

The Second Spectrum of Ruthenium (Ru II)

Allen G. Shenstone¹ and William F. Meggers

Wavelengths and estimated intensities of 2,227 spectral lines characteristic of singly ionized ruthenium atoms are presented. The wavelengths range from 1054.684 to 6371.29 Å. The Zeeman effect has been investigated for 488 lines ranging from 2323 to 4010 Å. Analysis of these basic data of Ru II has resulted in the classification of 1,633 lines as transitions between 68-even, and 140-odd energy levels. All but three of these levels have been grouped into designated spectral terms and assigned to electron configurations. The low-even terms arise from $4d^7$, $4d^6 5s$, and $4d^5 5s^2$. All the terms from the $4d^7$ configuration have been found, and $4d^7 a^4F$ represents the ground state of Ru II. From two members of the $4d^6 ns^0D$ series a limit, 135200 cm^{-1} , has been calculated which indicates a principal ionization potential (I. P.) of 16.76 electron volts for Ru⁺ ions.

As far back as 1930 [1]² an analysis was undertaken of the first spark spectrum of ruthenium, element number 44. Although the fundamental multiplets were easily found, the complexity of the spectrum made further work unrewarding until more complete and accurate measurements could be made. In 1955 [2] Kessler and Meggers published new measurements, and in 1952 Meggers measured Zeeman effects on plates taken at the Massachusetts Institute of Technology with their large-field magnet and high-dispersion spectrographs. In addition, the spectrum was photographed on the Princeton vacuum instrument to provide wavelengths from 500 Å to 2200 Å. This instrument uses a 30,000 line per inch grating of 2m radius of curvature in a normal incidence mounting. All of the measurements of wavelength were made from spectrograms of the spark, a source which is not altogether satisfactory for first-spark spectra. For instance, Dobbie's [3] excellent analysis of Fe II was made entirely from the polar lines in an arc. Therefore, some further observations were made with such a source, and a considerable number of lines were found in the longer wavelength region which were not observed in the spark. All of the arc and spark photographs were made with buttons of pure compressed ruthenium powder. The metallic impurities were very faint and easily eliminated. In the vacuum region the gas and carbon lines, which are always present, were used as standards. In that region the differentiation of stages of ionization was made from an examination of the polarity of the lines on a number of plates. In some cases, it was even possible to distinguish lines due to the lowest levels from those due to levels only 20000 cm^{-1} higher. As usual, lines due to transitions from high even levels to intermediate odd levels are very wide and displaced from the position they occupy in an arc source.

Although the Zeeman effect on ruthenium lines was photographed and machine-measured at the Massachusetts Institute of Technology in 1940 only the results for Ru I were exploited and published

[4]. In 1949 new Zeeman spectrograms of ruthenium were made at the Massachusetts Institute of Technology but the magnetic field intensity did not exceed 80,000 oersteds. Because some of the earlier spectrograms were made with higher field intensities which greatly enhanced Ru II, the best of these (Z-74) were loaned to the National Bureau of Standards where they were hand-measured and computed. A field intensity of 88,200 oersteds was derived from the magnetic splitting of impurity lines (Mg II 2795.53 and 2802.60 Å, Cu I 3247.54 and 3273.96 Å, Ag I 3280.68 and 3382.89 Å, and Ca II 3933.66 and 3968.47 Å).

The Ru II lines were easily distinguished from Ru I by comparing the total intensities of the Zeeman patterns with the intensities in the central comparison spectrum produced without the magnetic field; the Ru II lines were greatly enhanced by the magnetic field. In addition, the fully recorded and resolved patterns of Ru II lines were recognized by their types 4, 5, and 6 characteristic of even multiplicities according to Back and Landé [5]. Type 4 exhibits two symmetrically least-displaced p -components of equal intensity, and the two strongest n -components are also least displaced, when the level with the larger J has the smaller g . Type 5 occurs when the larger J has the larger g , in which case the two strongest n -components exhibit the maximum displacement. Type 6 is produced by levels with equal J but unequal g , in which case the strongest p -components show the largest displacement, and the strongest n -components an average displacement. The observed g -factors given to 3 decimals in tables 1, 2, and 5 are the average of all calculations from resolved patterns, indicated in table 6 by Δg . Only the displacements of maximum intensities of unresolved patterns on the MIT spectrograms were measured, and the types noted. Then after such a line was classified it was often possible to calculate a g -factor for one level if the other one is known. In many type 6 patterns the over-all width (w) of the unresolved p -components was measured so that g -values could be calculated for both energy levels when their J -values were fixed by the classification; in these cases the Δg (in table 6) is inclosed in parentheses and the g -factors are given to two deci-

¹ Present address: Palmer Physical Laboratory, Princeton University, Princeton, N. J.

² Figures in brackets indicate the literature references on page 378.

mals. For a few levels, the g -values were calculated to two decimals from unresolved patterns on plates taken 30 years ago at Princeton, according to a procedure described by Shenstone and Blair [6].

As remarked above, the lowest multiplets were found many years ago; but even after the new wavelength measurements were made and Zeeman effects observed, it still proved very difficult to break into the higher groups of terms. This was surprising since in a spectrum of this kind, one expects many intersystem and interfamilial lines. There are many such combinations but few of them are with the sextet system. In point of fact, the strongest interfamilial combinations with that system are in the long wavelength region where the lines can be observed only at the poles of the arc. This was unfortunately discovered after the analysis was practically complete.

The break into the higher quartet terms was made through a search in the Schumann region for the differences occurring in the low 4F term. From such differences the usual square array was built up, though the work was not made any easier by the fact that great reliance was placed on a comparison with Fe II.

Only after a very arduous numerical analysis was it possible to assign term designations to the even levels and a reasonable identification of odd levels was impossible until the analysis was nearly complete. A warning must be given against too great reliance on the names chosen. The levels are so mixed in character that the most that can be hoped is that designations have been selected which correspond to the particular Russell-Saunders type that is the chief contributor to each level. The terms of $4d^7$ and $4d^6(^5D)5s$ are the most reliably named because they are reasonably pure. The remaining even levels are in general less pure the higher they are.

The names of the odd levels are considerably less reliable than those of the even levels. The levels were found chiefly by the numerical analysis mentioned above, assisted by rough predictions of position and intensity of combinations. Because the spectrum Tc I, isoelectronic with Ru II, is only partially analyzed [7], the chief reliance had to be on the homologous spectrum Fe II [8] for predictions of position. Unfortunately, the correspondence is much rougher than was expected. For instance, the terms a^4H and

TABLE I. Even levels of RuII

Configuration	Designation	J	Level	g (obs)	g (Landé)	Configuration	Designation	J	Level	g (obs)	g (Landé)
$4d^7$	a^4F	$4\frac{1}{2}$	0. 0	-----	1. 333	$4d^6(^3G)5s$	a^4G	$5\frac{1}{2}$	29018. 6	1. 232	1. 273
$4d^7$	a^4F	$3\frac{1}{2}$	1523. 1	-----	1. 238	$4d^6(^3P)5s$	b^4P	$1\frac{1}{2}$	29091. 0	1. 646	1. 733
$4d^7$	a^4F	$2\frac{1}{2}$	2493. 9	-----	1. 029	$4d^6(^3G)5s$	a^4G	$4\frac{1}{2}$	30099. 6	1. 167	1. 172
$4d^7$	a^4F	$1\frac{1}{2}$	3104. 2	-----	0. 419	$4d^6(^3G)5s$	a^4G	$2\frac{1}{2}$	30293. 3	0. 651	0. 571
$4d^7$	a^4P	$2\frac{1}{2}$	8256. 7	1. 57	1. 600	$4d^6(^3G)5s$	a^4G	$3\frac{1}{2}$	30439. 5	1. 021	0. 984
$4d^7$	a^4P	$1\frac{1}{2}$	8477. 7	1. 68	1. 733	$4d^6(^3P)5s$	b^4P	$0\frac{1}{2}$	30489. 3	2. 541	2. 667
$4d^6(^5D)5s$	a^6D	$4\frac{1}{2}$	9151. 4	1. 53	1. 556	$4d^6(^3H)5s$	b^2H	$5\frac{1}{2}$	32623. 0	1. 065	1. 091
$4d^7$	a^4P	$0\frac{1}{2}$	9373. 9	2. 60	2. 667	$4d^6(^3H)5s$	b^2H	$4\frac{1}{2}$	32686. 7	0. 955	0. 909
$4d^6(^5D)5s$	a^6D	$3\frac{1}{2}$	10150. 4	1. 576	1. 587	$4d^6(^3D)5s$	b^4D	$1\frac{1}{2}$	32888. 4	1. 200	1. 200
$4d^6(^5D)5s$	a^6D	$2\frac{1}{2}$	10851. 7	1. 641	1. 657	$4d^6(^3D)5s$	b^4D	$0\frac{1}{2}$	32960. 8	0. 138	0. 00
$4d^7$	a^2G	$4\frac{1}{2}$	10860. 9	-----	1. 111	$4d^6(^3D)5s$	b^4D	$2\frac{1}{2}$	33018. 8	1. 338	1. 371
$4d^6(^5D)5s$	a^6D	$1\frac{1}{2}$	11303. 8	1. 843	1. 867	$4d^6(^3D)5s$	b^4D	$3\frac{1}{2}$	33332. 7	1. 397	1. 429
$4d^6(^5D)5s$	a^6D	$0\frac{1}{2}$	11604. 0	3. 271	3. 333	$4d^6(^3P)5s$	b^2P	$1\frac{1}{2}$	33734. 8	1. 185	1. 333
$4d^7$	a^2G	$3\frac{1}{2}$	12293. 4	-----	0. 889	$4d^6(^3F)5s$	b^2F	$3\frac{1}{2}$	34038. 3	1. 083	1. 143
$4d^7$	a^2P	$1\frac{1}{2}$	12956. 6	-----	1. 333	$4d^7$	b^2D	$1\frac{1}{2}$	34793. 1	0. 965	0. 800
$4d^7$	a^2D	$2\frac{1}{2}$	14581. 2	-----	1. 200	$4d^7$	b^2D	$2\frac{1}{2}$	34829. 3	1. 102	1. 200
$4d^7$	a^2H	$5\frac{1}{2}$	14663. 4	-----	1. 091	$4d^6(^3F)5s$	b^2F	$2\frac{1}{2}$	35298. 4	0. 945	0. 857
$4d^7$	a^2P	$0\frac{1}{2}$	14799. 5	-----	0. 667	$4d^6\ 5s^2$	a^6S	$2\frac{1}{2}$	35857. 6	-----	2. 000
$4d^7$	a^2H	$4\frac{1}{2}$	16125. 0	-----	0. 909	$4d^6(^1I)5s$	a^2I	$6\frac{1}{2}$	35939. 6	1. 06	1. 077
$4d^7$	a^2D	$1\frac{1}{2}$	17017. 6	-----	0. 800	$4d^6(^3G)5s$	b^2G	$4\frac{1}{2}$	36016. 0	1. 067	1. 111
$4d^6(^5D)5s$	a^4D	$3\frac{1}{2}$	19378. 7	1. 402	1. 429	$4d^6(^3P)5s$	b^2P	$0\frac{1}{2}$	36095. 0	0. 875	0. 667
$4d^6(^5D)5s$	a^4D	$2\frac{1}{2}$	20515. 0	1. 337	1. 371	$4d^6(^1I)5s$	a^2I	$5\frac{1}{2}$	36229. 7	0. 93	0. 923
$4d^6(^5D)5s$	a^4D	$1\frac{1}{2}$	21246. 4	1. 188	1. 200	$4d^6(^3G)5s$	b^2G	$3\frac{1}{2}$	36515. 8	0. 885	0. 889
$4d^7$	a^2F	$2\frac{1}{2}$	21557. 8	0. 863	0. 857	$4d^6(^1G)5s$	c^2G	$4\frac{1}{2}$	37433. 0	1. 078	1. 111
$4d^6(^5D)5s$	a^4D	$0\frac{1}{2}$	21645. 6	0. 015	0. 000	$4d^6(^1G)5s$	c^2G	$3\frac{1}{2}$	37981. 5	0. 942	0. 889
$4d^7$	a^2F	$3\frac{1}{2}$	22289. 0	1. 138	1. 143	$4d^6(^3D)5s$	c^2D	$2\frac{1}{2}$	38981. 8	1. 18	1. 200
$4d^6(^3H)5s$	a^4H	$6\frac{1}{2}$	25952. 2	1. 235	1. 231	$4d^6(^3D)5s$	c^2D	$1\frac{1}{2}$	39711. 9	0. 797	0. 800
$4d^6(^3H)5s$	a^4H	$5\frac{1}{2}$	26109. 4	1. 16	1. 133	$4d^6(^1S)5s$	a^2S	$0\frac{1}{2}$	40226. 2	1. 800	2. 000
$4d^6(^3H)5s$	a^4H	$4\frac{1}{2}$	26118. 4	1. 08	0. 970	$4d^6(^1D)5s$	d^2D	$1\frac{1}{2}$	42750. 1	0. 803	0. 800
$4d^6(^3H)5s$	a^4H	$3\frac{1}{2}$	26468. 0	0. 759	0. 667	$4d^6(^1D)5s$	d^2D	$2\frac{1}{2}$	43609. 9	1. 216	1. 200
$4d^6(^3P)5s$	b^4P	$2\frac{1}{2}$	26911. 4	1. 578	1. 600	$4d^6(^5D)6s$	e^6D	$4\frac{1}{2}$	84510. 9	-----	1. 556
$4d^6(^3F)5s$	b^4F	$4\frac{1}{2}$	27544. 6	1. 200	1. 333	$4d^6(^5D)6s$	e^4D	$3\frac{1}{2}$	86440. 4	-----	1. 429
$4d^6(^3F)5s$	b^4F	$3\frac{1}{2}$	27948. 8	1. 091	1. 238	$4d^6(^5D)6s$	e^4D	$2\frac{1}{2}$	87523. 4	-----	1. 371
$4d^6(^3F)5s$	b^4F	$2\frac{1}{2}$	28138. 8	0. 941	1. 029						
$4d^6(^3F)5s$	b^4F	$1\frac{1}{2}$	28495. 3	0. 420	0. 419	$4d^6\ ^5D_4$ (RuIII)	Limit	---	135200	-----	-----

