0 - 41337	2.0	0.18	-0.75
2421.30	Ti I	170 - 41458	3.2	0.28	-0.55
2424.24	Ti I	387 - 41624	4.4	0.39	-0.41
2428.23	Ti I	0 - 41170	1.5	0.13	-0.89
2433.22	Ti I	170 - 41255	1.5	0.13	-0.87
2434.10	Ti I	387 - 41458	0.85	0.076	-1.12
2440.98	Ti I	387 - 41342	3.1	0.28	-0.56
2519.04	Ti I	0 - 39686	1.3	0.13	-0.90
2520.54	Ti I	0 - 39662	5.0	0.47	-0.32
2527.98	Ti I	170 - 39716	1.0	0.097	-1.01
2529.85	Ti I	170 - 39686	7.4	0.71	-0.15
2541.92	Ti I	387 - 39716	6.8	0.66	-0.18
2590.26	Ti I	170 - 38765	0.93	0.093	-1.03
2593.64	Ti I	0 - 38544	5.0	0.50	-0.30
2596.58	Ti I	170 - 38671	1.8	0.18	-0.74
2599.92	Ti I	0 - 38451	6.8	0.69	-0.16
2605.15	Ti I	170 - 38544	9.0	0.92	-0.04
2611.28	Ti I	387 - 38671	12.	1.3	0.11
2611.48	Ti I	170 - 38451	1.7	0.17	-0.76
2619.94	Ti I	387 - 38544	7.0	0.72	-0.14
2631.54	Ti I	170 - 38160	3.6	0.38	-0.42
2632.42	Ti I	0 - 37977	3.4	0.36	-0.45
2641.10	Ti I	0 - 37852	13.	1.3	0.12
2644.26	Ti I	170 - 37977	16.	1.7	0.23
2646.64	Ti I	387 - 38160	21.	2.2	0.33
2654.93	Ti I	0 - 37655	0.28	0.029	-1.53
2657.19	Ti I	0 - 37623	0.69	0.073	-1.14
2661.97	Ti I	0 - 37555	1.5	0.16	-0.78
2669.60	Ti I	170 - 37618	1.8	0.19	-0.72
2679.93	Ti I	387 - 37690	2.4	0.26	-0.58
2685.14	Ti I	387 - 37618	0.60	0.064	-1.19
2725.07	Ti I	8492 - 45178	14.	1.5	0.18
2727.42	Ti I	8437 - 45091	12.	1.3	0.11
2731.13	Ti I	8602 - 45206	3.4	0.38	-0.42
2731.58	Ti I	8492 - 45091	6.6	0.74	-0.13
2733.26	Ti I	8602 - 45178	27.	3.1	0.48
2735.29	Ti I	8492 - 45041	8.2	0.92	-0.04
2735.61	Ti I	7255 - 43800	4.6	0.52	-0.28
2739.81	Ti I	8602 - 45091	13.	1.5	0.18
2742.32	Ti I	7255 - 43710	27.	3.1	0.49
2749.06	Ti I	8492 - 44858	6.3	0.71	-0.15

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2757.40	Ti I	8602 - 44858	9.4	1.1	0.03
2758.08	Ti I	12118 - 48365	36.	4.1	0.61
2802.50	Ti I	7255 - 42928	22.	2.6	0.42
2805.70	Ti I	8602 - 44233	6.7	0.79	-0.10
2809.17	Ti I	8492 - 44079	5.1	0.61	-0.22
2812.98	Ti I	8437 - 43976	3.7	0.44	-0.35
2817.40	Ti I	8492 - 43976	3.8	0.45	-0.35
2817.84	Ti I	8602 - 44079	7.7	0.92	-0.04
2828.07	Ti I	6557 - 41907	4.2	0.50	-0.30
2912.08	Ti I	7255 - 41585	28.	3.5	0.55
2928.34	Ti I	12118 - 46258	81.	10.	1.02
2933.55	Ti I	0 - 34079	1.4	0.18	-0.76
2937.32	Ti I	170 - 34205	1.2	0.15	-0.82
2942.00	Ti I	0 - 33981	7.8	1.0	0.00
2948.26	Ti I	170 - 34079	9.6	1.3	0.10
2956.13	Ti I	387 - 34205	13.	1.6	0.21
2956.80	Ti I	170 - 33981	1.3	0.16	-0.78
2959.71	Ti I	8492 - 42270	2.0	0.27	-0.57
2959.99	Ti I	8602 - 42377	2.9	0.39	-0.41
2965.71	Ti I	8602 - 42311	13.	1.7	0.24
2967.22	Ti I	387 - 34079	1.5	0.19	-0.72
2968.23	Ti I	0 - 33680	0.18	0.024	-1.62
2970.38	Ti I	0 - 33656	0.50	0.066	-1.18
2974.93	Ti I	8602 - 42207	2.4	0.32	-0.50
2983.31	Ti I	170 - 33680	1.2	0.15	-0.81
3000.87	Ti I	387 - 33701	0.22	0.030	-1.53
3100.67	Ti I	8602 - 40844	8.5	1.2	0.09
3106.81	Ti I	8492 - 40671	3.3	0.47	-0.33
3112.48	Ti I	8437 - 40556	2.1	0.31	-0.51
3119.72	Ti I	12118 - 44163	88.	13.	1.11
3123.07	Ti I	7255 - 39266	5.9	0.86	-0.07
3141.54	Ti I	7255 - 39078	4.2	0.62	-0.21
3141.67	Ti I	17215 - 49036	42.	6.2	0.79
3186.45	Ti I	0 - 31374	8.1	1.2	0.09
3191.99	Ti I	170 - 31489	11.	1.7	0.22
3199.92	Ti I	387 - 31629	14.	2.1	0.33
3203.83	Ti I	170 - 31374	0.81	0.13	-0.90
3204.87	Ti I	8492 - 39686	1.7	0.26	-0.58
3214.24	Ti I	387 - 31489	0.93	0.14	-0.84
3217.94	Ti I	15877 - 46944	30.	4.7	0.67
3219.21	Ti I	15976 - 47030	31.	4.8	0.68
3221.38	Ti I	16106 - 47140	32.	4.9	0.69
3223.52	Ti I	16268 - 47281	65.	10.	1.01
3226.13	Ti I	16459 - 47447	45.	7.1	0.85
3292.08	Ti I	7255 - 37623	5.8	0.95	-0.02
3299.41	Ti I	7255 - 37555	3.4	0.55	-0.26
3306.88	Ti I	17215 - 47447	54.	8.9	0.95
3308.39	Ti I	8437 - 38654	5.9	0.97	-0.01
3309.50	Ti I	8492 - 38700	7.3	1.2	0.08
3309.73	Ti I	17075 - 47281	19.	3.1	0.49

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3312.69	Ti I	16961 - 47140	32.	5.3	0.73
3314.42	Ti I	8602 - 38765	24.	3.9	0.59
3341.88	Ti I	0 - 29915	13.	2.3	0.35
3342.15	Ti I	0 - 29912	0.28	0.047	-1.33
3352.94	Ti I	170 - 29986	0.29	0.049	-1.31
3354.64	Ti I	170 - 29971	9.7	1.6	0.22
3358.28	Ti I	0 - 29769	0.65	0.11	-0.96
3360.99	Ti I	170 - 29915	0.68	0.11	-0.94
3361.84	Ti I	170 - 29907	0.28	0.048	-1.32
3370.44	Ti I	0 - 29661	2.5	0.43	-0.37
3371.45	Ti I	387 - 30039	11.	1.8	0.26
3377.48	Ti I	387 - 29986	7.0	1.2	0.08
3379.22	Ti I	387 - 29971	0.69	0.12	-0.93
3382.31	Ti I	8602 - 38160	4.1	0.70	-0.16
3385.66	Ti I	387 - 29915	0.40	0.069	-1.16
3385.95	Ti I	387 - 29912	3.4	0.59	-0.23
3390.68	Ti I	8492 - 37977	3.3	0.57	-0.24
3392.71	Ti I	12118 - 41585	9.2	1.6	0.20
3398.63	Ti I	8437 - 37852	1.3	0.23	-0.63
3439.30	Ti I	11777 - 40844	3.2	0.56	-0.25
3467.26	Ti I	8492 - 37325	1.9	0.34	-0.47
3478.92	Ti I	8437 - 37173	1.1	0.21	-0.69
3480.53	Ti I	8602 - 37325	4.7	0.86	-0.07
3485.69	Ti I	8492 - 37173	1.1	0.21	-0.68
3495.75	Ti I	8492 - 37091	1.1	0.20	-0.69
3499.10	Ti I	8602 - 37173	1.8	0.33	-0.48
3506.64	Ti I	387 - 28896	0.22	0.041	-1.39
3547.03	Ti I	12118 - 40303	8.9	1.7	0.23
3574.24	Ti I	18288 - 46258	16.	3.0	0.47
3598.72	Ti I	7255 - 35035	2.1	0.40	-0.40
3610.16	Ti I	7255 - 34947	6.3	1.2	0.09
3635.20	Ti I	387 - 27888	0.14	0.027	-1.56
3635.46	Ti I	0 - 27499	6.2	1.2	0.09
3637.97	Ti I	0 - 27480	0.15	0.031	-1.51
3642.68	Ti I	170 - 27615	8.8	1.8	0.24
3646.20	Ti I	0 - 27418	0.23	0.045	-1.34
3653.50	Ti I	387 - 27750	10.	2.0	0.30
3654.59	Ti I	0 - 27355	0.36	0.072	-1.14
3658.10	Ti I	170 - 27499	0.86	0.17	-0.77
3660.63	Ti I	170 - 27480	0.50	0.100	-1.00
3668.97	Ti I	170 - 27418	0.49	0.099	-1.01
3671.67	Ti I	387 - 27615	0.81	0.16	-0.79
3685.96	Ti I	11532 - 38654	3.6	0.74	-0.13
3687.35	Ti I	387 - 27499	0.13	0.026	-1.59
3689.91	Ti I	387 - 27480	0.78	0.16	-0.80
3694.45	Ti I	11640 - 38700	4.4	0.91	-0.04
3698.18	Ti I	18145 - 48178	13.	2.6	0.42
3698.43	Ti I	11640 - 38671	1.8	0.38	-0.42
3702.29	Ti I	8437 - 35439	1.5	0.30	-0.52
3704.30	Ti I	11777 - 38765	6.1	1.2	0.10

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3707.53	Ti I	16268 - 43232	5.3	1.1	0.04
3709.96	Ti I	8492 - 35439	3.6	0.73	-0.13
3717.40	Ti I	0 - 26893	0.51	0.10	-0.98
3722.57	Ti I	170 - 27026	0.39	0.081	-1.09
3724.57	Ti I	12118 - 38960	20.	4.2	0.62
3725.16	Ti I	8602 - 35439	4.8	0.99	-0.00
3729.82	Ti I	0 - 26803	3.1	0.65	-0.19
3738.90	Ti I	15157 - 41895	4.6	0.97	-0.01
3741.06	Ti I	170 - 26893	3.8	0.79	-0.10
3748.10	Ti I	15108 - 41781	12.	2.5	0.39
3752.86	Ti I	387 - 27026	6.1	1.3	0.11
3753.64	Ti I	170 - 26803	0.66	0.14	-0.86
3766.45	Ti I	8492 - 35035	0.67	0.14	-0.85
3771.66	Ti I	387 - 26893	0.68	0.14	-0.84
3786.04	Ti I	7255 - 33661	6.4	1.4	0.14
3789.30	Ti I	11777 - 38160	3.3	0.70	-0.15
3795.90	Ti I	11640 - 37977	1.9	0.40	-0.40
3798.31	Ti I	11532 - 37852	1.5	0.32	-0.49
3818.22	Ti I	18193 - 44376	11.	2.5	0.40
3822.03	Ti I	17075 - 43232	6.9	1.5	0.18
3828.19	Ti I	17215 - 43330	28.	6.2	0.79
3853.05	Ti I	15877 - 41823	10.	2.3	0.36
3853.73	Ti I	15976 - 41917	11.	2.3	0.37
3858.14	Ti I	16106 - 42018	14.	3.1	0.49
3866.44	Ti I	16268 - 42124	20.	4.6	0.66
3868.40	Ti I	15976 - 41819	13.	2.9	0.47
3873.21	Ti I	16106 - 41917	9.6	2.2	0.34
3875.26	Ti I	0 - 25798	0.22	0.051	-1.30
3882.15	Ti I	16268 - 42019	14.	3.1	0.50
3882.33	Ti I	16268 - 42018	14.	3.1	0.50
3882.89	Ti I	16459 - 42206	44.	9.9	1.00
3888.02	Ti I	16106 - 41819	4.7	1.1	0.03
3889.95	Ti I	0 - 25700	0.060	0.014	-1.87
3895.25	Ti I	16459 - 42124	17.	4.0	0.60
3898.49	Ti I	0 - 25644	0.069	0.016	-1.80
3900.96	Ti I	170 - 25798	0.15	0.035	-1.45
3904.78	Ti I	7255 - 32858	17.	3.8	0.58
3911.19	Ti I	16459 - 42019	9.0	2.1	0.31
3914.34	Ti I	387 - 25927	0.45	0.10	-0.99
3914.74	Ti I	0 - 25537	0.019	0.0044	-2.36
3919.82	Ti I	12118 - 37623	0.87	0.20	-0.70
3921.42	Ti I	0 - 25494	0.23	0.052	-1.28
3924.53	Ti I	170 - 25644	0.89	0.21	-0.69
3926.32	Ti I	20796 - 46258	31.	7.1	0.85
3929.88	Ti I	0 - 25439	0.70	0.16	-0.79
3934.24	Ti I	387 - 25798	0.062	0.014	-1.84
3947.78	Ti I	170 - 25494	0.86	0.20	-0.70
3948.67	Ti I	0 - 25318	3.4	0.81	-0.09
3956.34	Ti I	170 - 25439	3.6	0.84	-0.08
3958.21	Ti I	387 - 25644	4.4	1.0	0.01

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3962.85	Ti I	0 - 25227	0.71	0.17	-0.78
3964.27	Ti I	170 - 25388	0.74	0.18	-0.76
3981.76	Ti I	0 - 25107	3.4	0.82	-0.09
3982.48	Ti I	0 - 25103	0.41	0.098	-1.01
3984.33	Ti I	16961 - 42053	5.1	1.2	0.09
3989.76	Ti I	170 - 25227	4.3	1.0	0.01
3994.70	Ti I	16875 - 41901	3.0	0.71	-0.15
3998.64	Ti I	387 - 25388	6.1	1.5	0.16
3999.36	Ti I	16961 - 41959	6.0	1.4	0.16
4002.49	Ti I	17075 - 42053	6.2	1.5	0.17
4003.81	Ti I	17215 - 42185	6.4	1.5	0.19
4005.97	Ti I	16961 - 41917	3.0	0.72	-0.14
4008.06	Ti I	17075 - 42018	6.1	1.5	0.17
4008.93	Ti I	170 - 25107	0.69	0.17	-0.78
4009.66	Ti I	170 - 25103	0.14	0.033	-1.48
4013.58	Ti I	17215 - 42124	16.	3.8	0.58
4015.38	Ti I	16817 - 41714	5.7	1.4	0.14
4016.28	Ti I	17215 - 42107	3.2	0.76	-0.12
4017.77	Ti I	16875 - 41757	9.5	2.3	0.36
4021.83	Ti I	16961 - 41819	12.	2.8	0.45
4024.57	Ti I	387 - 25227	0.90	0.22	-0.66
4026.54	Ti I	17075 - 41903	16.	3.9	0.59
4030.51	Ti I	17215 - 42019	16.	4.0	0.60
4033.91	Ti I	17424 - 42207	3.8	0.93	-0.03
4034.91	Ti I	17370 - 42146	2.7	0.65	-0.19
4035.83	Ti I	17540 - 42311	10.	2.5	0.39
4040.32	Ti I	17075 - 41819	2.9	0.72	-0.14
4055.02	Ti I	8437 - 33091	2.0	0.49	-0.31
4057.62	Ti I	18594 - 43232	10.	2.5	0.40
4058.14	Ti I	18695 - 43330	11.	2.6	0.41
4060.26	Ti I	8492 - 33114	2.9	0.71	-0.15
4064.22	Ti I	8492 - 33091	1.4	0.35	-0.45
4065.10	Ti I	8492 - 33085	1.4	0.35	-0.45
4078.47	Ti I	8602 - 33114	5.9	1.5	0.17
4079.72	Ti I	17424 - 41929	3.6	0.89	-0.05
4082.46	Ti I	8602 - 33091	2.0	0.50	-0.30
4099.17	Ti I	17540 - 41929	7.2	1.8	0.26
4112.71	Ti I	387 - 24695	0.14	0.036	-1.44
4122.17	Ti I	21470 - 45722	21.	5.3	0.73
4123.31	Ti I	22405 - 46650	14.	3.5	0.55
4123.57	Ti I	21588 - 48832	46.	12.	1.07
4127.54	Ti I	21740 - 45960	35.	9.0	0.95
4131.25	Ti I	18525 - 42724	4.5	1.2	0.06
4137.29	Ti I	18695 - 42859	16.	4.1	0.62
4143.05	Ti I	18594 - 42724	9.0	2.3	0.37
4150.96	Ti I	17540 - 41624	13.	3.4	0.54
4159.64	Ti I	17424 - 41458	6.4	1.6	0.22
4164.14	Ti I	15108 - 39116	1.4	0.37	-0.44
4166.32	Ti I	15157 - 39152	1.7	0.43	-0.36
4169.35	Ti I	15220 - 39198	3.4	0.88	-0.06

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4171.03	Ti I	17370 - 41337	8.8	2.3	0.36
4183.30	Ti I	18062 - 41959	3.2	0.83	-0.08
4186.12	Ti I	12118 - 36000	5.9	1.5	0.19
4188.69	Ti I	18062 - 41929	3.7	0.96	-0.02
4200.75	Ti I	18145 - 41944	6.3	1.7	0.22
4203.46	Ti I	18145 - 41929	7.3	1.9	0.29
4211.73	Ti I	20063 - 43800	5.3	1.4	0.15
4224.79	Ti I	22405 - 46068	12.	3.3	0.51
4227.65	Ti I	20063 - 43710	6.1	1.6	0.21
4237.89	Ti I	20210 - 43800	20.	5.3	0.72
4249.12	Ti I	18525 - 42053	7.7	2.1	0.32
4256.04	Ti I	18695 - 42185	13.	3.4	0.53
4258.54	Ti I	18483 - 41959	6.4	1.7	0.24
4261.60	Ti I	18594 - 42053	6.6	1.8	0.25
4263.13	Ti I	15220 - 38671	12.	3.2	0.51
4265.71	Ti I	15108 - 38544	1.2	0.34	-0.47
4266.22	Ti I	18525 - 41959	3.8	1.0	0.01
4270.14	Ti I	18695 - 42107	6.7	1.8	0.26
4272.43	Ti I	6661 - 30060	0.26	0.072	-1.14
4274.58	Ti I	6599 - 29986	0.73	0.20	-0.70
4276.43	Ti I	13982 - 37359	2.9	0.81	-0.09
4278.23	Ti I	20796 - 44163	20.	5.5	0.74
4278.81	Ti I	18594 - 41959	2.7	0.74	-0.13
4281.38	Ti I	6557 - 29907	0.32	0.089	-1.05
4282.71	Ti I	15108 - 38451	7.2	2.0	0.30
4284.99	Ti I	14028 - 37359	3.8	1.1	0.02
4286.01	Ti I	6661 - 29986	2.8	0.76	-0.12
4287.40	Ti I	6743 - 30060	2.6	0.72	-0.14
4288.16	Ti I	6599 - 29912	0.090	0.025	-1.60
4289.07	Ti I	6599 - 29907	2.9	0.79	-0.10
4290.94	Ti I	6557 - 29855	2.5	0.69	-0.16
4295.76	Ti I	6557 - 29829	2.5	0.68	-0.17
4298.66	Ti I	6599 - 29855	6.0	1.7	0.22
4299.23	Ti I	14106 - 37359	5.0	1.4	0.14
4299.64	Ti I	6661 - 29912	0.61	0.17	-0.77
4300.56	Ti I	6661 - 29907	8.7	2.4	0.38
4301.09	Ti I	6743 - 29986	13.	3.5	0.54
4305.92	Ti I	6843 - 30060	19.	5.2	0.72
4308.50	Ti I	8602 - 31806	0.19	0.052	-1.29
4311.65	Ti I	17370 - 40556	2.6	0.71	-0.15
4314.35	Ti I	6743 - 29915	0.25	0.071	-1.15
4314.80	Ti I	6743 - 29912	3.6	1.0	0.01
4318.64	Ti I	18193 - 41342	27.	7.7	0.88
4321.66	Ti I	18037 - 41170	13.	3.7	0.56
4325.13	Ti I	18141 - 41255	14.	4.0	0.60
4326.36	Ti I	6661 - 29769	0.45	0.13	-0.89
4334.84	Ti I	6599 - 29661	0.085	0.024	-1.62
4346.11	Ti I	18037 - 41040	5.1	1.4	0.16
4354.06	Ti I	17424 - 40385	2.1	0.60	-0.22
4360.49	Ti I	17540 - 40467	5.8	1.6	0.22

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4368.94	Ti I	18288 - 41170	1.8	0.50	-0.30
4369.68	Ti I	20796 - 43674	14.	4.1	0.61
4372.38	Ti I	20063 - 42928	7.2	2.1	0.32
4388.08	Ti I	18062 - 40844	2.0	0.58	-0.24
4393.92	Ti I	18288 - 41040	12.	3.5	0.54
4404.28	Ti I	18145 - 40844	16.	4.7	0.67
4404.90	Ti I	15157 - 37852	1.7	0.51	-0.30
4405.68	Ti I	8492 - 31184	0.13	0.039	-1.41
4416.54	Ti I	15108 - 37744	1.7	0.49	-0.31
4417.28	Ti I	15220 - 37852	6.3	1.8	0.26
4421.76	Ti I	18062 - 40671	7.7	2.3	0.36
4422.82	Ti I	8602 - 31206	0.54	0.16	-0.80
4424.39	Ti I	18288 - 40883	1.6	0.48	-0.32
4425.83	Ti I	8602 - 31191	0.13	0.039	-1.41
4426.06	Ti I	15157 - 37744	3.4	1.00	-0.00
4427.10	Ti I	12118 - 34700	11.	3.2	0.50
4430.02	Ti I	19422 - 41988	2.0	0.59	-0.23
4430.37	Ti I	11640 - 34205	0.87	0.26	-0.59
4431.28	Ti I	17996 - 40556	3.0	0.88	-0.05
4433.58	Ti I	19323 - 41872	2.2	0.64	-0.19
4434.00	Ti I	11532 - 34079	1.7	0.50	-0.30
4436.59	Ti I	15157 - 37690	2.0	0.59	-0.23
4438.23	Ti I	18145 - 40671	1.9	0.57	-0.24
4440.35	Ti I	15108 - 37623	3.6	1.1	0.03
4441.27	Ti I	15108 - 37618	1.3	0.39	-0.41
4444.27	Ti I	18062 - 40556	1.5	0.45	-0.35
4449.15	Ti I	15220 - 37690	23.	7.0	0.84
4450.90	Ti I	15157 - 37618	15.	4.5	0.65
4453.32	Ti I	11532 - 33981	8.3	2.5	0.39
4453.71	Ti I	15108 - 37555	7.8	2.3	0.36
4455.33	Ti I	11640 - 34079	9.7	2.9	0.46
4457.43	Ti I	11777 - 34205	11.	3.4	0.53
4462.09	Ti I	0 - 22405	0.0081	0.0024	-2.62
4463.38	Ti I	15157 - 37555	1.9	0.58	-0.24
4463.54	Ti I	15220 - 37618	2.6	0.79	-0.10
4465.81	Ti I	14028 - 36415	5.6	1.7	0.23
4471.24	Ti I	13982 - 36341	4.6	1.4	0.14
4474.85	Ti I	11640 - 33981	0.95	0.28	-0.55
4479.70	Ti I	13982 - 36298	1.8	0.55	-0.26
4480.59	Ti I	14028 - 36341	0.92	0.28	-0.56
4481.26	Ti I	14106 - 36415	10.	3.1	0.49
4482.69	Ti I	11777 - 34079	0.98	0.29	-0.53
4489.09	Ti I	14028 - 36298	5.0	1.5	0.18
4492.55	Ti I	16961 - 39214	1.0	0.32	-0.50
4496.15	Ti I	14106 - 36341	4.6	1.4	0.15
4497.73	Ti I	17075 - 39302	1.1	0.32	-0.49
4503.78	Ti I	17215 - 39413	1.9	0.59	-0.23
4512.74	Ti I	6743 - 28896	1.9	0.57	-0.25
4515.62	Ti I	17075 - 39214	0.84	0.26	-0.59
4518.03	Ti I	6661 - 28788	2.3	0.72	-0.14

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4518.70	Ti I	11532 - 33656	0.87	0.27	-0.57
4522.80	Ti I	6599 - 28703	2.3	0.70	-0.15
4527.31	Ti I	6557 - 28639	1.7	0.53	-0.28
4533.24	Ti I	6843 - 28896	14.	4.4	0.64
4534.78	Ti I	6743 - 28788	8.3	2.6	0.41
4535.58	Ti I	6661 - 28703	5.4	1.7	0.22
4535.92	Ti I	6599 - 28639	2.7	0.82	-0.09
4536.05	Ti I	6557 - 28596	2.6	0.81	-0.09
4544.69	Ti I	6599 - 28596	1.6	0.49	-0.31
4548.77	Ti I	6661 - 28639	2.1	0.66	-0.18
4552.46	Ti I	6743 - 28703	2.2	0.68	-0.17
4555.08	Ti I	19422 - 41369	1.9	0.60	-0.22
4555.49	Ti I	6843 - 28788	1.7	0.52	-0.28
4557.86	Ti I	19938 - 41872	1.8	0.56	-0.25
4558.11	Ti I	18912 - 40844	1.3	0.42	-0.38
4559.92	Ti I	11777 - 33701	0.56	0.17	-0.76
4562.63	Ti I	170 - 22081	0.017	0.0053	-2.28
4563.43	Ti I	19574 - 41481	3.0	0.94	-0.03
4570.91	Ti I	19323 - 41194	2.8	0.87	-0.06
4617.27	Ti I	14106 - 35758	16.	5.2	0.71
4619.52	Ti I	18826 - 40467	1.5	0.49	-0.31
4623.09	Ti I	14028 - 35653	7.8	2.5	0.40
4629.34	Ti I	13982 - 35577	3.1	0.99	-0.00
4637.88	Ti I	18912 - 40467	3.8	1.2	0.09
4639.37	Ti I	14028 - 35577	3.9	1.2	0.09
4639.67	Ti I	14106 - 35653	3.5	1.1	0.06
4639.95	Ti I	13982 - 35528	3.0	0.98	-0.01
4645.19	Ti I	13982 - 35503	2.3	0.73	-0.13
4650.02	Ti I	14028 - 35528	1.9	0.62	-0.21
4656.04	Ti I	14106 - 35577	0.39	0.13	-0.90
4656.47	Ti I	0 - 21470	0.22	0.071	-1.15
4667.59	Ti I	170 - 21588	0.26	0.086	-1.07
4675.12	Ti I	8602 - 29986	0.24	0.079	-1.10
4681.92	Ti I	387 - 21740	0.31	0.10	-0.99
4686.92	Ti I	17370 - 38700	0.85	0.28	-0.55
4690.80	Ti I	8602 - 29915	0.079	0.026	-1.58
4691.34	Ti I	8602 - 29912	0.63	0.21	-0.68
4693.68	Ti I	170 - 21470	0.013	0.0042	-2.38
4696.94	Ti I	17370 - 38654	0.93	0.31	-0.51
4698.76	Ti I	8492 - 29769	0.61	0.20	-0.70
4710.19	Ti I	8437 - 29661	0.37	0.12	-0.91
4715.30	Ti I	387 - 21588	0.0076	0.0025	-2.60
4722.62	Ti I	8492 - 29661	0.22	0.074	-1.13
4723.17	Ti I	8602 - 29769	0.23	0.077	-1.12
4731.17	Ti I	17540 - 38671	2.4	0.79	-0.10
4733.43	Ti I	17424 - 38544	1.8	0.61	-0.21
4734.68	Ti I	18037 - 39152	0.86	0.29	-0.54
4742.11	Ti I	17370 - 38451	0.89	0.30	-0.52
4742.79	Ti I	18037 - 39116	8.0	2.7	0.43
4747.68	Ti I	18141 - 39198	1.1	0.37	-0.43

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4758.12	Ti I	18141 - 39152	15.	5.2	0.71
4759.28	Ti I	18193 - 39198	15.	5.2	0.72
4766.33	Ti I	18141 - 39116	2.1	0.73	-0.14
4769.77	Ti I	18193 - 39152	1.4	0.46	-0.33
4778.26	Ti I	18037 - 38960	3.1	1.1	0.02
4781.72	Ti I	6843 - 27750	0.087	0.030	-1.52
4792.49	Ti I	18826 - 39686	6.3	2.2	0.34
4796.22	Ti I	18818 - 39662	2.5	0.87	-0.06
4797.98	Ti I	18826 - 39662	1.9	0.65	-0.18
4799.80	Ti I	18288 - 39116	5.4	1.9	0.27
4805.43	Ti I	18912 - 39716	6.4	2.2	0.35
4808.53	Ti I	24695 - 45485	13.	4.5	0.66
4811.08	Ti I	15220 - 36000	0.45	0.16	-0.81
4812.25	Ti I	18912 - 39686	2.2	0.77	-0.11
4820.42	Ti I	12118 - 32858	1.7	0.58	-0.23
4825.46	Ti I	18695 - 39413	1.2	0.41	-0.38
4836.13	Ti I	18288 - 38960	1.8	0.64	-0.19
4840.87	Ti I	7255 - 27907	0.97	0.34	-0.47
4848.47	Ti I	17540 - 38160	2.5	0.88	-0.05
4856.01	Ti I	18193 - 38780	13.	4.6	0.66
4864.18	Ti I	17424 - 37977	1.2	0.42	-0.37
4868.26	Ti I	18037 - 38573	8.5	3.0	0.48
4870.14	Ti I	18141 - 38669	11.	3.8	0.58
4880.91	Ti I	17370 - 37852	0.96	0.34	-0.46
4882.35	Ti I	18193 - 38669	1.9	0.69	-0.16
4885.08	Ti I	15220 - 35685	7.5	2.7	0.43
4899.91	Ti I	15157 - 35560	7.3	2.6	0.42
4913.62	Ti I	15108 - 35454	5.9	2.1	0.33
4915.24	Ti I	15220 - 35560	1.0	0.37	-0.43
4919.87	Ti I	17424 - 37744	4.5	1.6	0.21
4921.77	Ti I	17540 - 37852	6.6	2.4	0.38
4925.41	Ti I	15157 - 35454	0.99	0.36	-0.44
4926.16	Ti I	6599 - 26893	0.053	0.019	-1.71
4928.34	Ti I	17370 - 37655	5.1	1.9	0.27
4937.74	Ti I	6557 - 26803	0.052	0.019	-1.72
4938.29	Ti I	20796 - 41040	8.6	3.2	0.50
4941.58	Ti I	17424 - 37655	1.1	0.41	-0.39
4948.19	Ti I	17540 - 37744	0.76	0.28	-0.56
4958.25	Ti I	7255 - 27418	0.041	0.015	-1.82
4964.75	Ti I	15877 - 36014	1.2	0.43	-0.37
4968.58	Ti I	15976 - 36096	1.4	0.53	-0.28
4973.05	Ti I	16106 - 36209	1.7	0.64	-0.19
4975.35	Ti I	20210 - 40303	8.6	3.2	0.51
4977.74	Ti I	16268 - 36351	1.5	0.57	-0.24
4978.20	Ti I	15877 - 35959	2.5	0.94	-0.03
4981.73	Ti I	6843 - 26911	9.9	3.7	0.57
4989.15	Ti I	15976 - 36014	3.3	1.2	0.09
4991.07	Ti I	6743 - 26773	7.6	2.8	0.45
4995.08	Ti I	18145 - 38160	1.3	0.48	-0.32
4997.10	Ti I	0 - 20006	0.033	0.012	-1.90

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4999.51	Ti I	6661 - 26657	6.4	2.4	0.38
5001.01	Ti I	16106 - 36096	5.3	2.0	0.30
5007.21	Ti I	6599 - 26564	5.6	2.1	0.32
5009.65	Ti I	170 - 20126	0.029	0.011	-1.96
5013.30	Ti I	16268 - 36209	5.5	2.1	0.31
5014.19	Ti I	0 - 19938	0.76	0.29	-0.54
5016.17	Ti I	6843 - 26773	0.96	0.36	-0.44
5020.03	Ti I	6743 - 26657	1.3	0.51	-0.29
5022.87	Ti I	6661 - 26564	1.3	0.50	-0.30
5024.84	Ti I	6599 - 26494	0.89	0.34	-0.47
5025.58	Ti I	16459 - 36351	7.3	2.8	0.44
5035.91	Ti I	11777 - 31629	7.6	2.9	0.46
5036.47	Ti I	11640 - 31489	5.3	2.0	0.30
5038.40	Ti I	11532 - 31374	4.5	1.7	0.23
5039.95	Ti I	170 - 20006	0.28	0.11	-0.96
5040.62	Ti I	6661 - 26494	0.11	0.043	-1.37
5043.59	Ti I	6743 - 26564	0.13	0.050	-1.30
5044.27	Ti I	17540 - 37359	1.2	0.46	-0.33
5045.41	Ti I	6843 - 26657	0.085	0.032	-1.49
5048.21	Ti I	17370 - 37173	0.82	0.31	-0.50
5052.87	Ti I	17540 - 37325	3.4	1.3	0.12
5054.08	Ti I	21588 - 41369	2.2	0.82	-0.08
5062.11	Ti I	17424 - 37173	3.3	1.3	0.10
5064.07	Ti I	21740 - 41481	3.9	1.5	0.18
5064.66	Ti I	387 - 20126	0.35	0.13	-0.87
5065.99	Ti I	11640 - 31374	0.58	0.22	-0.65
5068.33	Ti I	21470 - 41194	3.6	1.4	0.14
5069.35	Ti I	17370 - 37091	1.9	0.75	-0.13
5071.48	Ti I	11777 - 31489	0.80	0.31	-0.51
5085.34	Ti I	11532 - 31191	0.25	0.095	-1.02
5087.07	Ti I	11532 - 31184	0.73	0.28	-0.55
5109.44	Ti I	11640 - 31206	0.31	0.12	-0.92
5113.44	Ti I	11640 - 31191	1.1	0.44	-0.36
5120.42	Ti I	20796 - 40320	21.	8.3	0.92
5145.47	Ti I	11777 - 31206	1.6	0.64	-0.19
5147.48	Ti I	0 - 19422	0.049	0.020	-1.71
5152.20	Ti I	170 - 19574	0.047	0.019	-1.73
5173.75	Ti I	0 - 19323	0.22	0.088	-1.06
5186.34	Ti I	17075 - 36351	1.1	0.43	-0.36
5192.98	Ti I	170 - 19422	0.27	0.11	-0.96
5194.04	Ti I	16961 - 36209	2.1	0.83	-0.08
5201.10	Ti I	16875 - 36096	1.5	0.61	-0.22
5206.08	Ti I	20063 - 39266	6.7	2.7	0.44
5207.87	Ti I	16817 - 36014	1.7	0.70	-0.16
5210.39	Ti I	387 - 19574	0.31	0.13	-0.90
5219.71	Ti I	170 - 19323	0.031	0.013	-1.90
5222.69	Ti I	16817 - 35959	2.2	0.89	-0.05
5223.64	Ti I	16875 - 36014	2.0	0.80	-0.09
5224.32	Ti I	17215 - 36351	6.5	2.7	0.42
5224.56	Ti I	16961 - 36096	2.3	0.93	-0.03

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5224.95	Ti I	17075 - 36209	4.7	1.9	0.28
5238.58	Ti I	6843 - 25927	0.16	0.065	-1.19
5246.15	Ti I	20210 - 39266	1.2	0.51	-0.29
5246.57	Ti I	6743 - 25798	0.069	0.029	-1.55
5247.31	Ti I	16961 - 36014	1.7	0.71	-0.15
5250.95	Ti I	6661 - 25700	0.027	0.011	-1.95
5252.11	Ti I	387 - 19422	0.023	0.0095	-2.02
5255.83	Ti I	17075 - 36096	1.8	0.73	-0.13
5259.99	Ti I	22081 - 41087	5.2	2.1	0.33
5263.50	Ti I	17215 - 36209	1.3	0.54	-0.27
5265.98	Ti I	15220 - 34205	2.1	0.86	-0.06
5282.39	Ti I	8492 - 27418	0.088	0.037	-1.43
5283.45	Ti I	15157 - 34079	1.9	0.78	-0.11
5284.39	Ti I	8437 - 27355	0.076	0.032	-1.50
5295.79	Ti I	8602 - 27480	0.13	0.057	-1.25
5297.26	Ti I	15108 - 33981	1.5	0.65	-0.19
5298.44	Ti I	20210 - 39078	3.5	1.5	0.17
5341.50	Ti I	34947 - 53663	29.	13.	1.10
5351.08	Ti I	22405 - 41087	7.4	3.2	0.50
5366.65	Ti I	6599 - 25227	0.030	0.013	-1.89
5389.18	Ti I	6557 - 25107	0.047	0.020	-1.69
5389.99	Ti I	15108 - 33656	0.65	0.28	-0.55
5396.60	Ti I	170 - 18695	0.0031	0.0013	-2.87
5397.09	Ti I	15157 - 33680	1.1	0.46	-0.34
5404.02	Ti I	18826 - 37325	1.3	0.56	-0.25
5409.61	Ti I	15220 - 33701	1.3	0.58	-0.24
5426.26	Ti I	170 - 18594	0.0075	0.0033	-2.48
5429.15	Ti I	18912 - 37325	2.6	1.1	0.06
5436.73	Ti I	7255 - 25644	0.034	0.015	-1.82
5438.32	Ti I	11532 - 29915	0.073	0.032	-1.49
5446.64	Ti I	18818 - 37173	1.4	0.63	-0.20
5448.90	Ti I	18826 - 37173	1.1	0.47	-0.32
5449.16	Ti I	11640 - 29986	0.093	0.042	-1.38
5453.65	Ti I	11640 - 29971	0.16	0.073	-1.14
5460.51	Ti I	387 - 18695	0.0097	0.0043	-2.36
5471.21	Ti I	11640 - 29912	0.32	0.14	-0.84
5472.70	Ti I	11640 - 29907	0.16	0.072	-1.14
5473.55	Ti I	18826 - 37091	1.4	0.63	-0.20
5474.23	Ti I	11777 - 30039	0.38	0.17	-0.77
5474.46	Ti I	18912 - 37173	1.1	0.48	-0.32
5477.71	Ti I	19574 - 37825	4.7	2.1	0.33
5481.43	Ti I	19422 - 37660	4.1	1.8	0.27
5481.87	Ti I	11532 - 29769	0.31	0.14	-0.86
5488.20	Ti I	19323 - 37539	3.2	1.4	0.16
5490.15	Ti I	11777 - 29986	0.66	0.30	-0.53
5490.84	Ti I	387 - 18594	0.0047	0.0021	-2.67
5503.90	Ti I	20796 - 38960	5.9	2.7	0.43
5511.78	Ti I	20063 - 38201	1.9	0.87	-0.06
5512.53	Ti I	11777 - 29912	1.5	0.68	-0.17
5514.35	Ti I	11532 - 29661	1.1	0.51	-0.29

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5514.54	Ti I	11640 - 29769	1.3	0.61	-0.22
5565.49	Ti I	18037 - 36000	2.6	1.2	0.08
5644.14	Ti I	18288 - 36000	6.3	3.0	0.48
5648.58	Ti I	20126 - 37825	3.1	1.5	0.17
5662.16	Ti I	18695 - 36351	5.3	2.5	0.40
5662.91	Ti I	20006 - 37660	3.0	1.4	0.15
5673.42	Ti I	25103 - 42724	3.5	1.7	0.23
5675.44	Ti I	18594 - 36209	3.4	1.6	0.21
5679.94	Ti I	19938 - 37539	1.2	0.60	-0.23
5689.47	Ti I	18525 - 36096	2.5	1.2	0.08
5702.68	Ti I	18483 - 36014	1.9	0.91	-0.04
5708.23	Ti I	18695 - 36209	0.99	0.48	-0.31
5711.88	Ti I	18594 - 36096	1.6	0.81	-0.09
5713.92	Ti I	18463 - 35959	1.1	0.52	-0.29
5715.13	Ti I	18193 - 35685	2.2	1.1	0.03
5716.48	Ti I	18525 - 36014	1.3	0.66	-0.18
5720.48	Ti I	18483 - 35959	0.93	0.45	-0.34
5739.51	Ti I	18141 - 35560	1.9	0.94	-0.03
5740.02	Ti I	18037 - 35454	0.92	0.46	-0.34
5741.22	Ti I	20210 - 37623	0.76	0.38	-0.42
5752.84	Ti I	18062 - 35439	0.46	0.23	-0.64
5762.27	Ti I	26494 - 43844	9.9	4.9	0.69
5766.35	Ti I	26564 - 43902	13.	6.3	0.80
5774.05	Ti I	26657 - 43972	18.	9.0	0.95
5780.78	Ti I	18145 - 35439	0.69	0.35	-0.46
5785.98	Ti I	26773 - 44051	18.	9.2	0.96
5804.26	Ti I	26911 - 44135	16.	8.2	0.91
5823.71	Ti I	18288 - 35454	0.93	0.48	-0.32
5866.46	Ti I	8602 - 25644	0.56	0.29	-0.54
5880.31	Ti I	8492 - 25494	0.085	0.044	-1.35
5899.32	Ti I	8492 - 25439	0.31	0.16	-0.79
5903.33	Ti I	8602 - 25537	0.072	0.038	-1.42
5918.55	Ti I	8602 - 25494	0.16	0.083	-1.08
5922.12	Ti I	8437 - 25318	0.19	0.10	-1.00
5937.82	Ti I	8602 - 25439	0.099	0.052	-1.28
5941.76	Ti I	8492 - 25318	0.15	0.080	-1.10
5953.17	Ti I	15220 - 32014	2.5	1.3	0.13
5965.84	Ti I	15157 - 31914	1.7	0.89	-0.05
5978.56	Ti I	15108 - 31830	2.2	1.2	0.08
5999.04	Ti I	17540 - 34205	5.4	2.9	0.47
5999.68	Ti I	18037 - 34700	1.2	0.63	-0.20
6064.63	Ti I	8437 - 24921	0.12	0.069	-1.16
6085.23	Ti I	8492 - 24921	0.14	0.076	-1.12
6091.17	Ti I	18288 - 34700	2.2	1.2	0.08
6092.81	Ti I	15220 - 31629	0.33	0.19	-0.73
6098.67	Ti I	24695 - 41087	4.8	2.7	0.43
6121.01	Ti I	15157 - 31489	0.28	0.16	-0.80
6126.22	Ti I	8602 - 24921	0.14	0.078	-1.11
6138.38	Ti I	17370 - 33656	0.27	0.15	-0.82
6146.22	Ti I	15108 - 31374	0.23	0.13	-0.88

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6149.74	Ti I	17424 - 33680	0.30	0.17	-0.77
6186.15	Ti I	17540 - 33701	0.53	0.30	-0.52
6215.28	Ti I	21740 - 37825	4.4	2.5	0.40
6220.49	Ti I	21588 - 37660	3.3	1.9	0.28
6221.41	Ti I	21470 - 37539	2.7	1.6	0.19
6258.10	Ti I	11640 - 27615	0.99	0.58	-0.24
6258.70	Ti I	11777 - 27750	1.0	0.60	-0.22
6261.10	Ti I	11532 - 27499	0.75	0.44	-0.36
6303.75	Ti I	11640 - 27499	0.16	0.096	-1.02
6312.24	Ti I	11777 - 27615	0.14	0.083	-1.08
6318.03	Ti I	11532 - 27355	0.065	0.039	-1.41
6336.10	Ti I	11640 - 27418	0.079	0.048	-1.32
6366.35	Ti I	11777 - 27480	0.094	0.057	-1.24
6419.10	Ti I	17540 - 33114	0.13	0.082	-1.08
6497.69	Ti I	11640 - 27026	0.039	0.025	-1.61
6508.14	Ti I	11532 - 26893	0.042	0.027	-1.57
6546.28	Ti I	11532 - 26803	0.11	0.074	-1.13
6554.23	Ti I	11640 - 26893	0.14	0.091	-1.04
6556.07	Ti I	11777 - 27026	0.17	0.11	-0.96
6575.18	Ti I	20796 - 36000	0.49	0.32	-0.50
6599.11	Ti I	7255 - 22405	0.027	0.017	-1.76
6666.55	Ti I	11777 - 26773	0.046	0.031	-1.51
6677.18	Ti I	20063 - 35035	0.48	0.32	-0.50
6716.68	Ti I	20063 - 34947	0.70	0.47	-0.32
6743.12	Ti I	7255 - 22081	0.056	0.038	-1.42
6861.47	Ti I	18288 - 32858	0.53	0.37	-0.43
6873.92	Ti I	21588 - 36132	0.33	0.24	-0.63
6913.19	Ti I	21740 - 36201	0.48	0.34	-0.46
6933.15	Ti I	25107 - 39527	1.4	1.0	0.01
6943.70	Ti I	25388 - 39786	1.5	1.1	0.04
6996.63	Ti I	18826 - 33114	0.44	0.32	-0.50
7004.66	Ti I	18818 - 33091	0.29	0.21	-0.67
7008.35	Ti I	18826 - 33091	0.26	0.19	-0.72
7010.94	Ti I	18826 - 33085	0.26	0.19	-0.72
7035.86	Ti I	25318 - 39527	1.6	1.2	0.08
7038.80	Ti I	18912 - 33114	0.73	0.54	-0.27
7050.65	Ti I	18912 - 33091	0.26	0.19	-0.71
7069.11	Ti I	25644 - 39786	2.9	2.2	0.34
7138.91	Ti I	11640 - 25644	0.063	0.048	-1.32
7189.89	Ti I	20796 - 34700	1.6	1.3	0.10
7209.44	Ti I	11777 - 25644	0.62	0.48	-0.32
7216.20	Ti I	11640 - 25494	0.14	0.11	-0.96
7244.86	Ti I	11640 - 25439	0.29	0.23	-0.64
7251.72	Ti I	11532 - 25318	0.28	0.22	-0.65
7266.29	Ti I	13982 - 27740	0.083	0.065	-1.18
7315.56	Ti I	17540 - 31206	0.18	0.14	-0.85
7318.39	Ti I	18145 - 31806	0.37	0.29	-0.53
7344.72	Ti I	11777 - 25388	0.28	0.22	-0.65
7352.16	Ti I	20063 - 33661	0.25	0.20	-0.69
7357.74	Ti I	11640 - 25227	0.20	0.16	-0.79

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7364.11	Ti I	11532 - 25107	0.13	0.10	-0.98
7440.60	Ti I	18193 - 31629	0.36	0.29	-0.53
7474.94	Ti I	14106 - 27480	0.038	0.032	-1.50
7489.61	Ti I	18141 - 31489	0.34	0.29	-0.54
7496.12	Ti I	18037 - 31374	0.24	0.20	-0.70
7580.55	Ti I	17996 - 31184	0.15	0.13	-0.90
7614.50	Ti I	18062 - 31191	0.18	0.16	-0.80
7654.44	Ti I	18145 - 31206	0.28	0.24	-0.61
7949.17	Ti I	12118 - 24695	0.061	0.058	-1.24
7961.58	Ti I	26657 - 39214	3.2	3.1	0.49
7978.88	Ti I	15220 - 27750	0.29	0.28	-0.56
7979.07	Ti I	26773 - 39302	1.1	1.1	0.04
7996.53	Ti I	26911 - 39413	3.9	3.8	0.58
8024.84	Ti I	15157 - 27615	0.25	0.24	-0.62
8068.24	Ti I	15108 - 27499	0.14	0.13	-0.87
8306.31*	Ti I	27750 - 39786	2.0	2.1	0.32
8307.41	Ti I	6661 - 18695	0.0035	0.0037	-2.44
8311.76	Ti I	27499 - 39527	1.3	1.3	0.12
8312.85	Ti I	27615 - 39641	1.1	1.1	0.05
8334.37	Ti I	6599 - 18594	0.0046	0.0048	-2.32
8353.15	Ti I	6557 - 18525	0.0051	0.0053	-2.27
8364.24	Ti I	6743 - 18695	0.030	0.031	-1.51
8377.85	Ti I	6661 - 18594	0.038	0.040	-1.40
8382.54	Ti I	6599 - 18525	0.037	0.039	-1.41
8382.82	Ti I	6557 - 18483	0.020	0.021	-1.68
8396.87	Ti I	6557 - 18463	0.028	0.030	-1.53
8412.36	Ti I	6599 - 18483	0.045	0.048	-1.32
8416.98	Ti I	18037 - 29915	0.18	0.19	-0.73
8424.41	Ti I	16961 - 28829	0.10	0.11	-0.95
8426.52	Ti I	6661 - 18525	0.063	0.067	-1.18
8434.94	Ti I	6843 - 18695	0.19	0.21	-0.68
8435.70	Ti I	6743 - 18594	0.093	0.099	-1.00
8438.93	Ti I	18193 - 30039	0.37	0.39	-0.41
8450.89	Ti I	18141 - 29971	0.36	0.39	-0.41
8457.10	Ti I	14106 - 25927	0.028	0.030	-1.53
8467.15	Ti I	17075 - 28882	0.13	0.14	-0.84
8468.50	Ti I	15220 - 27026	0.19	0.20	-0.69
8496.04	Ti I	18145 - 29912	0.14	0.15	-0.81
8518.05	Ti I	17215 - 28952	0.14	0.15	-0.83
8518.32	Ti I	15157 - 26893	0.15	0.17	-0.78
8539.38*	Ti I	18062 - 29769	0.12	0.14	-0.87
8548.12	Ti I	15108 - 26803	0.15	0.16	-0.79
8569.77	Ti I	17996 - 29661	0.080	0.089	-1.05
8598.18	Ti I	18288 - 29915	0.087	0.096	-1.02
8675.39	Ti I	8602 - 20126	0.055	0.062	-1.20
8682.99	Ti I	8492 - 20006	0.027	0.030	-1.52
8692.33	Ti I	8437 - 19938	0.013	0.015	-1.83
8734.69	Ti I	8492 - 19938	0.011	0.013	-1.90
8766.64	Ti I	8602 - 20006	0.014	0.016	-1.81
8778.71	Ti I	14106 - 25494	0.042	0.049	-1.31

Wavelength Spectrum A	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
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Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2440.21	Ti II	12629 - 53597	19.	1.7	0.22
2450.44	Ti II	12758 - 53555	15.	1.4	0.14
2517.43	Ti II	1087 - 40798	2.7	0.26	-0.59
2524.64	Ti II	984 - 40582	2.6	0.25	-0.61
2525.60	Ti II	1216 - 40798	13.	1.2	0.09
2531.25	Ti II	1087 - 40582	6.4	0.62	-0.21
2534.62	Ti II	984 - 40426	6.2	0.59	-0.23
2535.87	Ti II	908 - 40330	4.2	0.41	-0.39
2555.99	Ti II	4629 - 43741	5.5	0.54	-0.26
2571.03	Ti II	4898 - 43781	9.7	0.96	-0.02
2716.25	Ti II	8744 - 45549	3.5	0.39	-0.41
2761.29	Ti II	8710 - 44915	1.7	0.19	-0.72
2806.50	Ti II	9851 - 45473	4.3	0.50	-0.30
2810.30	Ti II	29734 - 65307	107.	13.	1.10
2832.16	Ti II	4629 - 39927	3.6	0.43	-0.36
2841.94	Ti II	4898 - 40075	5.6	0.68	-0.17
2851.10	Ti II	9851 - 44915	12.	1.5	0.18
2853.93	Ti II	4898 - 39927	1.2	0.15	-0.83
2862.32	Ti II	9976 - 44902	11.	1.4	0.13
2868.74	Ti II	4629 - 39477	1.3	0.16	-0.78
2877.44	Ti II	8998 - 43741	15.	1.9	0.27
2884.11	Ti II	9118 - 43781	24.	2.9	0.47
2888.93	Ti II	4629 - 39233	1.5	0.19	-0.72
2891.07	Ti II	4898 - 39477	1.3	0.17	-0.77
2909.92	Ti II	393 - 34749	0.21	0.027	-1.57
3017.19	Ti II	12775 - 45909	17.	2.4	0.37
3029.73	Ti II	12677 - 45674	19.	2.7	0.43
3046.68	Ti II	9396 - 42209	5.5	0.77	-0.11
3056.74	Ti II	9364 - 42069	6.5	0.91	-0.04
3057.40	Ti II	0 - 32698	0.46	0.065	-1.19
3058.09	Ti II	9518 - 42209	8.6	1.2	0.08
3059.74	Ti II	9396 - 42069	4.1	0.58	-0.24
3066.22	Ti II	94 - 32698	4.6	0.65	-0.18
3071.24	Ti II	9518 - 42069	3.6	0.50	-0.30
3072.11	Ti II	225 - 32767	2.2	0.30	-0.52
3072.97	Ti II	0 - 32532	3.8	0.54	-0.27
3075.22	Ti II	94 - 32603	5.4	0.76	-0.12
3078.64	Ti II	225 - 32698	8.0	1.1	0.06
3088.02	Ti II	393 - 32767	13.	1.9	0.27
3089.40	Ti II	15266 - 47625	42.	6.1	0.78
3097.19	Ti II	9931 - 42209	9.3	1.3	0.13
3103.80	Ti II	15258 - 47467	52.	7.5	0.87
3105.08	Ti II	9873 - 42069	11.	1.6	0.22
3106.23	Ti II	10025 - 42209	14.	2.0	0.30
3110.67	Ti II	9931 - 42069	2.4	0.35	-0.46
3117.67	Ti II	9931 - 41997	7.1	1.0	0.01
3130.80	Ti II	94 - 32026	0.71	0.10	-0.98
3143.76	Ti II	225 - 32026	0.64	0.095	-1.02
3148.04	Ti II	0 - 31757	0.66	0.099	-1.01
3152.25	Ti II	984 - 32698	0.87	0.13	-0.89

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3154.20	Ti II	908 - 32603	0.84	0.13	-0.90
3155.67	Ti II	1087 - 32767	0.88	0.13	-0.88
3161.20	Ti II	908 - 32532	1.7	0.26	-0.58
3161.77	Ti II	984 - 32603	2.8	0.41	-0.38
3162.57	Ti II	1087 - 32698	3.7	0.55	-0.26
3168.52	Ti II	1216 - 32767	5.8	0.87	-0.06
3190.87	Ti II	8744 - 40075	30.	4.6	0.66
3197.52	Ti II	225 - 31491	0.13	0.019	-1.72
3202.54	Ti II	8710 - 39927	22.	3.4	0.53
3203.44	Ti II	0 - 31207	0.12	0.018	-1.75
3213.14	Ti II	94 - 31207	0.26	0.040	-1.39
3214.75	Ti II	393 - 31491	0.50	0.078	-1.11
3217.06	Ti II	225 - 31301	2.7	0.42	-0.38
3218.27	Ti II	12677 - 43741	22.	3.4	0.53
3222.84	Ti II	94 - 31114	3.1	0.49	-0.31
3224.24	Ti II	12775 - 43781	20.	3.2	0.50
3228.60	Ti II	8710 - 39675	14.	2.2	0.34
3229.19	Ti II	0 - 30959	1.8	0.28	-0.56
3229.42	Ti II	9118 - 40075	16.	2.4	0.39
3231.32	Ti II	1087 - 32026	0.33	0.052	-1.29
3232.28	Ti II	8998 - 39927	6.8	1.1	0.03
3234.52	Ti II	393 - 31301	16.	2.6	0.41
3236.12	Ti II	8710 - 39603	5.6	0.88	-0.05
3236.57	Ti II	225 - 31114	13.	2.0	0.29
3239.04	Ti II	94 - 30959	9.3	1.5	0.16
3239.66	Ti II	8744 - 39603	5.6	0.89	-0.05
3241.99	Ti II	0 - 30837	5.8	0.91	-0.04
3248.60	Ti II	10025 - 40798	44.	6.9	0.84
3251.91	Ti II	94 - 30837	2.1	0.34	-0.47
3252.91	Ti II	225 - 30959	2.7	0.43	-0.36
3254.25	Ti II	393 - 31114	2.9	0.45	-0.34
3261.60	Ti II	15258 - 45909	186.	30.	1.47
3271.65	Ti II	10025 - 40582	11.	1.7	0.24
3272.08	Ti II	9873 - 40426	10.	1.7	0.22
3278.29	Ti II	9931 - 40426	6.8	1.1	0.04
3278.92	Ti II	8744 - 39233	6.3	1.0	0.00
3282.33	Ti II	9873 - 40330	7.0	1.1	0.05
3287.66	Ti II	15266 - 45674	77.	13.	1.10
3308.81	Ti II	1087 - 31301	0.55	0.091	-1.04
3315.32	Ti II	9873 - 40027	8.6	1.4	0.15
3318.02	Ti II	984 - 31114	0.82	0.13	-0.87
3321.70	Ti II	9931 - 40027	17.	2.7	0.44
3322.94	Ti II	1216 - 31301	7.4	1.2	0.09
3326.76	Ti II	908 - 30959	0.90	0.15	-0.83
3329.46	Ti II	1087 - 31114	5.3	0.88	-0.06
3332.11	Ti II	10025 - 40027	17.	2.8	0.44
3335.20	Ti II	984 - 30959	4.2	0.70	-0.15
3340.34	Ti II	908 - 30837	2.6	0.43	-0.36
3343.77	Ti II	1216 - 31114	0.65	0.11	-0.96
3346.73	Ti II	1087 - 30959	0.79	0.13	-0.88

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3349.04	Ti II	4898 - 34748	30.	5.0	0.70
3349.41	Ti II	393 - 30241	23.	3.9	0.59
3361.21	Ti II	225 - 29968	13.	2.2	0.34
3372.21	Ti II	4898 - 34543	0.94	0.16	-0.80
3372.80	Ti II	94 - 29734	9.6	1.6	0.22
3374.35	Ti II	9976 - 39603	1.6	0.28	-0.56
3380.28	Ti II	393 - 29968	2.6	0.44	-0.35
3383.76	Ti II	0 - 29544	9.2	1.6	0.20
3387.84	Ti II	225 - 29734	2.4	0.42	-0.38
3388.76	Ti II	9976 - 39477	1.6	0.27	-0.57
3394.58	Ti II	94 - 29544	1.8	0.31	-0.50
3402.42	Ti II	9851 - 39233	1.5	0.26	-0.59
3407.20	Ti II	393 - 29734	0.10	0.018	-1.75
3409.81	Ti II	225 - 29544	0.15	0.027	-1.57
3444.31	Ti II	1216 - 30241	1.8	0.32	-0.50
3452.47	Ti II	16516 - 45473	8.7	1.6	0.19
3456.39	Ti II	16625 - 45549	27.	4.8	0.68
3461.50	Ti II	1087 - 29968	1.1	0.20	-0.70
3477.18	Ti II	984 - 29734	1.0	0.19	-0.73
3489.74	Ti II	1087 - 29734	0.10	0.019	-1.72
3491.05	Ti II	908 - 29544	0.79	0.14	-0.84
3504.89	Ti II	15258 - 43781	82.	15.	1.18
3510.84	Ti II	15266 - 43741	54.	10.	1.00
3520.25	Ti II	16516 - 44915	7.6	1.4	0.15
3535.41	Ti II	16625 - 44902	40.	7.4	0.87
3573.74	Ti II	4629 - 32603	0.48	0.092	-1.04
3587.13	Ti II	4898 - 32767	0.25	0.049	-1.31
3596.05	Ti II	4898 - 32698	0.99	0.19	-0.72
3624.82	Ti II	9851 - 37431	3.0	0.60	-0.22
3641.33	Ti II	9976 - 37431	3.0	0.61	-0.22
3659.76	Ti II	12758 - 40075	4.0	0.81	-0.09
3662.24	Ti II	12629 - 39927	6.2	1.2	0.10
3685.20	Ti II	4898 - 32026	11.	2.2	0.35
3706.23	Ti II	12629 - 39603	4.3	0.88	-0.05
3721.64	Ti II	4629 - 31491	0.44	0.091	-1.04
3741.64	Ti II	12758 - 39477	9.8	2.0	0.31
3757.69	Ti II	12629 - 39233	3.9	0.83	-0.08
3759.30	Ti II	4898 - 31491	10.	2.2	0.34
3761.32	Ti II	4629 - 31207	8.2	1.7	0.24
3761.89	Ti II	20892 - 47467	13.	2.8	0.45
3776.06	Ti II	12758 - 39233	0.82	0.18	-0.76
3900.54	Ti II	9118 - 34748	4.2	0.96	-0.02
3913.46	Ti II	8998 - 34543	3.8	0.87	-0.06
3932.02	Ti II	9118 - 34543	0.27	0.063	-1.20
4012.39	Ti II	4629 - 29544	0.14	0.033	-1.48
4025.14	Ti II	4898 - 29734	0.084	0.020	-1.69
4028.34	Ti II	15258 - 40075	1.6	0.38	-0.42
4163.65	Ti II	20892 - 44902	11.	2.8	0.45
4171.90	Ti II	20952 - 44915	6.3	1.6	0.22
4290.23	Ti II	9396 - 32698	0.59	0.16	-0.79

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4294.12	Ti II	8744 - 32026	0.59	0.16	-0.79
4300.05	Ti II	9518 - 32767	1.0	0.28	-0.55
4301.93	Ti II	9364 - 32603	0.40	0.11	-0.95
4307.90	Ti II	9396 - 32603	0.87	0.24	-0.62
4312.87	Ti II	9518 - 32698	0.42	0.12	-0.94
4337.92	Ti II	8710 - 31756	0.59	0.17	-0.78
4344.29	Ti II	8744 - 31756	0.092	0.026	-1.59
4395.04	Ti II	8744 - 31491	1.2	0.35	-0.46
4399.77	Ti II	9976 - 32698	0.30	0.088	-1.06
4417.72	Ti II	9396 - 32026	0.25	0.074	-1.13
4443.80	Ti II	8710 - 31207	0.76	0.23	-0.65
4450.49	Ti II	8744 - 31207	0.10	0.030	-1.53
4468.50	Ti II	9118 - 31491	0.87	0.26	-0.58
4488.32	Ti II	25193 - 47467	6.3	1.9	0.28
4501.27	Ti II	8998 - 31207	0.69	0.21	-0.68
4533.97	Ti II	9976 - 32026	1.0	0.32	-0.50
4549.63	Ti II	12775 - 34748	2.2	0.69	-0.16
4563.77	Ti II	9851 - 31756	0.43	0.14	-0.87
4571.98	Ti II	12677 - 34543	2.1	0.66	-0.18
4589.95	Ti II	9976 - 31756	0.097	0.031	-1.51
4805.10	Ti II	16625 - 37431	0.63	0.22	-0.66
5129.15	Ti II	15258 - 34748	0.38	0.15	-0.83
5188.70	Ti II	12758 - 32026	0.47	0.19	-0.72
5226.56	Ti II	12629 - 31756	0.33	0.14	-0.87
5336.81	Ti II	12758 - 31491	0.13	0.056	-1.25

Wavelength A	Spectrum	Energy Levels K	gA ·10 ⁸ /sec	gf	Log gf
2315.98	Tl I	0 - 43166	0.17	0.014	-1.86
2379.69	Tl I	0 - 42011	1.7	0.14	-0.84
2580.14	Tl I	0 - 38746	1.3	0.13	-0.89
2608.99	Tl I	7793 - 46110	0.91	0.093	-1.03
2665.57	Tl I	7793 - 45296	0.96	0.10	-0.99
2709.23	Tl I	7793 - 44693	4.3	0.47	-0.32
2710.67	Tl I	7793 - 44673	0.51	0.056	-1.25
2767.87	Tl I	0 - 36118	4.1	0.47	-0.33
2826.16	Tl I	7793 - 43166	1.9	0.23	-0.63
2918.32	Tl I	7793 - 42049	15.	1.9	0.27
2921.52	Tl I	7793 - 42011	2.3	0.29	-0.53
3229.75	Tl I	7793 - 38746	2.7	0.43	-0.37
3519.24	Tl I	7793 - 36200	24.	4.5	0.65
3529.43	Tl I	7793 - 36118	5.9	1.1	0.05
3775.72	Tl I	0 - 26478	1.0	0.22	-0.67
5350.46	Tl I	7793 - 26478	2.1	0.92	-0.04
6549.77	Tl I	26478 - 41741	0.17	0.11	-0.95
6713.69	Tl I	26478 - 41368	0.060	0.040	-1.39

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2914.83	Tm I	0 - 34297	1.4	0.17	-0.76
2932.96	Tm I	0 - 34085	0.61	0.079	-1.10
2973.22	Tm I	0 - 33624	3.4	0.45	-0.35
3081.12	Tm I	0 - 32446	1.7	0.25	-0.61
3172.66	Tm I	0 - 31510	1.7	0.25	-0.60
3180.56	Tm I	0 - 31432	0.55	0.083	-1.08
3233.75	Tm I	0 - 30915	0.24	0.038	-1.42
3349.99	Tm I	0 - 29842	0.58	0.098	-1.01
3410.05	Tm I	0 - 29317	1.9	0.32	-0.49
3412.59	Tm I	0 - 29295	0.74	0.13	-0.89
3416.59	Tm I	0 - 29260	0.73	0.13	-0.89
3429.33	Tm I	0 - 29152	0.71	0.13	-0.90
3487.38	Tm I	0 - 28666	0.79	0.14	-0.84
3499.95	Tm I	0 - 28564	0.62	0.11	-0.95
3514.12	Tm I	0 - 28449	0.15	0.028	-1.56
3517.60	Tm I	0 - 28420	0.45	0.083	-1.08
3563.88	Tm I	0 - 28051	0.68	0.13	-0.89
3567.36	Tm I	0 - 28024	0.67	0.13	-0.89
3624.20	Tm I	0 - 27584	0.11	0.021	-1.68
3638.41	Tm I	0 - 27477	0.47	0.093	-1.03
3646.70	Tm I	0 - 27414	0.22	0.043	-1.36
3717.92	Tm I	0 - 26889	8.3	1.7	0.23
3744.07	Tm I	0 - 26701	5.1	1.1	0.03
3751.81	Tm I	0 - 26646	1.7	0.35	-0.45
3781.15	Tm I	0 - 26440	0.080	0.017	-1.77
3807.72	Tm I	0 - 26255	0.55	0.12	-0.93
3826.38	Tm I	0 - 26127	0.25	0.056	-1.25
3883.13	Tm I	0 - 25745	4.8	1.1	0.04
3887.35	Tm I	0 - 25717	3.8	0.87	-0.06
3896.62	Tm I	0 - 25656	0.30	0.069	-1.16
3916.48	Tm I	8771 - 34297	28.	6.5	0.81
3949.28	Tm I	8771 - 34085	11.	2.7	0.42
4044.47	Tm I	0 - 24718	0.21	0.052	-1.29
4094.19	Tm I	0 - 24418	5.2	1.3	0.12
4105.84	Tm I	0 - 24349	4.8	1.2	0.08
4138.34	Tm I	0 - 24157	0.52	0.13	-0.87
4158.60	Tm I	8771 - 32811	0.68	0.18	-0.75
4187.62	Tm I	0 - 23873	4.0	1.0	0.02
4203.73	Tm I	0 - 23782	2.6	0.70	-0.16
4222.67	Tm I	8771 - 32446	1.9	0.52	-0.28
4271.71	Tm I	8771 - 32174	1.3	0.36	-0.45
4359.93	Tm I	0 - 22930	0.98	0.28	-0.55
4386.43	Tm I	0 - 22791	0.47	0.14	-0.86
4394.42	Tm I	0 - 22750	0.070	0.020	-1.69
4396.49	Tm I	8771 - 31510	0.55	0.16	-0.79
4599.02	Tm I	0 - 21738	0.074	0.023	-1.63
4643.12	Tm I	8771 - 30302	0.29	0.094	-1.03
4724.26	Tm I	0 - 21161	0.026	0.0086	-2.06
4733.34	Tm I	0 - 21121	0.16	0.054	-1.27
5060.90	Tm I	0 - 19754	0.025	0.0098	-2.01

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5113.99	Tm I	0 - 19549	0.015	0.0061	-2.22
5185.25	Tm I	8771 - 28051	0.074	0.030	-1.53
5307.12	Tm I	0 - 18837	0.090	0.038	-1.42
5631.40	Tm I	0 - 17753	0.030	0.014	-1.85
5658.30	Tm I	8771 - 26440	0.085	0.041	-1.39
5675.85	Tm I	0 - 17614	0.055	0.027	-1.57
5760.21	Tm I	8771 - 26127	0.064	0.032	-1.50
5764.30	Tm I	0 - 17343	0.019	0.0095	-2.02
5895.65	Tm I	0 - 16957	0.022	0.011	-1.94
5899.48	Tm I	8771 - 25717	0.036	0.019	-1.72
5971.28	Tm I	0 - 16742	0.011	0.0061	-2.21
7060.99	Tm I	8771 - 22930	0.0055	0.0041	-2.38

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2367.11	Tm II	237 - 42470	0.68	0.057	-1.24
2480.13	Tm II	237 - 40545	5.0	0.46	-0.33
2505.89	Tm II	0 - 39894	0.15	0.014	-1.85
2509.08	Tm II	0 - 39843	6.9	0.65	-0.19
2524.09	Tm II	237 - 39843	0.99	0.094	-1.03
2527.42	Tm II	0 - 39554	0.55	0.052	-1.28
2542.66	Tm II	237 - 39554	0.60	0.058	-1.24
2565.98	Tm II	237 - 39197	0.29	0.029	-1.54
2606.01	Tm II	0 - 38361	0.81	0.082	-1.09
2607.05	Tm II	237 - 38583	3.2	0.33	-0.48
2622.21	Tm II	237 - 38361	0.27	0.028	-1.55
2624.34	Tm II	0 - 38094	2.4	0.24	-0.61
2640.77	Tm II	237 - 38094	0.69	0.073	-1.14
2650.27	Tm II	237 - 37958	0.49	0.051	-1.29
2658.48	Tm II	237 - 37841	0.56	0.060	-1.23
2684.08	Tm II	237 - 37483	0.27	0.029	-1.54
2708.19	Tm II	237 - 37151	0.050	0.0055	-2.26
2711.51	Tm II	0 - 36869	0.25	0.028	-1.56
2729.04	Tm II	237 - 36869	0.35	0.039	-1.41
2735.33	Tm II	0 - 36548	0.11	0.012	-1.93
2753.18	Tm II	237 - 36548	0.23	0.027	-1.58
2756.69	Tm II	8770 - 45034	3.5	0.40	-0.40
2766.81	Tm II	0 - 36132	0.13	0.015	-1.82
2771.04	Tm II	8957 - 45034	2.6	0.30	-0.53
2773.80	Tm II	0 - 36041	0.17	0.019	-1.71
2779.55	Tm II	0 - 35966	0.51	0.059	-1.23
2785.07	Tm II	237 - 36132	0.69	0.080	-1.10
2792.15	Tm II	237 - 36041	0.34	0.039	-1.41
2796.09	Tm II	0 - 35754	0.17	0.020	-1.69
2797.98	Tm II	237 - 35966	0.11	0.013	-1.89
2808.42	Tm II	237 - 35834	0.30	0.036	-1.45
2814.74	Tm II	237 - 35754	0.052	0.0062	-2.21
2833.82	Tm II	8770 - 44047	1.3	0.15	-0.82
2844.66	Tm II	237 - 35380	0.51	0.061	-1.21
2848.98	Tm II	8957 - 44047	0.55	0.067	-1.18
2853.25	Tm II	237 - 35274	0.046	0.0056	-2.25
2860.55	Tm II	237 - 35185	0.11	0.013	-1.89
2863.35	Tm II	0 - 34914	0.14	0.017	-1.77
2886.46	Tm II	237 - 34871	0.19	0.024	-1.61
2889.64	Tm II	8770 - 43366	1.5	0.19	-0.72
2905.41	Tm II	8957 - 43366	1.5	0.19	-0.71
2913.96	Tm II	0 - 34308	0.16	0.020	-1.70
2925.92	Tm II	237 - 34404	0.086	0.011	-1.95
2969.50	Tm II	0 - 33666	0.12	0.016	-1.79
2978.42	Tm II	0 - 33565	0.15	0.020	-1.70
2983.13	Tm II	8957 - 42470	0.86	0.11	-0.94
2985.08	Tm II	0 - 33490	0.068	0.0091	-2.04
2990.54	Tm II	237 - 33666	0.67	0.089	-1.05
2993.26	Tm II	0 - 33399	0.19	0.026	-1.59
2993.90	Tm II	0 - 33392	0.11	0.015	-1.81

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2999.60	Tm II	237 - 33565	0.13	0.018	-1.76
3006.36	Tm II	237 - 33490	0.059	0.0080	-2.10
3014.65	Tm II	237 - 33399	0.42	0.057	-1.24
3015.30	Tm II	237 - 33392	1.4	0.20	-0.71
3042.35	Tm II	237 - 33097	0.23	0.032	-1.49
3046.76	Tm II	237 - 33049	0.28	0.039	-1.41
3098.60	Tm II	237 - 32500	0.53	0.077	-1.11
3131.26	Tm II	0 - 31927	4.6	0.68	-0.17
3133.89	Tm II	0 - 31900	1.4	0.21	-0.67
3146.16	Tm II	8770 - 40545	1.7	0.25	-0.61
3149.15	Tm II	0 - 31745	0.044	0.0065	-2.18
3150.07	Tm II	8770 - 40506	0.52	0.077	-1.11
3157.35	Tm II	237 - 31900	0.92	0.14	-0.86
3164.87	Tm II	8957 - 40545	0.53	0.079	-1.10
3168.82	Tm II	8957 - 40506	0.52	0.079	-1.10
3172.83	Tm II	237 - 31745	1.4	0.21	-0.68
3177.46	Tm II	8770 - 40232	0.83	0.13	-0.90
3195.33	Tm II	8770 - 40056	1.5	0.22	-0.65
3196.54	Tm II	8957 - 40232	0.84	0.13	-0.89
3210.83	Tm II	0 - 31136	0.16	0.025	-1.60
3212.02	Tm II	8770 - 39894	1.9	0.30	-0.53
3214.63	Tm II	8957 - 40056	0.80	0.12	-0.91
3231.51	Tm II	8957 - 39894	1.4	0.22	-0.66
3235.45	Tm II	237 - 31136	0.24	0.038	-1.43
3236.81	Tm II	8957 - 39843	7.0	1.1	0.04
3241.53	Tm II	0 - 30841	1.1	0.17	-0.76
3245.86	Tm II	237 - 31037	0.064	0.010	-2.00
3247.46	Tm II	8770 - 39554	2.3	0.37	-0.43
3258.05	Tm II	0 - 30684	0.87	0.14	-0.86
3266.63	Tm II	237 - 30841	0.76	0.12	-0.92
3267.40	Tm II	8957 - 39554	6.5	1.0	0.02
3276.81	Tm II	0 - 30509	0.46	0.074	-1.13
3283.40	Tm II	237 - 30684	0.53	0.086	-1.06
3285.61	Tm II	8770 - 39197	5.9	0.95	-0.02
3291.00	Tm II	0 - 30377	0.98	0.16	-0.80
3302.45	Tm II	237 - 30509	0.88	0.14	-0.84
3306.01	Tm II	8957 - 39197	1.1	0.18	-0.75
3306.91	Tm II	8770 - 39001	1.0	0.17	-0.78
3316.88	Tm II	237 - 30377	0.17	0.028	-1.55
3327.58	Tm II	8957 - 39001	0.41	0.068	-1.17
3362.62	Tm II	237 - 29967	1.5	0.26	-0.58
3374.51	Tm II	8957 - 38583	2.1	0.36	-0.44
3397.50	Tm II	0 - 29425	0.56	0.097	-1.01
3399.95	Tm II	8957 - 38361	1.8	0.30	-0.52
3425.08	Tm II	237 - 29425	2.1	0.37	-0.43
3425.63	Tm II	0 - 29183	0.30	0.052	-1.28
3431.20	Tm II	8957 - 38094	1.6	0.29	-0.54
3438.81	Tm II	8770 - 37841	0.50	0.088	-1.05
3441.50	Tm II	237 - 29286	1.6	0.28	-0.55
3447.26	Tm II	8957 - 37958	0.63	0.11	-0.95

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3453.67	Tm II	237 - 29183	1.5	0.27	-0.56
3461.16	Tm II	8957 - 37841	0.50	0.090	-1.05
3462.20	Tm II	0 - 28875	2.5	0.44	-0.35
3481.75	Tm II	8770 - 37483	1.1	0.20	-0.69
3522.43	Tm II	8770 - 37151	0.52	0.096	-1.02
3536.58	Tm II	0 - 28268	0.21	0.040	-1.40
3557.80	Tm II	8770 - 36869	1.2	0.23	-0.64
3566.47	Tm II	237 - 28268	0.32	0.061	-1.21
3608.77	Tm II	0 - 27702	0.46	0.090	-1.05
3623.42	Tm II	8957 - 36548	0.070	0.014	-1.86
3639.89	Tm II	237 - 27702	0.0070	0.0014	-2.86
3653.61	Tm II	8770 - 36132	1.3	0.25	-0.60
3665.81	Tm II	8770 - 36041	1.0	0.21	-0.68
3668.09	Tm II	0 - 27254	0.19	0.037	-1.43
3678.86	Tm II	8957 - 36132	0.96	0.19	-0.71
3700.26	Tm II	237 - 27254	0.83	0.17	-0.77
3701.36	Tm II	0 - 27009	0.62	0.13	-0.89
3704.85	Tm II	8770 - 35754	0.64	0.13	-0.88
3719.71	Tm II	8957 - 35834	0.14	0.029	-1.53
3730.81	Tm II	8957 - 35754	0.23	0.048	-1.32
3734.12	Tm II	237 - 27009	0.39	0.082	-1.09
3756.86	Tm II	8770 - 35380	0.54	0.11	-0.94
3761.33	Tm II	0 - 26579	0.87	0.19	-0.73
3761.91	Tm II	0 - 26575	0.70	0.15	-0.83
3783.56	Tm II	8957 - 35380	0.46	0.099	-1.00
3795.17	Tm II	237 - 26579	0.056	0.012	-1.91
3795.76	Tm II	237 - 26575	1.1	0.23	-0.64
3798.75	Tm II	8957 - 35274	0.41	0.089	-1.05
3810.72	Tm II	8770 - 35004	0.61	0.13	-0.88
3838.20	Tm II	8957 - 35004	2.1	0.47	-0.33
3848.02	Tm II	0 - 25980	1.1	0.25	-0.60
3857.84	Tm II	8957 - 34871	0.19	0.041	-1.38
3883.44	Tm II	237 - 25980	0.20	0.045	-1.35
3890.53	Tm II	0 - 25696	0.045	0.010	-1.99
3900.79	Tm II	8770 - 34398	0.82	0.19	-0.73
3928.66	Tm II	8957 - 34404	0.15	0.035	-1.46
3929.58	Tm II	8957 - 34398	0.70	0.16	-0.79
3958.10	Tm II	0 - 25258	0.14	0.033	-1.49
3995.59	Tm II	237 - 25258	0.041	0.0098	-2.01
4090.30	Tm II	8957 - 33399	0.078	0.020	-1.71
4091.49	Tm II	8957 - 33392	0.078	0.020	-1.71
4199.92	Tm II	0 - 23803	0.034	0.0090	-2.05
4212.79	Tm II	8770 - 32500	0.042	0.011	-1.96
4242.15	Tm II	237 - 23803	0.20	0.053	-1.27
4246.40	Tm II	8957 - 32500	0.042	0.011	-1.95
4351.18	Tm II	8770 - 31745	0.061	0.017	-1.76
4481.27	Tm II	0 - 22309	0.025	0.0075	-2.12
4489.71	Tm II	8770 - 31037	0.044	0.013	-1.88
4529.38	Tm II	237 - 22309	0.0082	0.0025	-2.60
4561.86	Tm II	8770 - 30684	0.020	0.0063	-2.20

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4601.29	Tm II	8957 - 30684	0.017	0.0054	-2.27
4626.56	Tm II	0 - 21608	0.0037	0.0012	-2.93
4677.86	Tm II	237 - 21608	0.0016	0.00053	-3.28

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3027.66	U I	620 - 33640	3.6	0.49	-0.31
3048.64	U I	620 - 33412	4.0	0.56	-0.25
3114.54	U I	0 - 32098	1.7	0.24	-0.62
3263.12	U I	0 - 30637	0.83	0.13	-0.88
3345.89	U I	620 - 30499	0.98	0.16	-0.79
3368.98	U I	620 - 30294	0.46	0.079	-1.10
3418.39	U I	620 - 29866	0.42	0.073	-1.14
3431.14	U I	4276 - 33412	2.3	0.40	-0.40
3435.49	U I	620 - 29720	3.2	0.57	-0.24
3462.21	U I	0 - 28875	1.4	0.25	-0.60
3466.30	U I	3801 - 32642	8.0	1.4	0.16
3489.37	U I	0 - 28650	6.5	1.2	0.08
3493.99	U I	620 - 29233	1.7	0.30	-0.52
3500.07	U I	0 - 28563	2.6	0.47	-0.33
3507.05	U I	620 - 29126	1.2	0.21	-0.67
3507.34	U I	0 - 28504	3.1	0.57	-0.24
3511.44	U I	0 - 28470	0.96	0.18	-0.75
3514.61	U I	0 - 28444	6.2	1.2	0.06
3534.33	U I	0 - 28286	1.2	0.22	-0.65
3538.23	U I	620 - 28875	0.54	0.10	-0.99
3542.57	U I	4276 - 32496	3.9	0.74	-0.13
3549.20	U I	3801 - 31968	3.4	0.64	-0.19
3555.32	U I	0 - 28119	2.5	0.47	-0.33
3557.84	U I	0 - 28099	1.4	0.27	-0.57
3563.66	U I	0 - 28053	1.4	0.27	-0.58
3565.05	U I	4276 - 32318	1.7	0.33	-0.48
3566.60	U I	620 - 28650	9.8	1.9	0.27
3574.76	U I	0 - 27966	1.1	0.21	-0.67
3577.92	U I	0 - 27941	1.3	0.24	-0.61
3580.25	U I	620 - 28543	0.80	0.15	-0.81
3584.88	U I	0 - 27887	11.	2.1	0.32
3587.78	U I	4453 - 32318	1.5	0.28	-0.55
3589.66	U I	620 - 28470	0.99	0.19	-0.72
3591.74	U I	620 - 28454	1.6	0.30	-0.52
3593.20	U I	4276 - 32098	2.7	0.53	-0.27
3592.97	U I	620 - 28444	0.49	0.095	-1.02
3602.48	U I	3801 - 31552	1.4	0.28	-0.56
3603.36	U I	0 - 27744	0.48	0.094	-1.03
3603.74	U I	4276 - 32017	1.3	0.26	-0.58
3611.40	U I	0 - 27682	0.24	0.047	-1.33
3616.33	U I	3801 - 31445	3.0	0.59	-0.23
3920.08	U I	0 - 27616	1.1	0.25	-0.60
3635.30	U I	3801 - 31301	1.3	0.26	-0.58
3638.20	U I	3801 - 31279	11.	2.1	0.32
3644.24	U I	620 - 28053	2.1	0.43	-0.37
3653.21	U I	3801 - 31166	1.7	0.34	-0.46
3654.89	U I	3868 - 31221	1.7	0.35	-0.46
3659.16	U I	620 - 27941	4.8	0.96	-0.02
3677.39	U I	3801 - 30986	3.1	0.62	-0.20
3679.38	U I	620 - 27791	1.2	0.24	-0.63

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3685.78	U I	620 - 27744	0.91	0.18	-0.73
3702.62	U I	4276 - 31276	3.8	0.78	-0.11
3703.27	U I	620 - 27616	1.4	0.28	-0.55
3707.95	U I	7104 - 34065	3.9	0.81	-0.09
3713.56	U I	0 - 26921	1.7	0.35	-0.45
3719.29	U I	620 - 27499	0.62	0.13	-0.89
3731.45	U I	0 - 26792	0.45	0.093	-1.03
3732.26	U I	3801 - 30587	3.2	0.66	-0.18
3751.18	U I	3801 - 30451	7.9	1.7	0.22
3758.36	U I	4276 - 30876	7.3	1.6	0.19
3763.27	U I	7006 - 33571	10.	2.2	0.35
3765.35	U I	0 - 26550	1.2	0.26	-0.59
3766.89	U I	4453 - 30993	6.7	1.4	0.16
3773.44	U I	3801 - 30294	6.9	1.5	0.17
3781.75	U I	3868 - 30304	1.6	0.34	-0.47
3801.15	U I	620 - 26921	1.2	0.26	-0.58
3808.93	U I	6249 - 32496	9.1	2.0	0.30
3812.00	U I	0 - 26226	7.8	1.7	0.23
3819.25	U I	4276 - 30451	1.6	0.36	-0.44
3821.95	U I	3801 - 29958	2.9	0.63	-0.20
3829.79	U I	0 - 26104	0.49	0.11	-0.97
3839.62	U I	3801 - 29838	14.	3.1	0.49
3846.55	U I	3801 - 29791	2.8	0.61	-0.21
3851.72	U I	5991 - 31946	2.5	0.56	-0.25
3854.22	U I	0 - 25938	2.4	0.53	-0.28
3867.17	U I	3868 - 29720	2.7	0.61	-0.21
3871.04	U I	0 - 25826	5.5	1.2	0.10
3876.13	U I	0 - 25792	0.90	0.20	-0.69
3879.53	U I	4453 - 30222	3.1	0.71	-0.15
3894.12	U I	0 - 25672	1.7	0.40	-0.40
3917.25	U I	8119 - 33640	8.3	1.9	0.28
3926.22	U I	0 - 25463	1.1	0.26	-0.59
3926.73	U I	5762 - 31221	5.6	1.3	0.11
3943.82	U I	0 - 25349	4.0	0.94	-0.03
3948.45	U I	0 - 25319	0.98	0.23	-0.64
3964.22	U I	6249 - 31469	6.6	1.6	0.19
3980.80	U I	5762 - 30876	1.9	0.46	-0.34
3997.09	U I	7008 - 32017	2.7	0.64	-0.19
3999.18	U I	3801 - 28799	1.1	0.26	-0.58
4005.21	U I	4453 - 29414	4.6	1.1	0.04
4034.50	U I	4453 - 29233	2.2	0.54	-0.27
4042.76	U I	620 - 25349	3.5	0.85	-0.07
4047.62	U I	620 - 25319	1.4	0.34	-0.47
4091.64	U I	0 - 24433	0.29	0.072	-1.14
4101.91	U I	8119 - 32491	5.3	1.3	0.12
4108.36	U I	0 - 24334	0.18	0.044	-1.35
4133.50	U I	0 - 24186	0.51	0.13	-0.89
4141.86	U I	620 - 24757	0.20	0.051	-1.29
4153.97	U I	0 - 24067	2.1	0.55	-0.26
4156.66	U I	620 - 24671	1.1	0.28	-0.55

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4160.95	U I	0 - 24026	0.16	0.042	-1.37
4162.43	U I	3801 - 27818	1.7	0.44	-0.35
4169.06	U I	8119 - 32098	3.8	1.00	-0.00
4186.96	U I	4276 - 28153	1.5	0.39	-0.41
4191.94	U I	0 - 23849	0.12	0.033	-1.48
4198.22	U I	620 - 24433	0.37	0.098	-1.01
4222.36	U I	3801 - 27478	2.3	0.61	-0.22
4231.67	U I	7646 - 31270	4.1	1.1	0.04
4246.26	U I	0 - 23544	0.55	0.15	-0.83
4266.32	U I	0 - 23433	0.11	0.031	-1.51
4288.84	U I	6249 - 29559	2.4	0.66	-0.18
4313.13	U I	3801 - 26979	0.86	0.24	-0.62
4335.73	U I	0 - 23058	0.23	0.066	-1.18
4355.75	U I	620 - 23572	0.96	0.27	-0.56
4362.05	U I	0 - 22919	0.80	0.23	-0.64
4371.76	U I	8119 - 30986	1.7	0.49	-0.31
4372.76	U I	0 - 22862	0.12	0.035	-1.45
4383.27	U I	3801 - 26608	0.28	0.082	-1.09
4393.60	U I	0 - 22754	0.58	0.17	-0.78
4426.94	U I	0 - 22583	0.12	0.034	-1.47
4440.74	U I	3801 - 26313	0.20	0.059	-1.23
4469.32	U I	0 - 22368	0.088	0.026	-1.58
4516.73	U I	620 - 22754	0.12	0.038	-1.42
4551.98	U I	620 - 22583	0.083	0.026	-1.59
4576.64	U I	620 - 22464	0.092	0.029	-1.54
4620.23	U I	6249 - 27887	2.4	0.76	-0.12
4631.62	U I	0 - 21585	0.31	0.100	-1.00
4663.75	U I	620 - 22056	0.084	0.027	-1.56
4715.68	U I	4453 - 25653	0.20	0.068	-1.17
4743.53	U I	6249 - 27324	0.28	0.095	-1.02
4756.80	U I	620 - 21637	0.23	0.077	-1.11
4768.66	U I	620 - 21585	0.056	0.019	-1.72
4790.06	U I	3801 - 24671	0.16	0.054	-1.27
4810.90	U I	3801 - 24581	0.13	0.046	-1.34
4842.48	U I	620 - 21265	0.070	0.024	-1.61
4868.86	U I	3801 - 24334	0.12	0.044	-1.35
4885.15	U I	0 - 20464	0.049	0.018	-1.76
4910.35	U I	6249 - 26608	0.32	0.12	-0.94
4928.44	U I	4276 - 24560	0.16	0.057	-1.24
4933.06	U I	3801 - 24067	0.078	0.029	-1.54
4955.78	U I	7646 - 27818	0.40	0.15	-0.84
4967.33	U I	3801 - 23927	0.13	0.049	-1.31
5011.42	U I	620 - 20569	0.030	0.011	-1.95
5027.38	U I	0 - 19885	0.18	0.070	-1.16
5063.77	U I	3801 - 23544	0.10	0.040	-1.40
5088.29	U I	0 - 19648	0.021	0.0081	-2.09
5164.14	U I	8119 - 27478	0.54	0.21	-0.67
5272.00	U I	7646 - 26608	0.12	0.050	-1.30
5280.38	U I	0 - 18933	0.059	0.025	-1.61
5308.54	U I	3801 - 22633	0.098	0.042	-1.38

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
5315.27	U I	7646 - 26454	0.13	0.056	-1.25
5329.26	U I	0 - 18759	0.033	0.014	-1.85
5382.94	U I	620 - 19192	0.011	0.0047	-2.33
5385.54	U I	7646 - 26209	0.078	0.034	-1.47
5410.24	U I	4276 - 22754	0.036	0.016	-1.81
5459.27	U I	620 - 18933	0.016	0.0073	-2.14
5496.43	U I	4276 - 22464	0.083	0.038	-1.42
5500.69	U I	11545 - 29720	0.30	0.14	-0.86
5511.49	U I	620 - 18759	0.039	0.018	-1.75
5531.26	U I	8119 - 26192	0.11	0.051	-1.29
5564.17	U I	3801 - 21768	0.14	0.064	-1.19
5573.07	U I	10347 - 28286	0.17	0.081	-1.09
5573.59	U I	6249 - 24186	0.046	0.021	-1.67
5610.89	U I	6249 - 24067	0.22	0.11	-0.98
5616.58	U I	8119 - 25918	0.090	0.043	-1.37
5620.78	U I	620 - 18406	0.045	0.021	-1.67
5621.51	U I	3801 - 21585	0.055	0.026	-1.58
5634.38	U I	7646 - 25389	0.16	0.077	-1.11
5658.26	U I	5762 - 23430	0.060	0.029	-1.54
5669.42	U I	620 - 18254	0.022	0.011	-1.98
5680.37	U I	6249 - 23849	0.051	0.025	-1.61
5685.19	U I	4453 - 22038	0.031	0.015	-1.83
5716.87	U I	4453 - 21941	0.045	0.022	-1.66
5736.38	U I	7006 - 24433	0.10	0.050	-1.30
5737.27	U I	5762 - 23187	0.071	0.035	-1.46
5758.14	U I	0 - 17362	0.014	0.0070	-2.16
5758.35	U I	4276 - 21637	0.023	0.011	-1.94
5763.63	U I	7326 - 24671	0.054	0.027	-1.57
5767.43	U I	5991 - 23325	0.037	0.019	-1.73
5771.05	U I	6249 - 23572	0.040	0.020	-1.70
5780.59	U I	6249 - 23544	0.24	0.12	-0.92
5802.11	U I	8119 - 25349	0.23	0.12	-0.93
5813.83	U I	5991 - 23187	0.036	0.018	-1.74
5814.41	U I	3868 - 21062	0.016	0.0080	-2.10
5819.01	U I	7006 - 24186	0.038	0.019	-1.71
5836.08	U I	10347 - 27478	0.48	0.25	-0.61
5898.78	U I	6249 - 23197	0.066	0.034	-1.46
5915.40	U I	0 - 16900	0.12	0.065	-1.19
5925.47	U I	7646 - 24517	0.11	0.056	-1.25
5929.33	U I	3801 - 20662	0.032	0.017	-1.77
5933.85	U I	620 - 17468	0.010	0.0055	-2.26
5942.77	U I	5762 - 22584	0.028	0.015	-1.83
5948.57	U I	7646 - 24452	0.063	0.033	-1.48
5956.86	U I	5991 - 22774	0.059	0.031	-1.50
5971.50	U I	620 - 17362	0.036	0.019	-1.71
5976.32	U I	3801 - 20529	0.16	0.084	-1.07
5986.10	U I	3868 - 20569	0.044	0.024	-1.62
5997.31	U I	6249 - 22919	0.14	0.074	-1.13
5997.96	U I	4276 - 20943	0.028	0.015	-1.83
5999.41	U I	3801 - 20464	0.034	0.019	-1.73

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6010.86	U I	10347 - 26979	0.20	0.11	-0.98
6016.73	U I	5762 - 22378	0.027	0.014	-1.84
6017.57	U I	6249 - 22862	0.061	0.033	-1.48
6019.19	U I	4453 - 21062	0.029	0.016	-1.81
6039.60	U I	8119 - 24671	0.10	0.056	-1.25
6050.48	U I	3868 - 20392	0.014	0.0075	-2.13
6050.67	U I	7326 - 23849	0.036	0.020	-1.70
6056.80	U I	0 - 16506	0.0076	0.0042	-2.38
6057.07	U I	6249 - 22754	0.046	0.026	-1.59
6062.30	U I	4276 - 20766	0.030	0.017	-1.78
6077.29	U I	620 - 17070	0.054	0.030	-1.53
6089.19	U I	3801 - 20219	0.023	0.013	-1.90
6101.77	U I	6249 - 22633	0.052	0.029	-1.54
6127.77	U I	8119 - 24433	0.075	0.042	-1.37
6129.72	U I	620 - 16930	0.016	0.0091	-2.04
6152.25	U I	10347 - 26597	0.080	0.045	-1.34
6164.50	U I	7326 - 23544	0.030	0.017	-1.77
6171.85	U I	7646 - 23844	0.16	0.092	-1.04
6175.38	U I	4276 - 20464	0.053	0.030	-1.52
6215.37	U I	3801 - 19885	0.021	0.012	-1.91
6234.30	U I	4276 - 20312	0.024	0.014	-1.85
6246.53	U I	5762 - 21766	0.036	0.021	-1.67
6268.66	U I	8119 - 24067	0.060	0.035	-1.45
6293.32	U I	620 - 16506	0.010	0.0060	-2.22
6298.53	U I	3868 - 19741	0.024	0.014	-1.85
6359.28	U I	0 - 15721	0.010	0.0061	-2.21
6372.47	U I	3801 - 19489	0.069	0.042	-1.37
6383.59	U I	4453 - 20114	0.012	0.0071	-2.15
6389.80	U I	5991 - 21637	0.051	0.031	-1.51
6392.78	U I	0 - 15638	0.0098	0.0060	-2.22
6395.45	U I	0 - 15632	0.031	0.019	-1.72
6397.18	U I	7006 - 22633	0.054	0.033	-1.48
6411.59	U I	7326 - 22919	0.029	0.018	-1.74
6449.17	U I	620 - 16122	0.049	0.031	-1.51
6465.00	U I	7326 - 22790	0.11	0.067	-1.17
6503.62	U I	4276 - 19648	0.021	0.013	-1.88
6518.94	U I	6249 - 21585	0.036	0.023	-1.64
6527.04	U I	5762 - 21079	0.0089	0.0057	-2.24
6542.97	U I	7104 - 22383	0.026	0.017	-1.78
6552.75	U I	7326 - 22583	0.010	0.0066	-2.18
6601.46	U I	7646 - 22790	0.015	0.0095	-2.02
6603.98	U I	7326 - 22464	0.030	0.020	-1.71
6620.52	U I	620 - 15721	0.011	0.0069	-2.16
6625.29	U I	5762 - 20852	0.021	0.014	-1.86
6656.81	U I	620 - 15638	0.0033	0.0022	-2.66
6683.38	U I	3801 - 18759	0.021	0.014	-1.84
6691.21	U I	10686 - 25627	0.033	0.022	-1.66
6727.96	U I	5762 - 20621	0.0081	0.0055	-2.26
6754.93	U I	8119 - 22919	0.023	0.016	-1.80
6782.85	U I	4453 - 19192	0.0054	0.0038	-2.43

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
6790.30	U I	7646 - 22368	0.067	0.046	-1.34
6812.98	U I	4453 - 19127	0.0027	0.0019	-2.73
6818.29	U I	3868 - 18531	0.011	0.0079	-2.10
6820.76	U I	4276 - 18933	0.044	0.031	-1.51
6826.93	U I	0 - 14644	0.036	0.025	-1.60
6832.71	U I	7006 - 21637	0.016	0.011	-1.94
6846.25	U I	6249 - 20852	0.022	0.015	-1.81
6887.74	U I	8119 - 22633	0.044	0.031	-1.51
6902.55	U I	4276 - 18759	0.012	0.0087	-2.06
6915.31	U I	5762 - 20219	0.022	0.016	-1.80
6917.05	U I	3801 - 18254	0.027	0.019	-1.72
7015.72	U I	8119 - 22368	0.041	0.031	-1.52
7033.84	U I	10347 - 24560	0.16	0.12	-0.92
7074.81	U I	4276 - 18406	0.057	0.043	-1.37
7101.63	U I	4453 - 18531	0.071	0.054	-1.27
7128.91	U I	620 - 14644	0.019	0.014	-1.84
7130.09	U I	5762 - 19783	0.017	0.013	-1.89
7147.89	U I	10347 - 24334	0.21	0.16	-0.79
7164.87	U I	4453 - 18406	0.023	0.018	-1.75
7172.10	U I	7326 - 21265	0.026	0.020	-1.70
7205.45	U I	10686 - 24560	0.066	0.051	-1.29
7210.29	U I	6249 - 20114	0.030	0.023	-1.63
7371.95	U I	5991 - 19552	0.016	0.013	-1.88
7396.99	U I	4453 - 17969	0.032	0.026	-1.59
7425.50	U I	0 - 13463	0.0073	0.0060	-2.22
7533.91	U I	3801 - 17070	0.083	0.071	-1.15
7590.54	U I	5762 - 18933	0.014	0.012	-1.91
7595.07	U I	10686 - 23849	0.057	0.049	-1.31
7609.16	U I	7326 - 20464	0.044	0.038	-1.42
7619.35	U I	7646 - 20766	0.083	0.073	-1.14
7631.71	U I	3801 - 16900	0.020	0.017	-1.76
7634.73	U I	7326 - 20420	0.035	0.030	-1.52
7639.54	U I	4276 - 17362	0.028	0.024	-1.61
7748.19	U I	11545 - 24448	0.11	0.099	-1.01
7754.19	U I	7326 - 20219	0.033	0.030	-1.52
7759.87	U I	7646 - 20529	0.036	0.033	-1.48
7761.86	U I	7006 - 19885	0.047	0.043	-1.37
7784.13	U I	620 - 13463	0.0046	0.0042	-2.38
7816.32	U I	13128 - 25918	0.17	0.15	-0.81
7868.75	U I	3801 - 16506	0.021	0.020	-1.71
7881.94	U I	6249 - 18933	0.16	0.15	-0.82
7900.43	U I	4276 - 16930	0.017	0.016	-1.81
7904.29	U I	8119 - 20766	0.035	0.032	-1.49
7908.00	U I	7006 - 19648	0.025	0.024	-1.63
7918.80	U I	4276 - 16900	0.016	0.015	-1.81
7959.96	U I	7326 - 19885	0.027	0.026	-1.59
7970.46	U I	8119 - 20662	0.097	0.092	-1.04
7975.09	U I	5991 - 18527	0.026	0.025	-1.60
7991.30	U I	6249 - 18759	0.020	0.019	-1.72
7998.60	U I	13128 - 25627	0.20	0.19	-0.72

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
8012.96	U I	4453 - 16930	0.0059	0.0057	-2.25
8019.38	U I	7006 - 19472	0.021	0.020	-1.70
8034.79	U I	10347 - 22790	0.089	0.086	-1.07
8055.60	U I	8119 - 20529	0.033	0.032	-1.49
8137.21	U I	10347 - 22633	0.060	0.060	-1.22
8153.71	U I	13128 - 25389	0.13	0.13	-0.88
8174.30	U I	4276 - 16506	0.026	0.026	-1.59
8175.85	U I	0 - 12228	0.00099	0.00099	-3.00
8230.83	U I	5762 - 17908	0.016	0.016	-1.78
8240.51	U I	5762 - 17894	0.0081	0.0082	-2.08
8262.05	U I	8119 - 20219	0.088	0.091	-1.04
8346.74	U I	5991 - 17969	0.030	0.031	-1.51
8381.86	U I	7006 - 18933	0.062	0.066	-1.18
8389.17	U I	5991 - 17908	0.029	0.031	-1.51
8441.20	U I	7646 - 19489	0.064	0.069	-1.16
8445.35	U I	3801 - 15638	0.041	0.044	-1.35
8450.03	U I	3801 - 15632	0.021	0.022	-1.65
8496.09	U I	8119 - 19885	0.033	0.036	-1.45
8540.20	U I	5762 - 17468	0.027	0.029	-1.53
8557.34	U I	10686 - 22368	0.067	0.074	-1.13
8567.73	U I	4453 - 16122	0.010	0.011	-1.94
8570.51	U I	8119 - 19783	0.071	0.078	-1.11
8574.61	U I	6249 - 17908	0.019	0.021	-1.67
8607.94	U I	0 - 11614	0.0080	0.0089	-2.05
8710.77	U I	5991 - 17468	0.044	0.050	-1.30
8753.69	U I	10347 - 21768	0.15	0.17	-0.78