TABLE 2. *Odd levels of Ru II—Continued*

Configuration	Designation	<i>J</i>	Level	<i>g</i> (obs)	<i>g</i> (Landé)	Configuration	Designation	<i>J</i>	Level	<i>g</i> (obs)	<i>g</i> (Landé)
$4d^6(1D)5p$	y^2P°	$1\frac{1}{2}$	77292.7	1.291	1.333	$4d^5 5s(5S)5p$	x^6P°	$2\frac{1}{2}$	90829.9	-----	-----
$4d^6(1D)5p$	w^2D°	$2\frac{1}{2}$	77819.1	1.068	1.200	$4d^5 5s(5S)5p$	x^6P°	$1\frac{1}{2}$	91503.7	-----	-----
$4d^6(1D)5p$	w^2D°	$1\frac{1}{2}$	78617.3	0.87	0.800	$4d^6(b^3F)5p?$	v^4D°	$3\frac{1}{2}$	95324.8	-----	-----
$4d^6(1D)5p$	v^2F°	$2\frac{1}{2}$	79114.8	0.96	0.857	$4d^6(b^3F)5p?$	w^4G°	$2\frac{1}{2}$	95713.4	-----	-----
	3°	$3\frac{1}{2}$	79503.7	1.033	-----	$4d^6(b^3F)5p?$	w^4G°	$3\frac{1}{2}$	96109.3	-----	-----
$4d^6(1D)5p$	v^2F°	$3\frac{1}{2}$	79804.0	1.046	1.143	$4d^6(b^3F)5p?$	v^4D°	$1\frac{1}{2}$	96349.7	-----	-----
$4d^5 5s(5S)5p$	w^4P°	$2\frac{1}{2}$	81721.7	-----	-----	$4d^6(b^3F)5p?$	w^4G°	$4\frac{1}{2}$	96501.7	-----	-----
$4d^5 5s(5S)5p$	w^4P°	$1\frac{1}{2}$	82239.5	-----	-----	$4d^6(b^3F)5p?$	w^4G°	$5\frac{1}{2}$	96722.4	-----	-----
$4d^5 5s(5S)5p$	w^4P°	$0\frac{1}{2}$	82650.8	-----	-----	$4d^6(b^3F)5p?$	v^2G°	$3\frac{1}{2}$	102865.4	-----	-----
$4d^5 5s(5S)5p$	x^6P°	$3\frac{1}{2}$	90165.8	-----	-----	$4d^6(b^3F)5p?$	v^2G°	$4\frac{1}{2}$	103434.2	-----	-----
						$4d^6 5D_4(\text{Ru III})$ Limit			~135200		

TABLE 3. Ru II

Configuration $1s^2 2s^2 2p^6 3s^2 3p^6$ $3d^{10} 4s^2 4p^6 +$	Observed Terms
$4d^7$	$a^4P, a^2P, a^4F, a^2D, a^2F, a^2G, a^2H, b^2D$
$4d^5 5s^2$	a^6S
	<i>ns</i> ($n \geq 5$)
	<i>np</i> ($n \geq 5$)
$4d^6(5D)nx$	$a, e^6D, a, e^4D, z^6P^\circ, z^6D^\circ, z^6F^\circ, z^4P^\circ, z^4D^\circ, z^4F^\circ$
$4d^6(3H)nx$	$a^4H, b^2H, z^4G^\circ, z^4H^\circ, z^4I^\circ, z^2G^\circ, z^2H^\circ, z^2I^\circ$
$4d^6(3P)nx$	$b^4P, b^2P, z^4S^\circ, y^4P^\circ, y^4D^\circ, z^2S^\circ, z^2P^\circ, z^2D^\circ$
$4d^6(3F)nx$	$b^4F, b^2F, x^4D^\circ, y^4F^\circ, y^4G^\circ, y^2D^\circ, z^2F^\circ, y^2G^\circ$
$4d^6(3G)nx$	$a^4G, b^2G, x^4F^\circ, x^4G^\circ, y^4H^\circ, y^2F^\circ, x^2G^\circ, y^2H^\circ$
$4d^6(3D)nx$	$b^4D, c^2D, x^4P^\circ, w^4D^\circ, w^4F^\circ, x^2D^\circ, x^2F^\circ$
$4d^6(1I)nx$	$a^2I, x^2H^\circ, y^2I^\circ, z^2K^\circ$
$4d^6(1G)nx$	$c^2G, w^2F^\circ, w^2G^\circ, w^2H^\circ$
$4d^6(1S)nx$	a^2S
$4d^6(1D)nx$	$d^2D, y^2P^\circ, w^2D^\circ, v^2F^\circ$
$4d^6(b^3F)5p$	$v^4D^\circ, w^4G^\circ, v^2G^\circ$
$4d^5 5s(7S)nx$	y^6P°
$4d^5 5s(5S)nx$	$x^6P^\circ, 4P^\circ$

TABLE 4. Numbers of levels of each J -value of the structure $4d^6 5p$ below 80000 cm^{-1}

No. of levels	$J=$	$7\frac{1}{2}$	$6\frac{1}{2}$	$5\frac{1}{2}$	$4\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$0\frac{1}{2}$
Predicted-----		2	6	13	20	25	26	23	14
Identified-----		2	6	13	20	25	24	20	10
Observed (not identified)-----						1		2	

b^4F have quite regular intervals in Fe II but in Ru II they are so irregular that parts of the terms at first eluded discovery. Figure 1 shows these unusual intervals in the terms a^4H , b^4F , b^4P and a^4G . Of considerable assistance, however, was the fact that the positions of the sextet and quartet terms of $d^6 s$ in Fe II when multiplied by $\frac{3}{4}$ give a rather close correspondence with the same terms in Ru II. The differences between the higher and lower multiplicities based on the same ion term is greater by an average factor of about 1.30 in Ru II.

The naming of the levels was based on relative intensities of combination, on the Zeeman effect, and on the comparison with Fe II. The various criteria were frequently at variance and compromises were therefore necessary. It will be noticed that hardly any of the g -values are in close agreement with the Landé values, and that the values tend to have less variation from the mean than do the Landé values. The worst disagreements are for the levels $x^4D_{3/2}^{\circ}$ and $y^4D_{5/2}^{\circ}$, and it is quite probable that these levels are either misnamed or unaccountably perturbed.

In Fe II there are known a number of even levels based on the high terms 3F , 3P , 1F , 1G from d^6 in Fe III. A thorough search has been made for the equivalent levels in Ru II without success, although there remain unidentified a number of lines which could be combinations of such levels with known terms. This failure is all the stranger when it is noticed that some odd terms of this same group have apparently been discovered. It is possible that the observations are not sufficiently exhaustive. Some plates taken at Princeton definitely show a considerably increased number of lines.

Tables 1 and 2, respectively, list all of the known even and odd levels in order of magnitude, and Table 3 relates them to the atomic structure. The levels are all given Russell-Saunders names except three odd levels which are numbered. Table 4 lists the numbers of $4d^6 5p$ levels to be expected with each J -value in the region below 80000 cm^{-1} . It is satisfactory that the numbers discovered are so nearly those predicted, but two discrepancies must be noted. The most striking is the presence of an extra level of $J=3\frac{1}{2}$. A quite thorough examination of all the $J=3\frac{1}{2}$ levels has been made and no one of them appears in any way spurious or to have been given an incorrect J -value. The two unidentified levels of $J=1\frac{1}{2}$ do not present such a serious problem since there is room for them numerically even if they do not fit the names and positions of any of the missing levels. The $J=2\frac{1}{2}$ column lacks two levels, and the $J=0\frac{1}{2}$ four levels, but the latter fact

is not surprising because such levels are always difficult to find.

It was satisfactory to find the $4d^5 5s^2 {}^6S$ level and three of its associated P° terms, $y, x {}^6P^{\circ}$ and $w {}^4P^{\circ}$. The odd terms are confirmed by strong multiplets in combination with $a {}^6D$, and the 6S itself combines with $z {}^6P^{\circ}$. The ${}^4P^{\circ}$ term of the odd structure was found from its combinations with a^4D in the Schumann region. An unsuccessful search was made for $4d^5 5s({}^7S)5p {}^8P^{\circ}$.

Most of the data in tables 1 and 2 were supplied in October 1957 for inclusion in Volume III of *Atomic Energy Levels* [9], where all the levels are grouped in spectral terms and the terms themselves are arranged in order of magnitude of the lowest level of each. This style of presentation has been used consistently in *Atomic Energy Levels*; it has the advantage of displaying directly the intervals between levels of terms and thus showing the actual splitting as well as whether any complex term is normal, inverted, or partially inverted. Since some slight revisions of level values, intervals, and g -factors for Ru II have been made during the past year our final results are shown in table 5 in the same style as in *Atomic Energy Levels* [9]. A large majority of the Ru II terms are inverted as expected, because they arise from configurations containing six or seven type- d electrons, that is, the d -shell is more than half filled. However, some terms produced by configurations containing six d -electrons are normal or only partially inverted, and even d^7 , expected to give inverted terms, yields two terms, $a {}^2F$ and $b {}^2D$, that are erect instead of inverted.

For pure LS coupling the intervals in complex terms are proportional to the larger J -values defining an interval. Thus, for $4d^7 a {}^4F$ the intervals should be proportional to 4.5:3.5:2.5 whereas they are actually in ratio 4.5:2.9:1.8. Similarly, the intervals between levels of $4d^6 ({}^5D)5s a {}^6D$ should be proportional to 4.50:3.50:2.50:1.50, but their ratios are observed to be 4.50:3.16:2.04:1.36. The irregular distribution of levels in four $4d^6 5s$ terms is illustrated in figure 1. The remaining Ru II terms with three or more levels all flagrantly violate the interval rule. These violations, as well as the departures of g -factors from the Landé values, indicate that LS coupling is far from perfect in the ruthenium ion but nevertheless strong enough to permit plausible designations of the spectral terms.

The line list (table 6) is given complete although a considerable number of lines remain unidentified. The majority of these are in the Schumann region and many are of large intensity. They probably have their origin in terms of the $4d^5 5s 5p$ structure, a few of which have been found. At 1937 A there is a pair of very strong lines which have been worked over very completely, but unsuccessfully. In the longer wavelength region there is a scattering of unidentified lines of some intensity and even two with resolved Zeeman patterns. They may be due to terms built on high levels of $3d^6$ or to terms of $3d^5 4s^2$. A few lines have been remeasured on plates taken in Princeton on high dispersion and have been separated into pairs or threes.

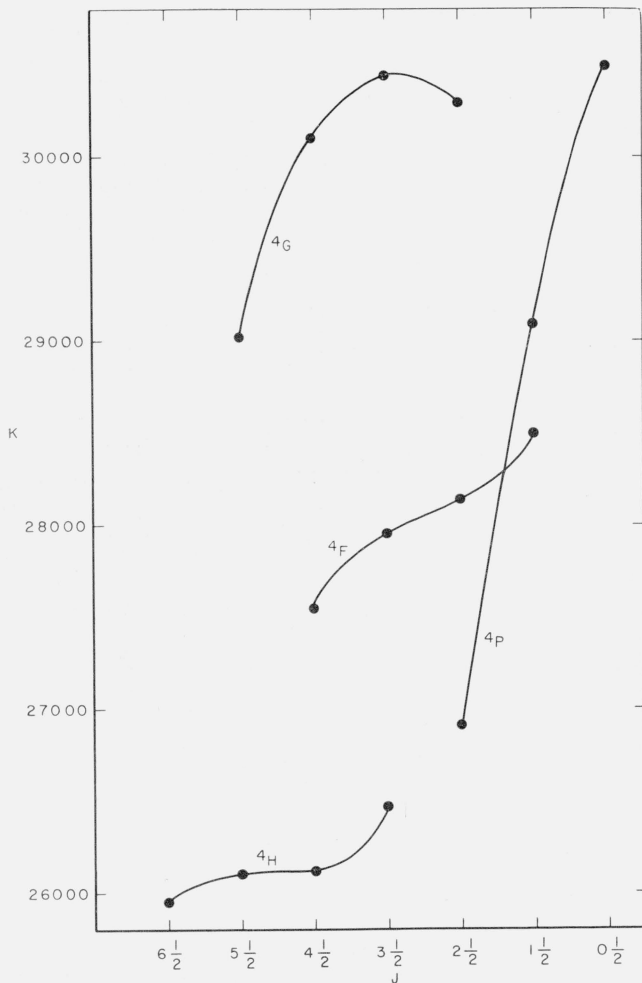


FIGURE 1. A plot of four Ru II terms from $4d^6 5s$.

Table 6 contains the measured wavelengths and estimated relative intensities of 2,227 spectral lines ascribed to Ru II in the wavelength range 1054.684 to 6371.29 Å. The wavelengths shorter than 2000 Å are valid for vacuum, but the longer ones are proper for standard air. For purposes of analysis and interpretation all wavelengths have been converted to vacuum wavenumbers, σ , in K ($=\text{cm}^{-1}$) units in column 3. The 4th column contains the designations of two energy levels (tables 1, 2, 5) which differ in value by the amount shown in column 3.

For wavelengths greater than 2322 Å six additional columns are required in table 6 to report the Zeeman data for 488 Ru II lines. Instead of giving all the observed components of each Zeeman pattern, only the strongest p - and n -components are reported in columns 9 and 10, respectively. This information together with the Zeeman-type numbers [5] in column 5, and the g -factors in columns 7 and 8 corresponding to the J -values in column 4, permits the reconstruction of the complete Zeeman pattern. Actually the absolute values of J and g were first derived from fully observed and resolved Zeeman

patterns indicated by Δg in column 6. Later, when many more lines were connected by the usual methods of interval analysis, most of the unresolved Zeeman patterns could be interpreted as confirming the analysis and extending the system of g -factors. Only a few Zeeman patterns were too unsymmetrical (us) to be useful. There are only two resolved and four unresolved Zeeman patterns that appear to disagree with the classification indicated in column 4. These are marked with asterisks accompanying the type number; they may be ascribed to errors of observation in a rich mixture of Zeeman patterns belonging to Ru I, Ru II, and to impurities.

The total number of Ru II lines classified in table 6 is 1,633, and, excepting the spectral range 1054 to 1400 Å, there remain relatively few lines of any importance to explain.

Series Limit. Because only two members of the $4d^6 ns^6D$ series are known, an accurate limit cannot be calculated directly because such series usually obey the Ritz formula

$$\frac{T}{4} = \frac{R}{\left(n + \mu + \alpha \frac{T}{4}\right)^2},$$

and the constant α is by no means negligible. An estimate of the value of α is, therefore, necessary and this can be obtained only by a general comparison of spectra of both the first and second long periods. Catalán and Rico [10] have made such a comparison and they deduce a value of $\alpha = 4.09 \times 10^{-6}$. With this value and the correct value of the separation between a^6D and e^6D , the limit is at 135200 cm^{-1} to the nearest 100 cm^{-1} , giving an I. P. of 16.76 v.

In a private communication the late Professor Catalán furnished a term table of Rh III, a spectrum isoelectronic with Ru II and Tc I. The agreement is excellent in the parts based on the 5D ion, but some of the $4f^7$ terms and many of the high odd and even terms show a considerable deviation from the positions which would be predicted from our analysis of Ru II.

References

- [1] W. F. Meggers and A. G. Shenstone, Phys. Rev. **35**, 868 (1930).
- [2] K. G. Kessler and W. F. Meggers, J. Research NBS **55**, 97 (1955) RP 2609.
- [3] J. C. Dobbie, Ann. Solar Phys. Obs., Cambridge, Engl. 5, Part 1, 1 (1938).
- [4] G. R. Harrison and J. R. McNally, Jr., Phys. Rev. **58**, 703 (1940).
- [5] E. Back and A. Landé, Zeemaneffekt und Multiplettstruktur der Spektrallinien, 168, (Julius Springer, Berlin, Germany (1925)).
- [6] A. G. Shenstone and H. A. Blair, Phil. Mag. [VIII], 765 (1929).
- [7] C. E. Moore, Atomic Energy Levels, NBS Circ. 467, III, 19 (1958).
- [8] C. E. Moore, Atomic Energy Levels, NBS Circ. 467, II, 55 (1952).
- [9] C. E. Moore, Atomic Energy Levels, NBS Circ. 467, III, 25 (1958).
- [10] M. A. Catalán and F. R. Rico, Anales real soc. espan. fis. y quim. (Madrid) [A] **48**, 328 (1952).

TABLE 5. *Terms and intervals of Ru II*

Configuration	Designation	<i>J</i>	Level	Interval	Obs. <i>g</i>	Configuration	Designation	<i>J</i>	Level	Interval	Obs. <i>g</i>												
$4d^7$	a^4F	$4\frac{1}{2}$	0. 0	-1523. 1 -970. 8 -610. 3		$4d^6(^3G)5s$	b^2G	$4\frac{1}{2}$	36016. 0	-499. 8	1. 067 0. 885												
		$3\frac{1}{2}$	1523. 1					$3\frac{1}{2}$	36515. 8														
		$2\frac{1}{2}$	2493. 9					$4d^6(^1G)5s$	c^2G			$4\frac{1}{2}$	37433. 0										
		$1\frac{1}{2}$	3104. 2									$3\frac{1}{2}$	37981. 5	-548. 5	1. 078 0. 942								
$4d^7$	a^4P	$2\frac{1}{2}$	8256. 7	-221. 0 -896. 2	1. 57 1. 68 2. 60	$4d^6(^3D)5s$	c^2D	$2\frac{1}{2}$	38981. 8	-730. 1	1. 18 0. 797												
		$1\frac{1}{2}$	8477. 7					$1\frac{1}{2}$	39711. 9														
		$0\frac{1}{2}$	9373. 9					$4d^6(^1S)5s$	a^2S			$0\frac{1}{2}$	40226. 2	1. 800									
$4d^6(^5D)5s$	a^6D	$4\frac{1}{2}$	9151. 4	-999. 0 -701. 3 -452. 1 -300. 2	1. 53 1. 576 1. 641 1. 849 3. 271	d^2D	$1\frac{1}{2}$			42750. 1	859. 8	0. 803 1. 216											
		$3\frac{1}{2}$	10150. 4				$2\frac{1}{2}$			43609. 9													
		$2\frac{1}{2}$	10851. 7				$4d^6(^5D)5p$			z^6D°			$4\frac{1}{2}$	46471. 0	-240. 5	1. 530							
		$1\frac{1}{2}$	11303. 8					$3\frac{1}{2}$	46711. 5				-573. 6	1. 569									
$0\frac{1}{2}$	11604. 0	$2\frac{1}{2}$	47285. 1	-423. 5	1. 634																		
$4d^7$	a^2G	$4\frac{1}{2}$	10860. 9	-1432. 5		$4d^6(^5D)5p$		z^6D°	$1\frac{1}{2}$		47708. 6	-275. 2	1. 840 3. 280										
		$3\frac{1}{2}$	12293. 4				$0\frac{1}{2}$		47983. 8														
		$4d^7$	a^2P				$1\frac{1}{2}$		12956. 6	-1842. 9				$4d^6(^5D)5p$	z^6F°	$5\frac{1}{2}$	50758. 3	-87. 0	1. 44 1. 42				
							$0\frac{1}{2}$		14799. 5							$4\frac{1}{2}$	50845. 3			-17. 2	1. 457		
$4d^7$	a^2D			$2\frac{1}{2}$	14581. 2	-2436. 4		$4d^6(^5D)5p$	z^6F°			$3\frac{1}{2}$	50862. 5			-317. 2	1. 312						
				$1\frac{1}{2}$	17017. 6							$2\frac{1}{2}$	51179. 7							-137. 3	1. 058		
		$4d^7$	a^2H	$5\frac{1}{2}$	14663. 4					-1461. 6		$4d^6(^5D)5p$	z^6F°	$1\frac{1}{2}$	51317. 0			-63. 1	0. 62				
				$4\frac{1}{2}$	16125. 0									$0\frac{1}{2}$	51380. 1								
$4d^6(^5D)5s$	a^4D			$3\frac{1}{2}$	19378. 7	-1136. 3 -713. 4 -399. 2	1. 402 1. 337 1. 188 -0. 015	$4d^6(^5D)5p$	z^6P°					$3\frac{1}{2}$	51548. 8	-1271. 5	1. 580 1. 835 2. 365						
				$2\frac{1}{2}$	20515. 0									$2\frac{1}{2}$	52820. 3					-864. 9			
		$1\frac{1}{2}$	21246. 4	$4d^6(^5D)5p$	z^4F°					$4\frac{1}{2}$	52964. 4	-1261. 1	1. 346										
		$0\frac{1}{2}$	21645. 6							$3\frac{1}{2}$	54225. 5	-568. 8	1. 274										
$4d^7$	a^2F	$2\frac{1}{2}$	21557. 8			731. 2	0. 863 1. 138	$4d^6(^5D)5p$	z^4F°	$2\frac{1}{2}$	54794. 3	-429. 9	1. 077 0. 468										
		$3\frac{1}{2}$	22289. 0							$1\frac{1}{2}$	55224. 2												
		$4d^6(^3H)5s$	a^4H	$6\frac{1}{2}$	25952. 2					-157. 2 -9. 0 -349. 6	1. 235 1. 16 1. 08 0. 759			$4d^6(^5D)5p$	z^4D°	$3\frac{1}{2}$	53317. 1	-748. 3	1. 391 1. 348				
				$5\frac{1}{2}$	26109. 4											$2\frac{1}{2}$	54065. 4			-598. 0	1. 145		
$4\frac{1}{2}$	26118. 4			$1\frac{1}{2}$	54663. 4	-318. 1	0. 011																
$3\frac{1}{2}$	26468. 0			$0\frac{1}{2}$	54981. 5																		
$4d^6(^3P)5s$	b^4P	$2\frac{1}{2}$	26911. 4	-2179. 6 -1398. 3	1. 578 1. 646 2. 541	$4d^6(^5D)5p$	z^4P°	$2\frac{1}{2}$	55695. 2	-969. 7	1. 570 1. 708 2. 648												
		$1\frac{1}{2}$	29091. 0					$1\frac{1}{2}$	56664. 9			-598. 9											
		$0\frac{1}{2}$	30489. 3					$0\frac{1}{2}$	57263. 8														
$4d^6(^3F)5s$	b^4F	$4\frac{1}{2}$	27544. 6	-404. 2 -190. 0 -356. 5	1. 200 1. 091 0. 941 0. 420	$4d^6(^3P)5p$	z^4S°	$1\frac{1}{2}$	62446. 1		1. 798												
		$3\frac{1}{2}$	27948. 8					$4d^6(^3H)5p$	z^4H°			$3\frac{1}{2}$	62526. 6	380. 2	0. 961								
		$2\frac{1}{2}$	28138. 8									$4\frac{1}{2}$	62906. 8			400. 9	1. 024						
		$1\frac{1}{2}$	28495. 3									$5\frac{1}{2}$	63307. 7			280. 5	1. 068						
$4d^6(^3G)5s$	a^4G	$5\frac{1}{2}$	29018. 6	-1081. 0 -339. 9 146. 2	1. 232 1. 167 1. 021 0. 651	$4d^6(^3H)5p$	z^4G°			$6\frac{1}{2}$	63588. 2	-332. 8	1. 24 1. 136										
		$4\frac{1}{2}$	30099. 6					$4\frac{1}{2}$	63851. 3	-89. 9	0. 978												
		$3\frac{1}{2}$	30439. 5					$3\frac{1}{2}$	63941. 2	-84. 1	0. 646												
		$2\frac{1}{2}$	30293. 3					$2\frac{1}{2}$	64025. 3														
$4d^6(^3H)5s$	b^2H	$5\frac{1}{2}$	32623. 0	-63. 7	1. 065 0. 955	$4d^6(^3P)5p$	y^4P°	$2\frac{1}{2}$	63797. 6	-1710. 5	1. 295 1. 85?												
		$4\frac{1}{2}$	32686. 7					$1\frac{1}{2}$	65508. 1														
$4d^6(^3D)5s$	b^4D	$0\frac{1}{2}$	32960. 8	-72. 4 130. 4 313. 9	0. 138 1. 200 1. 338 1. 396	$4d^6(^3P)5p$	y^4P°	$0\frac{1}{2}$															
		$1\frac{1}{2}$	32888. 4					$4d^6(^3H)5p$	z^4I°			$4\frac{1}{2}$	64385. 3	1086. 8	0. 959								
		$2\frac{1}{2}$	33018. 8									$5\frac{1}{2}$	65472. 1			726. 5	1. 046						
		$3\frac{1}{2}$	33332. 7									$6\frac{1}{2}$	66198. 6			-938. 8	1. 09						
$4d^6(^3P)5s$	b^2P	$1\frac{1}{2}$	33734. 8	-2360. 2	1. 185 0. 875	$4d^6(^3H)5p$	z^4I°			$7\frac{1}{2}$	65259. 8		1. 205										
		$0\frac{1}{2}$	36095. 0					$4d^6(^3F)5p$	y^4F°	$1\frac{1}{2}$	64921. 6			-457. 8	0. 428								
		$4d^6(^3F)5s$	b^2F							$3\frac{1}{2}$	34038. 3					-1260. 1	1. 083 0. 945	$4d^6(^3F)5p$	y^4F°	$2\frac{1}{2}$	64463. 8	285. 0	1. 045
										$2\frac{1}{2}$	35298. 4									$3\frac{1}{2}$	64748. 8		
$4d^7$	b^2D			$1\frac{1}{2}$	34793. 1	36. 2	0. 965 1. 102			$4d^6(^3F)5p$	y^4F°	$4\frac{1}{2}$	65326. 7										
				$2\frac{1}{2}$	34829. 3			$4d^6(^3H)5p$	z^3G°			$3\frac{1}{2}$	65212. 9	563. 2	1. 032								
		$4d^5 5s^2$	a^6S	$2\frac{1}{2}$	35857. 6							-290. 1	1. 06 0. 93			$4d^6(^3H)5p$	z^3G°	$4\frac{1}{2}$	65776. 1			0. 991	
				$4d^6(^1I)5s$	a^2I													$6\frac{1}{2}$	35939. 6				
$5\frac{1}{2}$	36229. 7																						