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2556.19	U II	0 - 39109	2.9	0.29	-0.55
2675.88	U II	1749 - 39109	1.5	0.16	-0.79
2715.54	U II	2295 - 39109	1.2	0.13	-0.89
2739.39	U II	289 - 36783	1.0	0.11	-0.94
2815.98	U II	289 - 35790	0.55	0.065	-1.18
2824.37	U II	289 - 35685	1.2	0.15	-0.83
2838.62	U II	915 - 36133	0.26	0.032	-1.50
2853.57	U II	1749 - 36783	0.84	0.10	-0.99
2862.62	U II	4585 - 39508	0.91	0.11	-0.95
2865.68	U II	0 - 34886	2.5	0.31	-0.52
2875.20	U II	915 - 35685	0.70	0.087	-1.06
2886.45	U II	289 - 34924	0.50	0.063	-1.20
2889.63	U II	289 - 34886	3.1	0.39	-0.41
2898.71	U II	2295 - 36783	0.64	0.081	-1.09
2902.81	U II	0 - 34439	0.22	0.028	-1.55
2904.51	U II	289 - 34708	0.60	0.076	-1.12
2914.25	U II	289 - 34593	0.75	0.096	-1.02
2918.97	U II	5260 - 39508	1.6	0.21	-0.68
2923.17	U II	0 - 34199	0.21	0.027	-1.57
2927.38	U II	289 - 34439	0.72	0.093	-1.03
2936.78	U II	1749 - 35790	0.33	0.042	-1.37
2941.92	U II	5527 - 39508	13.	1.7	0.22
2942.12	U II	289 - 34268	0.48	0.062	-1.20
2942.85	U II	915 - 34886	0.70	0.091	-1.04
2945.89	U II	1749 - 35685	0.72	0.093	-1.03
2948.09	U II	289 - 34199	0.73	0.096	-1.02
2954.39	U II	2295 - 36133	0.82	0.11	-0.97
2966.66	U II	1749 - 35447	0.75	0.099	-1.00
2968.40	U II	915 - 34593	0.41	0.055	-1.26
2984.61	U II	2295 - 35790	1.8	0.24	-0.61
2987.80	U II	289 - 33749	0.33	0.044	-1.36
3012.45	U II	289 - 33475	0.17	0.024	-1.62
3016.96	U II	1749 - 34886	0.78	0.11	-0.97
3033.19	U II	1749 - 34708	1.2	0.17	-0.76
3046.46	U II	289 - 33104	0.32	0.044	-1.35
3055.59	U II	0 - 32717	0.36	0.050	-1.30
3063.88	U II	2295 - 34924	0.27	0.038	-1.42
3080.74	U II	1749 - 34199	0.66	0.094	-1.03
3084.24	U II	2295 - 34708	0.32	0.045	-1.34
3095.04	U II	1749 - 34049	0.63	0.091	-1.04
3095.23	U II	2295 - 34593	0.49	0.071	-1.15
3098.01	U II	915 - 33184	0.54	0.077	-1.11
3119.35	U II	5260 - 37308	2.9	0.43	-0.37
3126.70	U II	2295 - 34268	0.40	0.058	-1.23
3133.42	U II	2295 - 34199	0.22	0.033	-1.48
3139.56	U II	4706 - 36549	2.4	0.35	-0.45
3145.56	U II	5527 - 37308	2.7	0.40	-0.40
3151.08	U II	1749 - 33475	0.27	0.041	-1.39
3155.41	U II	1749 - 33432	0.27	0.041	-1.39
3171.37	U II	5260 - 36783	0.70	0.11	-0.98

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3188.34	U II	1749 - 33104	0.38	0.057	-1.24
3206.23	U II	2295 - 33475	0.28	0.043	-1.37
3213.09	U II	8394 - 39508	0.77	0.12	-0.93
3232.16	U II	289 - 31219	0.69	0.11	-0.96
3244.79	U II	2295 - 33104	0.25	0.040	-1.40
3246.39	U II	289 - 31084	0.22	0.034	-1.47
3269.78	U II	289 - 30863	0.068	0.011	-1.96
3270.12	U II	289 - 30860	0.41	0.066	-1.18
3303.60	U II	289 - 30550	0.25	0.041	-1.38
3305.93	U II	0 - 30240	0.85	0.14	-0.86
3311.72	U II	5260 - 35447	1.0	0.17	-0.78
3325.66	U II	0 - 30061	0.11	0.018	-1.74
3332.42	U II	5791 - 35790	0.28	0.046	-1.33
3337.79	U II	289 - 30240	0.31	0.052	-1.28
3338.48	U II	915 - 30860	0.14	0.023	-1.63
3341.66	U II	2295 - 32211	0.61	0.10	-0.99
3355.11	U II	289 - 30086	0.056	0.0095	-2.02
3357.93	U II	289 - 30061	0.20	0.035	-1.46
3370.13	U II	5260 - 34924	0.37	0.063	-1.20
3372.01	U II	289 - 29936	0.16	0.028	-1.56
3382.68	U II	915 - 30469	0.063	0.011	-1.97
3384.45	U II	289 - 29828	0.16	0.027	-1.57
3392.99	U II	4585 - 34049	0.17	0.030	-1.52
3394.78	U II	5260 - 34708	0.98	0.17	-0.77
3406.28	U II	915 - 30264	0.18	0.031	-1.50
3424.56	U II	1749 - 30942	0.58	0.10	-0.99
3431.54	U II	5791 - 34924	0.45	0.079	-1.10
3433.71	U II	289 - 29404	0.047	0.0084	-2.08
3433.90	U II	289 - 29402	0.095	0.017	-1.78
3434.15	U II	1749 - 30860	0.26	0.046	-1.33
3451.21	U II	1749 - 30716	0.14	0.025	-1.61
3472.56	U II	2295 - 31084	0.15	0.028	-1.56
3489.57	U II	5791 - 34439	0.60	0.11	-0.96
3496.42	U II	1749 - 30342	0.46	0.085	-1.07
3499.33	U II	2295 - 30863	0.24	0.045	-1.35
3508.85	U II	1749 - 30240	0.27	0.049	-1.31
3511.58	U II	289 - 28758	0.081	0.015	-1.83
3517.05	U II	6283 - 34708	0.43	0.080	-1.09
3531.11	U II	1749 - 30061	0.31	0.059	-1.23
3533.57	U II	915 - 29207	0.40	0.075	-1.13
3543.16	U II	5260 - 33475	0.51	0.097	-1.01
3546.68	U II	1749 - 29936	0.19	0.036	-1.45
3547.19	U II	1749 - 29932	0.30	0.057	-1.24
3548.62	U II	5260 - 33432	0.31	0.058	-1.24
3550.82	U II	0 - 28154	0.55	0.10	-0.98
3560.44	U II	1749 - 29828	0.11	0.021	-1.68
3570.93	U II	4421 - 32417	0.12	0.022	-1.66
3589.79	U II	5667 - 33516	0.53	0.10	-0.99
3590.32	U II	5260 - 33104	0.56	0.11	-0.96
3590.50	U II	915 - 28758	0.18	0.035	-1.46

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3605.48	U II	1749 - 29477	0.085	0.017	-1.78
3612.67	U II	915 - 28587	0.11	0.021	-1.68
3619.13	U II	289 - 27912	0.033	0.0064	-2.19
3623.06	U II	915 - 28508	0.21	0.041	-1.39
3635.40	U II	0 - 27499	0.059	0.012	-1.93
3640.95	U II	1749 - 29207	0.22	0.044	-1.36
3670.07	U II	915 - 28154	1.9	0.38	-0.42
3676.56	U II	6283 - 33475	0.80	0.16	-0.79
3682.46	U II	6283 - 33432	0.42	0.086	-1.07
3700.58	U II	915 - 27930	0.45	0.092	-1.03
3701.52	U II	5527 - 32535	3.3	0.68	-0.17
3714.76	U II	2295 - 29207	0.27	0.057	-1.24
3724.99	U II	1749 - 28587	0.35	0.074	-1.13
3738.05	U II	5791 - 32535	1.8	0.38	-0.42
3746.41	U II	5527 - 32211	1.9	0.40	-0.40
3775.99	U II	915 - 27390	0.18	0.038	-1.42
3780.72	U II	915 - 27357	0.27	0.059	-1.23
3782.84	U II	289 - 26717	1.1	0.25	-0.61
3783.84	U II	5791 - 32211	1.2	0.26	-0.58
3793.10	U II	4585 - 30942	1.1	0.24	-0.61
3799.20	U II	8394 - 34708	1.4	0.30	-0.52
3813.79	U II	2295 - 28508	0.38	0.083	-1.08
3814.07	U II	915 - 27126	0.26	0.056	-1.25
3818.48	U II	1749 - 27930	0.10	0.023	-1.64
3826.51	U II	289 - 26415	0.42	0.092	-1.04
3848.62	U II	4585 - 30562	0.88	0.20	-0.71
3849.85	U II	0 - 25968	0.10	0.022	-1.65
3859.58	U II	289 - 26191	2.6	0.58	-0.24
3865.92	U II	2295 - 28154	1.8	0.39	-0.41
3868.42	U II	4421 - 30264	0.20	0.046	-1.34
3881.46	U II	4585 - 30342	1.7	0.39	-0.40
3882.36	U II	1749 - 27499	0.38	0.085	-1.07
3890.36	U II	289 - 25986	1.1	0.25	-0.61
3892.68	U II	5260 - 30942	1.3	0.29	-0.54
3895.27	U II	4421 - 30086	0.33	0.074	-1.13
3896.78	U II	8394 - 34049	2.4	0.55	-0.26
3899.10	U II	4421 - 30061	0.30	0.069	-1.16
3899.78	U II	2295 - 27930	0.54	0.12	-0.91
3902.49	U II	2295 - 27912	0.35	0.081	-1.09
3904.56	U II	5260 - 30863	0.49	0.11	-0.95
3918.06	U II	4421 - 29936	0.13	0.029	-1.54
3924.27	U II	4585 - 30061	0.30	0.070	-1.15
3932.03	U II	289 - 25714	0.096	0.022	-1.65
3933.03	U II	0 - 25419	0.053	0.012	-1.91
3942.55	U II	0 - 25357	0.081	0.019	-1.72
3944.13	U II	4585 - 29932	0.38	0.088	-1.05
3953.58	U II	4421 - 29707	0.44	0.10	-0.99
3962.79	U II	4706 - 29934	0.30	0.070	-1.16
3966.40	U II	2295 - 27499	0.19	0.045	-1.34
3985.80	U II	5260 - 30342	2.0	0.48	-0.32

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3988.89	U II	2295 - 27357	0.14	0.034	-1.46
3990.42	U II	915 - 25968	0.24	0.057	-1.25
4004.06	U II	1749 - 26717	0.22	0.054	-1.27
4009.17	U II	6283 - 31219	0.28	0.067	-1.18
4018.99	U II	289 - 25164	0.12	0.030	-1.53
4026.02	U II	2295 - 27126	0.058	0.014	-1.85
4033.43	U II	4421 - 29207	0.21	0.051	-1.29
4050.04	U II	0 - 24684	0.59	0.15	-0.84
4051.91	U II	5260 - 29932	0.87	0.21	-0.67
4053.03	U II	1749 - 26415	0.10	0.026	-1.59
4054.31	U II	6283 - 30942	0.63	0.16	-0.81
4062.55	U II	0 - 24608	0.31	0.078	-1.11
4067.76	U II	6283 - 30860	1.1	0.27	-0.57
4084.93	U II	5791 - 30264	0.34	0.084	-1.08
4088.25	U II	0 - 24453	0.093	0.023	-1.63
4090.14	U II	1749 - 26191	1.2	0.31	-0.52
4098.03	U II	289 - 24684	0.17	0.043	-1.37
4106.93	U II	0 - 24342	0.068	0.017	-1.76
4113.11	U II	0 - 24306	0.036	0.0091	-2.04
4116.10	U II	0 - 24288	0.27	0.068	-1.17
4124.73	U II	1749 - 25986	0.22	0.055	-1.26
4135.76	U II	4585 - 28758	0.11	0.028	-1.55
4136.81	U II	4421 - 28587	0.15	0.039	-1.41
4139.14	U II	0 - 24153	0.061	0.016	-1.81
4141.23	U II	8394 - 32535	1.6	0.40	-0.39
4144.70	U II	2295 - 26415	0.090	0.023	-1.63
4145.39	U II	6445 - 30562	0.11	0.027	-1.56
4155.41	U II	6283 - 30342	0.50	0.13	-0.89
4163.68	U II	0 - 24010	0.11	0.028	-1.55
4165.68	U II	289 - 24288	0.091	0.024	-1.63
4171.59	U II	1749 - 25714	0.68	0.18	-0.75
4172.97	U II	6283 - 30240	0.24	0.063	-1.20
4174.19	U II	5527 - 29477	0.31	0.082	-1.09
4179.00	U II	4585 - 28508	0.15	0.039	-1.41
4188.07	U II	289 - 24160	0.061	0.016	-1.79
4189.28	U II	289 - 24153	0.096	0.025	-1.60
4197.52	U II	8394 - 32211	0.55	0.15	-0.83
4200.10	U II	6283 - 30086	0.094	0.025	-1.61
4204.37	U II	0 - 23778	0.051	0.014	-1.87
4212.26	U II	4421 - 28154	0.14	0.036	-1.44
4214.42	U II	289 - 24010	0.025	0.0068	-2.17
4227.33	U II	6283 - 29932	0.11	0.030	-1.52
4232.04	U II	289 - 23912	0.021	0.0056	-2.26
4240.59	U II	6283 - 29858	0.089	0.024	-1.62
4241.67	U II	4585 - 28154	1.0	0.28	-0.56
4244.37	U II	0 - 23554	0.14	0.039	-1.41
4267.30	U II	915 - 24342	0.047	0.013	-1.89
4269.61	U II	1749 - 25164	0.071	0.019	-1.71
4273.98	U II	915 - 24306	0.028	0.0077	-2.11
4282.03	U II	289 - 23636	0.058	0.016	-1.80

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4282.45	U II	4585 - 27930	0.16	0.043	-1.37
4287.87	U II	0 - 23315	0.053	0.015	-1.83
4297.11	U II	289 - 23554	0.042	0.012	-1.94
4301.47	U II	0 - 23241	0.031	0.0087	-2.06
4310.39	U II	6283 - 29477	0.081	0.023	-1.65
4341.69	U II	289 - 23315	0.18	0.051	-1.30
4347.19	U II	915 - 23912	0.047	0.013	-1.88
4362.26	U II	0 - 22917	0.045	0.013	-1.89
4362.93	U II	4585 - 27499	0.059	0.017	-1.78
4372.57	U II	915 - 23778	0.049	0.014	-1.85
4373.41	U II	1749 - 24608	0.042	0.012	-1.92
4415.24	U II	0 - 22642	0.030	0.0088	-2.05
4426.68	U II	4706 - 27290	0.056	0.016	-1.78
4427.65	U II	289 - 22868	0.026	0.0076	-2.12
4433.89	U II	8394 - 30942	0.16	0.046	-1.33
4462.97	U II	915 - 23315	0.041	0.012	-1.92
4465.13	U II	2295 - 24684	0.027	0.0081	-2.09
4472.34	U II	289 - 22642	0.13	0.040	-1.39
4477.71	U II	915 - 23241	0.018	0.0054	-2.26
4490.84	U II	1749 - 24010	0.036	0.011	-1.96
4510.32	U II	0 - 22165	0.013	0.0041	-2.39
4515.28	U II	289 - 22430	0.052	0.016	-1.80
4538.19	U II	1749 - 23778	0.060	0.018	-1.73
4543.63	U II	915 - 22917	0.15	0.048	-1.32
4545.58	U II	2295 - 24288	0.054	0.017	-1.77
4553.86	U II	915 - 22868	0.0099	0.0031	-2.51
4555.10	U II	8394 - 30342	0.16	0.051	-1.29
4567.69	U II	1749 - 23636	0.029	0.0090	-2.04
4569.91	U II	289 - 22165	0.027	0.0085	-2.07
4570.99	U II	6283 - 28154	0.044	0.014	-1.86
4573.69	U II	2295 - 24153	0.057	0.018	-1.74
4584.85	U II	1749 - 23554	0.016	0.0051	-2.29
4601.13	U II	915 - 22642	0.013	0.0040	-2.40
4603.66	U II	2295 - 24010	0.046	0.015	-1.83
4605.15	U II	5791 - 27499	0.050	0.016	-1.80
4622.43	U II	5260 - 26887	0.031	0.010	-2.00
4627.08	U II	4585 - 26191	0.16	0.052	-1.28
4641.66	U II	8394 - 29931	0.12	0.040	-1.40
4646.60	U II	915 - 22430	0.054	0.017	-1.76
4666.86	U II	289 - 21711	0.027	0.0088	-2.06
4671.41	U II	4585 - 25986	0.066	0.021	-1.67
4689.07	U II	0 - 21320	0.031	0.010	-1.99
4702.05	U II	4706 - 25968	0.033	0.011	-1.96
4702.52	U II	2295 - 23554	0.033	0.011	-1.96
4722.73	U II	1749 - 22917	0.045	0.015	-1.82
4731.60	U II	4585 - 25714	0.077	0.026	-1.59
4755.73	U II	0 - 21021	0.016	0.0056	-2.25
4769.26	U II	0 - 20962	0.012	0.0042	-2.38
4772.70	U II	2295 - 23241	0.031	0.011	-1.98
4779.63	U II	6445 - 27361	0.049	0.017	-1.77

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4819.54	U II	4421 - 25164	0.027	0.0093	-2.03
4847.66	U II	2295 - 22917	0.021	0.0076	-2.12
4858.08	U II	4585 - 25164	0.047	0.017	-1.78
4859.68	U II	0 - 20572	0.011	0.0039	-2.41
4861.02	U II	5402 - 25968	0.068	0.024	-1.62
4886.33	U II	5527 - 25986	0.021	0.0077	-2.11
4899.29	U II	915 - 21320	0.018	0.0066	-2.18
4913.16	U II	2295 - 22642	0.020	0.0073	-2.14
4924.64	U II	5667 - 25968	0.030	0.011	-1.96
4933.66	U II	4421 - 24684	0.015	0.0055	-2.26
4950.17	U II	5791 - 25986	0.022	0.0080	-2.10
4972.10	U II	915 - 21021	0.0075	0.0028	-2.55
4986.90	U II	915 - 20962	0.0074	0.0028	-2.56
5008.22	U II	1749 - 21711	0.026	0.0099	-2.00
5047.42	U II	2295 - 22101	0.0059	0.0023	-2.65
5085.86	U II	915 - 20572	0.0058	0.0023	-2.65
5145.10	U II	6283 - 25714	0.017	0.0066	-2.18
5160.33	U II	5791 - 25164	0.050	0.020	-1.70
5184.59	U II	5402 - 24684	0.032	0.013	-1.90
5225.12	U II	4421 - 23554	0.0092	0.0038	-2.42
5247.35	U II	5402 - 24453	0.0096	0.0039	-2.40
5247.75	U II	4585 - 23636	0.019	0.0078	-2.11
5257.04	U II	5667 - 24684	0.026	0.011	-1.97
5278.18	U II	5402 - 24342	0.012	0.0049	-2.31
5288.40	U II	5402 - 24306	0.0092	0.0039	-2.41
5311.88	U II	4421 - 23241	0.015	0.0064	-2.20
5312.73	U II	5791 - 24608	0.0088	0.0037	-2.43
5321.60	U II	5667 - 24453	0.0085	0.0036	-2.44
5363.82	U II	5667 - 24306	0.0094	0.0040	-2.39
5400.95	U II	5402 - 23912	0.016	0.0069	-2.16
5406.00	U II	8394 - 26887	0.024	0.011	-1.97
5444.48	U II	5791 - 24153	0.017	0.0076	-2.12
5481.22	U II	6445 - 24684	0.040	0.018	-1.74
5487.02	U II	5791 - 24010	0.017	0.0075	-2.13
5492.97	U II	0 - 18200	0.015	0.0068	-2.17
5504.15	U II	6445 - 24608	0.023	0.010	-1.98
5551.44	U II	6445 - 24453	0.016	0.0073	-2.14
5552.62	U II	6283 - 24288	0.0097	0.0045	-2.35
5557.90	U II	5791 - 23778	0.010	0.0048	-2.31
5580.82	U II	5402 - 23315	0.0083	0.0039	-2.41
5581.61	U II	289 - 18200	0.0044	0.0020	-2.69
5597.38	U II	6445 - 24306	0.015	0.0072	-2.14
5602.91	U II	6445 - 24288	0.012	0.0057	-2.24
5628.02	U II	5791 - 23554	0.0060	0.0028	-2.55
5654.41	U II	4421 - 22101	0.0066	0.0032	-2.50
5691.39	U II	6445 - 24010	0.020	0.0097	-2.01
5723.63	U II	6445 - 23912	0.020	0.0096	-2.02
5788.59	U II	6283 - 23554	0.010	0.0051	-2.29
5837.71	U II	4585 - 21711	0.015	0.0078	-2.11
5843.29	U II	6445 - 23554	0.010	0.0053	-2.28

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5870.95	U II	5402 - 22430	0.011	0.0059	-2.23
5932.44	U II	5791 - 22642	0.0057	0.0030	-2.52
5952.05	U II	6445 - 23241	0.0087	0.0046	-2.34
6017.39	U II	4706 - 21320	0.0071	0.0038	-2.42
6059.73	U II	5667 - 22165	0.0058	0.0032	-2.50
6087.34	U II	6445 - 22868	0.011	0.0062	-2.21
6254.22	U II	6445 - 22430	0.0056	0.0033	-2.48
6279.64	U II	5791 - 21711	0.0033	0.0020	-2.71
6280.20	U II	5402 - 21320	0.0074	0.0044	-2.36
6400.36	U II	5402 - 21021	0.0019	0.0012	-2.92
6424.89	U II	5402 - 20962	0.0027	0.0017	-2.77
6536.58	U II	5667 - 20962	0.0017	0.0011	-2.97
6590.05	U II	5402 - 20572	0.0023	0.0015	-2.83
6720.84	U II	6445 - 21320	0.0025	0.0017	-2.77
8504.70	U II	6445 - 18200	0.0027	0.0029	-2.54

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2092.44	V I	553 - 48329	17.	1.1	0.04
2384.28	V I	0 - 41928	1.7	0.14	-0.85
2386.96	V I	10892 - 52774	33.	2.8	0.45
2388.92	V I	11101 - 52948	33.	2.9	0.46
2390.87	V I	137 - 41950	3.3	0.29	-0.54
2391.26	V I	2220 - 44026	6.0	0.51	-0.29
2392.90	V I	2425 - 44203	7.6	0.65	-0.19
2397.78	V I	553 - 42246	3.6	0.31	-0.50
2398.27	V I	553 - 42237	3.6	0.31	-0.50
2399.96	V I	0 - 41655	3.1	0.27	-0.57
2406.75	V I	323 - 41861	6.6	0.57	-0.24
2407.90	V I	137 - 41655	5.6	0.48	-0.31
2412.69	V I	323 - 41758	5.1	0.45	-0.35
2413.03	V I	0 - 41429	3.5	0.31	-0.52
2415.33	V I	0 - 41389	6.3	0.55	-0.26
2416.75	V I	553 - 41918	7.4	0.65	-0.19
2417.35	V I	137 - 41492	4.7	0.42	-0.38
2420.12	V I	553 - 41861	5.9	0.52	-0.28
2421.06	V I	137 - 41429	5.3	0.46	-0.34
2421.98	V I	323 - 41599	5.5	0.49	-0.31
2423.38	V I	137 - 41389	2.3	0.20	-0.69
2428.28	V I	323 - 41492	6.6	0.58	-0.24
2432.02	V I	323 - 41429	4.7	0.42	-0.38
2435.52	V I	553 - 41599	7.4	0.66	-0.18
2439.10	V I	553 - 41539	3.6	0.32	-0.49
2441.89	V I	553 - 41492	2.4	0.21	-0.67
2501.61	V I	0 - 39962	7.2	0.67	-0.17
2503.30	V I	0 - 39935	4.0	0.37	-0.43
2506.90	V I	0 - 39878	7.8	0.74	-0.13
2507.78	V I	137 - 40001	13.	1.2	0.09
2511.65	V I	323 - 40126	10.	0.95	-0.02
2511.95	V I	137 - 39935	9.5	0.90	-0.04
2515.15	V I	137 - 39884	3.5	0.34	-0.47
2517.14	V I	323 - 40039	9.8	0.94	-0.03
2519.62	V I	323 - 40000	13.	1.2	0.09
2526.22	V I	553 - 40126	23.	2.2	0.35
2530.18	V I	553 - 40064	13.	1.3	0.11
2545.98	V I	0 - 39267	2.7	0.26	-0.59
2552.65	V I	137 - 39300	5.4	0.53	-0.28
2554.86	V I	137 - 39267	2.3	0.23	-0.64
2558.90	V I	323 - 39391	1.7	0.17	-0.77
2562.13	V I	323 - 39342	9.6	0.95	-0.02
2564.23	V I	15265 - 54251	105.	10.	1.01
2564.82	V I	323 - 39300	5.1	0.50	-0.30
2574.02	V I	553 - 39391	10.	1.0	0.02
2577.29	V I	553 - 39342	2.1	0.21	-0.69
2620.29	V I	8716 - 46868	36.	3.7	0.57
2640.69	V I	9825 - 47683	18.	1.9	0.28
2643.16	V I	137 - 37960	1.4	0.15	-0.82
2645.26	V I	323 - 38116	5.0	0.53	-0.28

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2647.71	V I	0 - 37757	2.7	0.29	-0.54
2651.90	V I	137 - 37835	4.4	0.47	-0.33
2652.92	V I	15265 - 52948	56.	5.9	0.77
2653.83	V I	15104 - 52774	54.	5.8	0.76
2656.22	V I	323 - 37960	4.8	0.51	-0.29
2661.42	V I	553 - 38116	6.1	0.64	-0.19
2665.96	V I	0 - 37499	0.85	0.091	-1.04
2671.67	V I	137 - 37556	0.86	0.093	-1.03
2685.14	V I	9637 - 46868	18.	2.0	0.30
2686.36	V I	9637 - 46851	18.	2.0	0.30
2696.99	V I	10893 - 47960	64.	6.9	0.84
2697.74	V I	11101 - 48158	66.	7.3	0.86
2698.73	V I	9825 - 46868	18.	2.0	0.30
2699.11	V I	9825 - 46863	12.	1.3	0.13
2722.56	V I	10893 - 47612	74.	8.2	0.92
2731.35	V I	11101 - 47702	91.	10.	1.01
2773.68	V I	11101 - 47143	20.	2.3	0.37
2783.78	V I	13811 - 49723	41.	4.8	0.68
2785.54	V I	14515 - 50404	23.	2.7	0.43
2785.69	V I	13802 - 49689	41.	4.8	0.68
2838.06	V I	0 - 35225	0.48	0.057	-1.24
2844.93	V I	14549 - 49689	24.	2.9	0.46
2848.77	V I	0 - 35092	1.0	0.13	-0.90
2849.18	V I	137 - 35225	1.1	0.13	-0.88
2852.87	V I	13802 - 48845	91.	11.	1.05
2855.22	V I	0 - 35013	2.9	0.36	-0.45
2857.94	V I	9637 - 44617	14.	1.7	0.22
2859.97	V I	137 - 35092	2.8	0.34	-0.47
2864.36	V I	323 - 35225	3.8	0.47	-0.33
2866.42	V I	9825 - 44701	17.	2.1	0.33
2866.59	V I	15104 - 49978	140.	17.	1.24
2868.10	V I	15265 - 50121	182.	23.	1.35
2870.55	V I	553 - 35379	3.5	0.43	-0.36
2894.58	V I	0 - 34537	0.80	0.10	-1.00
2899.20	V I	137 - 34620	1.2	0.16	-0.81
2899.60	V I	0 - 34477	1.5	0.19	-0.73
2903.70	V I	0 - 34429	0.78	0.098	-1.01
2904.13	V I	323 - 34747	1.2	0.15	-0.83
2906.13	V I	137 - 34537	2.0	0.25	-0.59
2914.30	V I	16573 - 50876	53.	6.7	0.83
2914.93	V I	323 - 34620	5.2	0.66	-0.18
2915.33	V I	137 - 34429	0.78	0.100	-1.00
2916.02	V I	10893 - 45176	12.	1.5	0.19
2917.93	V I	11101 - 45361	17.	2.2	0.34
2923.62	V I	553 - 34747	10.	1.3	0.12
2926.26	V I	323 - 34487	0.80	0.10	-0.99
2935.87	V I	323 - 34375	1.5	0.19	-0.73
2937.69	V I	137 - 34168	1.1	0.14	-0.85
2942.33	V I	553 - 34530	3.0	0.39	-0.40
2943.20	V I	0 - 33967	2.6	0.34	-0.47

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2946.53	V I	137 - 34066	1.3	0.17	-0.76
2949.63	V I	137 - 34030	2.6	0.35	-0.46
2954.33	V I	137 - 33976	1.4	0.18	-0.74
2955.80	V I	553 - 34375	1.2	0.15	-0.81
2957.33	V I	323 - 34128	1.0	0.13	-0.88
2962.77	V I	323 - 34066	4.9	0.65	-0.19
2974.22	V I	9637 - 43249	7.2	0.95	-0.02
2977.54	V I	553 - 34128	2.9	0.39	-0.41
2999.24	V I	9637 - 42969	6.7	0.90	-0.04
3016.16	V I	9825 - 42969	11.	1.5	0.19
3031.01	V I	10893 - 43875	13.	1.8	0.26
3043.12	V I	137 - 32989	2.0	0.28	-0.55
3043.56	V I	0 - 32847	2.0	0.27	-0.57
3044.94	V I	323 - 33155	2.1	0.30	-0.53
3050.40	V I	11101 - 43874	8.8	1.2	0.09
3050.89	V I	0 - 32768	1.4	0.20	-0.71
3052.19	V I	137 - 32891	0.60	0.083	-1.08
3053.65	V I	0 - 32738	3.8	0.53	-0.27
3056.33	V I	137 - 32847	10.	1.5	0.17
3060.46	V I	323 - 32989	13.	1.8	0.26
3066.38	V I	553 - 33155	23.	3.2	0.51
3069.64	V I	323 - 32891	1.2	0.17	-0.77
3073.82	V I	323 - 32847	1.4	0.21	-0.69
3075.27	V I	15104 - 47612	54.	7.7	0.89
3082.11	V I	553 - 32989	1.4	0.20	-0.71
3087.06	V I	9545 - 41928	5.1	0.74	-0.13
3088.11	V I	9637 - 42010	11.	1.5	0.18
3089.13	V I	9637 - 41999	5.3	0.75	-0.12
3094.69	V I	9545 - 41848	5.9	0.84	-0.07
3183.41	V I	137 - 31541	20.	3.0	0.48
3183.98	V I	323 - 31722	35.	5.3	0.72
3185.40	V I	553 - 31937	26.	4.0	0.60
3193.92	V I	15063 - 46363	22.	3.4	0.53
3198.01	V I	137 - 31398	3.2	0.49	-0.31
3199.82	V I	15001 - 46244	22.	3.3	0.52
3202.38	V I	323 - 31541	4.7	0.73	-0.14
3205.58	V I	10893 - 42079	56.	8.6	0.93
3207.41	V I	553 - 31722	3.0	0.46	-0.33
3212.43	V I	11101 - 42221	53.	8.3	0.92
3218.87	V I	10893 - 41950	4.5	0.70	-0.16
3233.19	V I	11101 - 42021	6.5	1.0	0.01
3249.57	V I	553 - 31318	0.32	0.050	-1.30
3255.65	V I	8716 - 39423	2.2	0.35	-0.45
3263.24	V I	0 - 30636	0.67	0.11	-0.97
3271.64	V I	137 - 30694	0.46	0.074	-1.13
3273.03	V I	10893 - 41437	7.9	1.3	0.10
3283.31	V I	323 - 30771	0.47	0.076	-1.12
3284.36	V I	11101 - 41539	5.7	0.93	-0.03
3298.14	V I	553 - 30864	0.77	0.13	-0.90
3309.18	V I	9637 - 39847	3.6	0.59	-0.23

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3329.86	V I	9825 - 39847	7.2	1.2	0.08
3356.35	V I	9637 - 39423	5.5	0.93	-0.03
3365.55	V I	9545 - 39249	6.1	1.0	0.02
3376.06	V I	9637 - 39249	3.1	0.53	-0.28
3377.39	V I	9637 - 39237	3.1	0.53	-0.28
3377.62	V I	9825 - 39423	6.5	1.1	0.04
3400.40	V I	8716 - 38116	7.1	1.2	0.09
3402.57	V I	8579 - 37960	2.2	0.38	-0.43
3417.06	V I	8579 - 37835	2.1	0.37	-0.44
3418.52	V I	8716 - 37960	1.9	0.33	-0.49
3489.47	V I	17242 - 45892	18.	3.2	0.51
3500.82	V I	19145 - 47702	24.	4.5	0.65
3505.69	V I	13802 - 42318	7.6	1.4	0.15
3529.74	V I	9637 - 37960	9.6	1.8	0.25
3533.68	V I	9825 - 38116	25.	4.7	0.67
3543.50	V I	9545 - 37757	4.6	0.86	-0.07
3553.27	V I	9825 - 37960	4.8	0.92	-0.04
3556.25	V I	17242 - 45354	18.	3.4	0.54
3566.18	V I	8579 - 36612	3.3	0.63	-0.20
3568.94	V I	17055 - 45067	17.	3.2	0.51
3571.04	V I	17242 - 45237	18.	3.4	0.53
3571.65	V I	17117 - 45107	29.	5.6	0.75
3573.52	V I	17182 - 45158	30.	5.7	0.75
3577.87	V I	17117 - 45059	17.	3.2	0.51
3582.81	V I	17242 - 45145	17.	3.3	0.52
3606.69	V I	10893 - 38611	5.9	1.2	0.06
3639.02	V I	14549 - 42021	16.	3.1	0.49
3643.86	V I	14515 - 41950	7.1	1.4	0.15
3644.71	V I	11101 - 38530	5.8	1.2	0.06
3648.97	V I	16450 - 43847	21.	4.2	0.62
3656.71	V I	16573 - 43912	21.	4.3	0.63
3663.59	V I	16361 - 43649	43.	8.7	0.94
3665.14	V I	16729 - 44005	15.	2.9	0.47
3667.74	V I	16450 - 43707	44.	8.8	0.95
3671.20	V I	10893 - 38124	6.3	1.3	0.10
3672.40	V I	16917 - 44140	19.	3.9	0.59
3673.40	V I	16573 - 43788	52.	10.	1.02
3675.70	V I	2220 - 29418	0.90	0.18	-0.74
3676.68	V I	17136 - 44327	36.	7.3	0.87
3680.11	V I	16729 - 43894	57.	12.	1.06
3683.13	V I	2153 - 29296	1.7	0.35	-0.45
3686.26	V I	11101 - 38221	7.2	1.5	0.17
3687.47	V I	16917 - 44028	93.	19.	1.28
3688.07	V I	2311 - 29418	4.2	0.86	-0.07
3690.28	V I	2112 - 29203	3.1	0.64	-0.20
3692.22	V I	2220 - 29296	4.6	0.95	-0.02
3695.34	V I	17136 - 44190	93.	19.	1.28
3695.86	V I	2153 - 29203	3.1	0.64	-0.19
3703.58	V I	2425 - 29418	12.	2.5	0.39
3704.70	V I	2311 - 29296	5.5	1.1	0.06

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3705.04	V I	2220 - 29203	1.7	0.35	-0.45
3706.04	V I	15104 - 42079	11.	2.2	0.34
3708.72	V I	15265 - 42221	16.	3.2	0.51
3713.96	V I	553 - 27471	0.070	0.014	-1.84
3722.00	V I	15001 - 41861	5.1	1.1	0.02
3722.20	V I	18198 - 45057	12.	2.6	0.41
3729.04	V I	14949 - 41758	5.9	1.2	0.09
3734.43	V I	15078 - 41848	16.	3.4	0.53
3737.99	V I	14910 - 41655	4.8	1.0	0.00
3738.76	V I	15270 - 42010	9.6	2.0	0.30
3740.24	V I	15270 - 41999	4.2	0.89	-0.05
3741.50	V I	18438 - 45158	26.	5.4	0.73
3747.98	V I	15572 - 42246	4.6	0.96	-0.02
3751.78	V I	8579 - 35225	0.63	0.13	-0.88
3753.27	V I	13802 - 40437	2.7	0.58	-0.24
3755.70	V I	18302 - 44921	9.7	2.1	0.31
3759.32	V I	20830 - 47423	20.	4.1	0.62
3761.44	V I	15270 - 41848	5.1	1.1	0.03
3763.14	V I	15572 - 42138	10.0	2.1	0.33
3769.07	V I	13802 - 40326	2.7	0.57	-0.25
3774.11	V I	13811 - 40300	2.6	0.57	-0.25
3775.19	V I	15270 - 41752	4.0	0.85	-0.07
3775.72	V I	18680 - 45158	10.	2.2	0.35
3776.16	V I	15771 - 42246	4.6	0.98	-0.01
3778.68	V I	2311 - 28768	0.72	0.15	-0.81
3779.65	V I	10893 - 37343	1.4	0.31	-0.51
3781.39	V I	15572 - 42010	4.3	0.92	-0.04
3787.14	V I	15104 - 41501	6.5	1.4	0.15
3790.32	V I	2220 - 28596	1.3	0.29	-0.54
3793.61	V I	0 - 26353	0.13	0.028	-1.55
3794.96	V I	2425 - 28768	3.1	0.67	-0.18
3799.91	V I	2153 - 28462	1.4	0.31	-0.51
3803.47	V I	2311 - 28596	1.5	0.32	-0.49
3803.78	V I	10893 - 37175	2.5	0.54	-0.27
3806.80	V I	11101 - 37362	5.8	1.3	0.10
3807.50	V I	2112 - 28369	0.74	0.16	-0.79
3808.52	V I	0 - 26249	0.70	0.15	-0.82
3809.60	V I	2220 - 28462	0.57	0.12	-0.91
3813.49	V I	137 - 26353	1.4	0.31	-0.50
3815.51	V I	2112 - 28314	0.23	0.050	-1.30
3817.84	V I	553 - 26738	0.22	0.048	-1.32
3818.24	V I	0 - 26183	1.7	0.38	-0.42
3819.96	V I	2425 - 28596	0.59	0.13	-0.89
3821.49	V I	2153 - 28314	0.55	0.12	-0.92
3822.01	V I	323 - 26480	0.82	0.18	-0.75
3822.89	V I	2311 - 28462	1.1	0.25	-0.60
3823.21	V I	2220 - 28369	0.74	0.16	-0.79
3823.99	V I	8476 - 34620	0.95	0.21	-0.68
3826.77	V I	8413 - 34537	0.66	0.15	-0.84
3828.56	V I	137 - 26249	2.3	0.50	-0.30

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3832.84	V I	13802 - 39884	1.8	0.40	-0.40
3834.22	V I	13811 - 39884	18.	4.0	0.60
3835.56	V I	8413 - 34477	1.0	0.23	-0.64
3836.05	V I	8476 - 34537	1.1	0.23	-0.63
3839.00	V I	8579 - 34620	2.3	0.51	-0.29
3839.38	V I	14549 - 40587	8.8	1.9	0.29
3840.14	V I	10893 - 36926	2.1	0.46	-0.34
3840.44	V I	8716 - 34747	8.4	1.9	0.27
3840.75	V I	323 - 26353	3.7	0.82	-0.09
3841.89	V I	323 - 26345	0.16	0.035	-1.46
3844.44	V I	0 - 26004	0.48	0.11	-0.97
3847.33	V I	137 - 26122	0.42	0.093	-1.03
3851.17	V I	8579 - 34537	1.1	0.24	-0.63
3852.10	V I	8476 - 34429	0.52	0.11	-0.94
3855.37	V I	0 - 25931	1.5	0.34	-0.47
3855.84	V I	553 - 26480	4.4	0.98	-0.01
3858.68	V I	8579 - 34487	0.92	0.21	-0.69
3859.34	V I	8716 - 34620	1.1	0.24	-0.61
3862.22	V I	137 - 26022	0.19	0.043	-1.36
3863.87	V I	10893 - 36766	3.5	0.78	-0.11
3864.86	V I	137 - 26004	1.7	0.38	-0.42
3867.60	V I	323 - 26172	0.30	0.068	-1.17
3870.58	V I	15771 - 41599	3.9	0.88	-0.06
3871.08	V I	11101 - 36926	4.7	1.1	0.03
3873.64	V I	10893 - 36701	1.7	0.39	-0.41
3875.08	V I	323 - 26122	2.0	0.45	-0.35
3875.90	V I	137 - 25931	0.52	0.12	-0.93
3876.09	V I	553 - 26345	0.80	0.18	-0.75
3883.89	V I	15689 - 41429	2.8	0.64	-0.20
3886.59	V I	11101 - 36823	1.8	0.41	-0.39
3890.18	V I	323 - 26022	0.67	0.15	-0.82
3892.86	V I	323 - 26004	0.44	0.099	-1.00
3894.04	V I	18174 - 43847	13.	3.0	0.47
3896.16	V I	8716 - 34375	0.90	0.20	-0.69
3897.08	V I	18259 - 43912	13.	3.0	0.48
3898.02	V I	18680 - 44327	47.	11.	1.03
3900.18	V I	18372 - 44005	21.	4.9	0.69
3901.15	V I	18513 - 44140	22.	5.1	0.71
3902.25	V I	553 - 26172	2.4	0.55	-0.26
3904.47	V I	14515 - 40119	2.6	0.60	-0.23
3906.75	V I	8579 - 34168	0.97	0.22	-0.65
3909.89	V I	553 - 26122	0.69	0.16	-0.80
3910.79	V I	8413 - 33976	0.92	0.21	-0.67
3912.21	V I	8413 - 33967	2.0	0.45	-0.35
3912.89	V I	8579 - 34128	0.48	0.11	-0.96
3920.49	V I	8476 - 33976	0.92	0.21	-0.67
3921.90	V I	8476 - 33967	0.92	0.21	-0.67
3922.43	V I	8579 - 34066	2.1	0.49	-0.31
3924.66	V I	15063 - 40536	14.	3.2	0.51
3925.24	V I	19026 - 44495	27.	6.2	0.79

Wavelength A	Spectrum		Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3927.93	V	I	15001 - 40452	12.	2.7	0.43
3930.02	V	I	11101 - 36539	4.8	1.1	0.04
3931.34	V	I	14949 - 40379	8.5	2.0	0.29
3934.01	V	I	8716 - 34128	2.4	0.56	-0.25
3935.14	V	I	14910 - 40315	8.3	1.9	0.29
3936.28	V	I	8579 - 33976	0.93	0.22	-0.67
3937.53	V	I	15063 - 40452	2.9	0.67	-0.17
3938.20	V	I	19078 - 44463	8.9	2.1	0.32
3939.33	V	I	15001 - 40379	2.8	0.66	-0.18
3941.25	V	I	14949 - 40315	2.1	0.49	-0.31
3942.01	V	I	11101 - 36461	1.6	0.38	-0.42
3943.66	V	I	8716 - 34066	1.4	0.33	-0.48
3979.14	V	I	20768 - 45892	14.	3.2	0.51
3979.42	V	I	19023 - 44146	8.3	2.0	0.29
3984.34	V	I	14910 - 40001	2.6	0.61	-0.21
3984.60	V	I	14949 - 40039	4.5	1.1	0.03
3988.83	V	I	15001 - 40064	4.6	1.1	0.04
3990.57	V	I	14949 - 40001	27.	6.5	0.81
3992.80	V	I	15001 - 40038	13.	3.1	0.49
3998.73	V	I	15063 - 40064	22.	5.4	0.73
4023.17	V	I	15270 - 40119	2.7	0.65	-0.19
4031.83	V	I	19078 - 43874	17.	4.3	0.63
4042.64	V	I	15270 - 40000	5.9	1.4	0.16
4048.62	V	I	137 - 24830	0.036	0.0089	-2.05
4050.96	V	I	17182 - 41861	31.	7.6	0.88
4051.35	V	I	17242 - 41918	31.	7.7	0.89
4053.26	V	I	15270 - 39935	2.6	0.63	-0.20
4057.07	V	I	17117 - 41758	24.	5.8	0.77
4057.82	V	I	15689 - 40326	7.2	1.8	0.25
4063.93	V	I	17055 - 41655	19.	4.7	0.67
4071.54	V	I	15572 - 40126	12.	3.0	0.48
4082.93	V	I	9545 - 34030	0.61	0.15	-0.82
4090.58	V	I	8716 - 33155	8.6	2.2	0.33
4091.94	V	I	9545 - 33976	0.48	0.12	-0.92
4092.41	V	I	9637 - 34066	1.7	0.44	-0.36
4092.69	V	I	2311 - 26738	2.2	0.55	-0.26
4093.50	V	I	9545 - 33967	1.1	0.27	-0.57
4094.28	V	I	17242 - 41660	5.3	1.3	0.12
4095.49	V	I	8579 - 32989	6.4	1.6	0.21
4099.80	V	I	2220 - 26605	3.3	0.84	-0.08
4102.16	V	I	8476 - 32847	4.0	1.0	0.01
4104.40	V	I	17242 - 41599	19.	4.7	0.67
4104.78	V	I	15771 - 40126	14.	3.5	0.54
4105.17	V	I	2153 - 26506	3.2	0.82	-0.09
4107.49	V	I	9637 - 33976	0.61	0.15	-0.81
4108.22	V	I	17055 - 41389	8.8	2.2	0.35
4109.79	V	I	2112 - 26438	2.6	0.66	-0.18
4111.78	V	I	2425 - 26738	11.	2.8	0.45
4112.33	V	I	17182 - 41492	9.1	2.3	0.36
4113.52	V	I	9825 - 34128	2.3	0.58	-0.24

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4114.53	V I	15665 - 39962	3.3	0.83	-0.08
4115.18	V I	2311 - 26605	5.2	1.3	0.12
4116.47	V I	2220 - 26506	2.1	0.52	-0.28
4118.18	V I	15724 - 40000	9.3	2.4	0.37
4118.64	V I	8716 - 32989	1.3	0.33	-0.49
4119.46	V I	8579 - 32847	1.6	0.40	-0.39
4120.54	V I	8476 - 32738	1.2	0.31	-0.52
4123.19	V I	15689 - 39935	9.1	2.3	0.37
4123.57	V I	2153 - 26397	2.3	0.58	-0.23
4124.07	V I	9825 - 34066	1.1	0.29	-0.54
4128.07	V I	2220 - 26438	3.5	0.89	-0.05
4128.86	V I	15665 - 39878	5.8	1.5	0.17
4132.02	V I	2311 - 26506	3.6	0.91	-0.04
4134.49	V I	2425 - 26605	2.7	0.70	-0.15
4136.11	V I	15078 - 39249	2.7	0.69	-0.16
4139.26	V I	15270 - 39423	2.8	0.73	-0.14
4159.69	V I	2311 - 26345	0.17	0.044	-1.35
4171.30	V I	15270 - 39237	2.7	0.71	-0.15
4174.01	V I	13802 - 37753	2.9	0.75	-0.13
4179.42	V I	2425 - 26345	0.26	0.067	-1.17
4182.59	V I	2220 - 26122	0.16	0.042	-1.37
4189.84	V I	2311 - 26172	0.19	0.050	-1.30
4191.56	V I	2153 - 26004	0.18	0.048	-1.32
4197.60	V I	15265 - 39081	2.6	0.69	-0.16
4198.61	V I	2311 - 26122	0.067	0.018	-1.75
4200.19	V I	2220 - 26022	0.053	0.014	-1.86
4209.86	V I	2425 - 26172	0.25	0.066	-1.18
4218.71	V I	2425 - 26122	0.068	0.018	-1.74
4224.14	V I	15724 - 39391	2.9	0.77	-0.11
4226.62	V I	15689 - 39342	5.1	1.4	0.14
4227.74	V I	13811 - 37458	1.3	0.36	-0.45
4229.69	V I	15665 - 39300	2.2	0.60	-0.22
4232.46	V I	15771 - 39391	16.	4.3	0.64
4232.95	V I	15724 - 39342	7.9	2.1	0.33
4234.00	V I	15689 - 39300	7.8	2.1	0.32
4234.52	V I	0 - 23609	0.027	0.0072	-2.14
4235.76	V I	15665 - 39267	5.0	1.3	0.13
4240.36	V I	15724 - 39300	2.2	0.61	-0.22
4257.37	V I	15001 - 38483	3.6	0.97	-0.01
4259.31	V I	137 - 23609	0.061	0.017	-1.78
4262.16	V I	14949 - 38405	3.9	1.1	0.03
4268.64	V I	15063 - 38483	20.	5.4	0.73
4269.76	V I	14910 - 38324	1.7	0.47	-0.33
4270.32	V I	14549 - 37960	1.5	0.42	-0.37
4271.55	V I	15001 - 38405	16.	4.3	0.64
4276.96	V I	14949 - 38324	15.	4.2	0.63
4282.91	V I	15063 - 38405	1.5	0.42	-0.37
4284.06	V I	14910 - 38246	14.	3.9	0.60
4286.42	V I	15001 - 38324	1.7	0.47	-0.32
4291.30	V I	14949 - 38246	1.3	0.35	-0.46