TABLE 5. Terms and intervals of Ru II—Continued

Configuration	Designation	<i>J</i>	Level	Interval	Obs. <i>g</i>	Configuration	Designation	<i>J</i>	Level	Interval	Obs. <i>g</i>
$4d^6(^3P)5p$	$z\ ^2D^\circ$	$2\frac{1}{2}$	65244.7		1.324	$4d^5\ 5s(^7S)5p$	$y\ ^6P^\circ$	$1\frac{1}{2}$	72760.7		2.49
		$1\frac{1}{2}$						$2\frac{1}{2}$	72908.8	148.1	1.712
$4d^6(^3H)5p$	$z\ ^2I^\circ$	$6\frac{1}{2}$	65546.5	-702.8	1.14		2°	$1\frac{1}{2}$	72786.0		1.34
		$5\frac{1}{2}$	66249.3		1.04						
$4d^6(^3F)5p$	$z\ ^2F^\circ$	$3\frac{1}{2}$	66012.4	-1086.9	1.199	$4d^6(^3D)5p$	$w\ ^4D^\circ$	$0\frac{1}{2}$	73750.0	-434.3	0.552
		$2\frac{1}{2}$	67099.3		0.855			$1\frac{1}{2}$	73315.7	-31.7	1.214
$4d^6(^3P)5p$	$y\ ^4D^\circ$	$3\frac{1}{2}$	66338.0	-2435.9	1.343			$2\frac{1}{2}$	73284.0	1310.0	1.301
		$2\frac{1}{2}$	68773.9	873.8	1.308			$3\frac{1}{2}$	74594.0		1.134
		$1\frac{1}{2}$	67900.1	1266.8	1.234						
		$0\frac{1}{2}$	66633.3		0.789						
$4d^6(^3F)5p$	$x\ ^4D^\circ$	$0\frac{1}{2}$	68096.9	-993.9	0.385	$4d^6(^3G)5p$	$x\ ^2G^\circ$	$3\frac{1}{2}$	73810.0	235.7	1.114
		$1\frac{1}{2}$	67103.0	-452.0	1.187			$4\frac{1}{2}$	74045.7		0.809
		$2\frac{1}{2}$	66651.0	1578.3	1.279						
		$3\frac{1}{2}$	68229.3		0.955						
$4d^6(^3F)5p$	$y\ ^4G^\circ$	$5\frac{1}{2}$	67601.7	436.4	1.166	$4d^6(^3D)5p$	$x\ ^2D^\circ$	$1\frac{1}{2}$	74592.2	525.2	0.87
		$4\frac{1}{2}$	67165.3	-480.8	1.158			$2\frac{1}{2}$	75117.4		1.20
		$3\frac{1}{2}$	67646.1	-300.5	1.02						
		$2\frac{1}{2}$	67946.6		0.689						
$4d^6(^3H)5p$	$z\ ^2H^\circ$	$5\frac{1}{2}$	67501.4	-618.9	1.130	$4d^6(^1G)5p$	$w\ ^2G^\circ$	$4\frac{1}{2}$	75346.3	-85.4	1.03
		$4\frac{1}{2}$	68120.3		1.015			$3\frac{1}{2}$	75431.7		0.913
$4d^6(^3G)5p$	$x\ ^4F^\circ$	$4\frac{1}{2}$	67900.9	-1503.2	1.19	$4d^6(^1G)5p$	$w\ ^2H^\circ$	$5\frac{1}{2}$	75662.1	-726.9	1.08
		$3\frac{1}{2}$	69404.1	-242.3	1.059			$4\frac{1}{2}$	76389.0		0.93
		$2\frac{1}{2}$	69646.4	26.5	0.99						
		$1\frac{1}{2}$	69619.9		0.648						
$4d^6(^3F)5p$	$y\ ^2G^\circ$	$3\frac{1}{2}$	68265.6	915.2	1.028	$4d^6(^1I)5p$	$y\ ^2I^\circ$	$6\frac{1}{2}$	75789.5	-135.9	1.08
		$4\frac{1}{2}$	69180.8		1.058			$5\frac{1}{2}$	75925.4		0.98
$4d^6(^3G)5p$	$x\ ^4G^\circ$	$5\frac{1}{2}$	68328.3	-578.2	1.152	$4d^6(^1G)5p$	$w\ ^2F^\circ$	$3\frac{1}{2}$	76977.5		1.14
		$4\frac{1}{2}$	68906.5	-646.0	1.17			$2\frac{1}{2}$			
		$3\frac{1}{2}$	69552.5	497.7	1.00						
		$2\frac{1}{2}$	69054.8		0.706						
$4d^6(^3P)5p$	$z\ ^2P^\circ$	$1\frac{1}{2}$	68445.8	-993.7	1.160	$4d^6(^1D)5p$	$y\ ^2P^\circ$	$1\frac{1}{2}$	77292.7		1.291
		$0\frac{1}{2}$	69439.5		0.829			$0\frac{1}{2}$			
$4d^6(^3G)5p$	$y\ ^4H^\circ$	$6\frac{1}{2}$	69311.1	-335.8	1.180	$4d^6(^1D)5p$	$w\ ^2D^\circ$	$2\frac{1}{2}$	77819.1	-798.2	1.068
		$5\frac{1}{2}$	69646.9	34.0	1.108			$1\frac{1}{2}$	78617.3		0.87
		$4\frac{1}{2}$	69612.9	-42.6	0.99						
		$3\frac{1}{2}$	69655.5		0.797						
$4d^6(^3F)5p$	1°	$1\frac{1}{2}$	70150.7		1.209	$4d^6(^1D)5p$	$v\ ^2F^\circ$	$2\frac{1}{2}$	79114.8	689.2	0.96
		$1\frac{1}{2}$	70571.9	-207.7	1.157			$3\frac{1}{2}$	79804.0		1.046
$4d^6(^3P)5p$	$z\ ^2S^\circ$	$0\frac{1}{2}$	71036.3		2.046		3°	$3\frac{1}{2}$	79503.7		1.033
		$1\frac{1}{2}$	70779.6		0.744						
$4d^6(^3D)5p$	$x\ ^4P^\circ$	$2\frac{1}{2}$	71114.8	-751.3	1.247	$4d^5\ 5s(^5S)5p$	$w\ ^4P^\circ$	$2\frac{1}{2}$	81721.7	-517.8	
		$1\frac{1}{2}$	71866.1	-1329.3	1.567			$1\frac{1}{2}$	82239.5	-411.3	
		$0\frac{1}{2}$	73195.4		1.749			$0\frac{1}{2}$	82650.8		
$4d^6(^3G)5p$	$y\ ^2H^\circ$	$5\frac{1}{2}$	71202.9	-723.5	1.32	$4d^6(^5D)6s$	$e\ ^6D$	$4\frac{1}{2}$	84510.9		
		$4\frac{1}{2}$	71926.4		0.96			$3\frac{1}{2}$			
$4d^6(^3G)5p$	$y\ ^2F^\circ$	$2\frac{1}{2}$	71598.7	411.6	1.193			$2\frac{1}{2}$			
		$3\frac{1}{2}$	72010.3		1.121			$1\frac{1}{2}$			
		$1\frac{1}{2}$						$0\frac{1}{2}$			
$4d^6(^1I)5p$	$z\ ^2K^\circ$	$6\frac{1}{2}$	71798.3	1104.7	0.91	$4d^6(^5D)6s$	$e\ ^4D$	$3\frac{1}{2}$	86440.4	-1083.0	
		$7\frac{1}{2}$	72903.0		1.07			$2\frac{1}{2}$	87523.4		
$4d^6(^3D)5p$	$x\ ^2F^\circ$	$2\frac{1}{2}$			1.14			$1\frac{1}{2}$			
		$3\frac{1}{2}$	72248.6					$0\frac{1}{2}$			
$4d^6(^3D)5p$	$w\ ^4F^\circ$	$1\frac{1}{2}$	72523.5	446.6	0.490	$4d^5\ 5s(^5S)6p$	$x\ ^6P^\circ$	$3\frac{1}{2}$	90165.8	-664.1	
		$2\frac{1}{2}$	72970.1	172.0	0.984			$2\frac{1}{2}$	90829.9	-673.8	
		$3\frac{1}{2}$	73142.1	76.2	1.32			$1\frac{1}{2}$	91503.7		
		$4\frac{1}{2}$	73218.3		1.28						
$4d^6(^3D)5p$	$x\ ^2F^\circ$	$2\frac{1}{2}$			1.14	$4d^6(^3F)5p$	$v\ ^4D^\circ$	$3\frac{1}{2}$	95324.8		
		$3\frac{1}{2}$						$2\frac{1}{2}$			
		$1\frac{1}{2}$						$1\frac{1}{2}$	96349.7		
		$0\frac{1}{2}$						$0\frac{1}{2}$			
		$0\frac{1}{2}$									
$4d^6(^3D)5p$	$w\ ^4F^\circ$	$1\frac{1}{2}$	72523.5	446.6	0.490	$4d^6(^3F)5p$	$v\ ^4G^\circ$	$2\frac{1}{2}$	95713.4	395.9	
		$2\frac{1}{2}$	72970.1	172.0	0.984			$3\frac{1}{2}$	96109.3	392.4	
		$3\frac{1}{2}$	73142.1	76.2	1.32			$4\frac{1}{2}$	96501.7	220.7	
		$4\frac{1}{2}$	73218.3		1.28			$5\frac{1}{2}$	96722.4		
		$4\frac{1}{2}$									
$4d^6(^3D)5p$	$w\ ^4F^\circ$	$1\frac{1}{2}$	72523.5	446.6	0.490	$4d^6(^3F)5p$	$v\ ^2G^\circ$	$3\frac{1}{2}$	102865.4	568.8	
		$2\frac{1}{2}$	72970.1	172.0	0.984			$4\frac{1}{2}$	103434.2		

TABLE 6. *The second spectrum of ruthenium (Ru II)*

1	2	3	4	1	2	3	4
Intensity	λ (vacuum)	σ	Term combination	Intensity	λ (vacuum)	σ	Term combination
	<i>A</i>	<i>K</i>			<i>A</i>	<i>K</i>	
10	1054.684	94815.1	-----	2	1242.580	80477.7	-----
0	1066.361	93776.9	-----	5	1243.176	80439.1	-----
10	1069.266	93522.1	-----	50	1245.657	80278.9	-----
1	1074.380	93076.9	-----	50	1246.887	80199.7	$a^4F_{3/2} - w^4P_{3/2}$
1	1080.243	92571.8	$a^2G_{4/2} - v^2G_{4/2}$	15	1249.774	80014.5	$a^6D_{3/2} - x^6P_{3/2}$
0	1080.945	92511.6	-----	3	1250.171	79989.1	-----
2	1081.684	92448.4	-----	20	1250.340	79978.2	$a^6D_{2/2} - x^6P_{2/2}$
2	1083.701	92276.4	-----	5	1251.174	79924.9	-----
15	1093.505	91449.1	-----	15	1251.582	79898.9	$a^6D_{0/2} - x^6P_{1/2}$
1	1101.132	90815.6	-----	50	1252.789	79821.9	-----
10	1103.223	90643.5	-----	50	1253.419	79781.8	-----
15	1105.125	90487.5	-----	50	1253.622	79768.9	-----
10	1109.227	90152.9	-----	20	1254.717	79699.2	-----
5	1117.906	89453.0	-----	30	1255.329	79660.4	-----
2	1139.255	87776.7	-----	10	1255.430	79654.0	-----
1	1144.504	87374.1	-----	2	1256.082	79612.6	-----
1	1147.835	87120.5	-----	2	1256.898	79561.0	-----
1	1153.309	86707.0	-----	40	1257.443	79526.5	$a^6D_{1/2} - x^6P_{2/2}$
5	1162.357	86032.1	-----	15	1258.127	79483.2	-----
2	1163.330	85900.1	-----	20	1258.351	79469.1	-----
2	1163.537	85944.8	-----	10	1259.038	79425.7	-----
1	1169.846	85481.3	-----	15	1259.539	79394.1	-----
1	1176.783	84977.4	-----	50	1260.502	79333.5	-----
1	1182.233	84585.7	-----	20	1260.817	79313.7	$a^6D_{2/2} - x^6P_{3/2}$
1	1186.583	84275.6	-----	20	1261.418	79275.9	-----
100	1190.243	84016.5	-----	10	1262.688	79196.1	-----
10	1190.302	84012.3	-----	5	1263.172	79165.8	-----
10	1195.261	83663.7	-----	10	1263.396	79151.7	-----
10	1196.983	83543.4	-----	30	1263.537	79142.9	-----
2	1197.511	83506.5	-----	3	1263.848	79123.4	-----
5	1199.341	83379.1	-----	100	1264.726	79068.5	-----
5	1202.726	83144.5	-----	15	1265.944	78992.4	-----
50	1204.564	83017.6	-----	10	1266.010	78987.8	-----
30	1204.636	83012.6	-----	15?	1266.099	78982.8	-----
30	1204.995	82987.9	-----	20	1267.348	78904.9	-----
15	1205.200	82973.8	-----	10	1267.674	78884.6	-----
10	1206.195	82905.3	-----	2	1268.046	78861.5	-----
50	1207.811	82794.4	-----	3	1268.497	78833.5	-----
5	1208.863	82722.4	-----	2	1268.776	78816.1	-----
10	1213.028	82438.3	-----	50	1269.324	78782.1	-----
5	1213.644	82396.5	-----	15	1270.911	78683.7	-----
10	1213.863	82381.6	-----	5	1271.528	78645.5	-----
5	1222.201	81819.6	-----	3	1271.653	78637.8	-----
3	1223.684	81720.4	-----	30	1271.775	78630.3	-----
10	1226.736	81517.1	-----	15	1271.921	78621.2	-----
5	1226.867	81508.4	-----	5	1273.192	78542.7	-----
50	1227.101	81492.9	-----	200	1273.344	78533.4	-----
20	1228.255	81416.3	-----	300	1278.543	78214.0	-----
2	1232.670	81124.7	-----	30	1280.736	78080.1	-----
10	1232.809	81115.6	-----	3	1281.079	78059.2	-----
100	1234.347	81014.5	$a^6D_{4/2} - x^6P_{3/2}$	5	1281.183	78052.9	-----
3	1234.834	80982.5	-----	20	1281.419	78038.5	-----
10	1235.247	80955.5	-----	5	1282.159	77993.4	-----
10	1239.289	80691.4	-----	5	1283.769	77895.6	-----
100	1239.467	80679.8	$a^6D_{3/2} - x^6P_{2/2}$	5	1283.981	77882.8	-----
50	1239.879	80653.0	$a^6D_{2/2} - x^6P_{1/2}$	1	1284.292	77863.9	-----
20	1240.647	80603.1	-----	5	1285.006	77820.6	-----
3	1241.920	80520.5	-----	50	1285.528	77789.0	-----
5	1242.056	80511.7	-----	2	1285.811	77771.9	-----
3	1242.356	80492.2	-----	5	1285.923	77765.2	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	1	2	3	4
Intensity	λ (vacuum)	σ	Term combination	Intensity	λ (vacuum)	σ	Term combination
	A	K			A	K	
10	1286.574	77725.8	-----	5	1360.634	73495.2	-----
20	1287.965	77641.9	-----	2	1360.888	73481.6	-----
15	1288.658	77600.1	-----	2	1362.346	73402.8	-----
5	1288.884	77586.5	-----	3	1364.284	73298.5	-----
15	1290.177	77508.7	-----	20	1365.465	73235.1	-----
50	1290.780	77472.5	-----	5	1366.434	73183.2	-----
5	1291.757	77413.9	-----	5	1368.503	73072.5	$a^4F_{3/2}-w^4D_{3/2}$
15	1293.009	77339.0	-----	50	1369.106	73040.4	-----
10	1295.920	77165.3	-----	30	1369.852	73001.3	-----
10	1296.239	77146.3	-----	1	1376.344	72657.8	-----
50	1296.425	77135.2	-----	2	1381.703	72374.8	-----
5	1306.874	76518.5	-----	2	1382.354	72340.4	-----
5	1307.325	76492.1	-----	3	1384.134	72242.3	-----
5	1307.494	76482.2	-----	10	1385.133	72195.2	-----
10	1307.662	76472.4	-----	3	1386.015	72149.3	-----
10	1308.162	76443.1	-----	5	1388.640	72012.9	$\left\{ \begin{array}{l} a^4F_{4/2}-y^2F_{3/2} \\ a^4F_{1/2}-x^2D_{3/2} \end{array} \right.$
5	1308.656	76414.3	-----	5	1392.145	71831.6	-----
2	1311.302	76260.1	-----	20	1393.535	71759.9	$a^4F_{3/2}-w^4D_{3/2}$
20	1312.099	76213.8	-----	1h	1396.162	71624.9	-----
10	1312.557	76187.2	-----	2	1398.472	71506.6	-----
50	1313.384	76139.2	-----	5	1399.427	71457.8	-----
0	1314.306	76085.8	-----	50	1405.338	71157.3	-----
5	1314.886	76052.2	-----	10	1411.991	70822.0	$a^4F_{2/2}-w^4D_{1/2}$
2	1315.624	76009.6	$a^4F_{1/2}-v^2F_{2/2}$	50	1412.206	70811.2	$b^2H_{3/2}-v^2G_{4/2}$
1	1315.949	75990.8	$a^4F_{1/2}-v^2F_{2/2}$	100	1413.017	70770.6	$a^4H_{6/2}-w^4G_{5/2}$
50	1316.573	75954.8	$b^4P_{2/2}-v^2G_{3/2}$	5	1415.500	70646.4	$\left\{ \begin{array}{l} a^4F_{2/2}-w^4F_{3/2} \\ a^4F_{1/2}-w^4D_{5/2} \end{array} \right.$
20	1316.740	75945.1	$a^4D_{3/2}-v^4D_{3/2}$	5	1415.678	70637.5	$a^4P_{1/2}-v^2F_{3/2}$
1	1320.043	75755.1	-----	10	1416.358	70603.6	$a^4H_{4/2}-w^4G_{5/2}$
2	1321.495	75671.9	-----	1	1418.299	70507.0	-----
10	1324.275	75513.0	$a^4F_{1/2}-w^2D_{1/2}$	2	1418.909	70476.7	$a^4F_{2/2}-w^4F_{5/2}$
1	1324.654	75491.4	-----	100	1420.606	70392.5	$a^4H_{6/2}-w^4G_{4/2}$
3	1326.118	75408.1	-----	1	1420.793	70383.2	$a^4H_{4/2}-w^4G_{4/2}$
10	1326.318	75396.7	-----	5	1421.828	70332.0	-----
5	1327.776	75313.9	-----	3	1422.661	70290.8	$a^4F_{2/2}-2i_{1/2}$
1	1329.403	75221.7	-----	2	1423.056	70271.3	-----
2	1329.583	75211.6	-----	5	1424.272	70211.3	$a^4F_{1/2}-w^4D_{1/2}$
1	1329.836	75197.2	$a^4D_{2/2}-w^4G_{3/2}$	50	1424.934	70178.7	$b^2H_{4/2}-v^2G_{3/2}$
1	1333.018	75017.7	-----	10	1424.039	70173.5	-----
1	1334.830	74915.9	$b^4F_{3/2}-v^2G_{3/2}$	2	1426.391	70107.0	-----
3	1335.008	74905.9	-----	5	1426.503	70101.5	$b^4D_{3/2}-v^2G_{4/2}$
5h	1336.023	74849.0	-----	3	1426.706	70091.5	$a^4F_{1/2}-x^4P_{0/2}$
20	1338.388	74716.7	-----	3	1427.890	70033.4	$a^4H_{3/2}-w^4G_{4/2}$
10?	1339.517	74653.8	-----	5	1427.964	70029.8	$a^4F_{2/2}-w^4F_{1/2}$
8	1340.165	74617.7	-----	100	1428.751	69991.2	$a^4H_{4/2}-w^4G_{3/2}$
15	1340.590	74594.0	$a^4F_{4/2}-w^4D_{3/2}$	30	1429.002	69978.9	-----
50	1340.754	74584.9	-----	0	1429.348	69962.0	-----
10	1341.649	74535.1	-----	2	1431.278	69867.6	$a^4F_{1/2}-w^4F_{3/2}$
50	1342.358	74495.8	-----	1	1431.606	69851.6	-----
10	1342.798	74471.4	-----	1	1431.705	69846.8	$b^4D_{2/2}-v^2G_{3/2}$
3	1346.839	74247.9	-----	1	1431.819	69841.2	-----
200	1348.385	74162.8	-----	2	1433.294	69769.4	-----
15	1350.856	74027.1	-----	30	1434.330	69719.0	-----
3	1351.857	73972.3	-----	20	1435.085	69682.3	$a^4F_{1/2}-2i_{1/2}$
15	1353.907	73860.3	-----	20	1435.286	69672.5	-----
10	1354.835	73807.7	-----	50	1437.460	69567.2	-----
2	1357.221	73680.0	-----	50	1437.839	69548.8	-----
2	1357.524	73663.5	-----	1	1439.001	69492.7	-----
				30	1440.514	69419.7	$a^4F_{1/2}-w^4F_{1/2}$

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	1	2	3	4
Intensity	λ (vacuum)	σ	Term combination	Intensity	λ (vacuum)	σ	Term combination
	<i>A</i>	<i>K</i>			<i>A</i>	<i>K</i>	
5	1440.820	69404.9	$a^4F_{4\frac{1}{2}}-x^4F_{3\frac{1}{2}}$	1	1471.057	67978.3	-----
5	1441.012	69395.7	$b^2F_{3\frac{1}{2}}-v^2G_{4\frac{1}{2}}$	10	1471.220	67970.8	$b^4F_{2\frac{1}{2}}-w^4G_{3\frac{1}{2}}$
5	1441.268	69383.3	-----	10	1471.328	67965.8	-----
5	1441.344	69379.7	-----	2	1471.632	67951.8	-----
30	1442.147	69341.1	$a^4P_{1\frac{1}{2}}-w^2D_{3\frac{1}{2}}$	1	1471.735	67947.0	-----
3	1442.373	69330.2	-----	1	1471.828	67942.7	-----
50	1444.144	69245.2	$a^4H_{3\frac{1}{2}}-w^4G_{2\frac{1}{2}}$	3	1472.234	67924.0	-----
15	1444.645	69221.2	-----	500	1472.717	67901.7	$a^4F_{4\frac{1}{2}}-x^4F_{4\frac{1}{2}}$
15	1445.491	69180.6	$a^4F_{4\frac{1}{2}}-y^2G_{4\frac{1}{2}}$	400	1473.151	67881.7	$a^4F_{3\frac{1}{2}}-x^4F_{3\frac{1}{2}}$
30	1445.552	69177.7	$b^4F_{4\frac{1}{2}}-w^4G_{3\frac{1}{2}}$	3	1473.739	67854.6	$b^4F_{1\frac{1}{2}}-v^4D_{1\frac{1}{2}}$
3	1446.144	69149.4	-----	2	1473.860	67849.0	-----
2	1447.084	69104.5	$a^4F_{2\frac{1}{2}}-y^2F_{2\frac{1}{2}}$	3	1473.999	67842.7	-----
2	1447.292	69094.6	-----	50	1475.361	67780.0	$b^4F_{4\frac{1}{2}}-v^4D_{3\frac{1}{2}}$
10	1447.776	69071.5	-----	50	1477.025	67703.7	$a^4G_{5\frac{1}{2}}-w^4G_{5\frac{1}{2}}$
15	1449.323	68997.7	-----	1	1477.269	67692.5	-----
2	1449.705	68979.6	-----	100	1477.632	67675.8	$a^4F_{1\frac{1}{2}}-y^2D_{1\frac{1}{2}}$
2	1449.955	68967.7	-----	30	1478.021	67658.0	$a^4F_{3\frac{1}{2}}-y^2G_{4\frac{1}{2}}$
10	1450.177	68957.1	$b^4F_{4\frac{1}{2}}-w^4G_{4\frac{1}{2}}$	1	1478.960	67615.1	-----
10	1450.466	68943.4	$a^2G_{4\frac{1}{2}}-v^2F_{3\frac{1}{2}}$	1	1479.089	67609.2	-----
1	1450.623	68935.9	-----	50	1479.242	67602.2	$a^4F_{4\frac{1}{2}}-y^4G_{3\frac{1}{2}}$
1	1451.033	68916.4	-----	15	1479.732	67579.8	-----
100	1451.224	68907.3	$a^4F_{4\frac{1}{2}}-x^4G_{4\frac{1}{2}}$	2	1479.858	67574.1	$b^4F_{2\frac{1}{2}}-w^4G_{2\frac{1}{2}}$
5	1451.505	68894.0	-----	5	1480.004	67567.4	$b^2F_{2\frac{1}{2}}-v^2G_{3\frac{1}{2}}$
3	1451.985	68871.2	-----	100	1481.435	67502.1	$a^4F_{4\frac{1}{2}}-z^2H_{5\frac{1}{2}}$
10	1452.288	68856.9	$a^4H_{3\frac{1}{2}}-v^4D_{3\frac{1}{2}}$	10	1482.193	67467.6	$a^4F_{1\frac{1}{2}}-y^2D_{2\frac{1}{2}}$
2	1452.598	68842.2	-----	1	1483.033	67429.4	-----
10	1452.860	68829.8	-----	2	1483.276	67418.3	$b^2G_{4\frac{1}{2}}-v^2G_{4\frac{1}{2}}$
5	1453.443	68802.1	$b^4P_{2\frac{1}{2}}-w^4G_{2\frac{1}{2}}$	300	1484.035	67383.9	$a^4F_{3\frac{1}{2}}-x^4G_{4\frac{1}{2}}$
3	1453.633	68793.2	-----	1	1484.513	67362.2	-----
15	1454.666	68744.3	-----	2	1485.568	67314.3	$a^6D_{1\frac{1}{2}}-w^2D_{1\frac{1}{2}}?$
2	1455.950	68683.7	-----	15	1486.006	67294.5	-----
3	1457.220	68623.8	-----	1	1486.468	67273.6	-----
30	1458.491	68564.0	$b^4F_{4\frac{1}{2}}-w^4G_{3\frac{1}{2}}?$	500	1486.957	67251.4	$a^4F_{3\frac{1}{2}}-y^4D_{2\frac{1}{2}}$
20	1458.721	68553.2	$b^4F_{3\frac{1}{2}}-w^4G_{4\frac{1}{2}}$	1	1487.138	67243.3	-----
40	1459.028	68538.8	$a^2F_{3\frac{1}{2}}-x^6P_{2\frac{1}{2}}?$	10 <i>h</i>	1487.417	67230.6	-----
5	1459.416	68520.6	-----	5	1487.688	67218.4	$b^4F_{1\frac{1}{2}}-w^4G_{2\frac{1}{2}}$
5	1459.974	68494.4	$a^4F_{1\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	2	1487.857	67210.8	$a^2G_{3\frac{1}{2}}-3^3_{3\frac{1}{2}}$
5	1461.222	68435.9	-----	1	1487.992	67204.7	$a^2I_{3\frac{1}{2}}-v^2G_{4\frac{1}{2}}$
50	1461.699	68413.5	$b^4P_{2\frac{1}{2}}-v^4D_{3\frac{1}{2}}$	2	1488.402	67186.1	$b^4F_{2\frac{1}{2}}-v^4D_{3\frac{1}{2}}?$
30	1462.437	68379.0	-----	200	1488.618	67176.4	$a^4P_{2\frac{1}{2}}-w^2G_{3\frac{1}{2}}?$
2	1462.619	68370.5	-----	1000	1488.855	67165.7	$a^4F_{4\frac{1}{2}}-y^4G_{4\frac{1}{2}}$
100	1463.215	68342.7	-----	500	1489.136	67153.0	$a^4F_{2\frac{1}{2}}-x^4F_{3\frac{1}{2}}$
30	1463.515	68328.6	$a^4F_{4\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	20	1489.734	67126.1	$a^4F_{2\frac{1}{2}}-x^4F_{1\frac{1}{2}}$
50	1464.022	68305.0	$a^4F_{2\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	100 <i>h</i>	1490.707	67082.3	-----
0	1464.426	68286.1	-----	5	1491.224	67059.0	$a^4F_{2\frac{1}{2}}-x^4G_{3\frac{1}{2}}$
15	1464.855	68266.1	$a^4F_{4\frac{1}{2}}-y^2G_{3\frac{1}{2}}$	5	1491.497	67046.7	$a^4F_{1\frac{1}{2}}-1^1_{1\frac{1}{2}}$
1	1465.195	68250.3	-----	30 <i>h</i>	1492.355	67008.2	$a^6S_{2\frac{1}{2}}-v^2G_{3\frac{1}{2}}?$
50	1466.039	68211.0	$b^4F_{2\frac{1}{2}}-v^4D_{1\frac{1}{2}}$	10	1493.188	66970.8	-----
15	1467.127	68160.4	$b^4F_{3\frac{1}{2}}-w^4G_{3\frac{1}{2}}$	2	1493.450	66959.1	-----
30	1467.723	68132.7	$a^4F_{3\frac{1}{2}}-y^4H_{3\frac{1}{2}}$	500	1494.524	66910.9	$a^4F_{2\frac{1}{2}}-x^4F_{3\frac{1}{2}}$
30	1467.933	68123.0	$a^4F_{3\frac{1}{2}}-x^4F_{3\frac{1}{2}}$	5	1495.810	66853.4	-----
100	1467.977	68121.0	$a^4F_{4\frac{1}{2}}-z^2H_{4\frac{1}{2}}$	50	1498.289	66742.4	$a^4F_{3\frac{1}{2}}-y^2G_{3\frac{1}{2}}$
30	1468.158	68112.6	-----	0	1498.841	66718.2	-----
10	1468.660	68089.3	$a^4F_{3\frac{1}{2}}-y^4H_{4\frac{1}{2}}$	2	1499.104	66706.5	$a^4F_{3\frac{1}{2}}-x^4D_{3\frac{1}{2}}$
10	1468.725	68086.3	-----	0	1499.759	66677.4	-----
200	1468.909	68077.7	$a^4F_{2\frac{1}{2}}-y^2D_{3\frac{1}{2}}$	2	1501.216	66612.7	-----
2	1469.805	68036.2	$b^2D_{2\frac{1}{2}}-v^2G_{3\frac{1}{2}}$	2	1501.558	66597.5	$a^4F_{3\frac{1}{2}}-z^2H_{4\frac{1}{2}}$
100	1469.941	68029.9	$a^4F_{3\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	2	1502.383	66560.9	$a^4F_{2\frac{1}{2}}-x^4G_{2\frac{1}{2}}$
1	1470.674	67996.0	-----				
1	1470.854	67987.7	-----				