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4291.82	V I	17242 - 40536	21.	5.8	0.76
4296.11	V I	17182 - 40452	13.	3.7	0.57
4297.68	V I	17117 - 40379	10.	2.8	0.44
4298.03	V I	17055 - 40315	9.8	2.7	0.44
4306.21	V I	137 - 23353	0.082	0.023	-1.64
4307.18	V I	0 - 23211	0.067	0.019	-1.73
4309.80	V I	323 - 23520	0.086	0.024	-1.62
4313.89	V I	14949 - 38124	1.2	0.34	-0.46
4330.02	V I	0 - 23088	0.21	0.060	-1.22
4332.82	V I	137 - 23211	0.25	0.069	-1.16
4334.09	V I	9825 - 32891	0.28	0.079	-1.10
4341.01	V I	323 - 23353	0.38	0.11	-0.97
4342.83	V I	15104 - 38124	1.6	0.47	-0.33
4352.87	V I	553 - 23520	0.54	0.15	-0.82
4354.98	V I	15265 - 38221	4.3	1.2	0.08
4355.94	V I	137 - 23088	0.071	0.020	-1.69
4363.52	V I	2220 - 25131	0.042	0.012	-1.92
4364.22	V I	17055 - 39962	2.8	0.80	-0.10
4368.04	V I	323 - 23211	0.074	0.021	-1.67
4368.60	V I	17117 - 40001	2.8	0.81	-0.09
4373.23	V I	21603 - 44463	27.	7.8	0.89
4373.83	V I	17182 - 40039	4.3	1.2	0.09
4375.30	V I	21646 - 44495	20.	5.8	0.76
4379.24	V I	2425 - 25254	10.	3.0	0.48
4380.55	V I	17242 - 40064	5.8	1.7	0.22
4384.72	V I	2311 - 25112	5.8	1.7	0.23
4389.97	V I	2220 - 24993	3.9	1.1	0.05
4392.07	V I	2153 - 24915	0.070	0.020	-1.69
4393.09	V I	15078 - 37835	1.3	0.39	-0.41
4393.84	V I	8476 - 31229	0.21	0.060	-1.22
4395.23	V I	2153 - 24899	2.8	0.81	-0.09
4400.58	V I	2112 - 24830	1.1	0.31	-0.50
4403.67	V I	15063 - 37765	2.3	0.66	-0.18
4406.15	V I	8579 - 31268	0.42	0.12	-0.91
4406.64	V I	2425 - 25112	1.9	0.56	-0.25
4407.64	V I	2311 - 24993	2.3	0.66	-0.18
4408.20	V I	2220 - 24899	2.8	0.82	-0.09
4408.51	V I	2153 - 24830	3.5	1.0	0.01
4412.14	V I	2112 - 24771	0.11	0.031	-1.51
4415.06	V I	15001 - 37644	1.3	0.37	-0.43
4416.47	V I	2153 - 24789	0.49	0.14	-0.85
4419.94	V I	2220 - 24839	0.089	0.026	-1.58
4421.57	V I	2220 - 24830	0.49	0.14	-0.84
4423.21	V I	8716 - 31318	0.43	0.13	-0.90
4423.91	V I	20813 - 43411	4.7	1.4	0.14
4424.56	V I	11101 - 33695	0.42	0.12	-0.91
4425.71	V I	14910 - 37499	2.5	0.72	-0.14
4426.00	V I	2311 - 24899	0.36	0.11	-0.97
4427.31	V I	21603 - 44184	21.	6.1	0.79
4428.52	V I	2153 - 24728	0.23	0.068	-1.17

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4429.80	V I	2425 - 24993	0.19	0.055	-1.26
4430.50	V I	15270 - 37835	0.97	0.29	-0.54
4434.60	V I	15572 - 38116	2.9	0.87	-0.06
4436.14	V I	2112 - 24648	0.32	0.094	-1.02
4437.84	V I	2311 - 24839	0.50	0.15	-0.83
4441.68	V I	2220 - 24728	0.63	0.19	-0.73
4443.34	V I	21646 - 44146	16.	4.8	0.68
4444.21	V I	2153 - 24648	0.47	0.14	-0.85
4449.57	V I	10893 - 33360	0.55	0.16	-0.79
4450.90	V I	19078 - 41539	5.5	1.6	0.22
4452.01	V I	15063 - 37518	17.	5.1	0.71
4452.70	V I	14910 - 37362	0.68	0.20	-0.69
4457.48	V I	2220 - 24648	0.30	0.090	-1.04
4457.76	V I	15104 - 37530	3.2	0.96	-0.02
4459.76	V I	2311 - 24728	0.77	0.23	-0.64
4460.29	V I	2425 - 24839	1.6	0.48	-0.32
4460.99	V I	19026 - 41437	6.5	1.9	0.29
4462.36	V I	15001 - 37404	17.	5.0	0.70
4464.27	V I	19145 - 41539	3.3	1.00	-0.00
4464.75	V I	15724 - 38116	1.3	0.38	-0.42
4465.50	V I	15572 - 37960	1.2	0.36	-0.44
4468.01	V I	14910 - 37285	3.0	0.90	-0.04
4468.76	V I	15104 - 37475	1.1	0.32	-0.50
4469.71	V I	14949 - 37316	10.	3.0	0.48
4474.04	V I	15771 - 38116	3.8	1.1	0.06
4474.71	V I	15265 - 37606	5.9	1.8	0.25
4475.89	V I	14949 - 37285	0.67	0.20	-0.70
4480.04	V I	15001 - 37316	2.0	0.61	-0.21
4488.89	V I	14910 - 37181	9.8	3.0	0.47
4490.80	V I	14949 - 37211	2.0	0.60	-0.22
4496.06	V I	15724 - 37960	3.3	0.99	-0.00
4496.85	V I	14949 - 37181	1.6	0.50	-0.30
4497.40	V I	21646 - 43875	6.5	2.0	0.29
4501.95	V I	11101 - 33307	0.99	0.30	-0.52
4514.19	V I	15689 - 37835	2.4	0.72	-0.14
4524.22	V I	15265 - 37362	3.8	1.2	0.07
4525.16	V I	15665 - 37757	1.2	0.36	-0.45
4529.30	V I	15270 - 37343	1.0	0.32	-0.50
4529.59	V I	15104 - 37175	2.0	0.61	-0.22
4537.66	V I	14549 - 36580	0.84	0.26	-0.59
4540.01	V I	15265 - 37285	1.0	0.32	-0.50
4545.39	V I	15771 - 37765	11.	3.4	0.53
4551.84	V I	14515 - 36478	0.54	0.17	-0.77
4553.05	V I	19023 - 40981	6.8	2.1	0.32
4560.71	V I	15724 - 37644	8.3	2.6	0.41
4570.42	V I	15771 - 37644	1.9	0.59	-0.23
4571.78	V I	15689 - 37556	5.9	1.9	0.27
4577.17	V I	0 - 21841	0.18	0.055	-1.26
4578.73	V I	15665 - 37499	4.0	1.3	0.10
4579.19	V I	15724 - 37556	0.93	0.29	-0.54

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4580.40	V I	137 - 21964	0.23	0.072	-1.14
4583.78	V I	15689 - 37499	1.5	0.46	-0.34
4586.36	V I	323 - 22121	0.31	0.098	-1.01
4591.22	V I	19145 - 40920	12.	3.9	0.60
4594.11	V I	553 - 22314	0.50	0.16	-0.80
4606.15	V I	137 - 21841	0.035	0.011	-1.95
4609.65	V I	11101 - 32788	0.24	0.077	-1.11
4611.74	V I	15665 - 37343	0.70	0.22	-0.65
4619.77	V I	323 - 21964	0.083	0.026	-1.58
4624.41	V I	8476 - 30095	0.23	0.073	-1.14
4626.48	V I	8413 - 30022	0.18	0.057	-1.24
4635.18	V I	553 - 22121	0.039	0.012	-1.91
4640.07	V I	8476 - 30022	0.22	0.072	-1.14
4640.74	V I	8579 - 30121	0.23	0.074	-1.13
4646.40	V I	8579 - 30095	0.46	0.15	-0.83
4648.89	V I	19189 - 40694	2.3	0.74	-0.13
4666.14	V I	15270 - 36695	0.74	0.24	-0.62
4670.49	V I	8716 - 30121	0.56	0.18	-0.74
4684.45	V I	15270 - 36612	0.52	0.17	-0.76
4686.92	V I	15078 - 36408	0.69	0.23	-0.65
4706.16	V I	15572 - 36815	1.2	0.41	-0.39
4706.57	V I	17242 - 38483	3.0	0.99	-0.01
4710.56	V I	17182 - 38405	2.9	0.97	-0.01
4714.12	V I	17117 - 38324	2.4	0.79	-0.10
4715.89	V I	19026 - 40225	2.0	0.68	-0.17
4717.69	V I	17055 - 38246	1.9	0.62	-0.21
4721.51	V I	15724 - 36898	0.95	0.32	-0.50
4722.86	V I	15771 - 36938	0.96	0.32	-0.49
4729.53	V I	15270 - 36408	0.83	0.28	-0.56
4730.38	V I	15689 - 36823	0.62	0.21	-0.68
4742.63	V I	18805 - 39884	1.5	0.50	-0.30
4746.63	V I	16361 - 37423	0.67	0.23	-0.65
4748.52	V I	16450 - 37503	1.1	0.38	-0.42
4750.98	V I	16573 - 37615	1.4	0.46	-0.33
4751.56	V I	15572 - 36612	0.74	0.25	-0.60
4753.93	V I	16729 - 37758	1.2	0.41	-0.38
4757.48	V I	16361 - 37375	1.8	0.62	-0.21
4766.63	V I	16450 - 37423	1.5	0.51	-0.30
4776.36	V I	16573 - 37503	3.8	1.3	0.11
4786.51	V I	16729 - 37615	3.2	1.1	0.03
4796.92	V I	16917 - 37758	4.1	1.4	0.15
4799.77	V I	0 - 20828	0.0049	0.0017	-2.78
4807.53	V I	17136 - 37931	4.3	1.5	0.18
4827.45	V I	323 - 21033	0.037	0.013	-1.89
4831.64	V I	137 - 20828	0.038	0.013	-1.87
4832.43	V I	0 - 20688	0.030	0.011	-1.98
4833.02	V I	13802 - 34487	0.23	0.081	-1.09
4848.81	V I	21603 - 42221	2.0	0.72	-0.14
4851.48	V I	0 - 20606	0.079	0.028	-1.55
4862.61	V I	20830 - 41389	2.9	1.0	0.01

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
4864.74	V I	137 - 20688	0.12	0.043	-1.37
4871.26	V I	17242 - 37765	0.67	0.24	-0.62
4875.48	V I	323 - 20828	0.16	0.058	-1.24
4880.56	V I	9637 - 30121	0.19	0.069	-1.16
4881.56	V I	553 - 21033	0.21	0.073	-1.13
4894.21	V I	17055 - 37481	0.62	0.22	-0.65
4900.62	V I	17117 - 37517	1.6	0.57	-0.25
4904.29	V I	9637 - 30022	0.33	0.12	-0.92
4925.65	V I	9825 - 30121	0.29	0.11	-0.97
4932.03	V I	9825 - 30095	0.12	0.044	-1.35
4966.12	V I	23935 - 44066	4.0	1.5	0.17
5002.33	V I	19023 - 39009	3.0	1.1	0.06
5014.62	V I	19145 - 39081	3.7	1.4	0.15
5051.63	V I	21646 - 41437	2.4	0.94	-0.03
5128.53	V I	18438 - 37931	3.7	1.5	0.16
5138.42	V I	18302 - 37758	3.5	1.4	0.14
5139.53	V I	19078 - 38530	0.99	0.39	-0.41
5148.72	V I	18198 - 37615	2.1	0.84	-0.07
5159.35	V I	18126 - 37503	1.2	0.49	-0.31
5169.94	V I	18086 - 37423	0.64	0.26	-0.59
5192.01	V I	18120 - 37375	0.56	0.23	-0.65
5192.99	V I	18680 - 37931	3.7	1.5	0.18
5193.62	V I	18174 - 37423	0.65	0.26	-0.58
5194.83	V I	18259 - 37503	3.3	1.3	0.13
5195.36	V I	18372 - 37615	1.7	0.69	-0.16
5206.61	V I	18174 - 37375	0.56	0.23	-0.64
5216.59	V I	18259 - 37423	1.2	0.50	-0.30
5225.77	V I	18372 - 37503	1.0	0.43	-0.37
5233.75	V I	18513 - 37615	1.1	0.44	-0.35
5234.07	V I	19023 - 38124	4.0	1.6	0.21
5240.20	V I	18680 - 37758	0.63	0.26	-0.59
5240.87	V I	19145 - 38221	4.1	1.7	0.23
5260.98	V I	18438 - 37441	0.49	0.21	-0.69
5353.41	V I	19078 - 37753	1.4	0.59	-0.23
5383.43	V I	20828 - 39399	1.8	0.80	-0.10
5385.14	V I	21033 - 39597	2.3	1.0	0.00
5388.30	V I	20688 - 39241	0.70	0.31	-0.52
5397.87	V I	20606 - 39127	0.54	0.24	-0.62
5401.93	V I	19023 - 37530	3.0	1.3	0.12
5415.26	V I	19145 - 37606	4.4	2.0	0.29
5418.09	V I	19023 - 37475	0.86	0.38	-0.42
5424.08	V I	19026 - 37458	1.5	0.66	-0.18
5434.18	V I	19078 - 37475	1.3	0.57	-0.24
5437.66	V I	19145 - 37530	0.35	0.15	-0.81
5458.12	V I	19026 - 37343	0.50	0.22	-0.65
5487.22	V I	14549 - 32768	0.21	0.093	-1.03
5487.92	V I	19145 - 37362	2.5	1.1	0.06
5489.94	V I	14515 - 32725	0.20	0.093	-1.03
5504.87	V I	13802 - 31962	0.18	0.084	-1.08
5507.75	V I	19023 - 37175	2.0	0.91	-0.04

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5511.18	V I	19145 - 37285	0.41	0.19	-0.73
5545.93	V I	8579 - 26605	0.033	0.015	-1.82
5547.07	V I	8716 - 26738	0.11	0.049	-1.31
5558.75	V I	13802 - 31786	0.22	0.10	-0.99
5561.66	V I	13811 - 31786	0.18	0.082	-1.09
5584.50	V I	8579 - 26480	0.20	0.093	-1.03
5586.00	V I	15001 - 32898	0.19	0.091	-1.04
5592.42	V I	8476 - 26353	0.13	0.063	-1.20
5601.38	V I	19078 - 36926	0.76	0.36	-0.45
5604.94	V I	8413 - 26249	0.093	0.044	-1.36
5624.20	V I	18805 - 36580	0.31	0.15	-0.83
5624.60	V I	8579 - 26353	0.27	0.13	-0.89
5624.89	V I	8476 - 26249	0.094	0.044	-1.35
5626.01	V I	8413 - 26183	0.074	0.035	-1.46
5627.64	V I	8716 - 26480	0.56	0.27	-0.57
5632.46	V I	553 - 18302	0.0018	0.00085	-3.07
5633.90	V I	19078 - 36823	0.26	0.12	-0.91
5635.51	V I	19026 - 36766	0.33	0.16	-0.81
5646.11	V I	8476 - 26183	0.11	0.053	-1.28
5657.44	V I	8579 - 26249	0.15	0.072	-1.14
5668.36	V I	8716 - 26353	0.16	0.075	-1.13
5670.85	V I	8716 - 26345	0.43	0.21	-0.69
5698.52	V I	8579 - 26122	1.6	0.76	-0.12
5703.56	V I	8476 - 26004	1.2	0.56	-0.25
5706.98	V I	8413 - 25931	0.70	0.34	-0.47
5708.95	V I	19189 - 36701	0.29	0.14	-0.85
5725.64	V I	19078 - 36539	1.7	0.85	-0.07
5727.03	V I	8716 - 26172	1.1	0.55	-0.26
5727.66	V I	8476 - 25931	0.21	0.10	-0.99
5731.25	V I	8579 - 26022	0.29	0.14	-0.85
5734.01	V I	19026 - 36461	1.0	0.50	-0.30
5737.06	V I	8579 - 26004	0.29	0.14	-0.85
5743.45	V I	8716 - 26122	0.15	0.073	-1.14
5747.70	V I	19145 - 36539	0.42	0.21	-0.68
5748.87	V I	15270 - 32660	0.35	0.17	-0.76
5752.74	V I	15078 - 32456	0.13	0.066	-1.18
5761.41	V I	8579 - 25931	0.021	0.010	-1.98
5772.42	V I	15572 - 32891	0.63	0.31	-0.50
5776.64	V I	8716 - 26022	0.045	0.023	-1.65
5782.61	V I	8716 - 26004	0.014	0.0072	-2.14
5783.50	V I	21841 - 39127	0.58	0.29	-0.53
5784.38	V I	22314 - 39597	2.5	1.3	0.10
5786.16	V I	21964 - 39241	3.0	1.5	0.18
5788.56	V I	15078 - 32349	0.17	0.087	-1.06
5807.14	V I	24899 - 42114	4.2	2.1	0.33
5817.06	V I	15270 - 32456	0.18	0.091	-1.04
5817.53	V I	24993 - 42177	4.3	2.2	0.34
5830.72	V I	25112 - 42257	7.1	3.6	0.56
5846.30	V I	25254 - 42353	11.	5.6	0.75
5850.32	V I	15572 - 32660	0.095	0.049	-1.31

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5924.57	V I	15063 - 31937	0.29	0.16	-0.81
5978.91	V I	15001 - 31722	0.19	0.10	-1.00
5980.78	V I	9637 - 26353	0.029	0.015	-1.81
6002.31	V I	9825 - 26480	0.043	0.023	-1.64
6002.63	V I	8476 - 25131	0.058	0.032	-1.50
6016.12	V I	21603 - 38221	1.2	0.64	-0.20
6025.41	V I	14949 - 31541	0.13	0.068	-1.17
6039.73	V I	8579 - 25131	0.47	0.26	-0.59
6058.14	V I	8413 - 24915	0.097	0.053	-1.27
6067.26	V I	21646 - 38124	0.81	0.45	-0.35
6081.44	V I	8476 - 24915	0.47	0.26	-0.58
6090.22	V I	8716 - 25131	1.3	0.74	-0.13
6106.98	V I	11101 - 27471	0.057	0.032	-1.49
6111.67	V I	8413 - 24771	0.27	0.15	-0.82
6119.52	V I	8579 - 24915	0.59	0.33	-0.48
6128.34	V I	8476 - 24789	0.019	0.011	-1.97
6135.38	V I	8476 - 24771	0.27	0.15	-0.82
6150.15	V I	2425 - 18680	0.031	0.018	-1.75
6170.36	V I	2311 - 18513	0.014	0.0079	-2.10
6189.35	V I	2220 - 18372	0.0036	0.0021	-2.69
6199.19	V I	2311 - 18438	0.073	0.042	-1.38
6213.87	V I	2425 - 18513	0.021	0.012	-1.91
6216.37	V I	2220 - 18302	0.070	0.041	-1.39
6218.31	V I	23520 - 39597	1.8	1.0	0.02
6224.50	V I	2311 - 18372	0.020	0.012	-1.93
6230.74	V I	2153 - 18198	0.064	0.037	-1.43
6233.20	V I	2220 - 18259	0.015	0.0089	-2.05
6240.13	V I	2153 - 18174	0.0085	0.0050	-2.30
6242.81	V I	2112 - 18126	0.025	0.015	-1.83
6243.10	V I	2425 - 18438	0.11	0.067	-1.17
6251.82	V I	2311 - 18302	0.044	0.026	-1.59
6256.90	V I	2220 - 18198	0.013	0.0076	-2.12
6258.57	V I	2112 - 18086	0.013	0.0073	-2.13
6261.22	V I	2153 - 18120	0.0084	0.0050	-2.31
6266.32	V I	2220 - 18174	0.013	0.0076	-2.12
6268.82	V I	2425 - 18372	0.020	0.012	-1.92
6274.65	V I	2153 - 18086	0.025	0.015	-1.83
6282.33	V I	17242 - 33155	0.18	0.10	-0.98
6285.16	V I	2220 - 18126	0.030	0.018	-1.76
6292.83	V I	2311 - 18198	0.030	0.018	-1.74
6296.49	V I	2425 - 18302	0.027	0.016	-1.80
6311.50	V I	26738 - 42578	4.2	2.5	0.40
6324.66	V I	17182 - 32989	0.14	0.085	-1.07
6326.84	V I	15063 - 30864	0.39	0.23	-0.63
6339.09	V I	15001 - 30771	0.30	0.18	-0.74
6349.48	V I	14949 - 30694	0.26	0.16	-0.80
6355.58	V I	17117 - 32847	0.14	0.083	-1.08
6357.30	V I	14910 - 30636	0.26	0.15	-0.81
6358.82	V I	17242 - 32964	0.25	0.15	-0.81
6361.27	V I	17182 - 32898	0.35	0.21	-0.68

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6379.36	V I	17117 - 32788	0.22	0.13	-0.88
6393.28	V I	17055 - 32692	0.13	0.080	-1.09
6430.47	V I	15771 - 31318	0.22	0.14	-0.86
6431.63	V I	15724 - 31268	0.14	0.088	-1.06
6433.18	V I	15689 - 31229	0.087	0.054	-1.27
6435.16	V I	15665 - 31200	0.069	0.043	-1.37
6452.34	V I	9637 - 25131	0.078	0.049	-1.31
6488.05	V I	19078 - 34487	0.18	0.11	-0.95
6504.17	V I	9545 - 24915	0.060	0.038	-1.42
6531.43	V I	9825 - 25131	0.13	0.081	-1.09
6543.51	V I	9637 - 24915	0.030	0.019	-1.72
6558.02	V I	11101 - 26345	0.027	0.017	-1.76
6565.88	V I	9545 - 24771	0.012	0.0075	-2.13
6605.97	V I	9637 - 24771	0.058	0.038	-1.42
6607.83	V I	10892 - 26022	0.025	0.016	-1.79
6623.54	V I	15771 - 30864	0.065	0.043	-1.37
6624.85	V I	9825 - 24915	0.061	0.040	-1.40
6633.26	V I	11101 - 26172	0.022	0.014	-1.85
6643.79	V I	15724 - 30771	0.079	0.052	-1.28
6693.66	V I	21603 - 36539	0.24	0.16	-0.79
6708.07	V I	9825 - 24728	0.0087	0.0059	-2.23
6753.00	V I	8716 - 23520	0.052	0.036	-1.45
6766.49	V I	8579 - 23353	0.040	0.027	-1.56
6784.98	V I	8476 - 23211	0.029	0.020	-1.70
6812.40	V I	8413 - 23088	0.019	0.013	-1.89
6829.94	V I	8716 - 23353	0.0070	0.0049	-2.31
6832.44	V I	8579 - 23211	0.012	0.0081	-2.09
6839.58	V I	19023 - 33640	0.17	0.12	-0.94
6841.90	V I	8476 - 23088	0.0084	0.0059	-2.23
6870.88	V I	19145 - 33695	0.15	0.11	-0.97
6871.56	V I	15572 - 30121	0.048	0.034	-1.47
6894.00	V I	19026 - 33528	0.11	0.077	-1.12
6974.50	V I	19026 - 33360	0.17	0.13	-0.90
7026.07	V I	19078 - 33307	0.31	0.23	-0.64
7063.69	V I	11101 - 25254	0.011	0.0080	-2.10
7102.58	V I	17242 - 31318	0.049	0.037	-1.43
7151.36	V I	20768 - 34747	0.16	0.12	-0.92
7182.08	V I	18805 - 32725	0.089	0.069	-1.16
7264.29	V I	20768 - 34530	0.30	0.24	-0.62
7321.44	V I	17117 - 30771	0.061	0.049	-1.31
7338.92	V I	17242 - 30864	0.31	0.25	-0.59
7356.54	V I	17182 - 30771	0.26	0.21	-0.67
7358.66	V I	20789 - 34375	0.22	0.18	-0.75
7361.39	V I	17054 - 30636	0.17	0.14	-0.86
7362.49	V I	19189 - 32768	0.15	0.13	-0.90
7363.16	V I	17117 - 30694	0.17	0.14	-0.85
7385.95	V I	19189 - 32725	0.12	0.10	-1.00
7485.90	V I	20813 - 34168	0.23	0.20	-0.71
7488.08	V I	15270 - 28621	0.049	0.041	-1.39
7578.75	V I	24915 - 38106	0.72	0.62	-0.21

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7591.24	V I	24771 - 37940	0.55	0.47	-0.32
7596.92	V I	19189 - 32349	0.17	0.15	-0.83
7598.28	V I	18805 - 31962	0.13	0.11	-0.96
7624.81	V I	25131 - 38242	1.5	1.3	0.12
7701.37	V I	18805 - 31786	0.049	0.044	-1.36
7704.81	V I	25131 - 38106	0.51	0.45	-0.34
7937.92	V I	24728 - 37322	1.2	1.1	0.06
8027.39	V I	8579 - 21033	0.015	0.015	-1.83
8093.48	V I	8476 - 20828	0.0070	0.0069	-2.16
8108.59	V I	25112 - 37441	0.64	0.63	-0.20
8109.07	V I	24899 - 37227	0.48	0.47	-0.33
8116.80	V I	8716 - 21033	0.062	0.061	-1.21
8136.79	V I	24830 - 37117	0.52	0.52	-0.28
8144.59	V I	8413 - 20688	0.014	0.014	-1.85
8154.55	V I	24899 - 37158	0.47	0.47	-0.33
8161.07	V I	8579 - 20828	0.035	0.035	-1.45
8171.35	V I	24993 - 37227	0.72	0.72	-0.14
8180.21	V I	20768 - 32989	0.11	0.11	-0.96
8186.71	V I	8476 - 20688	0.017	0.017	-1.77
8187.33	V I	25112 - 37322	1.2	1.2	0.10
8198.87	V I	8413 - 20606	0.014	0.014	-1.85
8203.07	V I	25254 - 37441	1.9	1.9	0.29
8241.61	V I	8476 - 20606	0.011	0.011	-1.94
8253.51	V I	8716 - 20828	0.015	0.015	-1.82
8255.88	V I	8579 - 20688	0.014	0.015	-1.83
8280.39	V I	25931 - 38004	0.30	0.31	-0.50
8282.37	V I	26172 - 38242	1.3	1.3	0.13
8324.42	V I	25931 - 37940	0.53	0.55	-0.26
8331.23	V I	26004 - 38004	0.92	0.96	-0.02
8342.03	V I	26122 - 38106	0.95	0.99	-0.01
8499.52	V I	26480 - 38242	0.83	0.90	-0.04
8534.49	V I	21646 - 33360	0.11	0.12	-0.94
8919.85	V I	9824 - 21033	0.034	0.041	-1.39
8932.93	V I	9637 - 20828	0.016	0.019	-1.71
8971.62	V I	9545 - 20688	0.0062	0.0075	-2.12

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2384.00	V II	8842 - 50775	9.3	0.79	-0.10
2479.05	V II	13543 - 53869	54.	4.9	0.69
2479.52	V II	13609 - 53927	36.	3.3	0.52
2482.31	V II	11908 - 52181	29.	2.7	0.42
2503.02	V II	8640 - 48580	21.	1.9	0.29
2506.22	V II	8842 - 48731	24.	2.3	0.35
2514.64	V II	9098 - 48853	27.	2.6	0.42
2527.90	V II	12706 - 52253	138.	13.	1.12
2528.47	V II	12545 - 52083	77.	7.4	0.87
2528.84	V II	12622 - 52154	97.	9.3	0.97
2534.52	V II	11296 - 50739	16.	1.5	0.18
2548.69	V II	11515 - 50739	32.	3.1	0.49
2549.28	V II	11908 - 51123	59.	5.7	0.76
2552.96	V II	13609 - 52767	64.	6.3	0.80
2553.67	V II	11515 - 50662	20.	1.9	0.28
2630.67	V II	14656 - 52658	103.	11.	1.03
2642.21	V II	14556 - 52392	89.	9.4	0.97
2644.36	V II	34746 - 72551	92.	9.6	0.98
2645.84	V II	14462 - 52246	57.	6.0	0.77
2655.68	V II	35193 - 72837	108.	11.	1.06
2658.98	V II	14656 - 52253	21.	2.2	0.34
2659.61	V II	17911 - 55499	30.	3.2	0.51
2672.00	V II	107 - 37521	5.0	0.53	-0.27
2677.80	V II	36 - 37369	6.3	0.68	-0.17
2678.57	V II	209 - 37531	4.7	0.51	-0.29
2679.32	V II	209 - 37521	6.6	0.71	-0.15
2682.87	V II	107 - 37369	3.0	0.33	-0.49
2683.09	V II	0 - 37259	2.9	0.32	-0.50
2685.69	V II	36 - 37259	1.1	0.12	-0.92
2687.96	V II	339 - 37531	19.	2.0	0.30
2688.72	V II	339 - 37521	2.9	0.31	-0.50
2689.88	V II	36 - 37201	2.4	0.26	-0.58
2690.24	V II	209 - 37369	3.8	0.41	-0.39
2690.79	V II	107 - 37259	3.9	0.43	-0.37
2700.94	V II	339 - 37352	11.	1.2	0.09
2702.19	V II	209 - 37205	6.1	0.66	-0.18
2705.22	V II	0 - 36955	0.68	0.075	-1.13
2706.17	V II	209 - 37151	8.4	0.92	-0.04
2706.70	V II	107 - 37041	2.3	0.25	-0.59
2707.86	V II	36 - 36955	1.6	0.17	-0.76
2711.74	V II	339 - 37205	2.7	0.30	-0.53
2713.05	V II	107 - 36955	0.91	0.10	-1.00
2714.20	V II	209 - 37041	1.9	0.21	-0.69
2715.69	V II	107 - 36919	9.6	1.1	0.02
2723.22	V II	209 - 36919	0.45	0.050	-1.30
2728.64	V II	36 - 36674	3.4	0.38	-0.42
2733.90	V II	107 - 36674	0.53	0.059	-1.23
2739.71	V II	0 - 36489	1.3	0.15	-0.83
2742.41	V II	36 - 36489	1.2	0.14	-0.87
2742.67	V II	3163 - 39613	0.97	0.11	-0.96

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2747.48	V II	19113 - 55499	63.	7.1	0.85
2753.40	V II	19192 - 55499	149.	17.	1.23
2760.12	V II	13512 - 49731	29.	3.3	0.51
2760.70	V II	19192 - 55403	94.	11.	1.03
2765.67	V II	12706 - 48853	54.	6.2	0.80
2766.46	V II	13595 - 49731	29.	3.3	0.52
2768.56	V II	12622 - 48731	32.	3.7	0.57
2774.28	V II	12545 - 48580	34.	4.0	0.60
2774.72	V II	19113 - 55142	46.	5.3	0.72
2775.76	V II	19192 - 55207	46.	5.3	0.73
2777.73	V II	13742 - 49731	65.	7.5	0.88
2797.02	V II	16341 - 52083	48.	5.6	0.75
2797.80	V II	16422 - 52154	54.	6.3	0.80
2798.76	V II	16533 - 52253	60.	7.1	0.85
2799.45	V II	13491 - 49202	39.	4.6	0.67
2802.80	V II	13543 - 49211	39.	4.7	0.67
2803.47	V II	13609 - 49269	53.	6.3	0.80
2805.54	V II	18294 - 53927	27.	3.2	0.51
2810.16	V II	18294 - 53869	81.	9.6	0.98
2810.27	V II	18354 - 53927	81.	9.6	0.98
2817.50	V II	18269 - 53751	53.	6.3	0.80
2836.52	V II	13609 - 48853	25.	3.0	0.48
2841.04	V II	13543 - 48731	24.	2.9	0.47
2845.24	V II	20363 - 55499	49.	5.9	0.77
2847.57	V II	20242 - 55350	112.	14.	1.13
2849.05	V II	13491 - 48580	12.	1.4	0.16
2850.69	V II	22274 - 57343	95.	12.	1.07
2854.34	V II	20280 - 55304	144.	18.	1.24
2869.13	V II	20363 - 55207	143.	18.	1.25
2869.96	V II	2687 - 37521	0.56	0.070	-1.16
2877.69	V II	14462 - 49202	47.	5.9	0.77
2879.16	V II	2809 - 37531	2.0	0.25	-0.61
2880.03	V II	2809 - 37521	6.5	0.81	-0.09
2882.50	V II	2687 - 37369	6.8	0.84	-0.07
2884.78	V II	2605 - 37259	6.6	0.82	-0.09
2888.25	V II	14656 - 49269	65.	8.1	0.91
2889.62	V II	2605 - 37201	6.5	0.81	-0.09
2891.64	V II	2687 - 37259	16.	2.0	0.30
2892.44	V II	2968 - 37531	10.0	1.2	0.10
2892.66	V II	2809 - 37369	16.	2.0	0.31
2893.32	V II	2968 - 37521	27.	3.4	0.53
2896.21	V II	2687 - 37205	6.2	0.78	-0.11
2903.08	V II	2605 - 37041	6.0	0.75	-0.12
2906.46	V II	2809 - 37205	16.	2.0	0.30
2907.47	V II	2968 - 37352	8.8	1.1	0.05
2908.44	V II	20343 - 54716	46.	5.8	0.77
2908.82	V II	3163 - 37531	46.	5.8	0.76
2910.02	V II	2687 - 37041	12.	1.5	0.18
2910.39	V II	2605 - 36955	8.5	1.1	0.03
2911.06	V II	2809 - 37151	9.6	1.2	0.09

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2917.37	V II	2687 - 36955	2.0	0.25	-0.60
2919.99	V II	2968 - 37205	3.7	0.47	-0.33
2920.38	V II	2687 - 36919	6.0	0.77	-0.11
2924.02	V II	3163 - 37352	44.	5.6	0.75
2924.64	V II	2968 - 37151	28.	3.6	0.56
2930.13	V II	14462 - 48580	21.	2.7	0.44
2930.81	V II	2809 - 36919	12.	1.5	0.17
2932.32	V II	20623 - 54716	70.	9.0	0.95
2934.40	V II	2605 - 36674	3.2	0.41	-0.39
2938.25	V II	14556 - 48580	12.	1.6	0.20
2941.37	V II	3163 - 37151	16.	2.0	0.31
2941.49	V II	2687 - 36674	6.8	0.88	-0.05
2944.57	V II	2968 - 36919	17.	2.2	0.35
2949.17	V II	22274 - 56171	72.	9.3	0.97
2950.35	V II	2605 - 36489	4.3	0.56	-0.25
2952.08	V II	2809 - 36674	9.7	1.3	0.10
2957.52	V II	2687 - 36489	3.7	0.48	-0.32
2968.38	V II	13742 - 47420	189.	25.	1.40
2972.25	V II	19133 - 52767	99.	13.	1.12
2975.65	V II	13512 - 47108	26.	3.5	0.54
2976.20	V II	13512 - 47102	35.	4.7	0.67
2976.52	V II	13595 - 47181	112.	15.	1.17
2981.20	V II	19166 - 52700	49.	6.6	0.82
2988.02	V II	13595 - 47052	26.	3.5	0.54
2989.60	V II	13742 - 47181	13.	1.8	0.26
2994.54	V II	30673 - 64057	144.	19.	1.29
2996.00	V II	13512 - 46880	21.	2.8	0.45
3001.20	V II	13742 - 47052	74.	10.	1.00
3003.46	V II	13595 - 46880	25.	3.4	0.53
3008.61	V II	13512 - 46740	12.	1.6	0.22
3013.10	V II	13512 - 46690	24.	3.3	0.51
3014.82	V II	13595 - 46755	37.	5.0	0.70
3016.78	V II	13742 - 46880	50.	6.9	0.84
3033.45	V II	20363 - 53320	245.	34.	1.53
3033.82	V II	14656 - 47608	96.	13.	1.12
3041.42	V II	16341 - 49211	21.	3.0	0.47
3042.26	V II	16341 - 49202	43.	5.9	0.77
3048.22	V II	20280 - 53077	199.	28.	1.44
3048.89	V II	16422 - 49211	43.	6.0	0.78
3053.39	V II	14556 - 47297	57.	7.9	0.90
3053.89	V II	16533 - 49269	33.	4.6	0.66
3063.25	V II	20242 - 52878	124.	17.	1.24
3067.12	V II	14462 - 47056	58.	8.2	0.91
3093.11	V II	3163 - 35483	43.	6.1	0.79
3094.20	V II	16422 - 48731	86.	12.	1.09
3100.94	V II	16341 - 48580	77.	11.	1.04
3102.30	V II	2968 - 35193	32.	4.6	0.66
3110.71	V II	2809 - 34947	25.	3.6	0.56
3113.57	V II	23391 - 55499	107.	15.	1.19
3118.38	V II	2687 - 34746	18.	2.7	0.42

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3120.73	V II	20623 - 52658	64.	9.4	0.97
3121.14	V II	3163 - 35193	4.0	0.58	-0.24
3122.90	V II	23391 - 55403	177.	26.	1.41
3125.28	V II	2605 - 34593	13.	2.0	0.29
3126.22	V II	2968 - 34947	2.5	0.37	-0.43
3130.27	V II	2809 - 34746	4.9	0.72	-0.14
3133.33	V II	2687 - 34593	3.7	0.55	-0.26
3134.93	V II	20363 - 52253	171.	25.	1.40
3136.51	V II	20280 - 52154	121.	18.	1.25
3139.74	V II	20242 - 52083	120.	18.	1.25
3142.48	V II	17911 - 49724	106.	16.	1.19
3145.34	V II	3163 - 34947	1.5	0.22	-0.65
3145.97	V II	2968 - 34746	0.49	0.073	-1.13
3146.23	V II	20617 - 52392	38.	5.6	0.75
3151.32	V II	20522 - 52246	31.	4.6	0.66
3164.83	V II	8842 - 40430	1.8	0.26	-0.58
3168.14	V II	8640 - 40196	2.3	0.35	-0.46
3187.71	V II	8640 - 40002	17.	2.6	0.42
3188.51	V II	8842 - 40196	23.	3.6	0.55
3190.68	V II	9098 - 40430	36.	5.4	0.73
3208.35	V II	8842 - 40002	3.2	0.49	-0.31
3214.75	V II	9098 - 40196	3.4	0.52	-0.28
3217.11	V II	16533 - 47608	75.	12.	1.07
3237.87	V II	16422 - 47297	50.	7.9	0.90
3250.78	V II	23391 - 54144	56.	8.9	0.95
3251.87	V II	20343 - 51086	27.	4.2	0.63
3254.77	V II	16340 - 47056	43.	6.8	0.83
3267.70	V II	8640 - 39234	36.	5.8	0.77
3271.12	V II	8842 - 39404	33.	5.3	0.72
3276.12	V II	9098 - 39613	29.	4.7	0.67
3279.84	V II	19113 - 49593	58.	9.4	0.97
3282.53	V II	19113 - 49568	29.	4.7	0.67
3289.39	V II	8842 - 39234	3.1	0.51	-0.29
3298.74	V II	9098 - 39404	3.3	0.54	-0.27
3321.54	V II	19113 - 49211	27.	4.5	0.65
3485.92	V II	8842 - 37521	2.6	0.47	-0.33
3493.17	V II	8640 - 37259	1.1	0.20	-0.69
3497.03	V II	20981 - 49568	53.	9.7	0.99
3504.44	V II	8842 - 37369	4.6	0.85	-0.07
3517.30	V II	9098 - 37521	13.	2.4	0.38
3520.02	V II	8640 - 37041	3.0	0.56	-0.25
3524.72	V II	8842 - 37205	2.4	0.44	-0.35
3530.77	V II	8640 - 36955	4.4	0.83	-0.08
3545.20	V II	8842 - 37041	11.	2.1	0.33
3556.80	V II	9098 - 37205	12.	2.3	0.36
3560.60	V II	8842 - 36919	1.0	0.20	-0.71
3589.76	V II	8640 - 36489	9.9	1.9	0.28
3592.02	V II	8842 - 36674	9.0	1.7	0.24
3593.33	V II	9098 - 36919	5.4	1.0	0.02
3669.41	V II	20363 - 47608	37.	7.4	0.87

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3715.47	V II	12706 - 39613	11.	2.3	0.36
3727.34	V II	13609 - 40430	11.	2.3	0.35
3728.34	V II	20242 - 47056	14.	2.8	0.45
3732.76	V II	12622 - 39404	9.3	2.0	0.29
3745.80	V II	12545 - 39234	7.2	1.5	0.18
3750.87	V II	13543 - 40196	8.6	1.8	0.26
3770.97	V II	13491 - 40002	8.2	1.7	0.24
3878.71	V II	14656 - 40430	6.1	1.4	0.14
3899.13	V II	14556 - 40196	4.5	1.0	0.01
3903.26	V II	11908 - 37521	0.77	0.18	-0.76
3914.33	V II	14462 - 40002	4.3	0.98	-0.01
3916.41	V II	11515 - 37041	1.3	0.31	-0.51
3951.97	V II	11908 - 37205	2.0	0.46	-0.34
3968.09	V II	11296 - 36489	0.58	0.14	-0.86
3973.64	V II	11515 - 36674	1.2	0.29	-0.54
3997.12	V II	11908 - 36919	0.66	0.16	-0.80
4005.71	V II	14656 - 39613	4.6	1.1	0.05
4023.39	V II	14556 - 39404	3.0	0.73	-0.13
4035.63	V II	14462 - 39234	3.9	0.94	-0.03

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2182.90	W I	6219 - 52015	1.2	0.086	-1.06
2249.84	W I	1670 - 46105	0.75	0.057	-1.24
2271.37	W I	3326 - 47338	0.26	0.020	-1.70
2277.58	W I	0 - 43893	0.59	0.046	-1.34
2284.90	W I	1670 - 45422	0.30	0.024	-1.62
2285.17	W I	6219 - 49966	1.8	0.14	-0.85
2294.49	W I	6219 - 49789	3.5	0.28	-0.56
2298.28	W I	4830 - 48326	1.3	0.10	-0.98
2306.60	W I	2951 - 46292	0.81	0.065	-1.19
2309.04	W I	6219 - 49514	2.5	0.20	-0.70
2313.19	W I	0 - 43217	0.66	0.053	-1.27
2314.18	W I	6219 - 49418	1.7	0.13	-0.88
2318.94	W I	15070 - 58179	2.4	0.19	-0.71
2321.63	W I	3326 - 46385	1.9	0.15	-0.82
2326.56	W I	6219 - 49188	3.2	0.26	-0.59
2331.30	W I	12162 - 55043	3.7	0.30	-0.52
2341.37	W I	1670 - 44367	0.58	0.048	-1.32
2343.13	W I	17008 - 59673	2.2	0.18	-0.75
2347.97	W I	3326 - 45902	0.32	0.027	-1.57
2354.61	W I	6219 - 48676	3.3	0.27	-0.57
2358.07	W I	12162 - 54557	1.6	0.13	-0.87
2360.43	W I	3326 - 45678	3.0	0.25	-0.59
2363.06	W I	1670 - 43975	2.7	0.23	-0.64
2365.45	W I	0 - 42262	0.23	0.019	-1.72
2365.85	W I	17008 - 59264	4.6	0.39	-0.41
2366.18	W I	4830 - 47079	0.89	0.075	-1.13
2366.95	W I	9528 - 51763	1.9	0.16	-0.80
2367.68	W I	1670 - 43893	0.51	0.043	-1.37
2370.88	W I	2951 - 45117	0.51	0.043	-1.37
2371.39	W I	17107 - 59264	1.6	0.13	-0.87
2374.14	W I	6219 - 48326	0.61	0.052	-1.29
2374.46	W I	4830 - 46932	4.4	0.37	-0.43
2374.76	W I	3326 - 45422	0.48	0.040	-1.40
2376.07	W I	15070 - 57143	4.0	0.34	-0.47
2376.56	W I	17107 - 59172	2.4	0.20	-0.70
2382.99	W I	6219 - 48171	2.6	0.22	-0.65
2384.82	W I	6219 - 48138	8.5	0.73	-0.14
2386.17	W I	17008 - 58904	4.6	0.39	-0.41
2389.07	W I	1670 - 43515	0.93	0.080	-1.10
2397.72	W I	3326 - 45019	3.7	0.32	-0.49
2397.98	W I	3326 - 45015	3.7	0.32	-0.50
2399.04	W I	17107 - 58778	3.9	0.34	-0.47
2401.29	W I	6219 - 47851	0.49	0.043	-1.37
2402.44	W I	13778 - 55389	5.0	0.43	-0.37
2405.26	W I	13349 - 54912	2.4	0.21	-0.69
2405.58	W I	1670 - 43228	7.3	0.64	-0.20
2409.03	W I	4830 - 46328	1.1	0.093	-1.03
2410.63	W I	6219 - 47689	0.90	0.078	-1.11
2414.04	W I	3326 - 44737	2.3	0.20	-0.70
2415.68	W I	1670 - 43054	2.8	0.25	-0.61

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2416.23	W I	6219 - 47593	0.88	0.077	-1.11
2420.20	W I	13778 - 55084	3.4	0.30	-0.53
2422.28	W I	3326 - 44596	1.0	0.090	-1.05
2422.66	W I	6219 - 47484	0.72	0.063	-1.20
2424.22	W I	4830 - 46068	14.	1.2	0.09
2425.98	W I	13349 - 54557	15.	1.3	0.11
2427.29	W I	15070 - 56256	11.	0.96	-0.02
2429.84	W I	6219 - 47362	3.6	0.32	-0.49
2430.44	W I	14976 - 56109	11.	0.95	-0.02
2431.08	W I	3326 - 44447	6.2	0.55	-0.26
2433.98	W I	4830 - 45902	10.	0.91	-0.04
2435.96	W I	4830 - 45869	29.	2.6	0.42
2436.26	W I	2951 - 43985	0.27	0.024	-1.62
2436.62	W I	3326 - 44353	2.6	0.24	-0.63
2437.96	W I	9528 - 50534	1.3	0.12	-0.92
2443.33	W I	19826 - 60741	3.7	0.33	-0.48
2443.62	W I	17008 - 57919	13.	1.1	0.05
2444.06	W I	1670 - 42573	4.0	0.36	-0.44
2448.39	W I	12162 - 52993	22.	1.9	0.29
2451.34	W I	12162 - 52943	22.	1.9	0.29
2452.00	W I	0 - 40771	4.0	0.36	-0.45
2454.71	W I	15070 - 55796	46.	4.2	0.62
2454.97	W I	4830 - 45551	11.	1.00	-0.00
2455.50	W I	6219 - 46932	20.	1.8	0.26
2456.53	W I	3326 - 44020	8.8	0.80	-0.10
2459.30	W I	3326 - 43975	12.	1.1	0.04
2460.16	W I	6219 - 46855	7.0	0.63	-0.20
2461.57	W I	12162 - 52774	15.	1.4	0.14
2462.79	W I	1670 - 42262	3.4	0.31	-0.51
2464.31	W I	3326 - 43893	3.0	0.27	-0.56
2465.20	W I	17008 - 57561	12.	1.1	0.05
2466.85	W I	3326 - 43851	15.	1.3	0.13
2471.21	W I	17107 - 57561	9.8	0.90	-0.04
2472.51	W I	4830 - 45263	7.9	0.72	-0.14
2473.69	W I	14976 - 55389	10.	0.94	-0.03
2474.15	W I	6219 - 46625	28.	2.6	0.42
2480.13	W I	1670 - 41979	5.6	0.52	-0.28
2480.65	W I	2951 - 43251	0.36	0.033	-1.48
2480.95	W I	1670 - 41965	2.5	0.23	-0.64
2481.44	W I	6219 - 46506	37.	3.4	0.53
2482.10	W I	2951 - 43228	4.5	0.41	-0.39
2484.74	W I	12162 - 52395	43.	4.0	0.60
2487.49	W I	4830 - 45019	5.9	0.55	-0.26
2488.91	W I	6219 - 46385	2.7	0.25	-0.60
2489.72	W I	3326 - 43479	0.67	0.062	-1.20
2490.84	W I	17008 - 57143	9.6	0.89	-0.05
2493.39	W I	12162 - 52256	5.0	0.46	-0.33
2495.26	W I	1670 - 41734	3.8	0.36	-0.45
2496.97	W I	17107 - 57143	6.0	0.56	-0.25
2499.44	W I	13349 - 53346	8.2	0.77	-0.11

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2501.78	W I	2951 - 42911	1.3	0.12	-0.91
2503.04	W I	15070 - 55009	1.4	0.13	-0.88
2504.53	W I	9528 - 49444	3.2	0.30	-0.53
2504.70	W I	1670 - 41583	4.0	0.37	-0.43
2505.38	W I	3326 - 43228	0.36	0.034	-1.47
2505.65	W I	12162 - 52060	7.0	0.66	-0.18
2506.03	W I	3326 - 43217	2.5	0.24	-0.63
2508.44	W I	12162 - 52015	6.9	0.65	-0.18
2508.74	W I	6219 - 46068	4.1	0.39	-0.41
2510.16	W I	15070 - 54896	26.	2.4	0.38
2513.93	W I	4830 - 44596	1.9	0.18	-0.75
2516.58	W I	17107 - 56832	11.	1.0	0.01
2518.50	W I	12162 - 51856	2.0	0.19	-0.71
2520.45	W I	15070 - 54733	31.	3.0	0.47
2521.32	W I	2951 - 42601	6.1	0.58	-0.24
2523.41	W I	4830 - 44447	10.	0.98	-0.01
2524.81	W I	13349 - 52943	6.3	0.61	-0.22
2526.42	W I	6219 - 45790	1.9	0.18	-0.75
2529.72	W I	17008 - 56527	23.	2.2	0.35
2530.99	W I	2951 - 42450	0.18	0.018	-1.76
2533.63	W I	1670 - 41127	4.0	0.39	-0.41
2533.98	W I	15460 - 54912	3.0	0.29	-0.54
2535.10	W I	1670 - 41104	0.45	0.043	-1.36
2539.31	W I	19535 - 58904	9.7	0.94	-0.03
2541.69	W I	6219 - 45551	1.4	0.14	-0.87
2545.34	W I	3326 - 42601	4.6	0.45	-0.35
2547.14	W I	3326 - 42573	9.1	0.89	-0.05
2548.15	W I	6219 - 45452	0.60	0.058	-1.23
2550.37	W I	1670 - 40868	3.8	0.37	-0.43
2551.00	W I	3326 - 42514	1.0	0.10	-0.99
2551.35	W I	0 - 39183	8.2	0.80	-0.10
2551.98	W I	17107 - 56280	3.4	0.34	-0.47
2553.16	W I	4830 - 43985	2.0	0.20	-0.70
2553.82	W I	4830 - 43975	5.2	0.51	-0.29
2556.74	W I	1670 - 40771	1.5	0.14	-0.84
2557.56	W I	13349 - 52436	6.0	0.59	-0.23
2560.12	W I	15070 - 54119	28.	2.7	0.44
2561.51	W I	2951 - 41979	0.58	0.057	-1.24
2561.96	W I	4830 - 43851	8.2	0.81	-0.09
2564.68	W I	17008 - 55988	17.	1.7	0.22
2567.50	W I	3326 - 42262	0.98	0.097	-1.01
2568.21	W I	3326 - 42251	0.91	0.090	-1.05
2568.56	W I	2951 - 41872	0.63	0.062	-1.21
2568.98	W I	19648 - 58563	11.	1.1	0.04
2569.25	W I	12162 - 51072	12.	1.2	0.09
2570.09	W I	6219 - 45117	2.5	0.25	-0.60
2573.53	W I	13307 - 52153	14.	1.4	0.16
2575.46	W I	19828 - 58644	6.9	0.69	-0.16
2577.02	W I	15070 - 53863	13.	1.3	0.10
2579.40	W I	13307 - 52064	14.	1.4	0.16