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	1	2	3	4
Intensity	λ (vacuum)	σ	Term combination	Intensity	λ (vacuum)	σ	Term combination
	<i>A</i>	<i>K</i>			<i>A</i>	<i>K</i>	
1	1502. 596	66551. 5	-----	20	1537. 806	65027. 7	$a^4P_{2\frac{1}{2}}-w^4D_{\frac{3}{2}}$
30	1502. 802	66542. 4	$a^4F_{1\frac{1}{2}}-x^4F_{\frac{3}{2}}$	30	1538. 624	64993. 1	$a^4F_{1\frac{1}{2}}-x^4D_{\frac{3}{2}}$
30	1503. 401	66515. 9	$a^4F_{1\frac{1}{2}}-x^4F_{\frac{1}{2}}$	1	1539. 478	64957. 1	$a^4P_{2\frac{1}{2}}-y^6P_{\frac{3}{2}}$
1	1504. 724	66457. 4	-----	5	1541. 167	64885. 9	$a^4P_{2\frac{1}{2}}-w^4F_{\frac{3}{2}}$
0	1504. 855	66451. 6	-----	15	1541. 718	64862. 7	$a^2P_{1\frac{1}{2}}-w^2D_{\frac{3}{2}}$
0	1505. 128	66439. 5	-----	15	1542. 188	64842. 9	$a^4F_{1\frac{1}{2}}-y^4G_{\frac{3}{2}}$
20	1505. 610	66418. 3	-----	15	5142. 293	64838. 5	$a^4P_{1\frac{1}{2}}-w^4D_{\frac{1}{2}}$
50	1506. 515	66378. 4	$a^4F_{3\frac{1}{2}}-x^4F_{\frac{3}{2}}$	1	1542. 844	64815. 4	$a^4F_{3\frac{1}{2}}-y^4D_{\frac{3}{2}}$
0	1507. 077	66353. 6	-----	10	1543. 042	64807. 0	$a^4F_{1\frac{1}{2}}-w^4D_{\frac{3}{2}}$
100 <i>d</i> ?	1507. 429	66338. 1	$\left\{ \begin{array}{l} a^4F_{4\frac{1}{2}}-y^4D_{\frac{3}{2}} \\ a^4P_{2\frac{1}{2}}-w^4D_{\frac{3}{2}} \end{array} \right.$	5	1543. 299	64796. 3	$a^4F_{1\frac{1}{2}}-y^4D_{\frac{1}{2}}$
0	1508. 001	66313. 0	-----	30	1544. 414	64749. 5	$a^4F_{4\frac{1}{2}}-y^4F_{\frac{3}{2}}$
40	1509. 432	66250. 1	$a^4F_{4\frac{1}{2}}-z^2I_{\frac{3}{2}}$	15	1545. 152	64718. 6	$a^4P_{1\frac{1}{2}}-x^4P_{\frac{0}{2}}$
1	1511. 523	66158. 4	$a^2P_{1\frac{1}{2}}-v^2F_{\frac{3}{2}}$	15	1545. 961	64684. 7	$a^2G_{3\frac{1}{2}}-w^2F_{\frac{3}{2}}$
30	1512. 325	66123. 4	$a^4F_{3\frac{1}{2}}-y^4G_{\frac{3}{2}}$	30	1547. 756	64609. 7	$a^4F_{2\frac{1}{2}}-x^4D_{\frac{1}{2}}$
40	1512. 483	66116. 4	$a^2G_{4\frac{1}{2}}-w^2F_{\frac{3}{2}}$	1	1547. 856	64605. 5	$a^4F_{2\frac{1}{2}}-z^2F_{\frac{3}{2}}$
2	1513. 345	66078. 8	-----	10	1548. 679	64571. 2	$a^2G_{4\frac{1}{2}}-w^2G_{\frac{3}{2}}$
0	1513. 495	66072. 2	-----	15	1549. 571	64534. 0	$a^2D_{2\frac{1}{2}}-v^2F_{\frac{3}{2}}$
0	1514. 068	66047. 2	-----	2	1550. 065	64513. 4	-----
30	1514. 564	66025. 6	-----	3	1550. 640	64489. 5	$a^4F_{3\frac{1}{2}}-z^2F_{\frac{3}{2}}$
1	1514. 850	66013. 1	$a^4F_{4\frac{1}{2}}-z^2F_{\frac{3}{2}}$	30	1550. 740	64485. 3	$a^2G_{4\frac{1}{2}}-w^2G_{\frac{1}{2}}$
0	1515. 062	66003. 9	-----	5	1553. 141	64385. 7	$a^4F_{4\frac{1}{2}}-z^4I_{\frac{1}{2}}$
0	1515. 459	65986. 6	-----	0	1553. 532	64369. 4	-----
0	1515. 791	65972. 2	-----	0	1553. 777	64359. 3	-----
30	1516. 256	65951. 9	$\left\{ \begin{array}{l} a^4F_{2\frac{1}{2}}-z^2P_{\frac{1}{2}} \\ a^4F_{1\frac{1}{2}}-x^4G_{\frac{3}{2}} \\ b^4P_{0\frac{1}{2}}-v^4D_{\frac{1}{2}} \end{array} \right.$	5	1554. 334	64336. 2	$a^2P_{1\frac{1}{2}}-y^2P_{\frac{1}{2}}$
2	1518. 374	65859. 9	-----	3	1556. 341	64253. 3	$a^4F_{3\frac{1}{2}}-z^2G_{\frac{1}{2}}$
0	1519. 486	65811. 7	-----	3	1558. 655	64157. 9	$a^4F_{2\frac{1}{2}}-x^4D_{\frac{3}{2}}$
2	1520. 294	65776. 8	$a^4F_{4\frac{1}{2}}-z^2G_{\frac{1}{2}}$	3h	1560. 180	64095. 2	$a^2G_{3\frac{1}{2}}-w^2H_{\frac{1}{2}}$
16	1520. 406	65771. 9	$a^4F_{2\frac{1}{2}}-y^2G_{\frac{3}{2}}$	50	1560. 998	64061. 6	$a^2D_{4\frac{1}{2}}-y^6P_{\frac{3}{2}}$
3	1520. 765	65756. 8	-----	5	1561. 603	64036. 4	$a^2D_{2\frac{1}{2}}-w^2D_{\frac{1}{2}}$
10	1520. 961	65747. 9	-----	30	1562. 607	63995. 6	$a^4F_{1\frac{1}{2}}-z^2F_{\frac{3}{2}}$
25	1521. 238	65735. 9	$a^4F_{2\frac{1}{2}}-x^4D_{\frac{3}{2}}$	20	1562. 726	63990. 7	$a^6D_{4\frac{1}{2}}-w^4F_{\frac{3}{2}}$
2	1522. 786	65669. 1	$a^4F_{1\frac{1}{2}}-y^4D_{\frac{3}{2}}$	15	1563. 928	63941. 6	$\left\{ \begin{array}{l} a^4F_{4\frac{1}{2}}-z^4G_{\frac{3}{2}} \\ a^4P_{0\frac{1}{2}}-w^4D_{\frac{1}{2}} \end{array} \right.$
2	1522. 981	65660. 7	$a^2P_{1\frac{1}{2}}-w^2D_{\frac{1}{2}}$	0	1564. 620	63913. 3	-----
5	1523. 408	65642. 3	$a^4F_{3\frac{1}{2}}-y^4G_{\frac{1}{2}}$	1	1565. 029	63896. 6	$a^6D_{3\frac{1}{2}}-x^2G_{\frac{1}{2}}$
3	1524. 606	65590. 7	-----	100	1566. 128	63851. 7	$a^4F_{4\frac{1}{2}}-z^4G_{\frac{1}{2}}$
15	1524. 937	65576. 5	$a^4F_{2\frac{1}{2}}-z^2F_{\frac{3}{2}}$	20	1566. 965	63817. 6	$a^2P_{0\frac{1}{2}}-w^2D_{\frac{1}{2}}$
10	1525. 464	65553. 8	$a^4P_{2\frac{1}{2}}-x^2G_{\frac{3}{2}}$	50	1567. 308	63803. 7	$a^4F_{3\frac{1}{2}}-y^4F_{\frac{1}{2}}$
10h	1526. 071	65527. 8	$a^2G_{4\frac{1}{2}}-w^2H_{\frac{1}{2}}$	15	1567. 656	63789. 5	$a^4P_{2\frac{1}{2}}-y^2F_{\frac{3}{2}}$
1	1526. 712	65500. 2	$a^4F_{4\frac{1}{2}}-z^4I_{\frac{3}{2}}$	3	1568. 525	63754. 2	-----
1	1527. 350	65472. 9	-----	3	1568. 933	63737. 6	-----
30	1527. 813	65453. 0	$a^4F_{2\frac{1}{2}}-y^4G_{\frac{3}{2}}$	3	1569. 316	63722. 0	$a^4F_{3\frac{1}{2}}-z^2D_{\frac{3}{2}}$
5	1528. 903	65406. 4	$a^4F_{2\frac{1}{2}}-y^4D_{\frac{1}{2}}$	15	1570. 104	63690. 0	$a^4F_{3\frac{1}{2}}-z^2G_{\frac{3}{2}}$
3	1529. 395	65385. 3	-----	30	1570. 371	63679. 2	$a^2H_{4\frac{1}{2}}-v^2F_{\frac{3}{2}}$
2	1529. 942	65362. 0	-----	20	1571. 280	63642. 4	-----
10	1530. 415	65341. 8	$a^4F_{1\frac{1}{2}}-z^2P_{\frac{1}{2}}$	1	1571. 671	63626. 5	-----
5	1530. 762	65327. 9	$a^4F_{4\frac{1}{2}}-y^4F_{\frac{1}{2}}$	20	1572. 089	63609. 6	$a^4P_{2\frac{1}{2}}-x^4P_{\frac{1}{2}}$
0	1531. 113	65312. 0	-----	1	1573. 129	63567. 6	-----
10	1533. 236	65221. 5	$a^2D_{2\frac{1}{2}}-v^2F_{\frac{3}{2}}$	2	1573. 407	63556. 3	-----
10	1533. 435	65213. 1	$a^4F_{4\frac{1}{2}}-z^2G_{\frac{3}{2}}$	3	1573. 639	63547. 0	$a^4F_{1\frac{1}{2}}-x^4D_{\frac{3}{2}}$
15	1534. 587	65164. 1	-----	500 <i>d</i> ?	1574. 337	63518. 8	$a^4F_{4\frac{1}{2}}-z^4G_{\frac{3}{2}}$
20	1534. 860	65152. 5	$a^4F_{2\frac{1}{2}}-y^4G_{\frac{3}{2}}$	1	1575. 127	63486. 9	-----
10	1535. 055	65144. 2	-----	0	1575. 297	63480. 1	-----
50	1535. 426	65128. 5	$a^4F_{3\frac{1}{2}}-x^4D_{\frac{3}{2}}$	15	1576. 971	63412. 7	$a^4P_{0\frac{1}{2}}-2i_{\frac{1}{2}}$
5	1536. 603	65078. 6	-----	1	1577. 115	63406. 9	-----
3	1537. 057	65059. 4	$a^4P_{2\frac{1}{2}}-w^4D_{\frac{1}{2}}$	10	1577. 573	63388. 5	$a^4P_{1\frac{1}{2}}-x^4P_{\frac{1}{2}}$
				20	1577. 816	63378. 7	$a^2H_{4\frac{1}{2}}-3i_{\frac{1}{2}}$
				30	1578. 728	63342. 1	$a^4P_{2\frac{1}{2}}-y^2F_{\frac{3}{2}}$
				10	1579. 578	63308. 0	$a^4F_{4\frac{1}{2}}-z^4H_{\frac{5}{2}}$
				10	1580. 816	63258. 5	-----
				1	1580. 974	63252. 1	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	1	2	3	4
Intensity	λ (vacuum)	σ	Term combination	Intensity	λ (vacuum)	σ	Term combination
	<i>A</i>	<i>K</i>			<i>A</i>	<i>K</i>	
15	1581.328	63238.0	$a^2D_{2\frac{1}{2}}-w^2D_{3\frac{1}{2}}$	5	1621.728	61662.6	$a^4P_{0\frac{1}{2}}-z^2S_{0\frac{1}{2}}$
10	1581.636	63225.7	$a^4F_{3\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	20	1622.431	61635.9	$a^2P_{1\frac{1}{2}}-x^2D_{1\frac{1}{2}}$
5	1581.791	63219.5	-----	20	1623.231	61605.5	$a^6D_{1\frac{1}{2}}-y^6P_{1\frac{1}{2}}$
10	1582.652	63185.1	$a^2G_{4\frac{1}{2}}-x^2G_{4\frac{1}{2}}$	20	1623.390	61599.5	$a^2D_{1\frac{1}{2}}-w^2D_{1\frac{1}{2}}$
1	1582.903	63175.1	-----	1	1624.563	61555.0	$b^2D_{1\frac{1}{2}}-v^4D_{1\frac{1}{2}}$
200	1583.819	63138.5	$a^2G_{3\frac{1}{2}}-w^2G_{3\frac{1}{2}}$	100	1625.178	61531.7	$a^4F_{2\frac{1}{2}}-z^4G_{3\frac{1}{2}}$
30	1584.256	63121.1	$a^4P_{1\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	50	1625.565	61517.1	$a^2G_{3\frac{1}{2}}-x^2G_{3\frac{1}{2}}$
50	1585.040	63089.9	$a^2G_{4\frac{1}{2}}-x^2H_{3\frac{1}{2}}$	50	1627.138	61457.6	$a^6D_{1\frac{1}{2}}-y^6P_{1\frac{1}{2}}$
30	1585.740	63062.0	$a^6D_{3\frac{1}{2}}-y^6P_{3\frac{1}{2}}$	100	1627.397	61447.8	$a^4F_{2\frac{1}{2}}-z^4G_{3\frac{1}{2}}$
15	1585.965	63053.1	$a^2G_{3\frac{1}{2}}-w^2G_{4\frac{1}{2}}$	10	1628.541	61404.7	$a^4D_{1\frac{1}{2}}-w^4P_{0\frac{1}{2}}$
1	1586.945	63014.2	$a^4F_{2\frac{1}{2}}-y^4P_{1\frac{1}{2}}$	5	1628.986	61387.9	$a^2G_{4\frac{1}{2}}-x^2F_{3\frac{1}{2}}$
5	1587.517	62991.5	$a^6D_{3\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	15	1629.092	61383.9	$a^4F_{3\frac{1}{2}}-z^4H_{4\frac{1}{2}}$
1	1587.852	62978.2	-----	5	1629.721	61360.2	$a^4F_{1\frac{1}{2}}-y^4F_{2\frac{1}{2}}$
5	1588.797	62940.7	$a^4F_{3\frac{1}{2}}-y^4F_{2\frac{1}{2}}$	15	1631.284	61301.4	-----
15	1589.645	62907.1	$a^4F_{4\frac{1}{2}}-z^4H_{1\frac{1}{2}}$	30	1632.321	61262.5	$a^2H_{5\frac{1}{2}}-y^2I_{3\frac{1}{2}}$
30	1590.774	62862.5	$a^4F_{3\frac{1}{2}}-z^4I_{4\frac{1}{2}}$	10	1633.802	61206.9	$a^4D_{2\frac{1}{2}}-w^4P_{2\frac{1}{2}}$
30	1590.882	62858.2	$a^4P_{2\frac{1}{2}}-x^4P_{3\frac{1}{2}}$	1	1634.306	61188.1	-----
15	1591.744	62824.2	$a^2G_{3\frac{1}{2}}-x^2D_{3\frac{1}{2}}$	30	1635.129	61157.3	$a^6D_{0\frac{1}{2}}-y^6P_{1\frac{1}{2}}$
40	1593.403	62758.8	$a^6D_{3\frac{1}{2}}-y^6P_{3\frac{1}{2}}$	50	1635.333	61149.6	$a^2G_{4\frac{1}{2}}-y^2F_{3\frac{1}{2}}$
30	1594.398	62719.6	$a^4F_{2\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	100	1635.948	61126.6	$a^2H_{5\frac{1}{2}}-y^2I_{0\frac{1}{2}}$
30	1594.603	62711.5	$a^2D_{2\frac{1}{2}}-y^2P_{1\frac{1}{2}}$	30	1637.446	61070.7	$a^2G_{3\frac{1}{2}}-x^2H_{4\frac{1}{2}}$
10	1596.482	62637.7	$a^4P_{1\frac{1}{2}}-x^4P_{2\frac{1}{2}}$	40	1637.591	61065.3	$a^2G_{4\frac{1}{2}}-y^2H_{4\frac{1}{2}}$
1	1597.172	62610.7	-----	20	1638.366	61036.4	-----
0	1597.890	62582.5	-----	15	1639.209	61005.0	$a^4D_{0\frac{1}{2}}-w^4P_{0\frac{1}{2}}$
20	1598.491	62559.0	$a^4P_{1\frac{1}{2}}-z^2S_{0\frac{1}{2}}$	20	1639.371	60999.0	$a^2H_{5\frac{1}{2}}-w^2H_{5\frac{1}{2}}$
15	1599.309	62527.0	$a^4F_{4\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	15	1639.530	60993.1	$a^4D_{1\frac{1}{2}}-w^4P_{1\frac{1}{2}}$
10	1599.937	62502.5	$a^4F_{3\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	5	1639.963	60977.0	-----
30	1600.183	62492.9	$a^2G_{4\frac{1}{2}}-x^2H_{4\frac{1}{2}}$	2	1640.756	60947.5	-----
100	1602.095	62418.3	$a^4P_{0\frac{1}{2}}-x^4P_{1\frac{1}{2}}$	100	1641.460	60921.4	$a^4F_{1\frac{1}{2}}-z^4G_{2\frac{1}{2}}$
1	1602.447	62404.6	$a^4F_{3\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	10	1643.312	60852.7	$a^2H_{4\frac{1}{2}}-w^2F_{3\frac{1}{2}}$
15	1602.653	62396.5	$a^4F_{1\frac{1}{2}}-y^4P_{1\frac{1}{2}}$	2	1643.434	60848.2	$a^2G_{3\frac{1}{2}}-w^4F_{3\frac{1}{2}}$
10	1603.572	62360.8	$a^2D_{2\frac{1}{2}}-w^2F_{3\frac{1}{2}}$	15	1644.914	60793.5	$a^2P_{1\frac{1}{2}}-w^4D_{0\frac{1}{2}}$
3	1603.819	62351.2	$a^6D_{2\frac{1}{2}}-y^6P_{3\frac{1}{2}}$	10	1645.706	60764.2	-----
30	1604.029	62343.0	$a^2G_{4\frac{1}{2}}-y^6P_{3\frac{1}{2}}$	20	1647.615	60693.8	$a^4F_{1\frac{1}{2}}-y^4P_{2\frac{1}{2}}$
100	1604.405	62328.4	$a^4D_{3\frac{1}{2}}-w^4P_{3\frac{1}{2}}$	5	1647.913	60682.8	$a^2H_{5\frac{1}{2}}-w^2G_{4\frac{1}{2}}$
1	1604.767	62314.3	$a^4F_{3\frac{1}{2}}-z^4G_{4\frac{1}{2}}$	15	1648.069	60677.1	$a^2G_{3\frac{1}{2}}-w^4F_{2\frac{1}{2}}$
20	1605.111	62301.0	$a^4P_{2\frac{1}{2}}-y^2D_{3\frac{1}{2}}$	3	1650.327	60594.1	$a^4D_{0\frac{1}{2}}-w^4P_{1\frac{1}{2}}$
15	1605.616	62281.4	$a^4P_{1\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	1	1650.659	60581.9	-----
30	1605.787	62274.8	$a^2G_{3\frac{1}{2}}-w^4D_{3\frac{1}{2}}$	30	1651.898	60536.4	$a^2D_{2\frac{1}{2}}-x^2D_{2\frac{1}{2}}$
5	1608.733	62160.7	$a^2G_{4\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	1	1652.363	60519.4	-----
10	1610.372	62097.5	$a^4F_{3\frac{1}{2}}-y^4P_{2\frac{1}{2}}$	2	1653.564	60475.4	$a^4D_{1\frac{1}{2}}-w^4P_{2\frac{1}{2}}$
10	1610.464	62093.9	$a^2P_{1\frac{1}{2}}-x^2D_{3\frac{1}{2}}$	3	1654.477	60442.1	-----
50	1611.415	62057.3	$a^4P_{1\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	1	1656.747	60359.2	$a^2P_{1\frac{1}{2}}-w^4D_{2\frac{1}{2}}$
1	1613.158	61990.2	$a^6D_{2\frac{1}{2}}-y^6P_{3\frac{1}{2}}$?	30	1657.217	60342.1	$a^2G_{4\frac{1}{2}}-y^2H_{3\frac{1}{2}}$
3	1613.685	61969.9	$b^4D_{3\frac{1}{2}}-v^4D_{3\frac{1}{2}}$	1	1657.617	60327.6	$a^2P_{1\frac{1}{2}}-w^4D_{2\frac{1}{2}}$
20	1615.064	61917.1	$a^4F_{2\frac{1}{2}}-y^4F_{2\frac{1}{2}}$	10	1658.457	60297.0	$a^4P_{1\frac{1}{2}}-y^4D_{2\frac{1}{2}}$
20	1615.267	61909.3	-----	100	1659.364	60264.1	$a^2H_{4\frac{1}{2}}-w^2H_{4\frac{1}{2}}$
1	1615.656	61894.4	$a^6D_{2\frac{1}{2}}-y^6P_{1\frac{1}{2}}$	0	1659.871	60245.6	$a^4P_{0\frac{1}{2}}-x^4F_{1\frac{1}{2}}$
15	1617.663	61817.6	$a^4P_{2\frac{1}{2}}-I_{1\frac{1}{2}}$	2	1660.059	60238.8	$a^2P_{1\frac{1}{2}}-x^4P_{0\frac{1}{2}}$
1	1618.781	61774.9	$a^4F_{1\frac{1}{2}}-y^4F_{1\frac{1}{2}}$	0	1662.684	60143.7	-----
1	1618.986	61767.1	-----	10eh	1666.312	60012.8	$a^2P_{1\frac{1}{2}}-w^4F_{3\frac{1}{2}}$
20	1619.365	61752.6	$a^2G_{3\frac{1}{2}}-x^2G_{4\frac{1}{2}}$	2	1667.426	59972.7	$a^2D_{2\frac{1}{2}}-w^4D_{3\frac{1}{2}}$
20	1620.102	61724.5	$a^4D_{2\frac{1}{2}}-w^4P_{1\frac{1}{2}}$	3	1667.912	59955.2	$a^4P_{2\frac{1}{2}}-x^4D_{3\frac{1}{2}}$
30	1620.865	61695.5	-----	3	1670.788	59852.0	$a^2G_{3\frac{1}{2}}-x^2F_{3\frac{1}{2}}$
5	1621.445	61673.4	$a^4P_{1\frac{1}{2}}-I_{1\frac{1}{2}}$	5	1671.412	59829.7	$a^2P_{1\frac{1}{2}}-2I_{1\frac{1}{2}}$

TABLE 6. The second spectrum of ruthenium (Ru II)—Continued

1	2	3	4	1	2	3	4
Intensity	λ (vacuum)	σ	Term combination	Intensity	λ (vacuum)	σ	Term combination
	A	K			A	K	
0	1671. 819	59815. 1	-----	0	1748. 441	57193. 8	$a^2P_{1/2}-1i_{1/2}$
30	1672. 225	59800. 6	$a^2H_{4/2}-y^2I_{3/2}$	3	1750. 239	57135. 1	$a^2H_{5/2}-z^2K_{3/2}$
5	1672. 445	59792. 7	$a^2P_{0/2}-x^2D_{1/2}$	2	1750. 979	57110. 9	$a^2G_{3/2}-x^4F_{3/2}$
3	1676. 922	59633. 1	$a^2G_{3/2}-y^2H_{1/2}$	1	1752. 835	57050. 4	-----
2	1678. 781	59567. 0	$a^2P_{1/2}-w^4F_{1/2}?$	1	1753. 173	57039. 4	$a^2G_{4/2}-x^4F_{3/2}$
30	1679. 620	59537. 3	$a^2H_{4/2}-w^2H_{3/2}$	30	1753. 441	57030. 7	$a^4P_{1/2}-y^4P_{1/2}$
1	1683. 810	59389. 1	$a^4P_{2/2}-y^4G_{3/2}$	5	1754. 756	56988. 0	$a^4P_{2/2}-z^2D_{3/2}$
50	1683. 985	59383. 0	$a^2H_{5/2}-x^2G_{1/2}$	5	1755. 728	56956. 4	$a^4P_{2/2}-z^2G_{3/2}$
1	1684. 311	59371. 5	-----	10	1757. 854	56887. 5	$a^2G_{3/2}-y^2G_{4/2}$
15e	1686. 161	59306. 3	$a^2G_{3/2}-y^2F_{3/2}$	3	1759. 769	56825. 6	$a^2F_{3/2}-w^2F_{3/2}$
100	1686. 691	59287. 7	$a^2H_{5/2}-x^2H_{3/2}$	20	1761. 030	56784. 9	$a^2G_{4/2}-y^4G_{3/2}$
10	1688. 357	59229. 2	$a^2D_{2/2}-x^2G_{3/2}$	15	1761. 580	56767. 2	$a^4P_{1/2}-z^2D_{3/2}$
1	1692. 828	59072. 7	$a^4P_{0/2}-z^2P_{1/2}$	1	1763. 996	56689. 5	$a^2P_{1/2}-x^4F_{3/2}$
2	1694. 677	59008. 3	-----	0	1764. 829	56662. 7	$a^2P_{1/2}-x^4F_{1/2}$
20	1697. 943	58894. 8	-----	20	1765. 525	56640. 4	$a^2G_{4/2}-z^2H_{5/2}$
0	1699. 330	58846. 7	$a^4P_{2/2}-x^4D_{1/2}$	20	1768. 666	56539. 8	$a^2H_{5/2}-y^2H_{5/2}$
20	1699. 442	58842. 8	$a^6D_{1/2}-1i_{1/2}$	5	1770. 160	56492. 1	$a^4P_{2/2}-y^4F_{3/2}$
3	1700. 049	58821. 8	$a^4P_{2/2}-z^2F_{3/2}?$	15	1770. 446	56482. 9	$a^2P_{1/2}-z^2P_{0/2}$
1	1700. 839	58794. 5	$a^2G_{3/2}-x^4P_{2/2}$	50	1776. 061	56304. 4	$a^2G_{4/2}-y^4G_{4/2}$
30	1701. 080	58786. 2	$a^2G_{4/2}-y^4H_{3/2}$	5	1777. 432	56260. 9	$a^2F_{2/2}-w^2D_{2/2}$
3	1702. 061	58752. 3	$a^2G_{4/2}-y^4H_{3/2}$	10	1778. 206	56236. 4	$a^2P_{0/2}-z^2S_{0/2}$
1	1702. 572	58734. 7	$a^2D_{2/2}-w^4D_{1/2}$	5	1779. 124	56207. 4	$a^4P_{2/2}-y^4F_{2/2}$
50	1703. 562	58700. 5	$a^2H_{5/2}-x^2H_{3/2}$	0	1779. 420	56198. 1	$a^2D_{2/2}-y^2D_{1/2}$
10	1703. 818	58691. 7	$a^2G_{4/2}-x^4G_{3/2}$	0	1780. 057	56178. 0	$a^2D_{1/2}-x^4P_{0/2}$
5	1705. 263	58642. 0	$a^2P_{1/2}-y^2F_{3/2}$	0	1781. 407	56135. 4	$a^4P_{0/2}-y^4P_{1/2}$
2	1705. 572	58631. 4	$a^2D_{2/2}-y^6P_{3/2}?$	5	1781. 792	56123. 3	$a^2H_{4/2}-x^2F_{3/2}$
1	1705. 735	58625. 8	$a^4P_{1/2}-x^4D_{1/2}$	0	1784. 767	56029. 7	-----
1	1705. 840	58622. 1	$a^4P_{1/2}-z^2P_{3/2}$	20	1786. 032	55990. 0	$a^2D_{2/2}-y^2D_{2/2}$
10	1707. 608	58561. 4	$a^2D_{2/2}-w^4P_{3/2}$	1	1786. 155	55986. 2	$a^4P_{1/2}-y^4F_{3/2}$
15	1708. 620	58526. 8	$a^4P_{0/2}-y^4D_{1/2}$	2	1786. 347	55980. 2	$a^2P_{0/2}-y^2D_{1/2}$
20	1710. 299	58469. 3	$a^2H_{4/2}-w^4D_{3/2}$	10	1787. 233	55952. 4	$a^2D_{1/2}-w^4F_{3/2}$
20	1712. 456	58395. 7	$a^2P_{0/2}-x^4P_{0/2}$	1	1787. 770	55935. 6	$a^2G_{3/2}-x^4D_{3/2}$
3	1714. 667	58320. 4	$a^2G_{4/2}-y^2G_{1/2}$	1	1789. 383	55885. 2	$a^2H_{4/2}-y^2F_{3/2}$
3	1717. 160	58235. 7	-----	20	1791. 253	55826. 8	$a^2G_{3/2}-z^2H_{4/2}$
20	1718. 975	58174. 2	$a^4P_{1/2}-x^4D_{3/2}$	20	1791. 560	55817. 3	$a^2P_{1/2}-y^4D_{3/2}$
10	1721. 171	58100. 0	$a^2D_{1/2}-x^2D_{3/2}$	2	1792. 072	55801. 3	$a^2H_{4/2}-y^2H_{3/2}$
15	1721. 712	58081. 7	$a^4P_{2/2}-y^4D_{3/2}$	1	1797. 118	55644. 6	$a^6S_{2/2}-x^6P_{1/2}?$
15	1721. 778	58079. 5	$a^2P_{1/2}-z^2S_{0/2}$	10	1799. 549	55569. 5	$a^2D_{2/2}-1i_{1/2}$
0	1725. 761	57945. 5	$a^2F_{2/2}-3i_{3/2}$	15	1800. 470	55541. 1	$a^4P_{2/2}-y^4P_{3/2}$
5	1729. 417	57823. 0	$a^2P_{1/2}-y^2D_{1/2}$	15	1806. 599	55352. 6	$a^2G_{3/2}-y^4G_{3/2}$
1	1731. 110	57766. 4	-----	5	1807. 658	55320. 2	$a^4P_{1/2}-y^4P_{3/2}$
50	1731. 415	57756. 2	$a^4P_{2/2}-z^2F_{3/2}$	5	1813. 558	55140. 2	$a^2P_{1/2}-x^4D_{0/2}$
10	1732. 209	57729. 8	$a^4P_{0/2}-x^4D_{1/2}$	1	1815. 607	55078. 0	$a^2H_{4/2}-y^2H_{3/2}$
20	1733. 537	57685. 5	$a^2H_{4/2}-x^2G_{3/2}$	5	1816. 030	55065. 2	$a^2D_{2/2}-x^4F_{3/2}$
5	1734. 069	57667. 8	$a^2D_{2/2}-x^2F_{3/2}$	3	1818. 527	54989. 6	$a^2P_{1/2}-y^4G_{2/2}$
15	1735. 654	57615. 2	$a^2P_{1/2}-y^2D_{3/2}$	20	1818. 724	54983. 6	$a^2H_{3/2}-y^4H_{5/2}$
10	1737. 389	57557. 6	$a^2F_{2/2}-v^2F_{3/2}$	30	1819. 125	54971. 5	$a^6S_{2/2}-x^6P_{3/2}$
15	1738. 666	57515. 4	$a^2F_{3/2}-y^2F_{3/2}$	3	1819. 852	54949. 5	$a^2H_{5/2}-y^4H_{3/2}$
15	1740. 114	57467. 5	$a^2G_{4/2}-x^4G_{3/2}$	5	1820. 059	54943. 3	$a^2P_{1/2}-y^4D_{1/2}$
20	1741. 262	57429. 6	$a^2D_{2/2}-y^2F_{3/2}$	2	1820. 999	54914. 9	$a^2G_{4/2}-z^2G_{4/2}$
1	1743. 514	57355. 4	-----	1	1822. 238	54877. 6	-----
5	1744. 614	57319. 3	$a^2G_{3/2}-y^4H_{1/2}$	1	1822. 427	54871. 9	$a^2G_{3/2}-y^4G_{3/2}$
30	1746. 446	57259. 1	$a^2G_{4/2}-z^2H_{3/2}$	10	1824. 619	54806. 0	$a^2G_{3/2}-z^2F_{2/2}$
3	1747. 804	57214. 7	$a^2F_{3/2}-x^4G_{3/2}$	0	1828. 521	54689. 0	$a^2F_{3/2}-w^2F_{3/2}?$
1	1748. 310	57198. 1	$a^2F_{3/2}-3i_{3/2}$	5	1829. 894	54648. 0	$a^2H_{5/2}-y^4H_{5/2}$