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2580.33	W I	2951 - 41694	1.8	0.18	-0.74
2580.49	W I	1670 - 40411	3.8	0.38	-0.42
2581.06	W I	12162 - 50894	8.4	0.84	-0.08
2584.38	W I	17008 - 55691	44.	4.4	0.64
2585.43	W I	13349 - 52015	7.8	0.79	-0.10
2586.34	W I	3326 - 41979	0.26	0.026	-1.58
2586.64	W I	4830 - 43479	0.50	0.050	-1.30
2586.94	W I	12162 - 50806	7.1	0.71	-0.15
2587.76	W I	2951 - 41583	0.58	0.059	-1.23
2593.38	W I	2951 - 41499	0.40	0.040	-1.39
2596.67	W I	15460 - 53959	6.4	0.65	-0.19
2597.73	W I	17008 - 55492	8.7	0.88	-0.06
2598.42	W I	17701 - 56175	8.1	0.82	-0.09
2600.74	W I	17107 - 55546	8.7	0.89	-0.05
2601.96	W I	4830 - 43251	3.6	0.36	-0.44
2602.80	W I	3326 - 41734	0.80	0.081	-1.09
2603.54	W I	4830 - 43228	2.6	0.27	-0.57
2604.38	W I	17107 - 55492	16.	1.7	0.22
2605.51	W I	3326 - 41694	1.1	0.11	-0.95
2606.39	W I	0 - 38356	1.7	0.17	-0.77
2606.90	W I	17107 - 55455	8.7	0.88	-0.05
2607.38	W I	1670 - 40011	1.2	0.13	-0.90
2608.32	W I	6219 - 44547	5.2	0.53	-0.28
2612.19	W I	19648 - 57919	25.	2.6	0.41
2613.07	W I	3326 - 41583	5.9	0.60	-0.22
2613.82	W I	2951 - 41198	2.6	0.27	-0.57
2615.12	W I	6219 - 44447	3.2	0.33	-0.49
2618.81	W I	3326 - 41499	1.2	0.12	-0.93
2619.18	W I	15070 - 53238	22.	2.3	0.36
2620.23	W I	2951 - 41104	2.6	0.27	-0.57
2622.21	W I	15070 - 53194	42.	4.4	0.64
2625.22	W I	4830 - 42911	4.3	0.45	-0.35
2626.24	W I	14976 - 53042	8.3	0.86	-0.06
2628.25	W I	1670 - 39707	0.91	0.094	-1.03
2632.49	W I	12162 - 50137	27.	2.8	0.45
2632.70	W I	2951 - 40924	2.5	0.26	-0.59
2633.13	W I	1670 - 39637	3.4	0.36	-0.45
2636.55	W I	2951 - 40868	1.8	0.18	-0.74
2638.61	W I	19256 - 57143	64.	6.6	0.82
2643.12	W I	13778 - 51600	14.	1.4	0.16
2644.60	W I	6219 - 44020	1.2	0.12	-0.90
2645.69	W I	15070 - 52856	21.	2.2	0.35
2646.19	W I	3326 - 41104	4.2	0.44	-0.36
2646.74	W I	4830 - 42601	4.0	0.42	-0.38
2647.10	W I	6219 - 43985	2.4	0.25	-0.61
2649.98	W I	17008 - 54733	10.	1.1	0.03
2652.61	W I	16431 - 54119	19.	2.0	0.31
2654.67	W I	15460 - 53118	14.	1.4	0.16
2656.54	W I	2951 - 40583	9.1	0.96	-0.02
2657.38	W I	4830 - 42450	3.8	0.41	-0.39

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2660.52	W I	19256 - 56832	13.	1.3	0.12
2661.56	W I	13349 - 50909	6.2	0.66	-0.18
2662.84	W I	3326 - 40868	4.9	0.52	-0.28
2663.94	W I	14976 - 52503	7.9	0.84	-0.08
2664.32	W I	6219 - 43741	2.2	0.24	-0.63
2664.96	W I	1670 - 39183	0.98	0.10	-0.98
2665.77	W I	6219 - 43721	2.2	0.23	-0.63
2669.30	W I	13349 - 50800	16.	1.7	0.23
2669.77	W I	3326 - 40771	0.24	0.026	-1.59
2671.47	W I	4830 - 42251	7.3	0.78	-0.11
2675.13	W I	13349 - 50719	3.0	0.32	-0.49
2675.40	W I	15070 - 52436	3.9	0.42	-0.38
2675.87	W I	1670 - 39030	0.47	0.051	-1.30
2677.28	W I	3326 - 40666	3.7	0.40	-0.40
2678.52	W I	19826 - 57149	6.5	0.70	-0.16
2678.88	W I	2951 - 40269	2.1	0.22	-0.65
2680.04	W I	17008 - 54310	16.	1.7	0.23
2681.41	W I	2951 - 40234	11.	1.2	0.06
2683.34	W I	12162 - 49418	17.	1.9	0.27
2687.37	W I	18974 - 56175	12.	1.3	0.11
2691.09	W I	4830 - 41979	1.8	0.19	-0.72
2692.16	W I	18974 - 56108	5.9	0.65	-0.19
2695.67	W I	3326 - 40411	3.5	0.38	-0.42
2697.51	W I	2951 - 40011	0.63	0.068	-1.17
2698.84	W I	4830 - 41872	1.3	0.14	-0.84
2699.59	W I	6219 - 43251	7.8	0.85	-0.07
2700.01	W I	12162 - 49188	23.	2.5	0.40
2702.52	W I	19535 - 56527	32.	3.5	0.55
2706.01	W I	3326 - 40269	0.42	0.046	-1.33
2706.58	W I	13349 - 50285	28.	3.1	0.49
2707.88	W I	19256 - 56175	9.6	1.1	0.02
2708.18	W I	16431 - 53346	4.5	0.49	-0.31
2708.58	W I	15070 - 51979	37.	4.1	0.61
2708.79	W I	1670 - 38576	1.3	0.14	-0.84
2715.50	W I	6219 - 43034	4.6	0.51	-0.29
2717.53	W I	14976 - 51763	7.2	0.80	-0.10
2718.90	W I	2951 - 39720	9.4	1.0	0.02
2719.33	W I	16431 - 53194	35.	3.9	0.59
2719.86	W I	2951 - 39707	0.94	0.10	-0.98
2722.68	W I	14976 - 51694	14.	1.6	0.20
2724.35	W I	2951 - 39646	11.	1.3	0.10
2724.63	W I	6219 - 42911	2.3	0.26	-0.59
2725.03	W I	3326 - 40011	2.0	0.22	-0.66
2727.95	W I	6219 - 42866	1.4	0.16	-0.80
2733.18	W I	9528 - 46105	2.3	0.26	-0.59
2735.97	W I	19256 - 55796	5.9	0.66	-0.18
2738.00	W I	16431 - 52943	4.3	0.48	-0.32
2743.42	W I	13349 - 49789	11.	1.2	0.07
2744.34	W I	19828 - 56256	12.	1.4	0.14
2746.74	W I	15460 - 51856	7.4	0.84	-0.08

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2748.85	W I	4830 - 41198	4.5	0.50	-0.30
2754.92	W I	13349 - 49637	5.1	0.58	-0.23
2755.26	W I	17107 - 53390	4.6	0.52	-0.28
2755.94	W I	4830 - 41104	0.54	0.062	-1.21
2760.03	W I	15070 - 51291	3.4	0.39	-0.41
2762.34	W I	0 - 36190	0.68	0.078	-1.11
2768.98	W I	1670 - 37774	0.56	0.064	-1.19
2769.74	W I	4830 - 40924	2.6	0.30	-0.52
2770.88	W I	2951 - 39030	3.0	0.35	-0.46
2774.00	W I	4830 - 40868	5.1	0.59	-0.23
2774.48	W I	6219 - 42251	7.6	0.87	-0.06
2779.72	W I	16431 - 52395	16.	1.9	0.27
2780.28	W I	19535 - 55492	12.	1.3	0.13
2783.12	W I	19535 - 55455	23.	2.7	0.43
2785.88	W I	18974 - 54859	5.5	0.64	-0.20
2787.98	W I	3326 - 39183	0.83	0.097	-1.01
2789.07	W I	19648 - 55492	19.	2.2	0.34
2789.68	W I	4830 - 40666	0.24	0.028	-1.55
2791.95	W I	12162 - 47969	16.	1.8	0.26
2792.70	W I	2951 - 38748	2.8	0.33	-0.48
2796.15	W I	4830 - 40583	0.48	0.056	-1.25
2797.20	W I	13778 - 49517	2.5	0.30	-0.52
2799.92	W I	3326 - 39030	1.5	0.18	-0.74
2802.95	W I	13778 - 49444	5.0	0.59	-0.23
2804.01	W I	6219 - 41872	0.69	0.081	-1.09
2804.24	W I	16431 - 52081	13.	1.5	0.17
2804.67	W I	17701 - 53346	9.2	1.1	0.04
2805.63	W I	18117 - 53749	16.	1.8	0.26
2807.72	W I	19254 - 54859	11.	1.3	0.11
2813.13	W I	17701 - 53238	4.6	0.54	-0.27
2815.45	W I	19535 - 55043	11.	1.3	0.13
2818.06	W I	6219 - 41694	6.6	0.78	-0.11
2827.15	W I	19648 - 55009	18.	2.2	0.33
2829.82	W I	13349 - 48676	14.	1.7	0.22
2830.29	W I	12162 - 47484	1.7	0.20	-0.70
2831.38	W I	2951 - 38259	5.0	0.60	-0.22
2833.63	W I	6219 - 41499	6.3	0.75	-0.12
2835.64	W I	2951 - 38206	0.64	0.077	-1.11
2836.25	W I	19648 - 54896	11.	1.3	0.13
2837.34	W I	1670 - 36904	0.24	0.029	-1.54
2837.76	W I	18117 - 53345	4.7	0.57	-0.25
2838.89	W I	15070 - 50285	3.0	0.36	-0.44
2839.34	W I	9528 - 44737	2.5	0.30	-0.52
2841.57	W I	4830 - 40011	2.1	0.25	-0.60
2842.56	W I	16431 - 51600	3.7	0.45	-0.35
2847.82	W I	3326 - 38430	0.53	0.064	-1.19
2848.03	W I	2951 - 38053	2.4	0.29	-0.54
2849.46	W I	19828 - 54912	22.	2.7	0.44
2850.80	W I	15070 - 50138	9.3	1.1	0.06
2853.49	W I	15460 - 50495	6.2	0.76	-0.12

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2853.84	W I	3326 - 38356	0.13	0.016	-1.80
2855.35	W I	13307 - 48319	4.1	0.50	-0.30
2856.03	W I	1670 - 36674	1.3	0.16	-0.80
2857.13	W I	14976 - 49966	5.7	0.69	-0.16
2858.04	W I	6219 - 41198	1.2	0.14	-0.85
2863.01	W I	1670 - 36588	0.25	0.031	-1.51
2863.88	W I	19826 - 54733	18.	2.2	0.34
2866.06	W I	3326 - 38206	2.0	0.25	-0.61
2866.37	W I	4830 - 39707	0.19	0.023	-1.63
2870.90	W I	13349 - 48171	2.0	0.25	-0.61
2871.37	W I	4830 - 39646	0.60	0.074	-1.13
2875.21	W I	12162 - 46932	4.8	0.59	-0.23
2878.72	W I	3326 - 38053	0.67	0.084	-1.08
2879.11	W I	2951 - 37674	1.6	0.20	-0.70
2879.39	W I	0 - 34719	0.70	0.087	-1.06
2880.63	W I	6219 - 40924	0.27	0.034	-1.47
2884.18	W I	19648 - 54310	12.	1.5	0.16
2887.66	W I	13349 - 47969	4.2	0.53	-0.28
2893.12	W I	17701 - 52256	4.1	0.52	-0.29
2894.25	W I	13778 - 48319	2.1	0.26	-0.59
2896.01	W I	1670 - 36190	0.79	0.099	-1.01
2896.45	W I	2951 - 37466	3.9	0.49	-0.31
2900.52	W I	13778 - 48244	2.4	0.31	-0.51
2901.78	W I	17701 - 52153	4.9	0.62	-0.21
2907.26	W I	18117 - 52503	5.2	0.65	-0.18
2908.26	W I	16431 - 50806	7.3	0.93	-0.03
2909.12	W I	9528 - 43893	1.4	0.18	-0.75
2910.48	W I	3326 - 37674	0.61	0.078	-1.11
2911.00	W I	0 - 34342	0.29	0.037	-1.43
2915.11	W I	14976 - 49270	5.6	0.71	-0.15
2917.67	W I	18974 - 53238	5.7	0.73	-0.14
2918.25	W I	6219 - 40476	2.1	0.27	-0.57
2923.10	W I	4830 - 39030	1.4	0.18	-0.74
2923.54	W I	2951 - 37146	0.53	0.068	-1.17
2925.12	W I	15460 - 49637	15.	2.0	0.29
2926.98	W I	17701 - 51856	8.7	1.1	0.05
2927.93	W I	18974 - 53118	5.6	0.72	-0.14
2928.19	W I	3326 - 37466	0.23	0.029	-1.53
2928.66	W I	13349 - 47484	2.1	0.27	-0.57
2930.15	W I	15070 - 49188	5.0	0.65	-0.19
2934.99	W I	1670 - 35732	1.1	0.14	-0.85
2935.62	W I	15460 - 49514	3.2	0.41	-0.38
2936.00	W I	6219 - 40269	0.55	0.071	-1.15
2937.14	W I	19826 - 53863	12.	1.6	0.20
2939.04	W I	6219 - 40234	0.77	0.100	-1.00
2941.24	W I	13349 - 47338	2.0	0.26	-0.58
2944.40	W I	2951 - 36904	5.3	0.69	-0.16
2946.98	W I	2951 - 36874	5.3	0.69	-0.16
2947.38	W I	4830 - 38748	1.8	0.23	-0.63
2960.14	W I	13307 - 47079	3.8	0.50	-0.30

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2964.52	W I	2951 - 36674	0.92	0.12	-0.92
2966.57	W I	17107 - 50806	8.2	1.1	0.03
2967.07	W I	17107 - 50800	4.1	0.54	-0.27
2967.55	W I	15460 - 49148	3.0	0.40	-0.40
2969.62	W I	13778 - 47443	3.5	0.46	-0.34
2971.67	W I	1670 - 35311	0.21	0.027	-1.56
2972.92	W I	12162 - 45790	4.0	0.52	-0.28
2976.79	W I	13349 - 46932	3.7	0.49	-0.31
2977.10	W I	19648 - 53228	58.	7.7	0.89
2982.61	W I	19256 - 52774	16.	2.2	0.34
2984.14	W I	6219 - 39720	0.48	0.064	-1.19
2990.51	W I	4830 - 38259	0.50	0.067	-1.17
2990.71	W I	6219 - 39646	0.23	0.031	-1.50
2993.61	W I	6219 - 39614	1.9	0.26	-0.58
2995.26	W I	4830 - 38206	0.78	0.11	-0.98
2997.79	W I	3326 - 36674	0.41	0.055	-1.26
3000.24	W I	19535 - 52856	5.6	0.75	-0.12
3001.98	W I	13778 - 47079	3.2	0.44	-0.36
3002.82	W I	19826 - 53118	5.8	0.78	-0.11
3009.08	W I	4830 - 38053	0.60	0.082	-1.09
3013.79	W I	4830 - 38001	1.1	0.15	-0.83
3016.47	W I	6219 - 39361	2.4	0.32	-0.49
3017.44	W I	2951 - 36082	1.4	0.19	-0.73
3024.92	W I	1670 - 34719	0.26	0.035	-1.45
3026.68	W I	19826 - 52856	36.	4.9	0.69
3033.58	W I	12162 - 45117	3.7	0.51	-0.29
3034.20	W I	19826 - 52774	19.	2.6	0.41
3041.74	W I	15460 - 48326	24.	3.3	0.52
3043.81	W I	4830 - 37674	0.78	0.11	-0.97
3046.45	W I	1670 - 34486	0.51	0.071	-1.15
3048.66	W I	18280 - 51072	10.	1.4	0.15
3049.69	W I	2951 - 35732	1.3	0.18	-0.73
3054.01	W I	9528 - 42262	0.58	0.082	-1.09
3064.94	W I	3326 - 35943	0.20	0.028	-1.56
3073.28	W I	6219 - 38748	0.69	0.097	-1.01
3084.82	W I	17107 - 49514	12.	1.8	0.25
3089.18	W I	14976 - 47338	4.2	0.61	-0.22
3090.58	W I	19254 - 51600	6.4	0.92	-0.04
3093.51	W I	4830 - 37146	0.92	0.13	-0.88
3105.88	W I	19828 - 52015	6.9	0.99	-0.00
3107.23	W I	3326 - 35499	0.38	0.055	-1.26
3108.02	W I	2951 - 35117	0.34	0.049	-1.31
3111.12	W I	15460 - 47593	3.0	0.44	-0.36
3117.58	W I	13307 - 45374	5.7	0.84	-0.08
3120.18	W I	6219 - 38259	0.88	0.13	-0.89
3133.89	W I	13778 - 45678	4.5	0.66	-0.18
3141.42	W I	12162 - 43985	2.2	0.33	-0.48
3152.96	W I	16431 - 48138	3.5	0.52	-0.29
3155.10	W I	18280 - 49966	5.0	0.75	-0.13
3159.18	W I	13778 - 45422	2.5	0.38	-0.42

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3163.42	W I	15070 - 46672	11.	1.7	0.22
3164.44	W I	13349 - 44940	2.9	0.44	-0.35
3165.38	W I	18117 - 49700	9.6	1.4	0.16
3170.20	W I	2951 - 34486	0.12	0.017	-1.76
3176.59	W I	1670 - 33141	0.27	0.040	-1.40
3179.06	W I	17701 - 49148	8.6	1.3	0.12
3180.74	W I	13307 - 44737	1.4	0.21	-0.67
3181.81	W I	16431 - 47851	9.8	1.5	0.17
3184.04	W I	18117 - 49514	9.3	1.4	0.15
3184.42	W I	3326 - 34719	0.17	0.025	-1.60
3191.57	W I	0 - 31323	0.19	0.029	-1.53
3198.84	W I	4830 - 36082	0.73	0.11	-0.95
3207.25	W I	2951 - 34122	0.57	0.089	-1.05
3208.28	W I	3326 - 34486	0.17	0.026	-1.59
3215.56	W I	6219 - 37309	2.8	0.44	-0.36
3221.21	W I	18117 - 49152	9.3	1.4	0.16
3221.91	W I	3326 - 34354	0.16	0.025	-1.60
3232.49	W I	6219 - 37146	0.50	0.079	-1.10
3232.65	W I	15460 - 46385	2.9	0.46	-0.34
3237.09	W I	9528 - 40411	0.89	0.14	-0.85
3242.02	W I	21449 - 52285	16.	2.5	0.40
3254.36	W I	15070 - 45789	6.3	0.99	-0.00
3259.44	W I	18117 - 48788	8.7	1.4	0.14
3259.66	W I	4830 - 35499	0.34	0.055	-1.26
3293.71	W I	12162 - 42514	1.7	0.28	-0.55
3300.82	W I	4830 - 35117	1.1	0.18	-0.75
3311.38	W I	2951 - 33141	0.38	0.063	-1.20
3316.09	W I	1670 - 31818	0.043	0.0071	-2.15
3320.37	W I	9528 - 39637	0.39	0.064	-1.19
3326.19	W I	6219 - 36275	0.92	0.15	-0.81
3331.67	W I	2951 - 32958	0.36	0.060	-1.22
3345.86	W I	13349 - 43228	1.1	0.18	-0.74
3354.45	W I	4830 - 34633	0.19	0.032	-1.49
3363.34	W I	6219 - 35943	0.14	0.024	-1.63
3371.05	W I	4830 - 34486	0.20	0.033	-1.48
3371.35	W I	1670 - 31323	0.042	0.0072	-2.14
3373.75	W I	3326 - 32958	0.32	0.055	-1.26
3388.83	W I	21449 - 50949	7.9	1.4	0.14
3391.10	W I	15460 - 44940	2.0	0.34	-0.47
3391.53	W I	15070 - 44547	1.8	0.30	-0.52
3398.10	W I	19256 - 48676	5.2	0.91	-0.04
3412.96	W I	4830 - 34122	0.18	0.031	-1.51
3413.54	W I	2951 - 32238	0.10	0.018	-1.74
3427.72	W I	13349 - 42514	1.9	0.34	-0.47
3429.60	W I	19535 - 48685	15.	2.6	0.42
3443.01	W I	12162 - 41198	2.1	0.37	-0.43
3448.83	W I	15460 - 44447	1.7	0.31	-0.51
3463.25	W I	2951 - 31818	0.050	0.0090	-2.05
3468.40	W I	13778 - 42601	1.0	0.19	-0.72
3475.84	W I	12162 - 40924	0.65	0.12	-0.93

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3481.82	W I	19256 - 47969	4.6	0.84	-0.08
3495.25	W I	19648 - 48251	25.	4.5	0.65
3508.74	W I	3326 - 31818	0.10	0.019	-1.73
3510.03	W I	2951 - 31433	0.091	0.017	-1.78
3521.91	W I	13349 - 41734	0.83	0.15	-0.81
3526.85	W I	13349 - 41694	1.6	0.31	-0.51
3535.55	W I	13307 - 41583	1.6	0.30	-0.52
3537.45	W I	15070 - 43331	2.6	0.49	-0.31
3545.23	W I	0 - 28199	0.15	0.028	-1.56
3554.21	W I	4830 - 32958	0.070	0.013	-1.87
3568.04	W I	15460 - 43479	2.8	0.53	-0.28
3570.66	W I	3326 - 31323	0.13	0.026	-1.59
3575.23	W I	17008 - 44971	4.2	0.81	-0.09
3575.98	W I	13778 - 41734	0.84	0.16	-0.79
3590.83	W I	15070 - 42911	1.2	0.23	-0.64
3606.07	W I	1670 - 29393	0.078	0.015	-1.82
3607.07	W I	19826 - 47541	4.3	0.84	-0.07
3617.52	W I	2951 - 30587	0.88	0.17	-0.76
3622.34	W I	19256 - 46855	7.3	1.4	0.16
3627.24	W I	13307 - 40868	1.1	0.21	-0.67
3631.95	W I	1670 - 29196	0.100	0.020	-1.71
3651.00	W I	17008 - 44390	1.8	0.36	-0.44
3663.36	W I	16431 - 43721	1.8	0.37	-0.44
3667.72	W I	18117 - 45374	2.4	0.49	-0.31
3668.66	W I	19256 - 46506	3.4	0.69	-0.16
3674.58	W I	19648 - 46855	4.5	0.91	-0.04
3675.56	W I	12162 - 39361	0.89	0.18	-0.75
3679.61	W I	15070 - 42239	1.0	0.20	-0.69
3682.09	W I	6219 - 33370	0.66	0.13	-0.87
3683.31	W I	18280 - 45422	12.	2.5	0.40
3683.94	W I	19535 - 46672	7.1	1.5	0.16
3684.66	W I	19254 - 46385	3.3	0.67	-0.17
3688.07	W I	19648 - 46755	26.	5.2	0.72
3699.42	W I	19648 - 46672	3.6	0.74	-0.13
3702.32	W I	14976 - 41979	0.94	0.19	-0.72
3707.93	W I	2951 - 29913	0.30	0.061	-1.21
3714.24	W I	17008 - 43924	1.1	0.24	-0.63
3715.05	W I	20428 - 47338	3.0	0.62	-0.21
3717.10	W I	17701 - 44596	2.0	0.41	-0.39
3719.40	W I	17107 - 43985	2.0	0.41	-0.39
3722.25	W I	19648 - 46506	3.5	0.72	-0.14
3730.43	W I	19826 - 46625	3.6	0.74	-0.13
3739.48	W I	18280 - 45015	0.78	0.16	-0.79
3741.71	W I	14976 - 41694	1.2	0.26	-0.59
3742.68	W I	22477 - 49188	5.8	1.2	0.08
3751.43	W I	19254 - 45902	1.1	0.24	-0.62
3757.09	W I	6219 - 32828	0.029	0.0061	-2.22
3757.92	W I	4830 - 31433	0.29	0.062	-1.21
3760.13	W I	3326 - 29913	0.25	0.054	-1.27
3761.61	W I	18974 - 45551	0.78	0.17	-0.78

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
3764.31	W I	19828 - 46385	2.7	0.57	-0.24
3767.85	W I	19256 - 45790	2.2	0.48	-0.32
3768.45	W I	1670 - 28199	0.23	0.050	-1.30
3769.21	W I	14976 - 41499	1.2	0.25	-0.61
3769.87	W I	15460 - 41979	1.3	0.28	-0.55
3772.42	W I	20983 - 47484	3.6	0.76	-0.12
3773.70	W I	13778 - 40269	2.4	0.50	-0.30
3778.59	W I	19648 - 46106	2.8	0.61	-0.22
3778.68	W I	18280 - 44737	1.9	0.40	-0.40
3780.77	W I	2951 - 29393	0.33	0.071	-1.15
3783.73	W I	19256 - 45678	1.6	0.35	-0.46
3786.38	W I	17008 - 43411	0.57	0.12	-0.91
3792.77	W I	13349 - 39707	1.0	0.22	-0.66
3794.34	W I	15070 - 41417	0.82	0.18	-0.75
3796.28	W I	19535 - 45869	1.1	0.25	-0.60
3801.52	W I	13349 - 39646	0.40	0.086	-1.06
3801.92	W I	19256 - 45551	2.6	0.57	-0.24
3804.08	W I	19826 - 46106	0.95	0.21	-0.69
3809.23	W I	2951 - 29196	0.089	0.019	-1.71
3810.38	W I	18117 - 44353	4.1	0.90	-0.05
3810.80	W I	13778 - 40011	1.7	0.36	-0.44
3816.39	W I	19256 - 45452	2.1	0.45	-0.35
3817.48	W I	2951 - 29139	0.41	0.090	-1.05
3820.11	W I	16431 - 42601	0.46	0.10	-1.00
3824.15	W I	18974 - 45117	0.94	0.21	-0.69
3824.39	W I	19648 - 45790	3.1	0.68	-0.17
3826.19	W I	15070 - 41198	0.85	0.19	-0.73
3829.13	W I	1670 - 27778	0.021	0.0046	-2.33
3834.04	W I	19828 - 45902	1.2	0.26	-0.59
3835.05	W I	3326 - 29393	0.33	0.074	-1.13
3838.50	W I	12162 - 38206	1.1	0.24	-0.63
3842.30	W I	6219 - 32238	0.062	0.014	-1.86
3846.21	W I	1670 - 27662	0.14	0.030	-1.52
3847.49	W I	0 - 25984	0.030	0.0066	-2.18
3855.54	W I	13778 - 39707	0.82	0.18	-0.74
3859.29	W I	18117 - 44020	2.8	0.62	-0.21
3861.06	W I	14976 - 40868	0.57	0.13	-0.89
3861.24	W I	12162 - 38053	0.13	0.029	-1.54
3864.34	W I	3326 - 29196	0.053	0.012	-1.93
3866.05	W I	13778 - 39637	0.35	0.079	-1.10
3867.98	W I	2951 - 28797	0.47	0.11	-0.97
3872.83	W I	3326 - 29139	0.073	0.016	-1.78
3874.41	W I	19648 - 45452	3.1	0.70	-0.15
3875.68	W I	14976 - 40771	0.56	0.13	-0.90
3881.39	W I	4830 - 30587	0.32	0.071	-1.15
3883.83	W I	18280 - 44020	0.70	0.16	-0.80
3890.74	W I	18280 - 43975	0.69	0.16	-0.80
3892.72	W I	13349 - 39030	0.51	0.12	-0.93
3901.83	W I	18974 - 44596	0.82	0.19	-0.73
3903.98	W I	29773 - 55381	6.4	1.5	0.17

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3905.97	W I	19828 - 45422	2.1	0.48	-0.32
3918.60	W I	12162 - 37674	0.24	0.054	-1.27
3924.37	W I	20428 - 45902	1.2	0.28	-0.56
3924.70	W I	18974 - 44447	0.80	0.18	-0.74
3926.03	W I	15460 - 40924	0.29	0.068	-1.17
3930.25	W I	19826 - 45263	1.8	0.41	-0.39
3930.48	W I	14976 - 40411	0.57	0.13	-0.88
3930.97	W I	18083 - 43515	0.61	0.14	-0.85
3935.04	W I	13778 - 39183	0.72	0.17	-0.78
3936.23	W I	18117 - 43515	0.61	0.14	-0.85
3936.98	W I	18974 - 44367	2.5	0.59	-0.23
3937.63	W I	19535 - 44924	0.91	0.21	-0.67
3947.98	W I	19648 - 44971	3.0	0.70	-0.15
3952.52	W I	14976 - 40269	0.80	0.19	-0.73
3952.90	W I	19256 - 44547	2.7	0.63	-0.20
3953.16	W I	19828 - 45117	4.4	1.0	0.01
3955.31	W I	19648 - 44924	5.0	1.2	0.07
3958.88	W I	13778 - 39030	0.35	0.082	-1.09
3962.33	W I	17008 - 42239	0.97	0.23	-0.64
3964.99	W I	6219 - 31433	0.046	0.011	-1.96
3965.14	W I	22477 - 47689	8.9	2.1	0.32
3968.59	W I	19256 - 44447	2.8	0.67	-0.18
3969.20	W I	19828 - 45015	2.1	0.50	-0.30
3975.46	W I	12162 - 37309	0.24	0.057	-1.24
3975.89	W I	17107 - 42251	0.54	0.13	-0.89
3979.29	W I	13307 - 38430	0.52	0.12	-0.91
3980.64	W I	19826 - 44940	3.2	0.77	-0.11
3982.87	W I	18117 - 43217	0.57	0.14	-0.87
3982.96	W I	19254 - 44353	2.0	0.47	-0.33
3983.29	W I	19826 - 44924	6.5	1.5	0.19
3991.22	W I	21449 - 46497	3.3	0.79	-0.10
3993.90	W I	23047 - 48078	2.7	0.65	-0.19
3997.13	W I	18974 - 43985	0.89	0.21	-0.67
3998.16	W I	21454 - 46458	1.8	0.44	-0.36
3998.76	W I	18974 - 43975	1.4	0.34	-0.47
4001.37	W I	12162 - 37146	0.23	0.056	-1.25
4005.40	W I	1670 - 26630	0.011	0.0026	-2.59
4008.75	W I	2951 - 27890	1.8	0.44	-0.36
4010.38	W I	23047 - 47975	2.7	0.64	-0.19
4015.22	W I	19648 - 44547	13.	3.0	0.48
4019.23	W I	3326 - 28199	0.050	0.012	-1.92
4022.12	W I	19535 - 44390	2.8	0.68	-0.17
4028.79	W I	9528 - 34342	0.24	0.057	-1.24
4035.36	W I	15460 - 40234	0.31	0.076	-1.12
4036.86	W I	19256 - 44020	3.6	0.89	-0.05
4039.86	W I	18974 - 43721	2.5	0.61	-0.21
4040.59	W I	19648 - 44390	1.0	0.25	-0.61
4043.89	W I	19254 - 43975	0.90	0.22	-0.66
4044.29	W I	26230 - 50949	14.	3.5	0.54
4045.60	W I	2951 - 27662	0.18	0.044	-1.35

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	10 ⁸ /sec		
4046.70	W I	13349 - 38053	0.34	0.083	-1.08
4047.94	W I	1670 - 26367	0.0062	0.0015	-2.81
4053.94	W I	14976 - 39637	0.53	0.13	-0.88
4060.71	W I	19828 - 44447	1.0	0.25	-0.59
4064.79	W I	19256 - 43851	3.5	0.86	-0.06
4069.80	W I	19826 - 44390	3.2	0.81	-0.09
4069.95	W I	4830 - 29393	0.24	0.059	-1.23
4070.61	W I	1670 - 26230	0.046	0.011	-1.94
4071.93	W I	15460 - 40011	0.65	0.16	-0.79
4073.15	W I	15070 - 39614	0.48	0.12	-0.93
4074.36	W I	2951 - 27488	0.95	0.24	-0.63
4082.97	W I	19256 - 43741	2.7	0.68	-0.17
4088.33	W I	3326 - 27778	0.026	0.0066	-2.18
4088.77	W I	19535 - 43985	0.91	0.23	-0.64
4095.70	W I	17008 - 41417	0.97	0.24	-0.61
4097.67	W I	18117 - 42514	0.60	0.15	-0.82
4099.03	W I	19535 - 43924	0.72	0.18	-0.74
4102.70	W I	6219 - 30587	0.46	0.12	-0.94
4108.53	W I	18117 - 42450	0.71	0.18	-0.74
4109.76	W I	13349 - 37674	0.49	0.12	-0.90
4110.57	W I	18280 - 42601	0.74	0.19	-0.73
4111.81	W I	1670 - 25984	0.013	0.0032	-2.50
4115.59	W I	15070 - 39361	0.30	0.076	-1.12
4118.05	W I	18974 - 43251	2.5	0.64	-0.19
4118.18	W I	13778 - 38053	0.38	0.096	-1.02
4120.86	W I	15460 - 39720	0.61	0.15	-0.81
4122.02	W I	18974 - 43228	0.89	0.23	-0.65
4123.06	W I	15460 - 39707	0.33	0.084	-1.08
4125.18	W I	16431 - 40666	0.79	0.20	-0.69
4126.80	W I	19254 - 43479	2.7	0.69	-0.16
4132.21	W I	19828 - 44020	1.1	0.29	-0.54
4133.48	W I	19535 - 43721	1.9	0.48	-0.32
4136.35	W I	18280 - 42450	0.72	0.18	-0.74
4137.46	W I	3326 - 27488	0.11	0.027	-1.57
4138.02	W I	13307 - 37466	0.50	0.13	-0.89
4138.30	W I	19828 - 43985	1.8	0.47	-0.33
4139.32	W I	16431 - 40583	0.42	0.11	-0.96
4142.26	W I	18117 - 42251	1.4	0.35	-0.46
4145.16	W I	13349 - 37466	0.44	0.11	-0.95
4145.95	W I	12162 - 36275	0.25	0.065	-1.19
4149.44	W I	19648 - 43741	1.0	0.27	-0.57
4154.68	W I	19389 - 43452	2.9	0.74	-0.13
4160.04	W I	20983 - 45015	1.5	0.39	-0.41
4160.35	W I	22477 - 46506	1.9	0.50	-0.30
4168.66	W I	18280 - 42262	1.1	0.30	-0.53
4170.54	W I	18280 - 42251	2.0	0.53	-0.27
4171.18	W I	4830 - 28797	0.13	0.033	-1.48
4180.24	W I	19826 - 43741	1.0	0.27	-0.56
4183.67	W I	18083 - 41979	0.63	0.17	-0.78
4183.83	W I	19826 - 43721	1.7	0.45	-0.34

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4186.02	W I	17701 - 41583	0.47	0.12	-0.91
4199.63	W I	17107 - 40912	0.39	0.10	-0.98
4200.03	W I	16431 - 40234	0.39	0.10	-0.99
4203.82	W I	12162 - 35943	0.19	0.051	-1.29
4204.41	W I	19256 - 43034	2.6	0.68	-0.17
4207.05	W I	19648 - 43411	3.8	1.0	0.01
4215.38	W I	19535 - 43251	1.8	0.49	-0.31
4218.56	W I	18280 - 41979	0.64	0.17	-0.77
4219.38	W I	6219 - 29913	0.099	0.026	-1.58
4222.06	W I	15070 - 38748	0.51	0.14	-0.86
4224.76	W I	23930 - 47593	3.1	0.82	-0.08
4226.34	W I	19256 - 42911	0.69	0.19	-0.73
4226.92	W I	18083 - 41734	0.60	0.16	-0.80
4233.00	W I	18117 - 41734	0.60	0.16	-0.79
4234.35	W I	19256 - 42866	2.2	0.59	-0.23
4241.45	W I	15460 - 39030	1.5	0.40	-0.40
4244.37	W I	6219 - 29773	0.21	0.056	-1.26
4249.46	W I	13349 - 36874	0.15	0.041	-1.38
4258.53	W I	17107 - 40583	0.44	0.12	-0.93
4259.36	W I	21449 - 44920	7.9	2.1	0.33
4259.94	W I	17008 - 40476	0.42	0.11	-0.94
4260.29	W I	18117 - 41583	2.1	0.58	-0.24
4263.32	W I	23047 - 46497	8.7	2.4	0.37
4266.54	W I	23930 - 47362	2.9	0.80	-0.10
4269.39	W I	2951 - 26367	0.20	0.054	-1.27
4269.78	W I	18280 - 41694	1.2	0.33	-0.49
4273.69	W I	22477 - 45869	1.9	0.53	-0.27
4274.55	W I	20064 - 43452	3.9	1.1	0.03
4275.49	W I	18117 - 41499	1.7	0.47	-0.33
4276.75	W I	19535 - 42911	2.5	0.69	-0.16
4282.34	W I	19256 - 42601	1.5	0.43	-0.37
4284.96	W I	19535 - 42866	0.69	0.19	-0.72
4286.01	W I	13349 - 36674	0.29	0.080	-1.10
4294.10	W I	13307 - 36588	0.28	0.079	-1.10
4294.61	W I	2951 - 26230	0.57	0.16	-0.80
4302.11	W I	2951 - 26189	0.30	0.084	-1.07
4306.88	W I	24763 - 47975	10.	2.9	0.46
4307.64	W I	19826 - 43034	1.8	0.49	-0.31
4330.66	W I	19826 - 42911	1.3	0.36	-0.44
4330.97	W I	19828 - 42911	1.3	0.36	-0.44
4332.13	W I	14976 - 38053	0.43	0.12	-0.91
4345.84	W I	18974 - 41979	0.55	0.16	-0.81
4347.00	W I	19254 - 42251	1.3	0.37	-0.43
4347.51	W I	19256 - 42251	0.59	0.17	-0.77
4348.12	W I	20983 - 43975	1.2	0.33	-0.48
4355.16	W I	12162 - 35117	0.27	0.077	-1.11
4361.82	W I	6219 - 29139	0.032	0.0092	-2.03
4364.79	W I	3326 - 26230	0.022	0.0063	-2.20
4365.96	W I	28393 - 51291	12.	3.4	0.53
4372.53	W I	3326 - 26189	0.022	0.0063	-2.20

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4378.49	W I	4830 - 27662	0.043	0.012	-1.91
4384.86	W I	15460 - 38259	0.78	0.22	-0.65
4389.84	W I	19828 - 42601	0.79	0.23	-0.64
4394.08	W I	18117 - 40868	0.73	0.21	-0.67
4408.28	W I	26676 - 49355	17.	5.0	0.70
4412.20	W I	3326 - 25984	0.017	0.0050	-2.30
4415.08	W I	18280 - 40924	0.41	0.12	-0.92
4418.45	W I	20428 - 43054	0.76	0.22	-0.66
4420.47	W I	19256 - 41872	1.1	0.32	-0.50
4423.78	W I	22853 - 45452	2.7	0.79	-0.10
4425.91	W I	18280 - 40868	0.41	0.12	-0.92
4436.90	W I	20983 - 43515	3.1	0.92	-0.04
4438.30	W I	18974 - 41499	0.49	0.14	-0.84
4441.81	W I	17107 - 39614	0.46	0.14	-0.87
4445.15	W I	14976 - 37466	0.31	0.093	-1.03
4449.01	W I	12162 - 34633	0.14	0.042	-1.38
4450.36	W I	22477 - 44940	1.3	0.38	-0.41
4455.46	W I	19256 - 41694	0.42	0.12	-0.91
4458.09	W I	13307 - 35732	0.097	0.029	-1.54
4458.30	W I	19828 - 42251	0.49	0.14	-0.84
4460.50	W I	13778 - 36190	0.33	0.098	-1.01
4463.50	W I	23930 - 46328	3.2	0.94	-0.03
4466.35	W I	13349 - 35732	0.29	0.087	-1.06
4484.19	W I	1670 - 23965	0.049	0.015	-1.83
4492.33	W I	17107 - 39361	0.27	0.082	-1.09
4493.97	W I	19254 - 41499	0.79	0.24	-0.62
4494.51	W I	19256 - 41499	0.89	0.27	-0.57
4495.30	W I	15070 - 37309	0.15	0.046	-1.34
4498.47	W I	18974 - 41198	0.32	0.097	-1.01
4504.86	W I	12162 - 34354	0.24	0.073	-1.14
4512.91	W I	18117 - 40269	0.99	0.30	-0.52
4513.30	W I	13349 - 35499	0.24	0.073	-1.14
4529.76	W I	22477 - 44547	0.94	0.29	-0.54
4530.47	W I	12162 - 34229	0.051	0.016	-1.80
4534.71	W I	19826 - 41872	0.78	0.24	-0.62
4535.05	W I	19828 - 41872	1.0	0.31	-0.51
4536.66	W I	21856 - 43893	1.4	0.42	-0.37
4542.89	W I	15460 - 37466	0.13	0.040	-1.40
4543.51	W I	21449 - 43452	3.0	0.92	-0.04
4546.49	W I	18280 - 40269	1.2	0.37	-0.43
4551.85	W I	13349 - 35311	0.28	0.087	-1.06
4556.87	W I	23930 - 45869	1.4	0.43	-0.37
4558.97	W I	18083 - 40011	0.26	0.082	-1.08
4559.11	W I	14976 - 36904	0.11	0.034	-1.46
4563.59	W I	19828 - 41734	0.86	0.27	-0.57
4565.32	W I	14976 - 36874	0.11	0.034	-1.47
4570.66	W I	23047 - 44920	4.0	1.2	0.09
4586.85	W I	9528 - 31323	0.040	0.013	-1.90
4588.75	W I	26189 - 47975	12.	3.6	0.56
4592.42	W I	19648 - 41417	0.79	0.25	-0.60

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4592.58	W I	13349 - 35117	0.10	0.032	-1.50
4599.96	W I	24763 - 46497	6.4	2.0	0.31
4600.44	W I	18280 - 40011	0.23	0.074	-1.13
4609.92	W I	15460 - 37146	0.45	0.14	-0.85
4613.32	W I	6219 - 27890	0.039	0.013	-1.90
4614.86	W I	19535 - 41198	0.23	0.075	-1.13
4620.55	W I	19535 - 41171	0.33	0.10	-0.98
4623.69	W I	16431 - 38053	0.12	0.037	-1.43
4634.81	W I	16431 - 38001	0.23	0.074	-1.13
4641.80	W I	4830 - 26367	0.0050	0.0016	-2.79
4642.56	W I	13778 - 35311	0.18	0.058	-1.24
4643.15	W I	20983 - 42514	0.48	0.15	-0.81
4646.15	W I	19254 - 40771	0.29	0.095	-1.02
4657.44	W I	27890 - 49355	11.	3.5	0.54
4659.87	W I	0 - 21454	0.023	0.0076	-2.12
4661.23	W I	22477 - 43924	0.51	0.17	-0.78
4661.97	W I	15460 - 36904	0.098	0.032	-1.49
4668.46	W I	15460 - 36874	0.11	0.037	-1.44
4676.63	W I	19535 - 40912	0.44	0.14	-0.84
4677.69	W I	19826 - 41198	0.57	0.19	-0.73
4679.04	W I	18280 - 39646	0.18	0.060	-1.22
4680.52	W I	4830 - 26189	0.089	0.029	-1.53
4683.54	W I	19826 - 41171	0.38	0.12	-0.91
4693.73	W I	26676 - 47975	6.2	2.1	0.31
4698.63	W I	19828 - 41104	0.28	0.092	-1.04
4700.41	W I	6219 - 27488	0.0100	0.0033	-2.48
4702.47	W I	18974 - 40234	0.22	0.072	-1.14
4706.17	W I	16431 - 37674	0.071	0.023	-1.63
4711.19	W I	19256 - 40476	0.19	0.065	-1.19
4712.49	W I	14976 - 36190	0.093	0.031	-1.51
4716.86	W I	17008 - 38203	0.10	0.034	-1.47
4718.63	W I	23930 - 45117	0.72	0.24	-0.62
4720.40	W I	13307 - 34486	0.036	0.012	-1.92
4725.14	W I	19254 - 40411	0.38	0.13	-0.89
4729.65	W I	13349 - 34486	0.12	0.039	-1.41
4745.57	W I	18117 - 39183	0.11	0.037	-1.43
4752.21	W I	18974 - 40011	0.21	0.070	-1.15
4752.58	W I	13307 - 34342	0.042	0.014	-1.85
4757.55	W I	2951 - 23965	0.010	0.0035	-2.45
4757.78	W I	15070 - 36082	0.057	0.019	-1.71
4758.21	W I	23930 - 44940	0.55	0.19	-0.73
4773.91	W I	13778 - 34719	0.054	0.019	-1.73
4787.94	W I	13349 - 34229	0.034	0.012	-1.93
4788.43	W I	16431 - 37309	0.065	0.022	-1.65
4797.55	W I	19828 - 40666	0.21	0.072	-1.14
4799.92	W I	19648 - 40476	0.63	0.22	-0.66
4807.37	W I	12162 - 32958	0.048	0.017	-1.78
4816.11	W I	19254 - 40011	0.14	0.049	-1.31
4816.82	W I	28600 - 49355	1.7	0.59	-0.23
4835.02	W I	20428 - 41104	0.24	0.084	-1.08

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4843.83	W I	3326 - 23965	0.061	0.021	-1.67
4854.09	W I	13349 - 33944	0.051	0.018	-1.75
4863.08	W I	22477 - 43034	0.41	0.15	-0.83
4878.28	W I	18083 - 38576	0.12	0.042	-1.38
4886.91	W I	6219 - 26676	0.063	0.022	-1.65
4888.39	W I	13778 - 34229	0.022	0.0080	-2.10
4890.29	W I	16431 - 36874	0.047	0.017	-1.77
4890.89	W I	20428 - 40868	0.14	0.052	-1.29
4892.44	W I	22477 - 42911	0.48	0.17	-0.76
4902.32	W I	19254 - 39646	0.19	0.069	-1.16
4902.97	W I	19256 - 39646	0.10	0.037	-1.43
4910.74	W I	19256 - 39614	0.16	0.058	-1.24
4916.18	W I	14976 - 35311	0.057	0.021	-1.69
4931.56	W I	15460 - 35732	0.086	0.031	-1.51
4953.09	W I	19828 - 40011	0.22	0.079	-1.10
4957.37	W I	13778 - 33944	0.045	0.017	-1.78
4972.57	W I	19256 - 39361	0.084	0.031	-1.51
4979.85	W I	18280 - 38356	0.23	0.084	-1.07
4982.60	W I	0 - 20064	0.0052	0.0019	-2.71
4984.72	W I	18974 - 39030	0.11	0.041	-1.39
4986.94	W I	15070 - 35117	0.11	0.041	-1.39
4995.32	W I	22853 - 42866	0.23	0.085	-1.07
5002.80	W I	20428 - 40411	0.11	0.043	-1.37
5006.16	W I	6219 - 26189	0.044	0.017	-1.78
5015.32	W I	4830 - 24763	0.020	0.0074	-2.13
5040.36	W I	13307 - 33141	0.053	0.020	-1.70
5052.23	W I	20983 - 40771	0.18	0.069	-1.16
5053.30	W I	1670 - 21454	0.029	0.011	-1.95
5054.61	W I	1670 - 21449	0.0074	0.0028	-2.55
5055.53	W I	22477 - 42251	0.34	0.13	-0.88
5069.15	W I	3326 - 23047	0.012	0.0045	-2.35
5110.36	W I	15070 - 34633	0.057	0.022	-1.65
5124.24	W I	14976 - 34486	0.055	0.022	-1.67
5130.11	W I	23965 - 43452	0.59	0.23	-0.63
5138.40	W I	28233 - 47689	2.2	0.88	-0.05
5145.77	W I	20983 - 40411	0.33	0.13	-0.88
5183.97	W I	18974 - 38259	0.14	0.055	-1.26
5192.72	W I	14976 - 34229	0.059	0.024	-1.62
5195.63	W I	25984 - 45225	0.66	0.27	-0.58
5203.26	W I	19535 - 38748	0.21	0.086	-1.07
5204.51	W I	20428 - 39637	0.34	0.14	-0.86
5206.19	W I	19828 - 39030	0.29	0.12	-0.93
5212.79	W I	28797 - 47975	2.8	1.1	0.05
5224.67	W I	4830 - 23965	0.057	0.023	-1.63
5233.54	W I	19254 - 38356	0.14	0.059	-1.23
5242.99	W I	16431 - 35499	0.15	0.061	-1.21
5254.54	W I	15460 - 34486	0.048	0.020	-1.70
5255.42	W I	22477 - 41499	0.46	0.19	-0.72
5259.36	W I	27488 - 46497	2.9	1.2	0.08
5275.55	W I	19256 - 38206	0.18	0.077	-1.11

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5318.87	W I	27662 - 46458	1.2	0.52	-0.29
5337.37	W I	26189 - 44920	0.77	0.33	-0.48
5348.95	W I	26230 - 44920	1.2	0.53	-0.27
5350.44	W I	29393 - 48078	2.2	0.93	-0.03
5351.90	W I	27778 - 46458	0.98	0.42	-0.38
5354.46	W I	9528 - 28199	0.0055	0.0024	-2.62
5355.26	W I	19535 - 38203	0.056	0.024	-1.62
5357.12	W I	15460 - 34122	0.018	0.0076	-2.12
5368.70	W I	28233 - 46855	0.65	0.28	-0.55
5374.16	W I	20428 - 39030	0.12	0.051	-1.29
5388.02	W I	19648 - 38203	0.094	0.041	-1.39
5397.97	W I	19254 - 37774	0.058	0.025	-1.59
5419.40	W I	22477 - 40924	0.10	0.045	-1.35
5422.89	W I	22477 - 40912	0.061	0.027	-1.57
5423.93	W I	19828 - 38259	0.029	0.013	-1.90
5435.06	W I	1670 - 20064	0.0014	0.00063	-3.20
5435.61	W I	17107 - 35499	0.022	0.0098	-2.01
5440.08	W I	19826 - 38203	0.038	0.017	-1.77
5456.59	W I	23930 - 42251	0.30	0.13	-0.88
5475.11	W I	28199 - 46458	0.50	0.23	-0.65
5477.80	W I	9528 - 27778	0.0088	0.0040	-2.40
5486.01	W I	31433 - 49656	1.4	0.65	-0.19
5487.78	W I	4830 - 23047	0.00060	0.00027	-3.57
5492.32	W I	29773 - 47975	4.4	2.0	0.30
5496.24	W I	22477 - 40666	0.086	0.039	-1.41
5500.51	W I	19826 - 38001	0.11	0.051	-1.29
5503.45	W I	14976 - 33141	0.029	0.013	-1.88
5508.63	W I	20428 - 38576	0.048	0.022	-1.66
5514.70	W I	3326 - 21454	0.0085	0.0039	-2.41
5521.01	W I	18083 - 36190	0.022	0.0100	-2.00
5531.38	W I	18117 - 36190	0.038	0.018	-1.76
5537.74	W I	19256 - 37309	0.052	0.024	-1.62
5539.49	W I	20983 - 39030	0.049	0.022	-1.65
5576.34	W I	20428 - 38356	0.030	0.014	-1.85
5604.33	W I	31818 - 49656	1.3	0.59	-0.23
5617.08	W I	17701 - 35499	0.018	0.0086	-2.06
5624.58	W I	19535 - 37309	0.019	0.0090	-2.04
5629.65	W I	15070 - 32828	0.0086	0.0041	-2.39
5631.26	W I	33370 - 51123	1.4	0.65	-0.19
5631.97	W I	12162 - 29913	0.012	0.0056	-2.25
5642.04	W I	1670 - 19389	0.00017	0.00008	-4.09
5648.38	W I	18974 - 36674	0.19	0.092	-1.04
5660.07	W I	18280 - 35943	0.018	0.0088	-2.06
5660.75	W I	19648 - 37309	0.11	0.055	-1.26
5664.34	W I	18083 - 35732	0.017	0.0083	-2.08
5673.56	W I	19254 - 36874	0.024	0.011	-1.94
5674.42	W I	19256 - 36874	0.085	0.041	-1.39
5675.38	W I	18117 - 35732	0.015	0.0071	-2.15
5676.61	W I	12162 - 29773	0.0055	0.0027	-2.58
5676.93	W I	17701 - 35311	0.031	0.015	-1.83

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
5697.82	W I	13778 - 31323	0.0100	0.0049	-2.31
5723.06	W I	25984 - 43452	0.13	0.065	-1.19
5735.09	W I	27488 - 44920	1.7	0.82	-0.09
5739.60	W I	32238 - 49656	0.54	0.27	-0.58
5747.26	W I	30683 - 48078	0.47	0.23	-0.64
5749.22	W I	30587 - 47975	0.91	0.45	-0.34
5756.09	W I	15460 - 32828	0.011	0.0055	-2.26
5759.65	W I	29139 - 46497	0.32	0.16	-0.80
5793.07	W I	27662 - 44920	0.40	0.20	-0.69
5796.51	W I	17107 - 34354	0.020	0.010	-1.99
5799.53	W I	13349 - 30587	0.0024	0.0012	-2.93
5804.87	W I	26230 - 43452	0.89	0.45	-0.35
5806.07	W I	18280 - 35499	0.028	0.014	-1.84
5822.60	W I	22477 - 39646	0.046	0.023	-1.63
5833.59	W I	22477 - 39614	0.091	0.046	-1.33
5838.99	W I	17107 - 34229	0.020	0.010	-1.99
5845.26	W I	29393 - 46497	0.87	0.44	-0.35
5851.56	W I	26367 - 43452	0.58	0.30	-0.52
5856.62	W I	20983 - 38053	0.049	0.025	-1.60
5864.63	W I	19828 - 36874	0.070	0.036	-1.44
5874.23	W I	19256 - 36275	0.030	0.015	-1.81
5875.66	W I	17107 - 34122	0.013	0.0067	-2.17
5880.22	W I	34122 - 51123	1.7	0.88	-0.05
5891.61	W I	18974 - 35943	0.033	0.017	-1.77
5902.66	W I	19254 - 36190	0.10	0.053	-1.27
5947.58	W I	13778 - 30587	0.030	0.016	-1.80
5953.97	W I	20983 - 37774	0.055	0.029	-1.53
5956.18	W I	17701 - 34486	0.022	0.012	-1.94
5965.86	W I	18974 - 35732	0.13	0.069	-1.16
5972.52	W I	3326 - 20064	0.00078	0.00042	-3.38
5978.89	W I	28199 - 44920	0.62	0.33	-0.48
5983.84	W I	28233 - 44940	0.63	0.34	-0.47
6009.04	W I	18083 - 34719	0.023	0.013	-1.90
6012.81	W I	19648 - 36275	0.15	0.082	-1.08
6021.54	W I	18117 - 34719	0.069	0.037	-1.43
6028.35	W I	29913 - 46497	1.0	0.55	-0.26
6043.33	W I	31433 - 47975	1.4	0.79	-0.10
6049.92	W I	18974 - 35499	0.029	0.016	-1.79
6065.09	W I	20983 - 37466	0.051	0.028	-1.55
6081.48	W I	18280 - 34719	0.040	0.022	-1.66
6111.68	W I	15460 - 31818	0.011	0.0059	-2.23
6115.55	W I	14976 - 31323	0.0092	0.0051	-2.29
6128.27	W I	28233 - 44547	0.64	0.36	-0.44
6143.94	W I	22477 - 38748	0.075	0.042	-1.37
6153.73	W I	19254 - 35499	0.045	0.026	-1.59
6154.86	W I	17701 - 33944	0.029	0.016	-1.78
6203.51	W I	19828 - 35943	0.051	0.030	-1.53
6254.29	W I	33370 - 49355	2.0	1.2	0.07
6285.90	W I	19828 - 35732	0.068	0.040	-1.39
6292.03	W I	13307 - 29196	0.017	0.010	-1.99

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6303.24	W I	19256 - 35117	0.041	0.025	-1.61
6404.20	W I	14976 - 30587	0.020	0.012	-1.92
6445.13	W I	18974 - 34486	0.069	0.043	-1.37
6508.02	W I	13778 - 29139	0.0044	0.0028	-2.55
6532.42	W I	20428 - 35732	0.040	0.025	-1.60
6538.14	W I	19826 - 35117	0.029	0.018	-1.74
6563.22	W I	19254 - 34486	0.024	0.016	-1.81
6573.95	W I	20983 - 36190	0.058	0.038	-1.42
6607.15	W I	17107 - 32238	0.011	0.0070	-2.15
6609.04	W I	15460 - 30587	0.0067	0.0044	-2.36
6611.64	W I	32958 - 48078	1.4	0.94	-0.03
6621.68	W I	19256 - 34354	0.019	0.013	-1.89
6678.41	W I	18974 - 33944	0.021	0.014	-1.85
6693.12	W I	14976 - 29913	0.0079	0.0053	-2.28
6746.56	W I	23930 - 38748	0.034	0.023	-1.63
6805.28	W I	19254 - 33944	0.011	0.0074	-2.13
6814.95	W I	22477 - 37146	0.035	0.025	-1.61
6820.28	W I	19828 - 34486	0.017	0.012	-1.94
6828.42	W I	31818 - 46458	0.44	0.31	-0.51
6853.73	W I	19535 - 34122	0.0075	0.0053	-2.27
6876.02	W I	35117 - 49656	0.51	0.36	-0.44
6908.29	W I	13307 - 27778	0.0016	0.0011	-2.94
6934.27	W I	14976 - 29393	0.0040	0.0029	-2.54
6964.12	W I	13307 - 27662	0.0022	0.0016	-2.80
6984.30	W I	13349 - 27662	0.0037	0.0027	-2.56
6993.26	W I	19826 - 34122	0.013	0.0099	-2.01
6994.08	W I	19828 - 34122	0.0077	0.0057	-2.25
7098.22	W I	44547 - 58631	1.1	0.87	-0.06
7111.18	W I	20428 - 34486	0.0087	0.0066	-2.18
7140.54	W I	13778 - 27778	0.0046	0.0035	-2.45
7162.66	W I	18280 - 32238	0.0093	0.0071	-2.15
7191.37	W I	31323 - 45225	0.23	0.18	-0.75
7198.62	W I	19254 - 33141	0.0075	0.0058	-2.23
7200.18	W I	13778 - 27662	0.0032	0.0025	-2.60
7216.31	W I	18974 - 32828	0.0069	0.0054	-2.27
7226.05	W I	19535 - 33370	0.0064	0.0050	-2.30
7237.08	W I	37309 - 51123	1.2	0.96	-0.02
7278.23	W I	15460 - 29196	0.0045	0.0036	-2.45
7285.80	W I	19648 - 33370	0.023	0.018	-1.74
7296.58	W I	19256 - 32958	0.020	0.016	-1.79
7385.08	W I	18280 - 31818	0.0064	0.0052	-2.28
7483.35	W I	20983 - 34342	0.015	0.013	-1.89
7504.16	W I	13307 - 26630	0.0015	0.0013	-2.90
7508.99	W I	19828 - 33141	0.014	0.012	-1.92
7520.66	W I	19535 - 32828	0.0043	0.0037	-2.44
7537.43	W I	18974 - 32238	0.0098	0.0083	-2.08
7550.46	W I	18083 - 31323	0.0075	0.0065	-2.19
7569.91	W I	18117 - 31323	0.015	0.013	-1.89
7582.88	W I	28233 - 41417	0.082	0.070	-1.15
7614.11	W I	19828 - 32958	0.024	0.021	-1.68

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
7688.94	W I	19826 - 32828	0.018	0.016	-1.81
7701.00	W I	19256 - 32238	0.0050	0.0044	-2.35
7761.14	W I	13349 - 26230	0.0012	0.0010	-2.98
7784.12	W I	18974 - 31818	0.011	0.010	-1.99
7808.94	W I	14976 - 27778	0.0022	0.0020	-2.71
7863.46	W I	20428 - 33141	0.0066	0.0061	-2.22
7867.03	W I	16431 - 29139	0.0011	0.00099	-3.01
7880.34	W I	14976 - 27662	0.0014	0.0013	-2.88
7886.47	W I	13307 - 25984	0.0011	0.0010	-2.99
7940.93	W I	13778 - 26367	0.0020	0.0019	-2.73
7957.06	W I	19254 - 31818	0.0034	0.0033	-2.49
8017.18	W I	18117 - 30587	0.016	0.016	-1.80
8054.86	W I	13778 - 26189	0.0014	0.0014	-2.86
8055.60	W I	19828 - 32238	0.026	0.025	-1.60
8060.36	W I	18280 - 30683	0.0042	0.0041	-2.39
8123.79	W I	18280 - 30587	0.0099	0.0098	-2.01
8165.70	W I	28233 - 40476	0.040	0.040	-1.39
8210.20	W I	19256 - 31433	0.0053	0.0054	-2.27
8322.00	W I	23930 - 35943	0.015	0.016	-1.80
8338.01	W I	19828 - 31818	0.011	0.011	-1.95
8348.76	W I	20983 - 32958	0.0066	0.0069	-2.16
8382.87	W I	9528 - 21454	0.00019	0.00020	-3.69
8402.55	W I	19535 - 31433	0.0043	0.0046	-2.34
8475.16	W I	18117 - 29913	0.0028	0.0031	-2.51
8585.06	W I	22477 - 34122	0.059	0.065	-1.18
8594.37	W I	18280 - 29913	0.0065	0.0072	-2.14
8613.26	W I	19826 - 31433	0.0078	0.0086	-2.06
8614.48	W I	19828 - 31433	0.0033	0.0037	-2.43
8865.50	W I	18117 - 29393	0.0077	0.0091	-2.04

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2001.71	W II	3173 - 53114	20.	1.2	0.07
2008.07	W II	4716 - 54499	62.	3.7	0.57
2009.98	W II	1518 - 51254	15.	0.92	-0.04
2010.23	W II	3173 - 52902	16.	0.97	-0.01
2026.08	W II	4716 - 54057	37.	2.3	0.36
2029.98	W II	6147 - 55393	85.	5.3	0.72
2049.63	W II	1519 - 50292	22.	1.4	0.14
2065.57	W II	4716 - 53114	17.	1.1	0.03
2071.21	W II	3173 - 51438	21.	1.4	0.14
2075.59	W II	8711 - 56875	25.	1.6	0.21
2079.11	W II	6147 - 54229	93.	6.0	0.78
2089.14	W II	4716 - 52567	19.	1.2	0.10
2094.75	W II	1519 - 49242	33.	2.2	0.34
2100.67	W II	0 - 47589	9.1	0.60	-0.22
2106.18	W II	1519 - 48983	8.8	0.59	-0.23
2110.34	W II	8711 - 56084	24.	1.6	0.20
2118.87	W II	0 - 47180	9.5	0.64	-0.19
2121.59	W II	3173 - 50292	23.	1.5	0.19
2153.56	W II	6147 - 52567	16.	1.1	0.06
2157.80	W II	4716 - 51045	13.	0.91	-0.04
2166.32	W II	4716 - 50863	26.	1.8	0.25
2194.52	W II	0 - 45554	3.1	0.22	-0.65
2204.48	W II	6147 - 51495	40.	2.9	0.47
2248.75	W II	0 - 44455	4.7	0.35	-0.45
2270.24	W II	1519 - 45554	3.2	0.25	-0.61
2303.83	W II	1519 - 44912	5.4	0.43	-0.36
2315.02	W II	3173 - 46355	7.4	0.59	-0.23
2326.09	W II	6147 - 49125	24.	1.9	0.29
2328.31	W II	1519 - 44455	1.7	0.14	-0.86
2333.77	W II	1519 - 44355	3.5	0.29	-0.54
2358.81	W II	3173 - 45554	3.0	0.25	-0.60
2390.37	W II	7421 - 49242	21.	1.8	0.26
2392.93	W II	4716 - 46493	11.	0.97	-0.01
2397.09	W II	3173 - 44877	48.	4.1	0.61
2404.24	W II	8711 - 50292	18.	1.6	0.19
2411.54	W II	17437 - 58892	47.	4.1	0.61
2419.34	W II	20040 - 61361	46.	4.1	0.61
2421.01	W II	13412 - 54705	29.	2.5	0.40
2427.49	W II	3173 - 44355	18.	1.6	0.21
2435.01	W II	20534 - 61590	79.	7.0	0.85
2446.39	W II	7421 - 48285	53.	4.8	0.68
2451.48	W II	1519 - 42298	55.	5.0	0.70
2466.52	W II	1519 - 42049	16.	1.4	0.15
2470.80	W II	20781 - 61241	126.	12.	1.06
2477.80	W II	6147 - 46493	70.	6.4	0.81
2484.40	W II	20040 - 60279	45.	4.2	0.62
2488.77	W II	7420 - 47589	86.	8.0	0.90
2489.23	W II	4716 - 44877	58.	5.4	0.73
2492.93	W II	14857 - 54959	80.	7.5	0.87
2496.64	W II	4716 - 44758	34.	3.2	0.50

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2497.48	W II	6147 - 46175	22.	2.0	0.31
2499.69	W II	7420 - 47413	41.	3.9	0.59
2510.47	W II	19071 - 58892	112.	11.	1.02
2518.14	W II	10593 - 50292	32.	3.1	0.49
2522.04	W II	4716 - 44355	36.	3.4	0.53
2534.82	W II	20781 - 60219	76.	7.4	0.87
2549.09	W II	3173 - 42390	3.7	0.36	-0.44
2554.86	W II	0 - 39129	12.	1.2	0.08
2555.09	W II	3173 - 42298	43.	4.2	0.63
2563.16	W II	17437 - 56440	285.	28.	1.45
2563.91	W II	11301 - 50292	60.	5.9	0.77
2571.44	W II	3173 - 42049	37.	3.7	0.57
2572.24	W II	20534 - 59399	266.	26.	1.42
2573.95	W II	16553 - 55393	87.	8.6	0.94
2581.20	W II	6147 - 44877	6.0	0.60	-0.22
2589.17	W II	6147 - 44758	58.	5.9	0.77
2591.49	W II	0 - 38576	4.6	0.46	-0.33
2598.74	W II	8711 - 47180	32.	3.2	0.51
2603.02	W II	16553 - 54959	84.	8.5	0.93
2615.44	W II	15147 - 55370	77.	7.9	0.90
2653.42	W II	16553 - 54229	49.	5.2	0.72
2653.57	W II	4716 - 42390	7.7	0.81	-0.09
2658.04	W II	1519 - 39129	15.	1.6	0.21
2666.49	W II	7421 - 44912	14.	1.5	0.18
2677.79	W II	4716 - 42049	14.	1.5	0.18
2697.71	W II	1519 - 38576	6.9	0.75	-0.12
2701.48	W II	14857 - 51863	37.	4.1	0.61
2702.11	W II	13434 - 50431	118.	13.	1.11
2709.58	W II	14968 - 51863	75.	8.2	0.91
2710.78	W II	16235 - 53114	44.	4.9	0.69
2716.32	W II	14634 - 51438	70.	7.8	0.89
2718.04	W II	16590 - 53370	92.	10.	1.01
2729.62	W II	8833 - 45457	19.	2.1	0.32
2740.79	W II	23804 - 60279	149.	17.	1.23
2760.74	W II	19277 - 55488	59.	6.7	0.83
2761.59	W II	8711 - 44912	16.	1.9	0.27
2764.27	W II	0 - 36165	6.9	0.79	-0.10
2776.50	W II	14857 - 50863	131.	15.	1.18
2778.69	W II	16590 - 52567	42.	4.9	0.69
2799.03	W II	15147 - 50863	66.	7.7	0.89
2801.05	W II	13434 - 49125	96.	11.	1.05
2805.92	W II	16235 - 51863	124.	15.	1.16
2812.25	W II	13434 - 48983	24.	2.8	0.45
2822.57	W II	13412 - 48831	92.	11.	1.04
2918.63	W II	11301 - 45554	12.	1.6	0.20
2952.29	W II	14968 - 48831	125.	16.	1.21
3024.50	W II	11301 - 44355	20.	2.7	0.43
3149.85	W II	13173 - 44912	15.	2.2	0.34
3189.24	W II	15147 - 46493	24.	3.7	0.56
3572.48	W II	10593 - 38576	3.5	0.67	-0.17

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3592.42	W II	11301 - 39129	4.1	0.80	-0.10
3613.79	W II	14634 - 42298	10.	2.0	0.30
3641.41	W II	8711 - 36165	5.5	1.1	0.04
3646.52	W II	14634 - 42049	9.6	1.9	0.28
3657.59	W II	8833 - 36165	1.8	0.37	-0.44
3716.08	W II	15147 - 42049	6.8	1.4	0.15
3736.22	W II	18001 - 44758	13.	2.6	0.42
3851.57	W II	13173 - 39129	1.3	0.30	-0.53

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2354.20	Y I	530 - 42995	0.77	0.064	-1.19
2490.42	Y I	530 - 40672	0.66	0.062	-1.21
2681.65	Y I	0 - 37279	0.22	0.024	-1.62
2695.39	Y I	530 - 37620	0.37	0.040	-1.40
2723.00	Y I	530 - 37244	1.2	0.14	-0.87
2730.08	Y I	0 - 36618	0.23	0.026	-1.59
2742.53	Y I	0 - 36452	0.71	0.080	-1.09
2760.10	Y I	530 - 36751	1.6	0.18	-0.75
2791.20	Y I	0 - 35817	0.11	0.012	-1.91
2813.64	Y I	530 - 36061	0.25	0.029	-1.54
2818.86	Y I	10529 - 45994	2.7	0.32	-0.49
2822.56	Y I	10529 - 45948	6.7	0.80	-0.10
2886.48	Y I	11360 - 45994	15.	1.9	0.28
2919.05	Y I	0 - 34248	0.92	0.12	-0.93
2948.40	Y I	0 - 33907	2.1	0.27	-0.57
2964.96	Y I	530 - 34248	2.1	0.27	-0.56
2974.59	Y I	0 - 33608	2.4	0.32	-0.50
2984.26	Y I	530 - 34030	4.2	0.56	-0.26
2995.26	Y I	530 - 33907	0.38	0.051	-1.29
2996.94	Y I	0 - 33358	0.65	0.088	-1.06
3005.26	Y I	0 - 33265	0.32	0.043	-1.37
3018.95	Y I	10529 - 43644	4.5	0.61	-0.21
3021.73	Y I	530 - 33614	0.66	0.091	-1.04
3022.28	Y I	530 - 33608	0.44	0.060	-1.22
3045.37	Y I	530 - 33358	0.91	0.13	-0.90
3111.81	Y I	10529 - 42656	2.9	0.42	-0.37
3191.31	Y I	11360 - 42686	5.4	0.83	-0.08
3340.38	Y I	16066 - 45994	11.	1.9	0.27
3388.59	Y I	15246 - 44748	13.	2.2	0.34
3397.04	Y I	16234 - 45664	8.9	1.5	0.19
3412.47	Y I	15712 - 45008	14.	2.4	0.38
3450.95	Y I	16234 - 45204	12.	2.1	0.33
3485.73	Y I	17116 - 45796	35.	6.3	0.80
3521.53	Y I	14949 - 43338	8.0	1.5	0.17
3551.80	Y I	14949 - 43096	13.	2.4	0.38
3552.69	Y I	0 - 28140	0.77	0.15	-0.83
3558.76	Y I	15246 - 43338	18.	3.4	0.53
3571.43	Y I	15712 - 43704	22.	4.1	0.61
3576.05	Y I	16234 - 44190	35.	6.7	0.83
3589.69	Y I	15246 - 43096	9.9	1.9	0.28
3592.92	Y I	0 - 27824	3.7	0.71	-0.15
3620.94	Y I	530 - 28140	6.2	1.2	0.09
3692.53	Y I	17116 - 44190	21.	4.4	0.64
3718.12	Y I	16817 - 43704	6.5	1.4	0.13
3738.61	Y I	16597 - 43338	5.9	1.2	0.09
3749.89	Y I	16436 - 43096	4.8	1.0	0.00
3887.77	Y I	11360 - 37074	0.45	0.10	-0.99
3918.25	Y I	10937 - 36452	0.64	0.15	-0.83
3987.50	Y I	11360 - 36431	0.51	0.12	-0.91
4039.83	Y I	0 - 24747	0.46	0.11	-0.95

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4047.64	Y I	0 - 24699	1.1	0.28	-0.55
4077.38	Y I	0 - 24519	4.3	1.1	0.03
4081.22	Y I	18499 - 42995	7.6	1.9	0.28
4083.71	Y I	0 - 24481	0.91	0.23	-0.64
4102.38	Y I	530 - 24900	5.1	1.3	0.11
4106.39	Y I	18512 - 42858	4.9	1.2	0.09
4110.81	Y I	15246 - 39565	2.6	0.65	-0.19
4128.31	Y I	530 - 24747	4.4	1.1	0.06
4142.85	Y I	0 - 24131	3.1	0.80	-0.09
4157.63	Y I	15712 - 39758	3.4	0.89	-0.05
4167.52	Y I	530 - 24519	1.1	0.29	-0.53
4174.14	Y I	530 - 24481	0.93	0.24	-0.62
4213.02	Y I	16234 - 39964	2.9	0.78	-0.11
4213.54	Y I	14949 - 38675	1.0	0.27	-0.56
4217.80	Y I	10529 - 34231	1.2	0.31	-0.51
4220.63	Y I	14949 - 38636	7.1	1.9	0.28
4235.94	Y I	530 - 24131	0.94	0.25	-0.60
4251.20	Y I	15246 - 38762	7.9	2.2	0.33
4302.30	Y I	15712 - 38949	10.	2.8	0.45
4316.30	Y I	11360 - 34521	0.41	0.11	-0.94
4330.78	Y I	10529 - 33613	0.69	0.20	-0.71
4337.29	Y I	15712 - 38762	0.81	0.23	-0.64
4344.65	Y I	16436 - 39446	2.0	0.56	-0.25
4348.79	Y I	16234 - 39223	14.	3.9	0.59
4352.33	Y I	11278 - 34248	0.46	0.13	-0.89
4352.70	Y I	16597 - 39565	2.0	0.58	-0.24
4357.73	Y I	16817 - 39758	4.3	1.2	0.09
4366.03	Y I	11360 - 34257	0.92	0.26	-0.58
4375.61	Y I	17116 - 39964	5.7	1.6	0.22
4379.33	Y I	11079 - 33907	0.55	0.16	-0.80
4385.48	Y I	11360 - 34156	0.22	0.064	-1.19
4394.01	Y I	11278 - 34030	0.22	0.063	-1.20
4394.67	Y I	16817 - 39565	1.0	0.30	-0.53
4437.34	Y I	11079 - 33608	0.52	0.15	-0.82
4443.66	Y I	11532 - 34030	0.73	0.22	-0.67
4446.63	Y I	11360 - 33842	0.90	0.27	-0.57
4475.72	Y I	11278 - 33614	1.1	0.33	-0.48
4476.96	Y I	11278 - 33608	1.2	0.35	-0.45
4477.45	Y I	10937 - 33265	0.95	0.28	-0.55
4487.28	Y I	11079 - 33358	0.67	0.20	-0.69
4487.47	Y I	10937 - 33215	1.8	0.53	-0.28
4491.75	Y I	11532 - 33789	0.21	0.062	-1.20
4492.42	Y I	11360 - 33613	0.16	0.050	-1.30
4505.95	Y I	11079 - 33265	3.0	0.91	-0.04
4513.58	Y I	15327 - 37476	0.98	0.30	-0.52
4514.01	Y I	15329 - 37476	1.6	0.48	-0.32
4522.05	Y I	16436 - 38544	1.1	0.33	-0.49
4527.25	Y I	11532 - 33614	5.9	1.8	0.26
4527.80	Y I	11278 - 33358	2.7	0.83	-0.08
4544.32	Y I	15477 - 37476	2.0	0.61	-0.21

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4559.37	Y I	15222 - 37148	1.8	0.56	-0.25
4573.56	Y I	16817 - 38675	1.7	0.52	-0.28
4581.32	Y I	15327 - 37148	0.63	0.20	-0.70
4581.77	Y I	15329 - 37148	0.54	0.17	-0.77
4596.55	Y I	17116 - 38866	3.2	1.0	0.01
4604.80	Y I	15329 - 37040	1.4	0.45	-0.35
4613.00	Y I	15477 - 37148	0.64	0.20	-0.69
4643.70	Y I	0 - 21529	0.38	0.12	-0.91
4658.32	Y I	16159 - 37620	3.6	1.2	0.07
4667.47	Y I	15994 - 37413	1.4	0.45	-0.34
4674.84	Y I	530 - 21915	0.43	0.14	-0.85
4678.35	Y I	19148 - 40517	2.4	0.79	-0.11
4689.77	Y I	16159 - 37476	1.4	0.47	-0.33
4696.81	Y I	15994 - 37279	2.9	0.96	-0.02
4708.85	Y I	15222 - 36452	0.46	0.15	-0.82
4725.85	Y I	15994 - 37148	0.93	0.31	-0.50
4728.53	Y I	10529 - 31672	0.56	0.19	-0.73
4732.37	Y I	15327 - 36452	0.77	0.26	-0.59
4741.40	Y I	16159 - 37244	1.3	0.45	-0.34
4752.79	Y I	15327 - 36361	2.0	0.66	-0.18
4760.98	Y I	530 - 21529	0.078	0.027	-1.58
4780.18	Y I	15222 - 36136	0.20	0.068	-1.17
4781.04	Y I	11278 - 32188	0.47	0.16	-0.80
4786.89	Y I	15477 - 36361	2.1	0.73	-0.14
4799.30	Y I	11079 - 31909	0.65	0.22	-0.65
4804.31	Y I	15327 - 36136	0.57	0.20	-0.70
4804.81	Y I	15329 - 36136	0.86	0.30	-0.53
4819.64	Y I	10937 - 31680	0.49	0.17	-0.77
4822.13	Y I	15329 - 36061	1.4	0.49	-0.31
4839.15	Y I	15477 - 36136	0.72	0.25	-0.60
4839.87	Y I	11532 - 32188	3.1	1.1	0.03
4845.68	Y I	11278 - 31909	2.0	0.71	-0.15
4852.69	Y I	11079 - 31680	1.4	0.49	-0.31
4854.25	Y I	15222 - 35817	1.3	0.47	-0.33
4856.70	Y I	15477 - 36061	0.57	0.20	-0.70
4859.84	Y I	10937 - 31508	1.1	0.39	-0.41
4879.65	Y I	15329 - 35817	0.53	0.19	-0.72
4886.28	Y I	16159 - 36618	0.67	0.24	-0.62
4886.65	Y I	15994 - 36452	0.56	0.20	-0.70
4893.44	Y I	11079 - 31508	0.32	0.11	-0.95
4906.11	Y I	11532 - 31909	0.31	0.11	-0.95
4909.00	Y I	16066 - 36431	0.48	0.17	-0.76
4921.87	Y I	11360 - 31672	0.42	0.15	-0.82
4930.93	Y I	16146 - 36420	0.40	0.14	-0.84
4974.30	Y I	18499 - 38597	2.4	0.88	-0.06
5006.97	Y I	18512 - 38479	2.0	0.76	-0.12
5070.21	Y I	19148 - 38866	1.6	0.63	-0.20
5088.18	Y I	19028 - 38675	0.62	0.24	-0.62
5135.20	Y I	18499 - 37967	3.1	1.2	0.08
5240.81	Y I	18512 - 37588	2.8	1.2	0.06

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5380.62	Y I	15327 - 33907	0.43	0.19	-0.73
5417.03	Y I	16066 - 34521	0.16	0.072	-1.14
5424.37	Y I	15477 - 33907	0.52	0.23	-0.64
5438.24	Y I	15864 - 34248	1.2	0.55	-0.26
5466.46	Y I	11532 - 29820	1.3	0.59	-0.23
5468.47	Y I	15327 - 33608	0.56	0.25	-0.60
5493.17	Y I	14949 - 33148	0.28	0.13	-0.90
5495.59	Y I	16066 - 34257	0.24	0.11	-0.96
5503.45	Y I	15864 - 34030	1.8	0.82	-0.09
5513.64	Y I	15477 - 33608	0.32	0.15	-0.83
5521.63	Y I	15327 - 33432	0.61	0.28	-0.55
5526.76	Y I	16159 - 34248	0.15	0.071	-1.15
5527.54	Y I	11278 - 29364	1.2	0.56	-0.25
5541.63	Y I	15712 - 33753	0.21	0.097	-1.01
5544.61	Y I	15327 - 33358	0.60	0.28	-0.56
5556.43	Y I	15246 - 33238	0.36	0.17	-0.77
5567.75	Y I	15477 - 33432	0.31	0.14	-0.84
5577.42	Y I	15864 - 33789	1.0	0.48	-0.32
5581.08	Y I	15994 - 33907	0.14	0.066	-1.18
5581.87	Y I	11079 - 28989	0.93	0.43	-0.36
5590.96	Y I	15477 - 33358	0.11	0.050	-1.30
5594.12	Y I	16159 - 34030	0.13	0.060	-1.22
5606.33	Y I	11532 - 29364	0.20	0.093	-1.03
5623.91	Y I	16066 - 33842	0.087	0.041	-1.38
5630.13	Y I	10937 - 28694	0.78	0.37	-0.43
5632.25	Y I	15864 - 33614	0.13	0.063	-1.20
5632.89	Y I	16159 - 33907	0.12	0.059	-1.23
5644.69	Y I	11278 - 28989	0.18	0.085	-1.07
5648.47	Y I	15712 - 33412	0.62	0.30	-0.53
5675.27	Y I	11079 - 28694	0.12	0.060	-1.22
5693.63	Y I	16597 - 34156	0.12	0.056	-1.25
5706.73	Y I	16234 - 33753	0.95	0.47	-0.33
5720.61	Y I	16436 - 33912	0.15	0.071	-1.15
5732.09	Y I	16817 - 34257	0.14	0.069	-1.16
5743.85	Y I	17116 - 34521	0.65	0.32	-0.49
5765.64	Y I	16817 - 34156	0.49	0.24	-0.61
5773.86	Y I	16597 - 33912	0.23	0.11	-0.94
5821.87	Y I	16066 - 33238	0.15	0.078	-1.11
5832.27	Y I	17116 - 34257	0.14	0.073	-1.14
5871.83	Y I	16817 - 33842	0.091	0.047	-1.33
5879.96	Y I	16146 - 33148	0.12	0.062	-1.20
5902.96	Y I	16817 - 33753	0.22	0.12	-0.93
5945.72	Y I	16597 - 33412	0.25	0.13	-0.89
5950.02	Y I	16436 - 33238	0.12	0.066	-1.18
5981.86	Y I	16436 - 33148	0.27	0.14	-0.84
6009.19	Y I	17116 - 33753	0.73	0.39	-0.40
6023.41	Y I	0 - 16597	0.0056	0.0030	-2.52
6088.00	Y I	16817 - 33238	0.28	0.16	-0.81
6135.04	Y I	17116 - 33412	0.68	0.38	-0.42
6138.43	Y I	530 - 16817	0.0077	0.0044	-2.36

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
6191.73	Y I	0 - 16146	0.047	0.027	-1.56
6222.59	Y I	0 - 16066	0.012	0.0067	-2.18
6402.01	Y I	530 - 16146	0.0031	0.0019	-2.73
6435.00	Y I	530 - 16066	0.042	0.026	-1.59
6437.18	Y I	18499 - 34030	0.17	0.10	-0.98
6538.60	Y I	18499 - 33789	0.60	0.39	-0.41
6557.39	Y I	0 - 15246	0.0025	0.0016	-2.79
6576.85	Y I	19238 - 34438	0.36	0.24	-0.63
6584.87	Y I	530 - 15712	0.0010	0.00068	-3.17
6622.49	Y I	18512 - 33608	0.12	0.076	-1.12
6636.49	Y I	28989 - 44053	2.9	1.9	0.29
6650.61	Y I	19406 - 34438	0.43	0.28	-0.55
6664.40	Y I	29364 - 44366	3.6	2.4	0.38
6687.58	Y I	0 - 14949	0.0048	0.0032	-2.49
6691.83	Y I	29820 - 44760	2.7	1.8	0.26
6694.75	Y I	18499 - 33432	0.056	0.037	-1.43
6700.71	Y I	18512 - 33432	0.56	0.38	-0.43
6713.20	Y I	21529 - 36420	0.65	0.44	-0.36
6735.99	Y I	19406 - 34248	0.41	0.28	-0.55
6793.71	Y I	530 - 15246	0.0069	0.0048	-2.32
6803.15	Y I	19148 - 33842	0.11	0.073	-1.13
6815.16	Y I	19238 - 33907	0.19	0.14	-0.87
6845.24	Y I	19148 - 33753	0.42	0.29	-0.53
6887.22	Y I	21915 - 36431	0.56	0.40	-0.40
6908.26	Y I	14949 - 29420	0.025	0.018	-1.75
6933.52	Y I	530 - 14949	0.00046	0.00033	-3.48
6950.31	Y I	19028 - 33412	0.24	0.17	-0.76
6958.04	Y I	15246 - 29614	0.033	0.024	-1.62
6979.88	Y I	14949 - 29272	0.075	0.055	-1.26
7008.97	Y I	19148 - 33412	0.14	0.100	-1.00
7009.93	Y I	18976 - 33238	0.092	0.068	-1.17
7035.18	Y I	19028 - 33238	0.18	0.14	-0.86
7052.94	Y I	15246 - 29420	0.095	0.071	-1.15
7054.28	Y I	18976 - 33148	0.13	0.094	-1.03
7075.13	Y I	15712 - 29843	0.032	0.024	-1.62
7127.92	Y I	15246 - 29272	0.037	0.028	-1.55
7191.66	Y I	15712 - 29614	0.12	0.092	-1.04
7195.93	Y I	36361 - 50254	9.2	7.1	0.85
7293.08	Y I	15712 - 29420	0.029	0.023	-1.63
7346.46	Y I	16234 - 29843	0.18	0.15	-0.82
7398.77	Y I	15477 - 28989	0.035	0.029	-1.54
7494.88	Y I	19028 - 32366	0.14	0.12	-0.93
7563.13	Y I	19148 - 32366	0.27	0.23	-0.63
7622.94	Y I	18976 - 32091	0.14	0.13	-0.90
7652.89	Y I	19028 - 32091	0.051	0.045	-1.35
7689.49	Y I	18976 - 31978	0.035	0.031	-1.50
7719.89	Y I	19028 - 31978	0.14	0.13	-0.90
7724.08	Y I	19148 - 32091	0.15	0.13	-0.88
7788.42	Y I	16436 - 29272	0.047	0.043	-1.37
7796.32	Y I	16597 - 29420	0.049	0.044	-1.35

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
7802.52	Y I	15327 - 28140	0.015	0.013	-1.88
7812.16	Y I	16817 - 29614	0.066	0.061	-1.22
7855.52	Y I	17116 - 29843	0.12	0.11	-0.96
7999.33	Y I	17116 - 29614	0.038	0.036	-1.44
8329.61	Y I	32188 - 44190	2.2	2.2	0.35
8344.43	Y I	16159 - 28140	0.065	0.068	-1.17
8365.64	Y I	24481 - 36431	0.22	0.23	-0.64
8450.36	Y I	15994 - 27824	0.043	0.046	-1.33
8528.94	Y I	24699 - 36420	0.22	0.24	-0.62
8800.62	Y I	0 - 11360	0.00049	0.00057	-3.24

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2243.06	Y II	0 - 44568	0.68	0.051	-1.29
2413.93	Y II	23776 - 65189	4.7	0.41	-0.39
2422.20	Y II	3296 - 44568	8.0	0.70	-0.15
2460.61	Y II	24647 - 65275	18.	1.6	0.21
2734.85	Y II	24647 - 61200	7.1	0.79	-0.10
2785.21	Y II	23776 - 59670	9.3	1.1	0.03
2785.59	Y II	24647 - 60535	3.9	0.45	-0.34
2800.11	Y II	23445 - 59147	9.0	1.1	0.03
2825.37	Y II	29214 - 64597	8.4	1.0	0.00
2826.38	Y II	23776 - 59147	13.	1.6	0.19
2854.43	Y II	24647 - 59670	22.	2.7	0.42
2856.30	Y II	23776 - 58776	7.7	0.94	-0.03
2897.69	Y II	24647 - 59147	5.3	0.67	-0.17
2898.82	Y II	23776 - 58262	4.0	0.51	-0.29
2930.03	Y II	27532 - 61650	6.2	0.80	-0.10
2973.91	Y II	24647 - 58262	5.2	0.69	-0.16
2980.55	Y II	28394 - 61934	11.	1.5	0.17
3026.49	Y II	26147 - 59179	8.4	1.2	0.06
3036.59	Y II	28730 - 61650	11.	1.6	0.19
3055.22	Y II	29214 - 61934	23.	3.2	0.51
3086.85	Y II	26147 - 58533	19.	2.7	0.44
3093.76	Y II	32284 - 64597	9.2	1.3	0.12
3095.88	Y II	1045 - 33337	0.12	0.018	-1.75
3112.04	Y II	0 - 32124	0.048	0.0070	-2.15
3128.77	Y II	27227 - 59179	20.	3.0	0.47
3129.93	Y II	27532 - 59472	29.	4.3	0.64
3135.17	Y II	1450 - 33337	0.14	0.020	-1.69
3173.06	Y II	28394 - 59900	43.	6.5	0.81
3179.41	Y II	840 - 32284	0.24	0.037	-1.44
3195.62	Y II	840 - 32124	2.5	0.38	-0.42
3200.27	Y II	1045 - 32284	2.4	0.37	-0.43
3203.32	Y II	840 - 32049	2.3	0.35	-0.45
3216.69	Y II	1045 - 32124	4.2	0.65	-0.19
3242.28	Y II	1450 - 32284	7.0	1.1	0.05
3280.91	Y II	14098 - 44568	11.	1.8	0.26
3308.47	Y II	28730 - 58947	7.5	1.2	0.09
3327.89	Y II	3296 - 33337	7.3	1.2	0.08
3362.00	Y II	14833 - 44568	5.8	0.99	-0.00
3448.82	Y II	3296 - 32284	0.24	0.043	-1.36
3467.88	Y II	3296 - 32124	0.13	0.023	-1.64
3496.09	Y II	0 - 28595	0.74	0.14	-0.87
3549.01	Y II	1045 - 29214	2.0	0.38	-0.42
3584.52	Y II	840 - 28730	1.5	0.29	-0.54
3600.73	Y II	1450 - 29214	5.3	1.0	0.02
3601.92	Y II	840 - 28595	2.8	0.54	-0.27
3611.05	Y II	1045 - 28730	3.6	0.70	-0.15
3628.71	Y II	1045 - 28595	0.84	0.17	-0.78
3633.12	Y II	0 - 27517	2.6	0.51	-0.29
3664.61	Y II	1450 - 28730	1.3	0.26	-0.59
3668.49	Y II	28394 - 55645	13.	2.6	0.41

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3710.30	Y II	1450 - 28394	5.0	1.0	0.02
3747.55	Y II	840 - 27517	0.37	0.078	-1.11
3774.33	Y II	1045 - 27532	3.2	0.69	-0.16
3776.56	Y II	1045 - 27517	0.43	0.091	-1.04
3782.30	Y II	29214 - 55645	16.	3.4	0.53
3788.70	Y II	840 - 27227	2.1	0.45	-0.34
3818.35	Y II	1045 - 27227	0.37	0.082	-1.09
3832.88	Y II	1450 - 27532	1.3	0.28	-0.56
3878.28	Y II	1450 - 27227	0.12	0.027	-1.56
3930.66	Y II	3296 - 28730	0.094	0.022	-1.66
3950.36	Y II	840 - 26147	0.84	0.20	-0.71
3951.60	Y II	3296 - 28595	0.057	0.013	-1.88
3982.60	Y II	1045 - 26147	0.69	0.16	-0.79
4124.92	Y II	3296 - 27532	0.094	0.024	-1.62
4177.54	Y II	3296 - 27227	2.2	0.57	-0.24
4199.28	Y II	840 - 24647	0.016	0.0042	-2.38
4204.70	Y II	0 - 23776	0.039	0.010	-1.98
4235.73	Y II	1045 - 24647	0.080	0.022	-1.67
4309.63	Y II	1450 - 24647	0.38	0.11	-0.98
4358.73	Y II	840 - 23776	0.086	0.024	-1.61
4374.94	Y II	3296 - 26147	2.5	0.72	-0.14
4398.02	Y II	1045 - 23776	0.20	0.057	-1.25
4422.59	Y II	840 - 23445	0.089	0.026	-1.58
4682.32	Y II	3296 - 24647	0.032	0.011	-1.97
4786.58	Y II	8328 - 29214	0.071	0.024	-1.61
4823.31	Y II	8003 - 28730	0.077	0.027	-1.57
4854.87	Y II	8003 - 28595	0.35	0.12	-0.91
4883.69	Y II	8743 - 29214	0.89	0.32	-0.50
4900.12	Y II	8328 - 28730	0.46	0.17	-0.78
4982.13	Y II	8328 - 28394	0.036	0.013	-1.87
5087.42	Y II	8743 - 28394	0.35	0.13	-0.87
5119.11	Y II	8003 - 27532	0.051	0.020	-1.70
5123.21	Y II	8003 - 27517	0.11	0.043	-1.37
5196.43	Y II	14098 - 33337	0.15	0.062	-1.21
5200.41	Y II	8003 - 27227	0.22	0.089	-1.05
5205.72	Y II	8328 - 27532	0.37	0.15	-0.82
5289.82	Y II	8328 - 27227	0.014	0.0058	-2.24
5320.78	Y II	8743 - 27532	0.011	0.0048	-2.32
5402.78	Y II	14833 - 33337	0.30	0.13	-0.89
5473.39	Y II	14018 - 32284	0.089	0.040	-1.40
5480.74	Y II	13883 - 32124	0.085	0.038	-1.41
5497.41	Y II	14098 - 32284	0.24	0.11	-0.97
5509.90	Y II	8003 - 26147	0.045	0.021	-1.69
5546.02	Y II	14098 - 32124	0.086	0.040	-1.40
5662.94	Y II	15683 - 33337	1.0	0.50	-0.30
5728.89	Y II	14833 - 32284	0.078	0.038	-1.42
5781.69	Y II	14833 - 32124	0.11	0.053	-1.28
6613.75	Y II	14098 - 29214	0.060	0.040	-1.40
6795.41	Y II	14018 - 28730	0.041	0.028	-1.55
6832.49	Y II	14098 - 28730	0.0082	0.0057	-2.24

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
6858.24	Y II	14018 - 28595	0.0079	0.0056	-2.25
6896.00	Y II	14098 - 28595	0.012	0.0085	-2.07
6951.68	Y II	14833 - 29214	0.0079	0.0058	-2.24
7264.17	Y II	14833 - 28595	0.024	0.019	-1.71
7332.96	Y II	13883 - 27517	0.0026	0.0021	-2.68
7450.30	Y II	14098 - 27517	0.016	0.013	-1.88
7881.90	Y II	14833 - 27517	0.061	0.057	-1.24
8835.85	Y II	14833 - 26147	0.0085	0.0100	-2.00

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2464.49	Yb I	0 - 40564	2.7	0.24	-0.62
2671.98	Yb I	0 - 37415	1.0	0.11	-0.97
3464.36	Yb I	0 - 28857	0.72	0.13	-0.89
3517.02	Yb I	19710 - 48136	3.3	0.61	-0.21
3655.73	Yb I	17992 - 45339	2.1	0.42	-0.38
3734.70	Yb I	17992 - 44760	3.6	0.76	-0.12
3770.10	Yb I	17288 - 43805	8.6	1.8	0.26
3872.85	Yb I	17992 - 43805	3.2	0.72	-0.14
3900.86	Yb I	19710 - 45339	5.0	1.1	0.06
3987.98	Yb I	0 - 25068	1.6	0.38	-0.42
3990.89	Yb I	19710 - 44760	12.	2.8	0.45
4149.07	Yb I	19710 - 43805	4.8	1.2	0.09
4231.99	Yb I	17992 - 41615	0.66	0.18	-0.75
4393.76	Yb I	25068 - 47822	1.9	0.56	-0.25
4430.22	Yb I	24489 - 47055	1.6	0.48	-0.32
4439.21	Yb I	17288 - 39809	1.5	0.46	-0.34
4482.44	Yb I	24752 - 47055	2.3	0.70	-0.15
4564.00	Yb I	19710 - 41615	0.51	0.16	-0.80
4576.21	Yb I	17992 - 39838	2.3	0.74	-0.13
4582.36	Yb I	17992 - 39809	0.74	0.23	-0.63
4589.22	Yb I	25271 - 47055	1.9	0.61	-0.22
4837.47	Yb I	24489 - 45155	0.73	0.26	-0.59
4912.38	Yb I	19710 - 40062	0.11	0.041	-1.39
4935.51	Yb I	19710 - 39966	2.9	1.1	0.03
4966.91	Yb I	19710 - 39838	0.54	0.20	-0.70
5074.33	Yb I	24752 - 44453	3.3	1.3	0.10
5076.75	Yb I	25068 - 44760	0.82	0.32	-0.50
5211.59	Yb I	25271 - 44453	1.3	0.53	-0.28
5244.11	Yb I	24752 - 43816	1.3	0.54	-0.27
5277.08	Yb I	24489 - 43434	1.8	0.74	-0.13
5351.33	Yb I	24752 - 43434	0.36	0.15	-0.81
5481.94	Yb I	24489 - 42726	0.59	0.26	-0.58
5505.50	Yb I	24489 - 42648	0.41	0.19	-0.73
5556.48	Yb I	0 - 17992	0.022	0.010	-1.99
5562.07	Yb I	24752 - 42726	0.34	0.16	-0.80
5586.35	Yb I	24752 - 42648	0.20	0.094	-1.03
5720.01	Yb I	27678 - 45155	4.5	2.2	0.34
6400.40	Yb I	27678 - 43298	0.46	0.28	-0.55
6417.97	Yb I	27678 - 43255	0.45	0.28	-0.55
6489.10	Yb I	17288 - 32695	0.23	0.15	-0.83
6643.54	Yb I	27678 - 42726	0.32	0.21	-0.67
6667.85	Yb I	25068 - 40062	1.3	0.90	-0.05
6678.17	Yb I	27678 - 42648	0.24	0.16	-0.80
6768.70	Yb I	25068 - 39838	0.18	0.13	-0.90
6799.61	Yb I	17992 - 32695	0.67	0.47	-0.33
7244.47	Yb I	24752 - 38552	0.061	0.048	-1.32
7305.25	Yb I	24489 - 38174	0.049	0.040	-1.40
7313.10	Yb I	24752 - 38422	0.066	0.053	-1.27
7448.33	Yb I	24752 - 38174	0.16	0.13	-0.88
7527.56	Yb I	25271 - 38552	0.21	0.18	-0.74

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7699.49	Yb I	19710 - 32695	1.0	0.92	-0.03
7895.12	Yb I	24752 - 37415	0.038	0.035	-1.45

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2126.72	Yb II	0 - 47006	0.41	0.028	-1.56
2185.70	Yb II	0 - 45737	0.16	0.011	-1.94
2224.45	Yb II	0 - 44941	0.15	0.011	-1.95
2362.88	Yb II	21418 - 63727	0.68	0.057	-1.24
2390.73	Yb II	21418 - 63234	3.2	0.28	-0.56
2398.01	Yb II	0 - 41688	0.013	0.0011	-2.95
2421.36	Yb II	32371 - 73658	1.0	0.091	-1.04
2447.25	Yb II	28758 - 69608	1.2	0.10	-0.98
2460.24	Yb II	30224 - 70858	1.4	0.12	-0.91
2484.87	Yb II	30563 - 70794	0.68	0.063	-1.20
2502.00	Yb II	21418 - 61374	2.6	0.24	-0.61
2505.46	Yb II	31568 - 71469	1.4	0.13	-0.88
2512.05	Yb II	21418 - 61215	5.2	0.49	-0.31
2516.36	Yb II	33052 - 72780	0.89	0.084	-1.07
2522.42	Yb II	21418 - 61051	1.8	0.17	-0.76
2537.64	Yb II	30563 - 69957	3.1	0.30	-0.52
2538.67	Yb II	0 - 39379	0.19	0.019	-1.73
2552.14	Yb II	30224 - 69395	3.4	0.33	-0.48
2552.69	Yb II	31632 - 70794	2.8	0.27	-0.56
2565.56	Yb II	34785 - 73751	1.1	0.11	-0.97
2571.35	Yb II	31980 - 70858	1.4	0.14	-0.85
2573.13	Yb II	32371 - 71222	0.64	0.064	-1.20
2596.29	Yb II	31632 - 70136	1.4	0.14	-0.85
2615.26	Yb II	30224 - 68450	1.0	0.11	-0.98
2617.00	Yb II	21418 - 59619	3.5	0.36	-0.45
2639.44	Yb II	31568 - 69444	2.1	0.22	-0.65
2641.90	Yb II	21418 - 59259	2.9	0.31	-0.51
2644.30	Yb II	33052 - 70858	5.8	0.61	-0.21
2646.44	Yb II	33494 - 71270	1.5	0.15	-0.81
2647.46	Yb II	35019 - 72780	1.5	0.16	-0.80
2648.80	Yb II	33052 - 70794	1.5	0.15	-0.81
2649.79	Yb II	33494 - 71222	2.6	0.27	-0.57
2650.73	Yb II	30224 - 67939	1.4	0.15	-0.84
2653.74	Yb II	21418 - 59090	34.	3.6	0.56
2656.11	Yb II	28758 - 66396	1.7	0.18	-0.75
2659.26	Yb II	28758 - 66351	1.00	0.11	-0.98
2665.02	Yb II	31568 - 69080	9.9	1.1	0.03
2668.74	Yb II	33494 - 70954	2.9	0.31	-0.50
2672.65	Yb II	21418 - 58823	13.	1.4	0.15
2680.40	Yb II	26759 - 64056	0.94	0.10	-1.00
2683.42	Yb II	44438 - 81693	0.78	0.084	-1.08
2684.75	Yb II	32371 - 69608	3.6	0.39	-0.41
2687.96	Yb II	30224 - 67416	1.2	0.13	-0.88
2695.43	Yb II	31632 - 68720	1.4	0.16	-0.81
2696.62	Yb II	32371 - 69444	0.72	0.079	-1.10
2708.84	Yb II	33052 - 69957	1.1	0.12	-0.92
2710.54	Yb II	31568 - 68450	3.2	0.35	-0.45
2711.79	Yb II	21418 - 58284	0.83	0.091	-1.04
2712.66	Yb II	30563 - 67416	2.8	0.31	-0.51
2718.35	Yb II	31980 - 68756	8.6	0.96	-0.02

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2722.19	Yb II	34390 - 71114	1.1	0.13	-0.90
2732.72	Yb II	31568 - 68150	5.7	0.64	-0.19
2734.08	Yb II	34390 - 70954	1.1	0.13	-0.90
2741.71	Yb II	33494 - 69957	3.0	0.33	-0.48
2747.58	Yb II	32371 - 68756	2.9	0.33	-0.48
2748.03	Yb II	34575 - 70954	0.95	0.11	-0.97
2748.66	Yb II	31568 - 67939	11.	1.3	0.11
2750.48	Yb II	21418 - 57765	42.	4.7	0.67
2751.45	Yb II	30224 - 66558	4.2	0.47	-0.33
2759.00	Yb II	37516 - 73751	1.2	0.13	-0.87
2760.78	Yb II	35059 - 71270	3.4	0.39	-0.41
2761.38	Yb II	35019 - 71222	3.4	0.39	-0.41
2764.42	Yb II	35059 - 71222	1.9	0.22	-0.66
2771.33	Yb II	34785 - 70858	4.6	0.53	-0.28
2776.28	Yb II	34785 - 70794	9.2	1.1	0.02
2784.66	Yb II	33494 - 69395	5.2	0.61	-0.22
2787.96	Yb II	30224 - 66082	0.87	0.10	-1.00
2793.28	Yb II	33654 - 69444	2.2	0.26	-0.58
2794.44	Yb II	35019 - 70794	1.3	0.16	-0.80
2795.08	Yb II	37516 - 73283	1.2	0.14	-0.86
2798.21	Yb II	30224 - 65951	4.8	0.57	-0.24
2800.05	Yb II	28758 - 64461	4.0	0.47	-0.33
2810.72	Yb II	32371 - 67939	0.73	0.087	-1.06
2814.53	Yb II	30563 - 66082	3.1	0.37	-0.43
2816.35	Yb II	30392 - 65888	1.4	0.17	-0.78
2821.15	Yb II	31980 - 67416	7.3	0.87	-0.06
2824.97	Yb II	30563 - 65951	4.9	0.59	-0.23
2830.98	Yb II	30563 - 65876	9.1	1.1	0.04
2832.20	Yb II	28758 - 64056	0.83	0.099	-1.00
2834.98	Yb II	37516 - 72780	1.6	0.19	-0.71
2842.58	Yb II	32982 - 68150	0.74	0.090	-1.05
2847.17	Yb II	27062 - 62174	9.9	1.2	0.08
2848.44	Yb II	33052 - 68149	5.2	0.63	-0.20
2849.33	Yb II	44498 - 79583	1.2	0.15	-0.82
2851.12	Yb II	26759 - 61822	15.	1.9	0.27
2851.86	Yb II	33494 - 68549	3.0	0.37	-0.44
2853.41	Yb II	46170 - 81205	1.2	0.15	-0.82
2853.68	Yb II	34575 - 69608	0.96	0.12	-0.93
2854.13	Yb II	35832 - 70858	3.1	0.38	-0.42
2854.49	Yb II	40036 - 75058	2.5	0.30	-0.52
2858.33	Yb II	30224 - 65200	2.1	0.25	-0.59
2858.46	Yb II	32982 - 67955	2.2	0.27	-0.56
2859.38	Yb II	35832 - 70794	5.5	0.67	-0.17
2859.80	Yb II	21418 - 56376	13.	1.6	0.20
2861.21	Yb II	31632 - 66571	7.2	0.88	-0.05
2861.33	Yb II	35019 - 69957	5.4	0.67	-0.18
2867.05	Yb II	30224 - 65093	9.7	1.2	0.08
2885.97	Yb II	33494 - 68135	1.5	0.19	-0.72
2886.26	Yb II	30563 - 65200	3.5	0.44	-0.36
2888.03	Yb II	26759 - 61374	8.4	1.1	0.02

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2891.38	Yb II	0 - 34575	0.75	0.094	-1.03
2893.63	Yb II	35059 - 69608	2.3	0.29	-0.53
2896.90	Yb II	46170 - 80679	1.7	0.21	-0.67
2899.71	Yb II	28758 - 63234	3.9	0.50	-0.30
2902.40	Yb II	33494 - 67939	0.94	0.12	-0.92
2902.92	Yb II	38342 - 72780	1.2	0.16	-0.81
2906.88	Yb II	37078 - 71469	1.2	0.15	-0.81
2908.32	Yb II	30224 - 64598	1.4	0.18	-0.76
2909.19	Yb II	33052 - 67416	1.9	0.24	-0.62
2909.47	Yb II	30563 - 64923	2.8	0.35	-0.45
2911.52	Yb II	35059 - 69395	4.7	0.60	-0.23
2912.86	Yb II	31568 - 65888	0.90	0.11	-0.94
2914.21	Yb II	35832 - 70136	9.5	1.2	0.08
2915.27	Yb II	26759 - 61051	6.0	0.76	-0.12
2916.43	Yb II	39379 - 73658	1.0	0.13	-0.88
2919.34	Yb II	31632 - 65876	14.	1.8	0.27
2921.12	Yb II	32982 - 67205	3.0	0.38	-0.42
2924.23	Yb II	32371 - 66558	2.2	0.28	-0.55
2927.85	Yb II	37078 - 71222	1.4	0.18	-0.74
2935.10	Yb II	34390 - 68450	3.1	0.40	-0.40
2937.18	Yb II	37078 - 71114	1.2	0.16	-0.80
2939.52	Yb II	31568 - 65577	2.2	0.28	-0.55
2942.04	Yb II	32371 - 66351	1.5	0.19	-0.72
2945.90	Yb II	34785 - 68720	7.8	1.0	0.01
2946.30	Yb II	40036 - 73967	2.5	0.33	-0.48
2946.76	Yb II	43956 - 77882	1.1	0.14	-0.85
2950.32	Yb II	35059 - 68944	1.6	0.20	-0.69
2955.31	Yb II	26759 - 60586	1.8	0.23	-0.63
2962.52	Yb II	34390 - 68135	3.5	0.46	-0.34
2964.75	Yb II	30224 - 63944	6.2	0.82	-0.09
2970.56	Yb II	0 - 33654	0.33	0.044	-1.36
2982.49	Yb II	33052 - 66571	2.3	0.30	-0.52
2982.66	Yb II	32371 - 65888	1.1	0.15	-0.83
2983.70	Yb II	33052 - 66558	1.5	0.20	-0.70
2983.98	Yb II	30224 - 63727	9.6	1.3	0.11
2985.08	Yb II	35059 - 68549	5.1	0.68	-0.17
2985.87	Yb II	32982 - 66463	1.9	0.25	-0.60
2990.36	Yb II	35019 - 68450	2.4	0.32	-0.50
2991.87	Yb II	32982 - 66396	3.4	0.45	-0.34
2993.93	Yb II	35059 - 68450	1.6	0.21	-0.67
2994.80	Yb II	30563 - 63944	8.3	1.1	0.05
2995.86	Yb II	32982 - 66351	1.5	0.20	-0.70
3002.61	Yb II	41679 - 74973	1.5	0.20	-0.69
3005.76	Yb II	31632 - 64891	16.	2.1	0.33
3009.39	Yb II	31980 - 65200	5.1	0.69	-0.16
3010.62	Yb II	32371 - 65577	3.3	0.45	-0.35
3014.43	Yb II	30563 - 63727	2.8	0.38	-0.42
3017.55	Yb II	35019 - 68149	8.7	1.2	0.07
3026.67	Yb II	33052 - 66082	8.3	1.1	0.06
3031.11	Yb II	0 - 32982	0.13	0.018	-1.75

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3034.64	Yb II	31980 - 64923	2.9	0.40	-0.40
3037.99	Yb II	32982 - 65888	1.3	0.18	-0.74
3039.67	Yb II	35832 - 68720	3.2	0.45	-0.35
3042.65	Yb II	33494 - 66351	4.2	0.58	-0.24
3044.01	Yb II	30392 - 63234	1.0	0.14	-0.84
3046.48	Yb II	34390 - 67205	2.3	0.33	-0.49
3047.06	Yb II	33654 - 66463	1.9	0.27	-0.57
3063.13	Yb II	30224 - 62861	2.0	0.29	-0.54
3063.67	Yb II	34785 - 67416	1.2	0.17	-0.78
3065.04	Yb II	28758 - 61374	5.1	0.72	-0.14
3076.02	Yb II	26759 - 59259	0.71	0.10	-0.99
3089.10	Yb II	28758 - 61120	4.5	0.64	-0.20
3093.87	Yb II	31632 - 63944	3.6	0.52	-0.29
3101.36	Yb II	33654 - 65888	2.3	0.33	-0.48
3102.07	Yb II	32371 - 64598	1.5	0.21	-0.67
3107.76	Yb II	34390 - 66558	3.1	0.45	-0.34
3107.90	Yb II	40036 - 72202	10.	1.5	0.18
3115.33	Yb II	32371 - 64461	4.4	0.64	-0.19
3116.70	Yb II	31980 - 64056	2.9	0.42	-0.37
3117.80	Yb II	26759 - 58823	7.3	1.1	0.03
3136.75	Yb II	33052 - 64923	2.6	0.39	-0.41
3140.92	Yb II	28758 - 60586	10.	1.5	0.17
3141.72	Yb II	34575 - 66396	4.3	0.64	-0.19
3145.06	Yb II	34785 - 66571	4.4	0.65	-0.19
3153.17	Yb II	33494 - 65200	1.5	0.23	-0.64
3155.17	Yb II	32371 - 64056	2.6	0.38	-0.42
3163.79	Yb II	33494 - 65093	3.8	0.57	-0.24
3165.20	Yb II	35832 - 67416	2.8	0.43	-0.37
3169.06	Yb II	33052 - 64598	6.4	0.96	-0.02
3180.92	Yb II	33494 - 64923	6.5	0.98	-0.01
3192.88	Yb II	30563 - 61874	19.	2.9	0.46
3198.65	Yb II	31980 - 63234	3.6	0.55	-0.26
3201.16	Yb II	31632 - 62861	12.	1.9	0.27
3217.18	Yb II	32982 - 64056	4.1	0.64	-0.19
3218.33	Yb II	35019 - 66082	2.8	0.43	-0.36
3225.86	Yb II	30224 - 61215	2.3	0.36	-0.44
3239.20	Yb II	32371 - 63234	2.2	0.35	-0.46
3261.50	Yb II	30563 - 61215	6.1	0.97	-0.01
3289.37	Yb II	0 - 30392	1.4	0.22	-0.65
3305.73	Yb II	31632 - 61874	7.1	1.2	0.06
3333.06	Yb II	33654 - 63648	2.7	0.45	-0.35
3347.53	Yb II	35059 - 64923	2.8	0.47	-0.33
3375.48	Yb II	26759 - 56376	8.6	1.5	0.17
3391.10	Yb II	37078 - 66558	3.0	0.52	-0.29
3394.44	Yb II	32371 - 61822	2.5	0.44	-0.36
3401.02	Yb II	30224 - 59619	2.3	0.39	-0.41
3404.11	Yb II	35832 - 65200	2.1	0.36	-0.45
3428.47	Yb II	34785 - 63944	4.4	0.77	-0.11
3438.71	Yb II	34575 - 63648	2.8	0.49	-0.31
3438.85	Yb II	31980 - 61051	4.9	0.88	-0.06

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3446.89	Yb II	32371 - 61374	1.8	0.32	-0.49
3454.07	Yb II	26759 - 55702	17.	3.1	0.49
3458.28	Yb II	40036 - 68944	12.	2.1	0.33
3476.31	Yb II	0 - 28758	0.024	0.0044	-2.35
3478.84	Yb II	30224 - 58961	22.	4.0	0.61
3485.76	Yb II	32371 - 61051	4.3	0.78	-0.11
3507.82	Yb II	37078 - 65577	5.2	0.95	-0.02
3520.29	Yb II	30563 - 58961	10.	1.9	0.28
3549.82	Yb II	33052 - 61215	5.1	0.97	-0.01
3560.33	Yb II	21418 - 49498	3.0	0.57	-0.24
3560.71	Yb II	34785 - 62861	9.5	1.8	0.26
3563.94	Yb II	31568 - 59619	2.4	0.45	-0.35
3570.56	Yb II	33052 - 61051	4.4	0.84	-0.08
3585.47	Yb II	21418 - 49301	5.2	1.0	0.00
3606.48	Yb II	33494 - 61215	4.9	0.95	-0.02
3610.24	Yb II	31568 - 59259	1.7	0.33	-0.48
3611.30	Yb II	37516 - 65200	3.1	0.60	-0.22
3619.82	Yb II	28758 - 56376	5.4	1.1	0.03
3637.76	Yb II	21418 - 48900	2.3	0.46	-0.33
3669.70	Yb II	27062 - 54304	5.4	1.1	0.04
3670.69	Yb II	38342 - 65577	2.2	0.45	-0.34
3675.08	Yb II	30563 - 57765	4.3	0.87	-0.06
3690.56	Yb II	34785 - 61874	2.0	0.40	-0.40
3694.19	Yb II	0 - 27062	0.74	0.15	-0.82
3698.59	Yb II	35832 - 62861	2.9	0.59	-0.23
3710.33	Yb II	28758 - 55702	1.3	0.27	-0.57
3724.22	Yb II	31980 - 58823	2.0	0.42	-0.38
3904.82	Yb II	38342 - 63944	1.4	0.31	-0.51
4077.28	Yb II	38342 - 62861	2.3	0.57	-0.25
4135.09	Yb II	34785 - 58961	1.5	0.39	-0.41
4180.82	Yb II	30392 - 54304	5.1	1.3	0.13
4218.56	Yb II	37516 - 61215	3.9	1.0	0.02
4316.96	Yb II	30563 - 53721	0.99	0.28	-0.56
4515.17	Yb II	26759 - 48900	0.60	0.18	-0.73
4553.59	Yb II	30563 - 52517	0.45	0.14	-0.86
4598.37	Yb II	31980 - 53721	0.66	0.21	-0.68
4683.83	Yb II	32371 - 53715	0.54	0.18	-0.75
4726.08	Yb II	26759 - 47912	1.1	0.38	-0.42
4786.61	Yb II	31632 - 52517	2.4	0.81	-0.09
4820.25	Yb II	28758 - 49498	0.36	0.13	-0.90
4836.95	Yb II	33052 - 53721	0.55	0.19	-0.71
4851.16	Yb II	24333 - 44941	0.047	0.017	-1.78
4937.23	Yb II	37516 - 57765	0.58	0.21	-0.67
5009.52	Yb II	32982 - 52938	0.36	0.14	-0.86
5067.31	Yb II	34575 - 54304	0.31	0.12	-0.92
5135.99	Yb II	33052 - 52517	0.30	0.12	-0.92
5147.03	Yb II	38342 - 57765	0.35	0.14	-0.86
5184.18	Yb II	33654 - 52938	0.32	0.13	-0.88
5240.52	Yb II	30224 - 49301	0.30	0.13	-0.90
5257.51	Yb II	34390 - 53405	0.72	0.30	-0.52

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
5279.56	Yb II	34785 - 53721	0.60	0.25	-0.60
5300.95	Yb II	37516 - 56376	0.40	0.17	-0.78
5335.15	Yb II	30563 - 49301	1.5	0.66	-0.18
5345.67	Yb II	35019 - 53721	0.55	0.24	-0.63
5347.22	Yb II	35019 - 53715	1.1	0.46	-0.34
5352.96	Yb II	30224 - 48900	1.3	0.55	-0.26
5358.66	Yb II	35059 - 53715	0.55	0.24	-0.62
5389.87	Yb II	34390 - 52938	0.28	0.12	-0.91
5432.74	Yb II	47680 - 66082	0.54	0.24	-0.62
5449.30	Yb II	35059 - 53405	0.75	0.33	-0.48
5478.52	Yb II	40036 - 58284	0.38	0.17	-0.76
5588.47	Yb II	35832 - 53721	0.80	0.37	-0.43
5652.00	Yb II	30224 - 47912	0.43	0.21	-0.69
5749.92	Yb II	49009 - 66396	0.43	0.21	-0.67
5771.67	Yb II	31980 - 49301	0.27	0.13	-0.87
5819.43	Yb II	46548 - 63727	0.40	0.20	-0.69
5837.15	Yb II	32371 - 49498	0.35	0.18	-0.75
5897.23	Yb II	48923 - 65876	0.36	0.19	-0.72
5908.38	Yb II	31980 - 48900	0.19	0.099	-1.00
5991.51	Yb II	35832 - 52517	0.74	0.40	-0.40
6052.90	Yb II	32982 - 49498	0.11	0.060	-1.22
6152.58	Yb II	33052 - 49301	0.62	0.35	-0.45
6246.97	Yb II	33494 - 49498	0.34	0.20	-0.70
6274.80	Yb II	31980 - 47912	0.48	0.28	-0.55
6308.15	Yb II	33052 - 48900	0.14	0.081	-1.09
6432.73	Yb II	32371 - 47912	0.17	0.10	-0.98
6727.61	Yb II	33052 - 47912	0.29	0.20	-0.70
6934.04	Yb II	33494 - 47912	0.21	0.15	-0.82
7043.80	Yb II	47680 - 61873	0.75	0.56	-0.25
8922.62	Yb II	44498 - 55702	4.4	5.3	0.72

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2138.56	Zn I	0 - 46745	19.	1.3	0.12
2756.45	Zn I	32311 - 68579	0.69	0.079	-1.10
2770.86	Zn I	32501 - 68581	1.2	0.14	-0.86
2800.87	Zn I	32890 - 68583	1.8	0.21	-0.67
3072.06	Zn I	32890 - 65432	2.0	0.29	-0.54
3075.90	Zn I	0 - 32502	0.013	0.0018	-2.75
3282.33	Zn I	32311 - 62769	4.0	0.64	-0.19
3302.59	Zn I	32501 - 62772	18.	2.9	0.47
3302.94	Zn I	32501 - 62769	5.6	0.91	-0.04
3345.02	Zn I	32890 - 62777	28.	4.7	0.68
3345.57	Zn I	32890 - 62772	6.1	1.0	0.01
3345.93	Zn I	32890 - 62769	1.2	0.20	-0.69
4680.14	Zn I	32311 - 53672	5.8	1.9	0.28
4722.16	Zn I	32501 - 53672	15.	4.9	0.69
4810.53	Zn I	32890 - 53672	21.	7.2	0.86
6362.35	Zn I	46745 - 62458	4.5	2.8	0.44

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
2025.51	Zn II	0 - 49354	21.	1.3	0.10
2061.91	Zn II	0 - 48481	92.	5.8	0.77

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2374.42	Zr I	0 - 42103	0.90	0.076	-1.12
2388.01	Zr I	570 - 42434	1.00	0.085	-1.07
2405.52	Zr I	1241 - 42799	1.1	0.097	-1.02
2539.65	Zr I	570 - 39934	1.7	0.17	-0.77
2550.51	Zr I	570 - 39766	0.84	0.081	-1.09
2556.43	Zr I	1241 - 40346	0.99	0.097	-1.01
2567.45	Zr I	1241 - 40178	1.3	0.12	-0.90
2589.65	Zr I	570 - 39174	0.36	0.036	-1.44
2609.43	Zr I	570 - 38882	1.1	0.11	-0.95
2635.42	Zr I	1241 - 39174	2.2	0.23	-0.64
2647.78	Zr I	570 - 38327	1.2	0.12	-0.92
2658.69	Zr I	4186 - 41788	4.1	0.44	-0.36
2687.75	Zr I	1241 - 38436	2.0	0.22	-0.66
2692.92	Zr I	0 - 37123	0.35	0.038	-1.42
2706.17	Zr I	0 - 36942	1.3	0.15	-0.83
2709.33	Zr I	570 - 37469	1.2	0.14	-0.87
2717.48	Zr I	4186 - 40974	0.58	0.065	-1.19
2725.47	Zr I	1241 - 37921	2.8	0.32	-0.50
2727.02	Zr I	570 - 37230	1.0	0.11	-0.94
2759.48	Zr I	1241 - 37469	0.22	0.025	-1.60
2763.03	Zr I	4376 - 40558	3.8	0.43	-0.36
2774.04	Zr I	570 - 36608	2.4	0.27	-0.56
2786.86	Zr I	5102 - 40974	3.8	0.45	-0.35
2790.14	Zr I	5102 - 40932	9.3	1.1	0.04
2792.04	Zr I	0 - 35806	1.4	0.16	-0.79
2795.13	Zr I	570 - 36336	0.41	0.048	-1.32
2806.78	Zr I	4186 - 39804	3.1	0.37	-0.44
2814.90	Zr I	0 - 35515	6.5	0.77	-0.11
2819.56	Zr I	5102 - 40558	3.1	0.37	-0.44
2821.56	Zr I	570 - 36001	0.64	0.076	-1.12
2829.81	Zr I	4376 - 39704	2.1	0.26	-0.59
2836.49	Zr I	5102 - 40346	1.5	0.18	-0.75
2837.23	Zr I	570 - 35806	8.1	0.98	-0.01
2848.52	Zr I	1241 - 36336	4.7	0.58	-0.24
2860.85	Zr I	570 - 35515	1.0	0.13	-0.90
2875.98	Zr I	1241 - 36001	6.0	0.74	-0.13
2880.83	Zr I	5102 - 39804	1.3	0.16	-0.80
2892.26	Zr I	1241 - 35806	1.4	0.18	-0.74
2916.25	Zr I	570 - 34851	0.24	0.030	-1.52
2923.85	Zr I	570 - 34762	0.62	0.080	-1.10
2960.87	Zr I	0 - 33764	3.0	0.39	-0.41
2969.19	Zr I	570 - 34240	1.3	0.17	-0.77
2985.39	Zr I	0 - 33487	7.2	0.96	-0.02
3005.37	Zr I	4186 - 37450	2.7	0.37	-0.43
3005.50	Zr I	8057 - 41320	13.	1.8	0.25
3011.75	Zr I	570 - 33764	7.9	1.1	0.03
3014.44	Zr I	0 - 33164	0.51	0.070	-1.16
3029.52	Zr I	1241 - 34240	9.7	1.3	0.13
3043.25	Zr I	570 - 33420	0.28	0.039	-1.41
3045.83	Zr I	4186 - 37008	2.4	0.34	-0.47

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3049.33	Zr I	4186 - 36971	1.7	0.23	-0.63
3063.57	Zr I	4376 - 37008	1.7	0.24	-0.62
3085.34	Zr I	570 - 32972	0.84	0.12	-0.92
3090.44	Zr I	5102 - 37450	1.6	0.23	-0.65
3094.80	Zr I	4186 - 36489	2.3	0.33	-0.48
3095.82	Zr I	4197 - 36489	2.3	0.33	-0.48
3108.37	Zr I	4376 - 36538	2.5	0.36	-0.45
3120.74	Zr I	4186 - 36220	6.9	1.0	0.00
3131.11	Zr I	4197 - 36125	2.7	0.40	-0.40
3132.07	Zr I	4376 - 36295	7.1	1.0	0.02
3133.23	Zr I	5102 - 37008	2.7	0.39	-0.41
3136.96	Zr I	5102 - 36971	4.4	0.64	-0.19
3139.80	Zr I	5102 - 36942	3.4	0.50	-0.30
3148.82	Zr I	4376 - 36125	3.4	0.51	-0.29
3157.82	Zr I	4376 - 36035	6.0	0.90	-0.05
3191.21	Zr I	0 - 31327	2.7	0.42	-0.38
3197.04	Zr I	4186 - 35456	1.2	0.19	-0.72
3204.90	Zr I	5102 - 36295	2.0	0.30	-0.52
3212.01	Zr I	570 - 31695	3.1	0.47	-0.32
3212.58	Zr I	5102 - 36220	0.90	0.14	-0.85
3234.12	Zr I	1241 - 32152	4.1	0.65	-0.19
3250.39	Zr I	570 - 31327	1.6	0.26	-0.58
3254.28	Zr I	16978 - 47698	105.	17.	1.22
3260.11	Zr I	4186 - 34851	2.8	0.45	-0.34
3269.66	Zr I	4186 - 34762	2.6	0.42	-0.38
3282.73	Zr I	1241 - 31695	1.8	0.30	-0.53
3326.41	Zr I	4186 - 34240	0.46	0.076	-1.12
3353.66	Zr I	1241 - 31050	0.63	0.11	-0.98
3360.46	Zr I	5102 - 34851	2.2	0.37	-0.43
3368.64	Zr I	0 - 29677	0.085	0.015	-1.84
3370.59	Zr I	5102 - 34762	2.2	0.37	-0.44
3379.92	Zr I	17556 - 47135	27.	4.6	0.66
3397.92	Zr I	18277 - 47698	20.	3.5	0.55
3411.79	Zr I	17833 - 47135	18.	3.1	0.50
3414.66	Zr I	570 - 29847	1.4	0.24	-0.62
3419.66	Zr I	4186 - 33420	1.1	0.20	-0.71
3426.93	Zr I	8057 - 37230	0.73	0.13	-0.89
3430.29	Zr I	1241 - 30385	0.27	0.047	-1.33
3440.45	Zr I	0 - 29058	0.51	0.091	-1.04
3446.61	Zr I	4186 - 33192	1.8	0.31	-0.50
3447.36	Zr I	0 - 28999	1.7	0.31	-0.51
3455.91	Zr I	4186 - 33114	1.8	0.33	-0.48
3457.18	Zr I	4197 - 33114	1.0	0.19	-0.73
3461.09	Zr I	8057 - 36942	4.4	0.80	-0.10
3465.63	Zr I	1241 - 30087	0.37	0.067	-1.18
3471.19	Zr I	0 - 28801	1.6	0.30	-0.53
3472.90	Zr I	4186 - 32972	0.22	0.040	-1.39
3478.79	Zr I	4376 - 33114	1.9	0.34	-0.47
3482.81	Zr I	570 - 29275	0.59	0.11	-0.97
3483.01	Zr I	8057 - 36760	4.9	0.89	-0.05

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3495.37	Zr I	11956 - 40558	3.3	0.61	-0.21
3501.35	Zr I	570 - 29123	0.38	0.070	-1.16
3501.49	Zr I	8057 - 36608	2.0	0.37	-0.43
3509.32	Zr I	570 - 29058	3.0	0.55	-0.26
3519.60	Zr I	0 - 28404	5.0	0.93	-0.03
3530.22	Zr I	5102 - 33420	0.90	0.17	-0.77
3533.22	Zr I	1241 - 29535	1.5	0.28	-0.55
3535.16	Zr I	8057 - 36336	5.0	0.93	-0.03
3547.68	Zr I	570 - 28750	4.8	0.92	-0.04
3549.74	Zr I	8057 - 36220	4.8	0.92	-0.04
3550.46	Zr I	0 - 28157	1.5	0.28	-0.56
3558.96	Zr I	5102 - 33192	1.5	0.28	-0.56
3566.10	Zr I	1241 - 29275	3.4	0.65	-0.18
3568.88	Zr I	5102 - 33114	2.0	0.39	-0.41
3575.79	Zr I	570 - 28528	2.8	0.53	-0.27
3577.55	Zr I	8057 - 36001	3.8	0.73	-0.14
3586.29	Zr I	0 - 27876	1.9	0.37	-0.43
3591.72	Zr I	570 - 28404	0.17	0.034	-1.47
3593.13	Zr I	17060 - 44882	12.	2.3	0.35
3601.19	Zr I	1241 - 29002	10.	2.0	0.31
3613.70	Zr I	4186 - 31851	0.93	0.18	-0.74
3623.86	Zr I	570 - 28157	2.7	0.53	-0.28
3634.15	Zr I	1241 - 28750	0.89	0.18	-0.76
3638.72	Zr I	4376 - 31851	0.21	0.042	-1.37
3661.20	Zr I	570 - 27876	0.45	0.090	-1.05
3663.65	Zr I	1241 - 28528	2.4	0.47	-0.32
3680.37	Zr I	1241 - 28404	0.11	0.023	-1.64
3706.63	Zr I	1241 - 28212	0.17	0.035	-1.45
3714.13	Zr I	1241 - 28157	0.37	0.076	-1.12
3737.39	Zr I	5102 - 31851	0.26	0.055	-1.26
3754.79	Zr I	14349 - 40974	3.5	0.73	-0.14
3764.39	Zr I	0 - 26557	0.59	0.13	-0.90
3766.72	Zr I	12342 - 38882	19.	4.1	0.61
3780.54	Zr I	0 - 26444	0.87	0.19	-0.73
3791.40	Zr I	570 - 26938	0.78	0.17	-0.78
3792.40	Zr I	570 - 26931	0.12	0.026	-1.58
3822.41	Zr I	0 - 26154	0.63	0.14	-0.86
3835.96	Zr I	0 - 26062	2.5	0.54	-0.27
3847.01	Zr I	570 - 26557	0.51	0.11	-0.95
3849.25	Zr I	0 - 25972	0.43	0.095	-1.02
3863.87	Zr I	570 - 26444	2.6	0.57	-0.24
3864.34	Zr I	1241 - 27111	0.83	0.19	-0.73
3877.60	Zr I	8057 - 33839	7.2	1.6	0.21
3879.05	Zr I	570 - 26343	0.17	0.039	-1.41
3885.42	Zr I	0 - 25730	1.1	0.26	-0.59
3890.32	Zr I	1241 - 26938	3.0	0.67	-0.17
3891.38	Zr I	1241 - 26931	2.0	0.46	-0.33
3892.03	Zr I	15201 - 40888	5.2	1.2	0.08
3893.84	Zr I	12761 - 38436	2.0	0.46	-0.33
3896.53	Zr I	570 - 26227	0.13	0.030	-1.53

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3897.66	Zr I	14697 - 40346	3.5	0.80	-0.10
3900.52	Zr I	0 - 25630	0.28	0.065	-1.19
3916.64	Zr I	1241 - 26766	0.15	0.035	-1.45
3921.79	Zr I	570 - 26062	0.49	0.11	-0.94
3926.78	Zr I	15720 - 41179	4.5	1.0	0.01
3929.53	Zr I	570 - 26012	0.97	0.23	-0.65
3941.62	Zr I	8057 - 33420	0.65	0.15	-0.82
3951.33	Zr I	11641 - 36942	0.68	0.16	-0.80
3963.80	Zr I	16317 - 41538	5.0	1.2	0.07
3966.66	Zr I	1241 - 26444	0.44	0.10	-0.98
3968.26	Zr I	1241 - 26434	0.91	0.21	-0.67
3972.30	Zr I	15720 - 40888	2.1	0.49	-0.31
3973.39	Zr I	12761 - 37921	2.6	0.61	-0.21
3973.50	Zr I	570 - 25730	0.50	0.12	-0.93
3975.29	Zr I	12773 - 37921	4.6	1.1	0.04
3977.34	Zr I	5249 - 30385	0.18	0.044	-1.36
3977.48	Zr I	8057 - 33192	0.95	0.23	-0.65
3978.74	Zr I	12342 - 37469	2.0	0.49	-0.31
3981.60	Zr I	11017 - 36125	2.8	0.67	-0.18
3982.16	Zr I	10885 - 35990	1.3	0.32	-0.49
3984.75	Zr I	4186 - 29275	0.32	0.075	-1.12
3986.80	Zr I	570 - 25646	0.049	0.012	-1.94
3988.68	Zr I	5023 - 30087	0.26	0.061	-1.21
3989.29	Zr I	570 - 25630	0.057	0.013	-1.87
3989.50	Zr I	15120 - 40178	6.8	1.6	0.21
4001.09	Zr I	1241 - 26227	0.034	0.0081	-2.09
4002.55	Zr I	4871 - 29847	0.19	0.045	-1.35
4003.10	Zr I	11017 - 35990	2.0	0.47	-0.33
4004.40	Zr I	12503 - 37469	1.6	0.38	-0.41
4004.87	Zr I	16978 - 41941	5.7	1.4	0.13
4007.60	Zr I	14989 - 39934	8.3	2.0	0.30
4012.25	Zr I	15720 - 40637	10.	2.4	0.39
4016.98	Zr I	12342 - 37230	3.0	0.73	-0.14
4023.98	Zr I	5541 - 30385	1.1	0.27	-0.56
4024.92	Zr I	5249 - 30087	2.0	0.49	-0.31
4027.20	Zr I	5023 - 29847	2.4	0.59	-0.23
4028.95	Zr I	4186 - 28999	0.46	0.11	-0.95
4030.04	Zr I	4871 - 29677	1.1	0.27	-0.56
4035.89	Zr I	1241 - 26012	0.33	0.080	-1.10
4041.64	Zr I	15201 - 39937	4.2	1.0	0.01
4042.22	Zr I	11258 - 35990	3.3	0.82	-0.09
4043.58	Zr I	4186 - 28910	1.1	0.28	-0.56
4044.56	Zr I	4871 - 29588	1.1	0.27	-0.57
4050.48	Zr I	4376 - 29058	0.39	0.096	-1.02
4054.43	Zr I	1241 - 25898	0.097	0.024	-1.62
4055.03	Zr I	5023 - 29677	1.8	0.44	-0.35
4055.71	Zr I	12773 - 37422	12.	3.0	0.48
4061.53	Zr I	4186 - 28801	0.60	0.15	-0.83
4064.16	Zr I	5249 - 29847	3.8	0.94	-0.03
4068.72	Zr I	10885 - 35456	0.92	0.23	-0.64

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4072.70	Zr I	5541 - 30087	5.2	1.3	0.11
4074.93	Zr I	4376 - 28910	0.58	0.15	-0.84
4076.53	Zr I	4186 - 28710	0.35	0.088	-1.05
4078.31	Zr I	4197 - 28710	0.43	0.11	-0.97
4081.22	Zr I	5889 - 30385	5.7	1.4	0.15
4082.30	Zr I	1241 - 25730	0.051	0.013	-1.89
4083.08	Zr I	11641 - 36125	1.8	0.44	-0.36
4084.30	Zr I	14697 - 39174	5.3	1.3	0.12
4085.66	Zr I	12761 - 37230	3.1	0.76	-0.12
4087.69	Zr I	12773 - 37230	1.5	0.38	-0.42
4090.79	Zr I	12503 - 36942	2.8	0.71	-0.15
4093.16	Zr I	4376 - 28801	0.10	0.025	-1.59
4094.27	Zr I	12342 - 36760	2.1	0.53	-0.28
4099.31	Zr I	0 - 24388	0.058	0.015	-1.83
4107.50	Zr I	11956 - 36295	2.4	0.60	-0.22
4108.40	Zr I	4376 - 28710	0.36	0.090	-1.04
4119.83	Zr I	12342 - 36608	1.8	0.47	-0.33
4121.46	Zr I	4376 - 28633	0.70	0.18	-0.75
4127.96	Zr I	4186 - 28404	0.13	0.033	-1.49
4134.31	Zr I	12761 - 36942	1.4	0.37	-0.44
4135.68	Zr I	5102 - 29275	0.33	0.084	-1.08
4140.01	Zr I	14123 - 38271	1.0	0.27	-0.57
4147.37	Zr I	12503 - 36608	1.1	0.29	-0.54
4152.64	Zr I	11017 - 35091	2.2	0.56	-0.25
4153.75	Zr I	12773 - 36841	1.4	0.36	-0.44
4166.36	Zr I	5541 - 29535	0.91	0.24	-0.62
4169.36	Zr I	14349 - 38327	2.1	0.55	-0.26
4171.48	Zr I	10885 - 34851	1.3	0.33	-0.49
4183.32	Zr I	5102 - 28999	0.39	0.10	-0.99
4187.56	Zr I	11641 - 35515	8.3	2.2	0.34
4191.79	Zr I	11956 - 35806	1.6	0.43	-0.36
4192.10	Zr I	12761 - 36608	0.66	0.17	-0.76
4194.01	Zr I	12761 - 36597	0.66	0.17	-0.76
4194.76	Zr I	11258 - 35091	4.4	1.2	0.07
4196.13	Zr I	12773 - 36597	1.3	0.35	-0.46
4199.09	Zr I	5102 - 28910	1.2	0.31	-0.51
4201.46	Zr I	5023 - 28818	1.1	0.30	-0.52
4211.34	Zr I	14697 - 38436	2.2	0.59	-0.23
4212.62	Zr I	10885 - 34617	0.75	0.20	-0.70
4213.86	Zr I	4871 - 28595	0.71	0.19	-0.72
4218.45	Zr I	5102 - 28801	0.23	0.061	-1.21
4220.65	Zr I	5023 - 28710	0.071	0.019	-1.72
4225.46	Zr I	12342 - 36001	0.96	0.26	-0.59
4227.76	Zr I	5889 - 29535	4.6	1.2	0.09
4234.63	Zr I	5102 - 28710	0.29	0.077	-1.11
4236.06	Zr I	11017 - 34617	1.9	0.52	-0.28
4236.55	Zr I	0 - 23597	0.029	0.0078	-2.11
4237.43	Zr I	11258 - 34851	1.0	0.28	-0.55
4239.31	Zr I	5541 - 29123	4.1	1.1	0.05
4240.34	Zr I	4871 - 28447	1.3	0.36	-0.45

Wavelength	Spectrum	Energy Levels	gA	gf	Log gf
A		K	$10^8/\text{sec}$		
4241.20	Zr I	5023 - 28595	1.4	0.37	-0.43
4241.69	Zr I	5249 - 28818	2.3	0.63	-0.20
4253.57	Zr I	11258 - 34762	0.79	0.21	-0.67
4256.44	Zr I	4186 - 27673	0.11	0.029	-1.54
4261.21	Zr I	5541 - 29002	0.16	0.043	-1.37
4261.42	Zr I	12761 - 36220	1.2	0.33	-0.49
4268.02	Zr I	5023 - 28447	0.54	0.15	-0.83
4274.77	Zr I	4186 - 27573	0.12	0.033	-1.48
4276.72	Zr I	4197 - 27573	0.16	0.045	-1.34
4282.03	Zr I	17833 - 41179	4.9	1.3	0.13
4282.20	Zr I	5249 - 28595	1.0	0.28	-0.56
4291.20	Zr I	4376 - 27673	0.15	0.043	-1.37
4291.35	Zr I	4186 - 27482	0.15	0.040	-1.39
4294.79	Zr I	5541 - 28818	1.1	0.30	-0.53
4302.89	Zr I	5889 - 29123	0.65	0.18	-0.74
4304.68	Zr I	14697 - 37921	4.7	1.3	0.12
4309.82	Zr I	4376 - 27573	0.053	0.015	-1.83
4319.05	Zr I	1241 - 24388	0.043	0.012	-1.92
4321.17	Zr I	1241 - 24376	0.043	0.012	-1.92
4324.03	Zr I	14349 - 37469	2.5	0.69	-0.16
4325.44	Zr I	5889 - 29002	0.36	0.10	-0.99
4329.56	Zr I	570 - 23661	0.018	0.0049	-2.31
4341.13	Zr I	11258 - 34287	5.1	1.4	0.15
4343.04	Zr I	0 - 23019	0.015	0.0042	-2.38
4346.52	Zr I	14123 - 37123	1.4	0.38	-0.42
4347.22	Zr I	570 - 23567	0.015	0.0042	-2.38
4347.89	Zr I	8057 - 31050	3.9	1.1	0.04
4348.93	Zr I	5541 - 28528	0.060	0.017	-1.77
4358.74	Zr I	4186 - 27122	0.081	0.023	-1.64
4360.81	Zr I	4186 - 27111	0.38	0.11	-0.97
4366.45	Zr I	11017 - 33912	2.9	0.84	-0.08
4373.07	Zr I	5889 - 28750	0.064	0.018	-1.74
4394.50	Zr I	570 - 23320	0.014	0.0040	-2.39
4394.94	Zr I	10885 - 33632	1.0	0.30	-0.53
4395.21	Zr I	4376 - 27122	0.12	0.035	-1.45
4400.24	Zr I	5889 - 28609	0.17	0.048	-1.32
4402.95	Zr I	4197 - 26902	0.077	0.022	-1.65
4413.04	Zr I	11258 - 33912	1.6	0.46	-0.34
4414.14	Zr I	1241 - 23889	0.016	0.0048	-2.32
4420.46	Zr I	11017 - 33632	1.9	0.55	-0.26
4427.24	Zr I	18739 - 41320	8.2	2.4	0.38
4429.11	Zr I	5102 - 27673	0.080	0.023	-1.63
4431.49	Zr I	10885 - 33445	1.1	0.34	-0.47
4438.05	Zr I	4376 - 26902	0.10	0.030	-1.52
4444.33	Zr I	11956 - 34451	0.27	0.080	-1.10
4448.95	Zr I	5102 - 27573	0.039	0.012	-1.94
4450.28	Zr I	10885 - 33350	0.64	0.19	-0.72
4455.43	Zr I	14791 - 37230	1.2	0.35	-0.45
4456.30	Zr I	14989 - 37422	1.3	0.37	-0.43
4457.43	Zr I	11017 - 33445	0.82	0.24	-0.61

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
4460.34	Zr I	5102 - 27515	0.038	0.011	-1.94
4466.91	Zr I	5102 - 27482	0.15	0.046	-1.34
4468.22	Zr I	11258 - 33632	0.22	0.065	-1.19
4468.79	Zr I	4186 - 26557	0.047	0.014	-1.85
4470.31	Zr I	12342 - 34706	1.2	0.35	-0.45
4470.56	Zr I	12773 - 35135	2.2	0.67	-0.17
4480.77	Zr I	14697 - 37008	0.67	0.20	-0.69
4482.50	Zr I	15120 - 37422	1.0	0.30	-0.52
4491.56	Zr I	4186 - 26444	0.029	0.0087	-2.06
4494.94	Zr I	14989 - 37230	0.60	0.18	-0.74
4507.12	Zr I	4376 - 26557	0.59	0.18	-0.74
4523.13	Zr I	17753 - 39855	1.3	0.39	-0.41
4535.75	Zr I	4186 - 26227	0.60	0.18	-0.73
4539.98	Zr I	5102 - 27122	0.098	0.030	-1.52
4542.22	Zr I	5102 - 27111	0.61	0.19	-0.72
4553.01	Zr I	4197 - 26154	0.19	0.060	-1.22
4555.13	Zr I	12503 - 34451	2.0	0.62	-0.21
4555.52	Zr I	12760 - 34706	1.6	0.48	-0.32
4558.04	Zr I	11258 - 33192	0.31	0.097	-1.01
4565.47	Zr I	12342 - 34240	0.42	0.13	-0.88
4575.52	Zr I	0 - 21849	0.14	0.044	-1.36
4576.20	Zr I	11641 - 33487	0.30	0.093	-1.03
4582.29	Zr I	14791 - 36608	1.8	0.58	-0.24
4584.24	Zr I	11956 - 33764	0.64	0.20	-0.69
4590.16	Zr I	11641 - 33420	0.15	0.048	-1.32
4590.55	Zr I	4376 - 26154	0.14	0.044	-1.35
4602.57	Zr I	15120 - 36841	7.0	2.2	0.35
4604.42	Zr I	4186 - 25898	0.13	0.042	-1.38
4609.15	Zr I	12761 - 34451	0.22	0.072	-1.15
4609.29	Zr I	5249 - 26938	0.027	0.0086	-2.07
4609.83	Zr I	4871 - 26557	0.024	0.0077	-2.11
4610.11	Zr I	4376 - 26062	0.021	0.0067	-2.17
4626.41	Zr I	14989 - 36597	3.9	1.3	0.10
4627.72	Zr I	11956 - 33559	0.18	0.056	-1.25
4633.98	Zr I	570 - 22144	0.21	0.068	-1.17
4634.64	Zr I	5541 - 27111	0.028	0.0092	-2.04
4640.13	Zr I	14791 - 36336	1.2	0.37	-0.43
4644.83	Zr I	14697 - 36220	3.4	1.1	0.04
4654.38	Zr I	12761 - 34240	0.32	0.10	-0.98
4657.64	Zr I	11956 - 33420	0.68	0.22	-0.66
4659.49	Zr I	5102 - 26557	0.037	0.012	-1.92
4667.14	Zr I	5023 - 26444	0.071	0.023	-1.63
4683.42	Zr I	12342 - 33688	2.0	0.67	-0.18
4684.25	Zr I	5102 - 26444	0.072	0.024	-1.63
4686.57	Zr I	11641 - 32972	0.15	0.050	-1.30
4687.80	Zr I	5889 - 27215	3.0	0.98	-0.01
4688.45	Zr I	1241 - 22564	0.18	0.058	-1.24
4691.73	Zr I	5249 - 26557	0.025	0.0081	-2.09
4695.04	Zr I	17143 - 38436	0.70	0.23	-0.63
4707.79	Zr I	11956 - 33192	0.72	0.24	-0.62

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4710.08	Zr I	5541 - 26766	2.1	0.70	-0.16
4711.92	Zr I	12342 - 33559	1.3	0.42	-0.38
4713.43	Zr I	14791 - 36001	1.1	0.36	-0.45
4717.62	Zr I	4871 - 26062	0.11	0.036	-1.44
4719.12	Zr I	14989 - 36173	3.4	1.1	0.05
4731.14	Zr I	5023 - 26154	0.022	0.0075	-2.13
4732.33	Zr I	5102 - 26227	0.29	0.099	-1.00
4734.36	Zr I	18739 - 39855	1.6	0.53	-0.27
4739.48	Zr I	5249 - 26343	1.4	0.47	-0.32
4742.94	Zr I	12342 - 33420	0.26	0.087	-1.06
4751.91	Zr I	5023 - 26062	0.038	0.013	-1.89
4753.05	Zr I	15120 - 36153	0.94	0.32	-0.50
4762.78	Zr I	14791 - 35782	2.7	0.92	-0.04
4772.31	Zr I	5023 - 25972	0.80	0.27	-0.56
4784.92	Zr I	5541 - 26434	0.22	0.075	-1.12
4788.67	Zr I	5889 - 26766	0.19	0.064	-1.19
4789.11	Zr I	5023 - 25898	0.037	0.013	-1.90
4793.28	Zr I	14349 - 35206	0.43	0.15	-0.83
4794.96	Zr I	12342 - 33192	0.20	0.071	-1.15
4805.87	Zr I	5541 - 26343	0.26	0.091	-1.04
4806.68	Zr I	12761 - 33559	0.27	0.095	-1.02
4809.47	Zr I	12773 - 33559	1.1	0.38	-0.42
4815.04	Zr I	5249 - 26012	0.17	0.060	-1.22
4815.63	Zr I	4871 - 25630	0.58	0.20	-0.69
4824.29	Zr I	5249 - 25972	0.26	0.090	-1.05
4828.04	Zr I	5023 - 25730	0.16	0.056	-1.25
4838.78	Zr I	12503 - 33164	0.74	0.26	-0.59
4838.98	Zr I	12761 - 33420	0.44	0.15	-0.81
4841.45	Zr I	5249 - 25898	0.017	0.0059	-2.23
4846.35	Zr I	5102 - 25730	0.016	0.0057	-2.25
4851.36	Zr I	5023 - 25630	0.18	0.062	-1.20
4866.06	Zr I	5889 - 26434	0.17	0.061	-1.21
4881.24	Zr I	5249 - 25730	0.091	0.033	-1.49
4883.60	Zr I	5541 - 26012	0.099	0.035	-1.45
4893.12	Zr I	12761 - 33192	0.33	0.12	-0.92
4905.08	Zr I	5249 - 25630	0.016	0.0057	-2.24
4930.87	Zr I	15201 - 35476	0.40	0.15	-0.83
4933.64	Zr I	14784 - 35047	0.85	0.31	-0.51
4948.76	Zr I	4186 - 24388	0.028	0.010	-1.98
4962.30	Zr I	14989 - 35135	0.37	0.14	-0.87
4963.72	Zr I	15720 - 35861	0.54	0.20	-0.70
4987.82	Zr I	16317 - 36360	0.37	0.14	-0.85
4994.76	Zr I	15120 - 35135	1.2	0.44	-0.35
4996.33	Zr I	15201 - 35210	1.1	0.40	-0.40
5011.46	Zr I	17060 - 37008	0.63	0.24	-0.63
5046.58	Zr I	12342 - 32152	1.3	0.49	-0.31
5060.39	Zr I	15720 - 35476	1.2	0.44	-0.35
5064.91	Zr I	11956 - 31695	1.6	0.63	-0.20
5065.22	Zr I	18739 - 38476	3.5	1.3	0.12
5070.26	Zr I	14989 - 34706	1.1	0.41	-0.39

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5073.98	Zr I	4186 - 23889	0.038	0.015	-1.84
5078.25	Zr I	11641 - 31327	1.9	0.75	-0.12
5085.26	Zr I	14791 - 34451	0.87	0.34	-0.47
5115.24	Zr I	16317 - 35861	2.0	0.80	-0.10
5120.42	Zr I	15932 - 35456	0.66	0.26	-0.58
5133.40	Zr I	4186 - 23661	0.042	0.016	-1.78
5155.45	Zr I	12761 - 32152	1.6	0.63	-0.20
5158.00	Zr I	16978 - 36360	3.4	1.4	0.14
5158.67	Zr I	12773 - 32152	0.20	0.079	-1.10
5160.99	Zr I	11956 - 31327	0.31	0.12	-0.90
5165.96	Zr I	12342 - 31695	0.41	0.16	-0.79
5178.99	Zr I	4186 - 23489	0.0080	0.0032	-2.49
5183.70	Zr I	5102 - 24388	0.059	0.024	-1.62
5187.03	Zr I	15932 - 35206	0.39	0.16	-0.80
5201.15	Zr I	4376 - 23597	0.047	0.019	-1.72
5209.30	Zr I	12503 - 31695	0.41	0.17	-0.78
5224.93	Zr I	4186 - 23320	0.039	0.016	-1.80
5243.47	Zr I	17060 - 36125	0.51	0.21	-0.68
5277.41	Zr I	4376 - 23320	0.056	0.023	-1.63
5280.05	Zr I	12761 - 31695	0.35	0.15	-0.83
5294.82	Zr I	8057 - 26938	0.077	0.033	-1.49
5296.79	Zr I	8057 - 26931	0.15	0.065	-1.19
5301.97	Zr I	17753 - 36608	1.2	0.50	-0.30
5311.40	Zr I	4197 - 23019	0.046	0.020	-1.71
5321.26	Zr I	5102 - 23889	0.013	0.0056	-2.25
5330.84	Zr I	570 - 19324	0.0033	0.0014	-2.85
5338.43	Zr I	4871 - 23597	0.0061	0.0026	-2.58
5350.90	Zr I	18739 - 37422	0.60	0.26	-0.59
5362.56	Zr I	4376 - 23019	0.031	0.013	-1.87
5363.35	Zr I	5249 - 23889	0.0066	0.0029	-2.54
5369.39	Zr I	4871 - 23489	0.0083	0.0036	-2.44
5382.37	Zr I	5023 - 23597	0.0098	0.0043	-2.37
5385.14	Zr I	4186 - 22751	0.11	0.046	-1.33
5386.65	Zr I	5102 - 23661	0.016	0.0068	-2.17
5391.18	Zr I	5023 - 23567	0.0085	0.0037	-2.43
5395.88	Zr I	17833 - 36360	0.32	0.14	-0.86
5405.13	Zr I	5102 - 23597	0.012	0.0054	-2.27
5407.62	Zr I	5889 - 24376	0.054	0.024	-1.63
5413.93	Zr I	5541 - 24006	0.0097	0.0043	-2.37
5421.86	Zr I	17422 - 35861	0.31	0.14	-0.86
5426.36	Zr I	16787 - 35210	0.20	0.087	-1.06
5428.42	Zr I	17060 - 35476	0.35	0.16	-0.81
5437.76	Zr I	1241 - 19626	0.0040	0.0018	-2.75
5440.41	Zr I	4871 - 23246	0.0067	0.0030	-2.52
5448.57	Zr I	5541 - 23889	0.020	0.0090	-2.05
5474.92	Zr I	16787 - 35047	0.13	0.057	-1.25
5477.40	Zr I	4871 - 23122	0.0044	0.0020	-2.71
5478.33	Zr I	17753 - 36001	0.62	0.28	-0.55
5480.83	Zr I	5249 - 23489	0.018	0.0082	-2.09
5486.09	Zr I	5023 - 23246	0.014	0.0064	-2.19

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
5502.12	Zr I	8057 - 26227	0.14	0.066	-1.18
5507.87	Zr I	17060 - 35210	0.33	0.15	-0.82
5517.11	Zr I	5541 - 23661	0.016	0.0073	-2.14
5518.05	Zr I	5889 - 24006	0.0057	0.0026	-2.59
5528.41	Zr I	18277 - 36360	1.4	0.64	-0.20
5532.30	Zr I	5249 - 23320	0.0093	0.0043	-2.37
5537.46	Zr I	17422 - 35476	0.63	0.29	-0.54
5545.32	Zr I	17833 - 35861	0.80	0.37	-0.43
5612.11	Zr I	0 - 17814	0.0013	0.00060	-3.22
5620.14	Zr I	4186 - 21974	0.041	0.019	-1.72
5623.53	Zr I	4197 - 21974	0.012	0.0058	-2.24
5664.51	Zr I	5102 - 22751	0.066	0.032	-1.50
5666.28	Zr I	17833 - 35476	0.30	0.14	-0.85
5680.90	Zr I	4376 - 21974	0.041	0.020	-1.70
5685.42	Zr I	18277 - 35861	0.25	0.12	-0.92
5708.89	Zr I	0 - 17512	0.0030	0.0015	-2.84
5735.70	Zr I	0 - 17430	0.012	0.0058	-2.24
5797.74	Zr I	570 - 17814	0.017	0.0086	-2.07
5847.32	Zr I	17143 - 34240	0.34	0.17	-0.76
5868.27	Zr I	1241 - 18277	0.0060	0.0031	-2.51
5869.50	Zr I	15120 - 32152	0.67	0.35	-0.46
5879.80	Zr I	1241 - 18244	0.041	0.022	-1.67
5885.62	Zr I	570 - 17556	0.0087	0.0045	-2.34
5901.09	Zr I	570 - 17512	0.0049	0.0026	-2.59
5925.13	Zr I	5102 - 21974	0.047	0.025	-1.61
5935.20	Zr I	0 - 16844	0.0079	0.0042	-2.38
5955.35	Zr I	0 - 16787	0.0088	0.0047	-2.33
5984.23	Zr I	14989 - 31695	0.54	0.29	-0.54
5995.37	Zr I	5889 - 22564	0.0072	0.0039	-2.41
6001.05	Zr I	12342 - 29002	0.13	0.068	-1.17
6025.36	Zr I	1241 - 17833	0.0034	0.0019	-2.73
6032.61	Zr I	11956 - 28528	0.19	0.11	-0.98
6045.85	Zr I	14791 - 31327	0.85	0.47	-0.33
6049.24	Zr I	19834 - 36360	2.0	1.1	0.05
6062.84	Zr I	570 - 17060	0.012	0.0067	-2.18
6120.83	Zr I	4186 - 20519	0.012	0.0066	-2.18
6121.91	Zr I	8057 - 24388	0.12	0.069	-1.16
6124.84	Zr I	4197 - 20519	0.021	0.012	-1.94
6127.44	Zr I	1241 - 17556	0.071	0.040	-1.40
6134.55	Zr I	0 - 16297	0.023	0.013	-1.88
6140.46	Zr I	4186 - 20467	0.023	0.013	-1.88
6143.20	Zr I	570 - 16844	0.037	0.021	-1.68
6155.61	Zr I	12761 - 29002	0.081	0.046	-1.34
6157.71	Zr I	19626 - 35861	1.3	0.76	-0.12
6160.20	Zr I	12773 - 29002	0.065	0.037	-1.43
6189.40	Zr I	19324 - 35476	0.60	0.35	-0.46
6192.96	Zr I	4376 - 20519	0.015	0.0085	-2.07
6213.05	Zr I	4376 - 20467	0.021	0.012	-1.93
6214.69	Zr I	17753 - 33839	1.0	0.59	-0.23
6257.26	Zr I	12773 - 28750	0.24	0.14	-0.84

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6267.06	Zr I	11956 - 27908	0.072	0.043	-1.37
6299.66	Zr I	12342 - 28212	0.26	0.16	-0.80
6304.34	Zr I	4376 - 20234	0.0033	0.0020	-2.70
6313.02	Zr I	12773 - 28609	0.71	0.42	-0.37
6314.71	Zr I	8057 - 23889	0.020	0.012	-1.93
6321.35	Zr I	12342 - 28157	0.10	0.063	-1.20
6340.36	Zr I	12761 - 28528	0.052	0.032	-1.50
6345.22	Zr I	12773 - 28528	0.17	0.11	-0.98
6407.00	Zr I	1241 - 16844	0.0032	0.0020	-2.70
6426.17	Zr I	22144 - 37701	0.39	0.24	-0.62
6434.33	Zr I	22564 - 38101	1.3	0.82	-0.09
6445.74	Zr I	8057 - 23567	0.036	0.023	-1.64
6451.62	Zr I	5023 - 20519	0.0049	0.0031	-2.51
6457.63	Zr I	11641 - 27122	0.032	0.020	-1.70
6470.21	Zr I	12761 - 28212	0.24	0.15	-0.81
6484.35	Zr I	5102 - 20519	0.0028	0.0018	-2.75
6489.64	Zr I	12503 - 27908	0.22	0.14	-0.85
6493.10	Zr I	12761 - 28157	0.048	0.031	-1.52
6503.26	Zr I	12503 - 27876	0.099	0.063	-1.20
6506.36	Zr I	5102 - 20467	0.012	0.0078	-2.11
6550.54	Zr I	11641 - 26902	0.057	0.037	-1.44
6569.43	Zr I	5249 - 20467	0.0077	0.0050	-2.30
6576.56	Zr I	0 - 15201	0.00087	0.00056	-3.25
6591.99	Zr I	11956 - 27122	0.081	0.053	-1.28
6596.71	Zr I	11956 - 27111	0.016	0.011	-1.98
6598.84	Zr I	570 - 15720	0.00055	0.00036	-3.44
6603.27	Zr I	12342 - 27482	0.090	0.059	-1.23
6620.56	Zr I	18739 - 33839	0.16	0.11	-0.97
6688.18	Zr I	4376 - 19324	0.0046	0.0031	-2.51
6702.12	Zr I	11641 - 26557	0.018	0.012	-1.93
6709.61	Zr I	4197 - 19097	0.0034	0.0023	-2.63
6717.88	Zr I	11017 - 25898	0.037	0.025	-1.61
6752.73	Zr I	8057 - 22862	0.022	0.015	-1.82
6762.38	Zr I	0 - 14784	0.0032	0.0022	-2.66
6769.16	Zr I	12342 - 27111	0.17	0.11	-0.94
6772.89	Zr I	10885 - 25646	0.034	0.024	-1.63
6790.85	Zr I	12761 - 27482	0.070	0.048	-1.32
6796.68	Zr I	14349 - 29058	0.025	0.018	-1.76
6828.78	Zr I	11258 - 25898	0.060	0.042	-1.38
6832.89	Zr I	570 - 15201	0.0022	0.0016	-2.80
6833.67	Zr I	11017 - 25646	0.0083	0.0058	-2.23
6845.33	Zr I	10885 - 25490	0.016	0.011	-1.95
6846.34	Zr I	5023 - 19626	0.0041	0.0029	-2.54
6846.97	Zr I	11956 - 26557	0.16	0.11	-0.94
6849.26	Zr I	12342 - 26938	0.050	0.035	-1.45
6852.56	Zr I	12342 - 26931	0.024	0.017	-1.77
6854.63	Zr I	5249 - 19834	0.0022	0.0015	-2.82
6857.90	Zr I	14697 - 29275	0.016	0.011	-1.96
6883.23	Zr I	5102 - 19626	0.0015	0.0011	-2.96
6888.29	Zr I	11641 - 26154	0.19	0.14	-0.86

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
6900.59	Zr I	11956 - 26444	0.053	0.038	-1.42
6904.36	Zr I	1241 - 15720	0.0014	0.0010	-2.99
6907.37	Zr I	11017 - 25490	0.040	0.029	-1.54
6916.87	Zr I	4871 - 19324	0.0047	0.0034	-2.47
6922.23	Zr I	12773 - 27215	0.013	0.0094	-2.02
6932.38	Zr I	11641 - 26062	0.025	0.018	-1.74
6948.46	Zr I	11258 - 25646	0.042	0.031	-1.51
6953.84	Zr I	5249 - 19626	0.039	0.028	-1.55
6966.44	Zr I	12761 - 27111	0.13	0.094	-1.03
6975.91	Zr I	11641 - 25972	0.016	0.011	-1.95
6990.84	Zr I	5023 - 19324	0.036	0.026	-1.58
6994.32	Zr I	5541 - 19834	0.022	0.016	-1.79
7005.46	Zr I	11956 - 26227	0.017	0.012	-1.91
7027.40	Zr I	4871 - 19097	0.023	0.017	-1.78
7057.36	Zr I	12773 - 26938	0.052	0.039	-1.41
7087.30	Zr I	4871 - 18976	0.031	0.023	-1.64
7089.43	Zr I	12342 - 26444	0.045	0.034	-1.47
7094.46	Zr I	12342 - 26434	0.063	0.048	-1.32
7095.59	Zr I	11641 - 25730	0.074	0.056	-1.25
7097.70	Zr I	5541 - 19626	0.15	0.11	-0.96
7102.91	Zr I	5249 - 19324	0.068	0.051	-1.29
7103.72	Zr I	5023 - 19097	0.039	0.029	-1.53
7111.68	Zr I	4186 - 18244	0.025	0.019	-1.72
7112.82	Zr I	11956 - 26012	0.064	0.049	-1.31
7113.52	Zr I	12503 - 26557	0.034	0.026	-1.59
7132.95	Zr I	11956 - 25972	0.019	0.015	-1.84
7138.28	Zr I	12761 - 26766	0.016	0.012	-1.91
7140.74	Zr I	12342 - 26343	0.028	0.022	-1.67
7144.47	Zr I	12773 - 26766	0.024	0.018	-1.74
7169.09	Zr I	5889 - 19834	0.17	0.13	-0.88
7201.62	Zr I	15120 - 29002	0.19	0.15	-0.83
7258.17	Zr I	11956 - 25730	0.018	0.014	-1.84
7264.76	Zr I	14989 - 28750	0.12	0.098	-1.01
7284.69	Zr I	12503 - 26227	0.014	0.011	-1.95
7306.21	Zr I	12761 - 26444	0.037	0.030	-1.53
7311.62	Zr I	12761 - 26434	0.046	0.037	-1.43
7313.72	Zr I	12342 - 26012	0.058	0.046	-1.33
7318.08	Zr I	12773 - 26434	0.17	0.13	-0.87
7335.97	Zr I	4186 - 17814	0.0083	0.0067	-2.17
7343.96	Zr I	14791 - 28404	0.16	0.13	-0.88
7373.50	Zr I	12503 - 26062	0.034	0.027	-1.56
7374.80	Zr I	12342 - 25898	0.013	0.011	-1.98
7383.63	Zr I	14989 - 28528	0.085	0.069	-1.16
7400.90	Zr I	12503 - 26012	0.023	0.019	-1.72
7411.39	Zr I	15120 - 28609	0.035	0.029	-1.54
7417.89	Zr I	14123 - 27600	0.021	0.017	-1.76
7422.75	Zr I	12503 - 25972	0.017	0.014	-1.86
7433.10	Zr I	14123 - 27573	0.026	0.022	-1.67
7439.86	Zr I	4376 - 17814	0.019	0.015	-1.81
7467.57	Zr I	12342 - 25730	0.028	0.023	-1.63

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
7479.58	Zr I	14791 - 28157	0.049	0.041	-1.38
7502.92	Zr I	14349 - 27673	0.024	0.021	-1.69
7515.70	Zr I	15700 - 29002	0.055	0.047	-1.33
7517.95	Zr I	17753 - 31050	0.084	0.071	-1.15
7521.03	Zr I	15457 - 28750	0.033	0.028	-1.55
7540.62	Zr I	15146 - 28404	0.067	0.057	-1.24
7544.59	Zr I	12761 - 26012	0.034	0.029	-1.54
7551.46	Zr I	12773 - 26012	0.051	0.044	-1.36
7553.00	Zr I	4186 - 17422	0.0011	0.00092	-3.04
7554.70	Zr I	4197 - 17430	0.0062	0.0053	-2.28
7558.45	Zr I	12503 - 25730	0.039	0.034	-1.47
7560.09	Zr I	14349 - 27573	0.032	0.027	-1.56
7560.31	Zr I	14989 - 28212	0.022	0.019	-1.72
7562.12	Zr I	5023 - 18244	0.0023	0.0020	-2.71
7607.15	Zr I	5102 - 18244	0.015	0.013	-1.88
7610.83	Zr I	4376 - 17512	0.0013	0.0011	-2.96
7612.08	Zr I	14349 - 27482	0.036	0.032	-1.50
7621.17	Zr I	11258 - 24376	0.022	0.019	-1.72
7621.61	Zr I	14791 - 27908	0.015	0.013	-1.89
7658.60	Zr I	4376 - 17430	0.0047	0.0041	-2.38
7690.83	Zr I	14123 - 27122	0.043	0.038	-1.42
7704.27	Zr I	14697 - 27673	0.039	0.035	-1.46
7708.42	Zr I	12761 - 25730	0.016	0.014	-1.84
7722.48	Zr I	22145 - 35091	0.14	0.12	-0.92
7723.95	Zr I	4871 - 17814	0.0016	0.0014	-2.85
7765.70	Zr I	4186 - 17060	0.0011	0.0010	-2.99
7766.55	Zr I	11017 - 23889	0.0096	0.0087	-2.06
7800.74	Zr I	21801 - 34617	0.12	0.11	-0.96
7816.32	Zr I	5023 - 17814	0.0021	0.0019	-2.71
7819.35	Zr I	14697 - 27482	0.29	0.27	-0.57
7822.94	Zr I	14123 - 26902	0.079	0.073	-1.14
7826.72	Zr I	14349 - 27122	0.097	0.089	-1.05
7849.35	Zr I	5541 - 18277	0.018	0.017	-1.78
7869.99	Zr I	5541 - 18244	0.0069	0.0064	-2.19
7876.25	Zr I	22398 - 35091	0.32	0.30	-0.52
7882.18	Zr I	4376 - 17060	0.0023	0.0021	-2.67
7897.98	Zr I	4186 - 16844	0.0013	0.0012	-2.91
7908.46	Zr I	4871 - 17512	0.0026	0.0025	-2.61
7924.20	Zr I	22145 - 34762	0.13	0.12	-0.92
7940.47	Zr I	4197 - 16787	0.0026	0.0025	-2.61
7944.61	Zr I	5249 - 17833	0.029	0.027	-1.56
7956.66	Zr I	5249 - 17814	0.014	0.014	-1.86
7959.98	Zr I	4871 - 17430	0.013	0.012	-1.91
7963.63	Zr I	14349 - 26902	0.046	0.044	-1.36
8005.27	Zr I	5023 - 17512	0.027	0.026	-1.59
8015.26	Zr I	11017 - 23489	0.0062	0.0060	-2.22
8040.10	Zr I	14123 - 26557	0.0085	0.0082	-2.09
8046.05	Zr I	14697 - 27122	0.062	0.060	-1.22
8053.06	Zr I	14697 - 27111	0.040	0.039	-1.41
8055.29	Zr I	4376 - 16787	0.0026	0.0026	-2.59

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
8055.76	Zr I	5102 - 17512	0.0034	0.0033	-2.48
8058.08	Zr I	5023 - 17430	0.0099	0.0096	-2.02
8063.09	Zr I	5023 - 17422	0.025	0.024	-1.62
8070.08	Zr I	5889 - 18277	0.16	0.16	-0.79
8114.28	Zr I	5102 - 17422	0.0017	0.0016	-2.79
8120.17	Zr I	18739 - 31050	0.15	0.15	-0.82
8132.99	Zr I	5541 - 17833	0.074	0.073	-1.13
8152.58	Zr I	5249 - 17512	0.0034	0.0034	-2.47
8188.77	Zr I	14349 - 26557	0.026	0.026	-1.59
8194.73	Zr I	10885 - 23085	0.032	0.033	-1.49
8201.73	Zr I	4871 - 17060	0.0089	0.0090	-2.05
8212.53	Zr I	5249 - 17422	0.047	0.047	-1.32
8240.37	Zr I	17143 - 29275	0.093	0.095	-1.02
8283.81	Zr I	11017 - 23085	0.033	0.034	-1.47
8299.81	Zr I	12342 - 24388	0.0083	0.0086	-2.07
8305.90	Zr I	5023 - 17060	0.021	0.022	-1.66
8309.50	Zr I	14123 - 26154	0.014	0.014	-1.85
8320.16	Zr I	5541 - 17556	0.0012	0.0013	-2.89
8332.44	Zr I	17060 - 29058	0.062	0.065	-1.19
8370.23	Zr I	5889 - 17833	0.0095	0.0100	-2.00
8389.41	Zr I	4871 - 16787	0.016	0.017	-1.76
8414.00	Zr I	5541 - 17422	0.012	0.013	-1.89
8453.17	Zr I	11258 - 23085	0.042	0.045	-1.35
8457.48	Zr I	5023 - 16844	0.00085	0.00091	-3.04
8464.65	Zr I	5249 - 17060	0.0077	0.0082	-2.08
8495.98	Zr I	17143 - 28910	0.039	0.042	-1.37
8498.44	Zr I	5023 - 16787	0.0056	0.0060	-2.22
8513.78	Zr I	5102 - 16844	0.00071	0.00077	-3.11
8515.06	Zr I	17060 - 28801	0.021	0.023	-1.64
8568.54	Zr I	5889 - 17556	0.0015	0.0016	-2.80
8571.05	Zr I	12342 - 24006	0.0077	0.0085	-2.07
8584.21	Zr I	15120 - 26766	0.043	0.048	-1.32
8587.84	Zr I	11956 - 23597	0.0069	0.0076	-2.12
8610.24	Zr I	11956 - 23567	0.0049	0.0054	-2.27
8734.86	Zr I	14989 - 26434	0.022	0.025	-1.60
8749.48	Zr I	4871 - 16297	0.0014	0.0015	-2.79
8786.23	Zr I	11641 - 23019	0.0085	0.0099	-2.01
8804.98	Zr I	14989 - 26343	0.035	0.041	-1.39
8836.09	Zr I	15120 - 26434	0.16	0.18	-0.74
8899.52	Zr I	12773 - 24006	0.068	0.081	-1.09

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
2419.41	Zr II	4248 - 45568	3.2	0.28	-0.56
2449.85	Zr II	4248 - 45055	9.2	0.83	-0.08
2457.44	Zr II	4506 - 45186	1.3	0.12	-0.91
2487.29	Zr II	8153 - 48345	11.	1.0	0.02
2496.48	Zr II	7838 - 47882	6.1	0.57	-0.25
2532.46	Zr II	763 - 40239	2.9	0.28	-0.55
2542.10	Zr II	315 - 39640	3.1	0.30	-0.52
2550.74	Zr II	0 - 39192	2.8	0.27	-0.57
2567.64	Zr II	0 - 38934	6.5	0.65	-0.19
2568.87	Zr II	1323 - 40239	27.	2.7	0.43
2571.39	Zr II	763 - 39640	29.	2.9	0.46
2583.40	Zr II	4506 - 43202	2.9	0.29	-0.54
2589.07	Zr II	4248 - 42861	4.7	0.47	-0.32
2630.91	Zr II	4506 - 42504	8.2	0.85	-0.07
2639.09	Zr II	763 - 38644	3.9	0.41	-0.39
2643.40	Zr II	315 - 38134	1.1	0.12	-0.93
2650.38	Zr II	763 - 38483	1.9	0.20	-0.70
2667.80	Zr II	315 - 37788	2.6	0.28	-0.56
2669.49	Zr II	5753 - 43202	3.6	0.38	-0.42
2670.96	Zr II	4248 - 41677	5.0	0.54	-0.27
2678.63	Zr II	1323 - 38644	33.	3.6	0.55
2681.76	Zr II	763 - 38041	0.56	0.060	-1.22
2692.60	Zr II	8058 - 45186	11.	1.1	0.06
2693.53	Zr II	315 - 37430	2.1	0.23	-0.64
2694.06	Zr II	5753 - 42861	11.	1.2	0.08
2695.43	Zr II	4248 - 41337	2.8	0.31	-0.51
2699.60	Zr II	315 - 37346	1.3	0.14	-0.86
2700.13	Zr II	763 - 37788	11.	1.2	0.08
2711.51	Zr II	0 - 36869	3.2	0.36	-0.45
2712.42	Zr II	315 - 37171	1.8	0.19	-0.71
2714.26	Zr II	4506 - 41337	5.7	0.63	-0.20
2722.61	Zr II	1323 - 38041	21.	2.4	0.37
2726.49	Zr II	763 - 37430	11.	1.2	0.08
2732.72	Zr II	763 - 37346	6.4	0.72	-0.14
2734.86	Zr II	315 - 36869	16.	1.8	0.26
2740.35	Zr II	3758 - 40239	2.1	0.24	-0.62
2740.51	Zr II	4248 - 40727	3.6	0.41	-0.39
2741.55	Zr II	1323 - 37788	2.1	0.24	-0.62
2742.56	Zr II	0 - 36452	11.	1.2	0.09
2745.86	Zr II	763 - 37171	8.4	0.95	-0.02
2752.21	Zr II	315 - 36639	7.2	0.82	-0.09
2758.81	Zr II	0 - 36237	5.2	0.59	-0.23
2761.91	Zr II	0 - 36197	0.68	0.078	-1.11
2768.73	Zr II	1323 - 37430	2.7	0.31	-0.51
2796.90	Zr II	5724 - 41468	6.9	0.81	-0.09
2799.15	Zr II	5753 - 41468	4.6	0.54	-0.27
2808.16	Zr II	315 - 35915	0.32	0.038	-1.42
2810.91	Zr II	6112 - 41677	8.2	0.97	-0.01
2818.74	Zr II	7736 - 43202	28.	3.3	0.52
2825.56	Zr II	7513 - 42894	35.	4.2	0.62

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
2827.50	Zr II	6112 - 41468	3.9	0.46	-0.33
2833.91	Zr II	7513 - 42789	6.8	0.81	-0.09
2834.40	Zr II	6468 - 41738	3.8	0.45	-0.34
2838.02	Zr II	6112 - 41337	2.2	0.27	-0.57
2839.34	Zr II	6468 - 41677	5.8	0.70	-0.16
2843.52	Zr II	7736 - 42894	8.7	1.1	0.02
2844.58	Zr II	8058 - 43202	48.	5.8	0.76
2848.19	Zr II	5753 - 40853	7.9	0.96	-0.02
2851.97	Zr II	7736 - 42789	23.	2.8	0.44
2854.43	Zr II	7838 - 42861	4.6	0.57	-0.25
2856.06	Zr II	5724 - 40727	0.95	0.12	-0.93
2865.10	Zr II	2895 - 37788	0.83	0.10	-0.99
2865.60	Zr II	3758 - 38644	1.8	0.22	-0.66
2869.81	Zr II	8058 - 42894	22.	2.8	0.44
2872.53	Zr II	8058 - 42861	2.3	0.29	-0.54
2877.55	Zr II	3300 - 38041	1.5	0.19	-0.73
2882.09	Zr II	4248 - 38934	0.77	0.096	-1.02
2883.80	Zr II	7838 - 42504	3.2	0.40	-0.40
2888.04	Zr II	6112 - 40727	3.2	0.40	-0.40
2889.43	Zr II	2572 - 37171	0.59	0.074	-1.13
2898.71	Zr II	3300 - 37788	1.4	0.18	-0.75
2901.62	Zr II	13428 - 47882	16.	2.1	0.32
2901.82	Zr II	2895 - 37346	0.74	0.094	-1.03
2905.23	Zr II	6468 - 40878	6.1	0.77	-0.12
2907.38	Zr II	6468 - 40853	2.7	0.34	-0.47
2910.25	Zr II	8153 - 42504	5.3	0.68	-0.17
2915.99	Zr II	3758 - 38041	5.2	0.66	-0.18
2916.64	Zr II	2895 - 37171	1.4	0.18	-0.74
2918.24	Zr II	8153 - 42410	16.	2.0	0.30
2924.64	Zr II	14163 - 48345	13.	1.7	0.23
2926.99	Zr II	14190 - 48345	95.	12.	1.09
2934.61	Zr II	2572 - 36639	1.9	0.24	-0.62
2936.31	Zr II	3300 - 37346	2.3	0.29	-0.53
2945.46	Zr II	7736 - 41677	4.3	0.56	-0.25
2948.94	Zr II	7838 - 41738	16.	2.0	0.31
2951.48	Zr II	3300 - 37171	2.9	0.38	-0.42
2952.24	Zr II	1323 - 35186	0.76	0.099	-1.01
2955.78	Zr II	14060 - 47882	86.	11.	1.05
2962.68	Zr II	2895 - 36639	5.2	0.68	-0.17
2968.96	Zr II	3758 - 37430	6.5	0.86	-0.07
2969.63	Zr II	2572 - 36237	3.3	0.44	-0.35
2976.61	Zr II	8153 - 41738	8.8	1.2	0.07
2978.05	Zr II	3300 - 36869	5.6	0.74	-0.13
2979.18	Zr II	2895 - 36452	3.6	0.47	-0.32
2981.02	Zr II	4506 - 38041	4.0	0.54	-0.27
2987.80	Zr II	9743 - 43202	2.7	0.36	-0.45
2991.41	Zr II	0 - 33419	0.34	0.045	-1.34
3003.74	Zr II	4506 - 37788	7.3	0.98	-0.01
3013.32	Zr II	4506 - 37682	2.3	0.31	-0.51
3019.84	Zr II	315 - 33419	1.1	0.15	-0.82

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3020.47	Zr II	4248 - 37346	7.1	0.97	-0.01
3028.04	Zr II	7838 - 40853	28.	3.8	0.58
3030.92	Zr II	0 - 32984	1.1	0.15	-0.84
3036.39	Zr II	4506 - 37430	7.3	1.0	0.00
3054.84	Zr II	8153 - 40878	39.	5.4	0.74
3057.22	Zr II	8153 - 40853	3.9	0.54	-0.27
3060.11	Zr II	315 - 32984	0.61	0.086	-1.07
3061.35	Zr II	763 - 33419	0.61	0.085	-1.07
3064.63	Zr II	4248 - 36869	1.8	0.26	-0.59
3065.21	Zr II	0 - 32615	0.28	0.039	-1.41
3095.07	Zr II	315 - 32615	1.4	0.20	-0.70
3099.23	Zr II	0 - 32257	1.4	0.20	-0.70
3106.58	Zr II	8058 - 40239	33.	4.8	0.68
3110.88	Zr II	763 - 32899	1.3	0.19	-0.73
3125.19	Zr II	4248 - 36237	1.1	0.16	-0.80
3125.92	Zr II	0 - 31981	1.5	0.22	-0.67
3129.18	Zr II	4248 - 36197	7.7	1.1	0.06
3129.76	Zr II	315 - 32257	2.5	0.37	-0.43
3133.48	Zr II	7736 - 39640	14.	2.1	0.32
3138.68	Zr II	763 - 32615	3.9	0.57	-0.24
3155.67	Zr II	7513 - 39192	10.	1.6	0.19
3157.00	Zr II	4248 - 35915	2.2	0.32	-0.49
3164.31	Zr II	5753 - 37346	12.	1.7	0.24
3165.45	Zr II	8058 - 39640	6.2	0.93	-0.03
3165.97	Zr II	1323 - 32899	5.4	0.81	-0.09
3166.26	Zr II	6468 - 38041	4.0	0.59	-0.23
3178.09	Zr II	7736 - 39192	6.9	1.0	0.02
3181.58	Zr II	7513 - 38934	6.4	0.97	-0.01
3181.92	Zr II	5753 - 37171	3.1	0.47	-0.33
3182.86	Zr II	4506 - 35915	13.	1.9	0.29
3191.90	Zr II	6468 - 37788	5.3	0.80	-0.10
3204.35	Zr II	7736 - 38934	0.86	0.13	-0.88
3212.85	Zr II	5753 - 36869	1.4	0.22	-0.65
3214.19	Zr II	763 - 31866	3.5	0.54	-0.26
3222.47	Zr II	14163 - 45186	21.	3.3	0.52
3228.81	Zr II	6468 - 37430	4.5	0.71	-0.15
3231.69	Zr II	315 - 31249	2.5	0.39	-0.41
3236.58	Zr II	14299 - 45186	21.	3.4	0.53
3241.05	Zr II	315 - 31160	2.9	0.46	-0.34
3264.81	Zr II	7513 - 38134	1.0	0.17	-0.78
3271.13	Zr II	4248 - 34810	1.6	0.26	-0.58
3272.22	Zr II	0 - 30551	1.7	0.28	-0.55
3273.05	Zr II	1323 - 31866	4.8	0.77	-0.12
3279.26	Zr II	763 - 31249	5.0	0.81	-0.09
3284.71	Zr II	0 - 30435	2.8	0.45	-0.34
3285.88	Zr II	8058 - 38483	4.3	0.69	-0.16
3288.80	Zr II	763 - 31160	0.59	0.096	-1.02
3296.40	Zr II	7736 - 38063	2.1	0.34	-0.47
3302.67	Zr II	9969 - 40239	3.8	0.63	-0.20
3305.15	Zr II	315 - 30562	1.8	0.29	-0.54

Wavelength A	Spectrum	Energy Levels K	gA $10^8/\text{sec}$	gf	Log gf
3306.28	Zr II	315 - 30551	2.9	0.48	-0.32
3309.89	Zr II	7838 - 38041	1.0	0.17	-0.77
3311.34	Zr II	5724 - 35915	0.57	0.093	-1.03
3313.70	Zr II	7513 - 37682	3.7	0.62	-0.21
3314.50	Zr II	5753 - 35915	3.2	0.53	-0.28
3318.51	Zr II	6112 - 36237	1.2	0.21	-0.69
3319.02	Zr II	315 - 30435	0.48	0.080	-1.10
3322.99	Zr II	6112 - 36197	6.2	1.0	0.01
3326.80	Zr II	12360 - 42410	36.	5.9	0.77
3334.25	Zr II	8058 - 38041	10.	1.7	0.24
3334.62	Zr II	4506 - 34485	2.2	0.36	-0.44
3338.41	Zr II	7736 - 37682	4.7	0.79	-0.10
3340.56	Zr II	1323 - 31249	3.1	0.51	-0.29
3344.79	Zr II	8153 - 38041	10.	1.8	0.24
3354.39	Zr II	6112 - 35915	2.7	0.45	-0.34
3356.09	Zr II	763 - 30551	2.5	0.43	-0.37
3357.26	Zr II	0 - 29778	1.4	0.24	-0.61
3359.96	Zr II	11984 - 41738	14.	2.4	0.37
3362.68	Zr II	8058 - 37788	2.4	0.41	-0.38
3363.82	Zr II	2895 - 32615	0.91	0.15	-0.81
3367.82	Zr II	2572 - 32257	0.82	0.14	-0.85
3369.26	Zr II	9969 - 39640	1.7	0.28	-0.55
3373.42	Zr II	8153 - 37788	4.6	0.78	-0.11
3374.73	Zr II	8058 - 37682	9.5	1.6	0.21
3376.27	Zr II	7736 - 37346	2.5	0.42	-0.38
3377.46	Zr II	3300 - 32899	0.99	0.17	-0.77
3378.30	Zr II	7838 - 37430	1.3	0.23	-0.64
3387.87	Zr II	7838 - 37346	13.	2.2	0.35
3388.30	Zr II	0 - 29505	1.9	0.33	-0.48
3391.98	Zr II	1323 - 30796	21.	3.6	0.55
3393.12	Zr II	315 - 29778	1.5	0.27	-0.57
3396.33	Zr II	7736 - 37171	3.6	0.62	-0.21
3396.66	Zr II	13429 - 42861	4.1	0.71	-0.15
3399.35	Zr II	2572 - 31981	1.9	0.33	-0.48
3402.87	Zr II	12360 - 41738	12.	2.1	0.32
3403.68	Zr II	8058 - 37430	4.5	0.78	-0.11
3404.83	Zr II	2895 - 32257	3.1	0.54	-0.27
3408.08	Zr II	7838 - 37171	4.2	0.72	-0.14
3410.25	Zr II	3300 - 32615	4.6	0.80	-0.09
3419.11	Zr II	1323 - 30562	0.26	0.045	-1.34
3424.82	Zr II	315 - 29505	0.40	0.071	-1.15
3430.53	Zr II	3758 - 32899	6.7	1.2	0.07
3431.57	Zr II	7736 - 36869	2.3	0.41	-0.39
3432.41	Zr II	7513 - 36639	2.6	0.47	-0.33
3433.91	Zr II	8058 - 37171	2.5	0.44	-0.35
3437.14	Zr II	5724 - 34810	4.3	0.76	-0.12
3438.23	Zr II	763 - 29840	13.	2.4	0.37
3443.57	Zr II	7838 - 36869	2.4	0.43	-0.36
3457.56	Zr II	4506 - 33419	3.2	0.57	-0.24
3458.93	Zr II	7736 - 36639	3.9	0.70	-0.16

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3463.02	Zr II	11984 - 40853	52.	9.3	0.97
3469.94	Zr II	8058 - 36869	0.78	0.14	-0.85
3478.30	Zr II	763 - 29505	0.33	0.059	-1.23
3478.50	Zr II	9743 - 38483	2.0	0.37	-0.43
3479.02	Zr II	4248 - 32984	1.2	0.22	-0.66
3479.39	Zr II	5753 - 34485	13.	2.3	0.36
3480.41	Zr II	7513 - 36237	2.6	0.47	-0.32
3481.15	Zr II	6468 - 35186	16.	2.9	0.47
3483.54	Zr II	6112 - 34810	8.7	1.6	0.20
3485.32	Zr II	7513 - 36197	2.2	0.39	-0.41
3496.21	Zr II	315 - 28909	9.0	1.6	0.22
3499.58	Zr II	3300 - 31866	0.96	0.18	-0.76
3505.48	Zr II	12360 - 40878	22.	4.1	0.61
3505.67	Zr II	1323 - 29840	2.3	0.43	-0.36
3506.05	Zr II	9969 - 38483	2.7	0.50	-0.31
3507.67	Zr II	7736 - 36237	0.77	0.14	-0.85
3510.46	Zr II	4506 - 32984	1.4	0.26	-0.59
3520.87	Zr II	4506 - 32899	0.86	0.16	-0.80
3525.81	Zr II	2895 - 31249	1.9	0.35	-0.45
3530.85	Zr II	14190 - 42504	7.1	1.3	0.12
3536.94	Zr II	2895 - 31160	0.48	0.089	-1.05
3539.01	Zr II	13429 - 41677	3.6	0.68	-0.17
3542.62	Zr II	14190 - 42410	63.	12.	1.08
3549.51	Zr II	9969 - 38134	3.8	0.72	-0.14
3551.95	Zr II	763 - 28909	3.9	0.74	-0.13
3554.07	Zr II	9553 - 37682	3.3	0.63	-0.20
3556.60	Zr II	3758 - 31866	11.	2.1	0.32
3568.14	Zr II	6468 - 34485	0.95	0.18	-0.74
3572.47	Zr II	0 - 27984	3.7	0.71	-0.15
3573.08	Zr II	2572 - 30551	0.76	0.15	-0.83
3576.85	Zr II	3300 - 31249	5.5	1.1	0.02
3578.23	Zr II	9743 - 37682	4.0	0.78	-0.11
3587.98	Zr II	2572 - 30435	1.5	0.30	-0.53
3588.32	Zr II	3300 - 31160	0.75	0.14	-0.84
3599.90	Zr II	14733 - 42504	9.2	1.8	0.25
3607.38	Zr II	9969 - 37682	4.4	0.86	-0.07
3611.89	Zr II	14060 - 41738	59.	11.	1.06
3613.10	Zr II	315 - 27984	2.0	0.39	-0.41
3614.77	Zr II	2895 - 30551	4.1	0.80	-0.10
3630.02	Zr II	2895 - 30435	0.62	0.12	-0.91
3633.49	Zr II	14163 - 41677	12.	2.3	0.36
3636.45	Zr II	3758 - 31249	0.78	0.15	-0.81
3655.56	Zr II	7838 - 35186	0.42	0.085	-1.07
3662.14	Zr II	13429 - 40727	4.9	0.98	-0.01
3668.45	Zr II	3300 - 30551	0.46	0.093	-1.03
3671.27	Zr II	5753 - 32984	2.2	0.45	-0.35
3674.72	Zr II	2572 - 29778	1.9	0.38	-0.42
3678.90	Zr II	14163 - 41337	8.7	1.8	0.25
3697.46	Zr II	3758 - 30796	1.2	0.25	-0.61
3698.17	Zr II	8153 - 35186	10.	2.1	0.33

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
3709.26	Zr II	6468 - 33419	4.7	0.97	-0.01
3714.78	Zr II	4248 - 31160	0.67	0.14	-0.86
3718.84	Zr II	2895 - 29778	0.15	0.031	-1.51
3731.26	Zr II	14060 - 40853	15.	3.0	0.48
3738.11	Zr II	4506 - 31249	0.17	0.036	-1.44
3745.98	Zr II	14190 - 40878	30.	6.4	0.81
3750.64	Zr II	4506 - 31160	0.28	0.059	-1.23
3751.60	Zr II	7838 - 34485	7.9	1.7	0.22
3757.79	Zr II	14733 - 41337	5.9	1.3	0.10
3766.82	Zr II	3300 - 29840	0.81	0.17	-0.76
3767.88	Zr II	5724 - 32257	0.12	0.024	-1.61
3782.22	Zr II	6468 - 32899	0.28	0.059	-1.23
3796.48	Zr II	8153 - 34485	1.2	0.25	-0.60
3817.58	Zr II	4248 - 30435	0.60	0.13	-0.88
3836.76	Zr II	4506 - 30562	3.9	0.86	-0.07
3838.28	Zr II	4506 - 30551	0.34	0.075	-1.13
3843.02	Zr II	2895 - 28909	0.76	0.17	-0.77
3855.43	Zr II	4506 - 30435	0.23	0.052	-1.28
3914.34	Zr II	19515 - 45055	5.2	1.2	0.07
3915.94	Zr II	4248 - 29778	0.55	0.13	-0.89
3934.12	Zr II	2572 - 27984	0.22	0.050	-1.30
3934.79	Zr II	5753 - 31160	0.53	0.12	-0.91
3936.06	Zr II	6468 - 31866	0.22	0.050	-1.30
3958.22	Zr II	4248 - 29505	1.6	0.37	-0.43
3991.13	Zr II	6112 - 31160	2.1	0.50	-0.30
3998.97	Zr II	4506 - 29505	1.3	0.31	-0.50
4018.38	Zr II	7736 - 32615	0.50	0.12	-0.92
4024.44	Zr II	8058 - 32899	0.54	0.13	-0.88
4029.68	Zr II	5753 - 30562	0.92	0.22	-0.65
4034.09	Zr II	6468 - 31249	0.11	0.026	-1.58
4040.24	Zr II	7513 - 32257	0.14	0.035	-1.45
4045.61	Zr II	5724 - 30435	0.89	0.22	-0.66
4048.67	Zr II	6468 - 31160	1.7	0.41	-0.39
4050.33	Zr II	5753 - 30435	0.44	0.11	-0.96
4090.51	Zr II	6112 - 30551	0.36	0.090	-1.04
4096.63	Zr II	4506 - 28909	0.097	0.024	-1.61
4149.20	Zr II	6468 - 30562	2.9	0.74	-0.13
4150.97	Zr II	6468 - 30551	0.37	0.094	-1.02
4156.24	Zr II	5724 - 29778	0.55	0.14	-0.85
4161.21	Zr II	5753 - 29778	0.76	0.20	-0.71
4179.81	Zr II	13429 - 37346	1.3	0.33	-0.48
4186.69	Zr II	14163 - 38041	2.0	0.52	-0.29
4208.98	Zr II	5753 - 29505	1.1	0.29	-0.54
4211.88	Zr II	4248 - 27984	0.23	0.061	-1.21
4231.63	Zr II	14163 - 37788	0.72	0.19	-0.72
4258.04	Zr II	4506 - 27984	0.21	0.056	-1.25
4273.52	Zr II	6112 - 29506	0.14	0.038	-1.42
4286.51	Zr II	7838 - 31160	0.11	0.031	-1.51
4296.74	Zr II	14163 - 37430	0.66	0.18	-0.74
4317.31	Zr II	5753 - 28909	0.12	0.033	-1.48

Wavelength A	Spectrum	Energy Levels K	gA 10 ⁸ /sec	gf	Log gf
4333.26	Zr II	19433 - 42504	2.8	0.78	-0.11
4359.74	Zr II	9969 - 32899	1.4	0.39	-0.40
4370.95	Zr II	9743 - 32615	0.59	0.17	-0.77
4379.78	Zr II	12360 - 35186	2.2	0.64	-0.19
4403.34	Zr II	9553 - 32257	0.27	0.078	-1.11
4414.54	Zr II	9969 - 32615	0.30	0.087	-1.06
4440.46	Zr II	9743 - 32257	0.32	0.094	-1.03
4443.00	Zr II	11984 - 34485	1.1	0.33	-0.49
4461.22	Zr II	8153 - 30562	0.23	0.067	-1.17
4494.42	Zr II	19433 - 41677	3.3	0.99	-0.01
4496.97	Zr II	5753 - 27984	0.25	0.075	-1.13
4553.97	Zr II	19515 - 41468	2.5	0.78	-0.11
4574.50	Zr II	19614 - 41468	1.1	0.35	-0.45
4629.07	Zr II	20080 - 41677	2.4	0.76	-0.12
4685.19	Zr II	19515 - 40853	1.1	0.35	-0.45
5112.27	Zr II	13428 - 32984	0.26	0.10	-1.00
5191.60	Zr II	14163 - 33419	0.59	0.24	-0.62
5350.09	Zr II	14299 - 32984	0.17	0.072	-1.14
5350.35	Zr II	14733 - 33419	0.19	0.081	-1.09
6678.01	Zr II	19515 - 34485	0.13	0.085	-1.07
6787.15	Zr II	20080 - 34810	0.20	0.14	-0.86

THE NATIONAL BUREAU OF STANDARDS

Functions and Activities

The functions of the National Bureau of Standards are set forth in the Act of Congress, March 3, 1901, as amended by Congress in Public Law 619, 1950. These include the development and maintenance of the national standards of measurement and the provision of means and methods for making measurements consistent with these standards; the determination of physical constants and properties of materials; the development of methods and instruments for testing materials, devices, and structures; advisory services to government agencies on scientific and technical problems; invention and development of devices to serve special needs of the Government; and the development of standard practices, codes, and specifications. The work includes basic and applied research, development, engineering, instrumentation, testing, evaluation, calibration services, and various consultation and information services. Research projects are also performed for other government agencies when the work relates to and supplements the basic program of the Bureau or when the Bureau's unique competence is required. The scope of activities is suggested by the listing of divisions and sections on the next page.

Publications

The results of the Bureau's research are published either in the Bureau's own series of publications or in the journals of professional and scientific societies. The Bureau itself publishes three periodicals available from the Government Printing Office: The Journal of Research, published in four separate sections, presents complete scientific and technical papers; the Technical News Bulletin presents summary and preliminary reports on work in progress; and Basic Radio Propagation Predictions provides data for determining the best frequencies to use for radio communications throughout the world. There are also five series of non-periodical publications: Monographs, Applied Mathematics Series, Handbooks, Miscellaneous Publications, and Technical Notes.

A complete listing of the Bureau's publications can be found in National Bureau of Standards Circular 460, Publications of the National Bureau of Standards, 1901 to June 1947 (\$1.25), and the Supplement to National Bureau of Standards Circular 460, July 1947 to June 1957 (\$1.50), and Miscellaneous Publications 240, July 1957 to June 1960 (Includes Titles of Papers Published in Outside Journals 1950 to 1959) (\$2.25); available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

U. S. DEPARTMENT OF COMMERCE

Luther H. Hodges, *Secretary*

NATIONAL BUREAU OF STANDARDS

A. V. Astin, *Director*

THE NATIONAL BUREAU OF STANDARDS

The scope of activities of the National Bureau of Standards at its major laboratories in Washington, D. C., and Boulder, Colorado, is suggested in the following listing of the divisions and sections engaged in technical work. In general, each section carries out specialized research, development, and engineering in the field indicated by its title. A brief description of the activities, and of the resultant publications, appears on the preceding page.

WASHINGTON, D. C.

Electricity. Resistance and Reactance. Electrochemistry. Electrical Instruments. Magnetic Measurements. Dielectrics. High Voltage.

Metrology. Photometry and Colorimetry. Refractometry. Photographic Research. Length. Engineering Metrology. Mass and Scale. Volumetry and Densimetry.

Heat. Temperature Physics. Heat Measurements. Cryogenic Physics. Equation of State. Statistical Physics.

Radiation Physics. X-ray. Radioactivity. Radiation Theory. High Energy Radiation. Radiological Equipment. Nucleonic Instrumentation. Neutron Physics.

Analytical and Inorganic Chemistry. Pure Substances. Spectrochemistry. Solution Chemistry. Standard Reference Materials. Applied Analytical Research. Crystal Chemistry.

Mechanics. Sound. Pressure and Vacuum. Fluid Mechanics. Engineering Mechanics. Rheology. Combustion Controls.

Polymers. Macromolecules: Synthesis and Structure. Polymer Chemistry. Polymer Physics. Polymer Characterization. Polymer Evaluation and Testing. Applied Polymer Standards and Research. Dental Research.

Metallurgy. Engineering Metallurgy. Microscopy and Diffraction. Metal Reactions. Metal Physics. Electrolysis and Metal Deposition.

Inorganic Solids. Engineering Ceramics. Glass. Solid State Chemistry. Crystal Growth. Physical Properties. Crystallography.

Building Research. Structural Engineering. Fire Research. Mechanical Systems. Organic Building Materials. Codes and Safety Standards. Heat Transfer. Inorganic Building Materials. Metallic Building Materials.

Applied Mathematics. Numerical Analysis. Computation. Statistical Engineering. Mathematical Physics. Operations Research.

Data Processing Systems. Components and Techniques. Computer Technology. Measurements Automation. Engineering Applications. Systems Analysis.

Atomic Physics. Spectroscopy. Infrared Spectroscopy. Solid State Physics. Electron Physics. Atomic Physics.

Instrumentation. Engineering Electronics. Electron Devices. Electronic Instrumentation. Mechanical Instruments. Basic Instrumentation.

Physical Chemistry. Thermochemistry. Surface Chemistry. Organic Chemistry. Molecular Spectroscopy. Molecular Kinetics. Mass Spectrometry.

Office of Weights and Measures.

BOULDER, COLO.

Cryogenic Engineering Laboratory. Cryogenic Equipment. Cryogenic Processes. Properties of Materials. Cryogenic Technical Services.

CENTRAL RADIO PROPAGATION LABORATORY

Ionosphere Research and Propagation. Low Frequency and Very Low Frequency Research. Ionosphere Research. Prediction Services. Sun-Earth Relationships. Field Engineering. Radio Warning Services. Vertical Soundings Research.

Radio Propagation Engineering. Data Reduction Instrumentation. Radio Noise. Tropospheric Measurements. Tropospheric Analysis. Propagation-Terrain Effects. Radio-Meteorology. Lower Atmosphere Physics.

Radio Systems. Applied Electromagnetic Theory. High Frequency and Very High Frequency Research. Modulation Research. Antenna Research. Navigation Systems.

Upper Atmosphere and Space Physics. Upper Atmosphere and Plasma Physics. Ionosphere and Exosphere Scatter. Airglow and Aurora. Ionospheric Radio Astronomy.

RADIO STANDARDS LABORATORY

Radio Physics. Radio Broadcast Service. Radio and Microwave Materials. Atomic Frequency and Time-Interval Standards. Millimeter-Wave Research.

Circuit Standards. High Frequency Electrical Standards. Microwave Circuit Standards. Electronic Calibration Center.

Selected Publications of the National Bureau of Standards

Atomic Energy Levels, C. E. Moore:

Circular 467, Volume I.	H to V ($Z = 1$ to 23)	206 spectra.	309 p.	(1949)	\$5.50
Circular 467, Volume II.	Cr to Nb ($Z = 24$ to 41)	152 spectra.	227 p.	(1952)	\$4.00
Circular 467, Volume III.	{Mo to La ($Z = 42$ to 57)} {Hf to Ac ($Z = 72$ to 89)}	124 spectra.	245 p.	(1953)	\$2.50

An Ultraviolet Multiplet Table, C. E. Moore:

Circular 488, Section 1.	H to V ($Z = 1$ to 23); Selected Multiplets of 79 spectra.	78 p.	(1950).	\$0.55
Circular 488, Section 2.	Cr to Nb ($Z = 24$ to 41); Selected Multiplets of 46 spectra.	115 p.	(1952).	\$0.70
Circular 488, Section 3.	{Mo to La ($Z = 42$ to 57)} {Hf to Ra ($Z = 72$ to 88)} Selected Multiplets of 78 spectra.	94 p.	(1961).	\$0.60
Circular 488, Section 4.	H to Nb ($Z = 1$ to 41); Finding List for Sections 1 and 2 of the Table.	65 p.	(1961).	\$0.45
Circular 488, Section 5.	{Mo to La ($Z = 42$ to 57)} {Hf to Ra ($Z = 72$ to 88)} Finding List for Section 3 of the Table.	30 p.	(1961).	\$0.30

Table of Wavenumbers, C. D. Coleman, W. R. Bozman, and W. F. Meggers:

Monograph 3, Volume I.	2000 A to 7000 A.	508 p.	(1960)	\$6.00
Monograph 3, Volume II.	7000 A to 1000 μ .	542 p.	(1960)	\$6.00

New Description of Thorium Spectra, Romuald Zalubas:

Monograph 17,	108 p.	(1960)	\$0.65
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Tables of Spectral-Line Intensities, W. F. Meggers, C. H. Corliss, and B. F. Scribner:

Monograph 32, Part I.	Arranged by Elements.	474 p.	(1961)	\$4.00
Monograph 32, Part II.	Arranged by Wavelengths.	272 p.	(1961)	\$3.00

The above publications may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

A Multiplet Table of Astrophysical Interest, C. E. Moore. A Reprinting of the 1945 Multiplet Table (Princeton Univ., Obs. Contr. No. 20):

Technical Note 36 (PB151395), Part I Table of Multiplets, and Part II Finding List, $\lambda\lambda 2951\text{\AA}$ — 13164\AA .	242 p.	(1959).	\$4.00
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The above Technical Note may be purchased by the PB number from the Department of Commerce, Office of Technical Services, Washington 25, D. C.

This is the first production-line book in which the tables were composed by a photocomposition machine controlled by the output of a digital computer. Printing instructions, column headings, and the decimal tabular material were programmed for the computer. The output magnetic tape then became the input to the photocomposition machine which produced auto-positive film. These, in turn, were used to produce direct offset printing plates.