TABLE 6. The second spectrum of ruthenium (Ru II)—Continued

1	2	3	4	1	2	3	4
Intensity	λ (vacuum)	σ	Term combination	Intensity	λ (vacuum)	σ	Term combination
	<i>A</i>	<i>K</i>			<i>A</i>	<i>K</i>	
0	1830. 163	54639. 9	$a^2P_{0\frac{1}{2}}-z^2P_{0\frac{1}{2}}$	3	1904. 679	52502. 3	$a^2H_{5\frac{1}{2}}-y^4G_{4\frac{1}{2}}$
3	1830. 296	54636. 0	-----	5	1906. 378	52455. 5	$a^2G_{3\frac{1}{2}}-y^4F_{3\frac{1}{2}}$
0	1831. 130	54611. 1	$a^2G_{4\frac{1}{2}}-z^4I_{3\frac{1}{2}}$	0	1907. 601	52421. 9	$a^4D_{2\frac{1}{2}}-w^4F_{2\frac{1}{2}}$
20	1832. 144	54580. 9	$a^2D_{1\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	1	1910. 093	52353. 5	$a^2D_{1\frac{1}{2}}-z^2P_{0\frac{1}{2}}$
3	1834. 262	54517. 8	$a^2H_{3\frac{1}{2}}-y^2G_{3\frac{1}{2}}$	10	1911. 888	52304. 3	-----
							$a^2P_{0\frac{1}{2}}-x^4D_{1\frac{1}{2}}$
50	1836. 013	54465. 8	$a^2G_{4\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	50	1912. 036	52300. 3	$a^4F_{2\frac{1}{2}}-z^4F_{2\frac{1}{2}}$
15	1841. 375	54307. 2	$a^6S_{2\frac{1}{2}}-x^6P_{3\frac{1}{2}}$	30	1912. 484	52288. 0	$a^2P_{1\frac{1}{2}}-z^2D_{2\frac{1}{2}}$
5	1842. 642	54269. 9	$a^4P_{2\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	20	1913. 797	52252. 1	$a^2F_{2\frac{1}{2}}-x^2G_{3\frac{1}{2}}$
200	1844. 138	54225. 9	$a^4F_{4\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	1	1914. 999	52219. 3	$a^4D_{3\frac{1}{2}}-y^2F_{2\frac{1}{2}}$
2	1844. 886	54203. 9	$a^6D_{1\frac{1}{2}}-y^4P_{1\frac{1}{2}}$	1	1915. 597	52203. 0	$a^2H_{4\frac{1}{2}}-x^4G_{3\frac{1}{2}}$
100	1845. 368	54189. 7	$a^4P_{2\frac{1}{2}}-z^4S_{1\frac{1}{2}}$	200	1916. 829	52169. 5	$a^4F_{2\frac{1}{2}}-z^4D_{1\frac{1}{2}}$
30	1845. 974	54171. 9	$a^4F_{2\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	50	1918. 650	52120. 0	$a^4F_{1\frac{1}{2}}-z^4F_{1\frac{1}{2}}$
			$a^4F_{3\frac{1}{2}}-z^4P_{2\frac{1}{2}}$	2	1919. 292	52102. 5	$d^2D_{2\frac{1}{2}}-w^4G_{2\frac{1}{2}}$
1	1846. 147	54166. 9	-----	3	1919. 431	52098. 8	-----
1	1846. 983	54142. 3	$a^2P_{1\frac{1}{2}}-z^2F_{2\frac{1}{2}}$	3	1919. 679	52092. 0	$a^2G_{3\frac{1}{2}}-z^4I_{1\frac{1}{2}}$
15	1848. 515	54097. 5	$a^2D_{1\frac{1}{2}}-x^4P_{2\frac{1}{2}}$	5	1921. 377	52046. 0	$a^2G_{4\frac{1}{2}}-z^4H_{4\frac{1}{2}}$
				0	1921. 695	52037. 4	$a^2D_{1\frac{1}{2}}-z^4G_{2\frac{1}{2}}$
5	1851. 213	54018. 6	$a^2D_{1\frac{1}{2}}-z^2S_{0\frac{1}{2}}$	0	1923. 250	51995. 3	$a^4D_{1\frac{1}{2}}-w^4D_{2\frac{1}{2}}$
3	1853. 683	53946. 7	-----	2	1925. 000	51948. 1	$a^2H_{4\frac{1}{2}}-z^2H_{4\frac{1}{2}}$
0	1856. 193	53873. 7	$a^2F_{2\frac{1}{2}}-w^2G_{3\frac{1}{2}}$	0	1926. 867	51897. 7	$a^4D_{1\frac{1}{2}}-x^4P_{0\frac{1}{2}}$
5	1856. 503	53864. 7	$a^2D_{2\frac{1}{2}}-z^2P_{1\frac{1}{2}}$	100	1927. 623	51877. 4	-----
10	1860. 065	53761. 6	$a^2D_{1\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	100	1930. 717	51794. 2	$a^4F_{3\frac{1}{2}}-z^4D_{3\frac{1}{2}}$
				15	1931. 763	51766. 2	-----
10	1861. 527	53719. 3	$a^2G_{3\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	50	1932. 118	51756. 7	$a^2D_{2\frac{1}{2}}-y^4D_{3\frac{1}{2}}$
0	1862. 386	53694. 6	$a^2P_{1\frac{1}{2}}-x^4D_{3\frac{1}{2}}$	1	1932. 892	51736. 0	$a^2D_{1\frac{1}{2}}-y^4D_{2\frac{1}{2}}$
0	1863. 023	53676. 2	$a^2P_{1\frac{1}{2}}-y^4D_{0\frac{1}{2}}$	15	1933. 055	51731. 6	$a^2F_{3\frac{1}{2}}-x^2G_{4\frac{1}{2}}$
500	1863. 404	53665. 2	$a^2H_{3\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	50	1933. 615	51689. 9	$a^4F_{2\frac{1}{2}}-z^4F_{3\frac{1}{2}}$
5 <i>h</i>	1864. 030	53647. 2	$a^2P_{0\frac{1}{2}}-z^2P_{1\frac{1}{2}}$	20	1934. 615	51689. 9	$a^4F_{1\frac{1}{2}}-z^4F_{1\frac{1}{2}}$
				2	1935. 210	51674. 0	$a^6D_{2\frac{1}{2}}-z^4H_{3\frac{1}{2}}$
0	1868. 088	53530. 7	$a^2H_{4\frac{1}{2}}-y^4H_{3\frac{1}{2}}$	100	1937. 089	51623. 9	-----
10	1868. 308	53524. 4	$a^2G_{4\frac{1}{2}}-z^4I_{4\frac{1}{2}}$	50	1937. 715	51607. 2	-----
2	1869. 588	53487. 7	$a^2H_{4\frac{1}{2}}-y^4H_{4\frac{1}{2}}$	20	1938. 193	51594. 4	$a^6D_{2\frac{1}{2}}-z^4S_{1\frac{1}{2}}$
2	1869. 763	53482. 7	$a^2G_{3\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	200	1939. 056	51571. 5	$a^4F_{2\frac{1}{2}}-z^4D_{2\frac{1}{2}}$
5	1870. 657	53457. 2	$a^2H_{3\frac{1}{2}}-z^2H_{3\frac{1}{2}}$	200	1939. 521	51559. 1	$a^4F_{1\frac{1}{2}}-z^4D_{1\frac{1}{2}}$
				5	1939. 911	51548. 8	$a^4F_{4\frac{1}{2}}-z^6P_{3\frac{1}{2}}$
5	1871. 692	53427. 6	$a^2H_{4\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	30	1940. 422	51535. 2	$a^2H_{5\frac{1}{2}}-z^4I_{6\frac{1}{2}}$
0	1873. 874	53365. 4	$a^2D_{2\frac{1}{2}}-y^4G_{2\frac{1}{2}}$	5	1940. 964	51520. 8	-----
500	1875. 564	53317. 3	$a^4F_{4\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	10	1942. 628	51476. 7	$a^2H_{4\frac{1}{2}}-y^4G_{3\frac{1}{2}}$
100	1877. 186	53271. 2	$a^4F_{3\frac{1}{2}}-z^4F_{2\frac{1}{2}}$	20	1943. 966	51441. 2	$a^2F_{3\frac{1}{2}}-z^4F_{3\frac{1}{2}}$
5	1878. 364	53237. 8	$a^2H_{3\frac{1}{2}}-x^4F_{1\frac{1}{2}}$	10	1946. 421	51376. 3	$a^2H_{4\frac{1}{2}}-z^2H_{5\frac{1}{2}}$
				3	1947. 393	51350. 7	$a^4D_{2\frac{1}{2}}-x^4P_{1\frac{1}{2}}$
5	1883. 220	53100. 5	$a^2P_{0\frac{1}{2}}-y^4D_{1\frac{1}{2}}$	10	1947. 638	51344. 2	-----
10?	1884. 154	53074. 2	$a^4P_{0\frac{1}{2}}-z^4S_{1\frac{1}{2}}?$	30	1949. 196	51303. 2	-----
15	1884. 484	53064. 9	$a^2D_{2\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	15	1949. 423	51297. 2	$a^4F_{3\frac{1}{2}}-z^6P_{2\frac{1}{2}}$
15	1884. 801	53056. 0	$a^2H_{4\frac{1}{2}}-y^2G_{4\frac{1}{2}}$	3	1953. 081	51201. 2	-----
			$a^2G_{3\frac{1}{2}}-y^4F_{1\frac{1}{2}}$	0	1953. 468	51191. 0	$a^4F_{2\frac{1}{2}}-z^6P_{1\frac{1}{2}}$
50 <i>h</i>	1885. 559	53034. 7	$a^2F_{2\frac{1}{2}}-x^2D_{1\frac{1}{2}}$				-----
15	1887. 134	52990. 4	$a^2G_{4\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	15	1954. 559	51162. 4	-----
500	1888. 045	52964. 8	$a^4F_{4\frac{1}{2}}-z^4F_{1\frac{1}{2}}$	5	1956. 462	51112. 7	$a^2H_{5\frac{1}{2}}-z^2G_{4\frac{1}{2}}$
15	1889. 655	52919. 7	$a^2G_{3\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	1	1957. 748	51079. 1	$a^2D_{1\frac{1}{2}}-x^4D_{0\frac{1}{2}}$
1	1890. 774	52888. 4	-----	5	1957. 931	51074. 3	$a^2F_{3\frac{1}{2}}-x^2H_{4\frac{1}{2}}$
2	1891. 702	52862. 4	-----	1	1962. 144	50964. 7	$a^2F_{2\frac{1}{2}}-w^4F_{1\frac{1}{2}}$
5	1892. 570	52838. 2	$a^2H_{3\frac{1}{2}}-z^2H_{3\frac{1}{2}}$	20	1962. 285	50961. 0	$a^4F_{1\frac{1}{2}}-z^4D_{2\frac{1}{2}}$
20	1892. 926	52828. 3	$a^2F_{3\frac{1}{2}}-x^2D_{2\frac{1}{2}}$	20	1962. 503	50955. 3	-----
100	1896. 441	52730. 4	$a^4F_{2\frac{1}{2}}-z^4F_{1\frac{1}{2}}$	200	1965. 293	50883. 0	$a^2H_{5\frac{1}{2}}-z^2I_{6\frac{1}{2}}$
1	1897. 132	52711. 1	-----	200	1966. 076	50862. 7	$a^4F_{4\frac{1}{2}}-z^6F_{3\frac{1}{2}}$
100	1897. 437	52702. 7	$a^4F_{3\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	2	1966. 467	50852. 6	$a^2F_{3\frac{1}{2}}-w^4F_{3\frac{1}{2}}$
3	1901. 073	52601. 9	$a^2D_{1\frac{1}{2}}-x^4F_{1\frac{1}{2}}$				
1	1902. 897	52551. 5	$a^2P_{1\frac{1}{2}}-y^4P_{1\frac{1}{2}}$				
500	1903. 227	52542. 3	$a^4F_{3\frac{1}{2}}-z^4D_{2\frac{1}{2}}$				
2	1903. 966	52521. 9	$a^2D_{2\frac{1}{2}}-x^4D_{1\frac{1}{2}}$				
2	1904. 393	52510. 2	-----				

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	1	2	3	4
Intensity	λ (vacuum)	σ	Term combination	Intensity	λ (air)	σ	Term combination
	<i>A</i>	<i>K</i>			<i>A</i>	<i>K</i>	
200	1966. 746	50845. 4	$a^4F_{4\frac{1}{2}}-z^6F_{4\frac{1}{2}}$	5	2085. 037	47945. 5	$a^2D_{2\frac{1}{2}}-z^4H_{3\frac{1}{2}}$
10	1966. 926	50840. 8	$a^2P_{1\frac{1}{2}}-y^4F_{2\frac{1}{2}}$	3	2085. 683	47930. 7	$a^4D_{2\frac{1}{2}}-z^2P_{1\frac{1}{2}}$
5	1967. 515	50825. 5		20	2087. 463	47889. 8	$a^4P_{0\frac{1}{2}}-z^4P_{0\frac{1}{2}}$
20	1967. 610	50823. 1	$a^4F_{2\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	1	2088. 543	47865. 1	$a^2D_{2\frac{1}{2}}-z^4S_{1\frac{1}{2}}$
0	1969. 862	50765. 0	-----	1	2091. 668	47793. 5	$a^4D_{0\frac{1}{2}}-z^2P_{0\frac{1}{2}}$
1	1970. 115	50758. 5	$a^4F_{4\frac{1}{2}}-z^6F_{5\frac{1}{2}}$	15	2091. 979	47786. 4	$a^4D_{3\frac{1}{2}}-y^4G_{3\frac{1}{2}}$
2	1970. 381	50751. 6		10	2103. 377	47527. 5	$a^4D_{1\frac{1}{2}}-y^4D_{2\frac{1}{2}}$
5	1972. 061	50708. 4	$a^2P_{0\frac{1}{2}}-y^4P_{1\frac{1}{2}}$	2	2104. 747	47496. 6	$a^2F_{2\frac{1}{2}}-z^4G_{2\frac{1}{2}}$
5	1972. 770	50690. 1	$a^2F_{2\frac{1}{2}}-x^2F_{3\frac{1}{2}}?$	500	2107. 322	47438. 6	$a^4P_{2\frac{1}{2}}-z^4P_{3\frac{1}{2}}$
10	1973. 811	50663. 4	$a^2D_{2\frac{1}{2}}-z^2D_{3\frac{1}{2}}$	1	2110. 538	47366. 3	$a^2F_{3\frac{1}{2}}-y^4H_{3\frac{1}{2}}$
			$a^2H_{3\frac{1}{2}}-y^4F_{4\frac{1}{2}}$				
10	1975. 048	50631. 7	$a^2D_{2\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	10	2110. 945	47357. 2	$a^2F_{3\frac{1}{2}}-x^4F_{3\frac{1}{2}}$
5	1987. 023	50326. 5	$a^4F_{2\frac{1}{2}}-z^6P_{2\frac{1}{2}}$	200	2113. 895	47291. 1	$a^4P_{0\frac{1}{2}}-z^4P_{1\frac{1}{2}}$
200	1990. 720	50233. 1	$a^2G_{3\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	100	2117. 190	47217. 5	$a^4P_{1\frac{1}{2}}-z^4P_{3\frac{1}{2}}$
10	1993. 078	50173. 7	$a^4D_{3\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	1	2121. 077	47131. 0	$a^4D_{2\frac{1}{2}}-y^4G_{3\frac{1}{2}}$
5	1994. 127	50147. 3	-----	2	2121. 701	47117. 1	$b^2H_{4\frac{1}{2}}-v^2F_{3\frac{1}{2}}$
100	1995. 048	50124. 1	$a^2H_{4\frac{1}{2}}-z^2I_{5\frac{1}{2}}$	3	2122. 086	47108. 5	$a^4H_{3\frac{1}{2}}-w^4F_{3\frac{1}{2}}$
5	1996. 748	50081. 4	$a^2D_{1\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	10	2128. 836	46959. 2	$a^4D_{3\frac{1}{2}}-y^4D_{2\frac{1}{2}}$
2	1997. 770	50055. 8	$a^4D_{2\frac{1}{2}}-y^2D_{3\frac{1}{2}}$	100	2131. 898	46891. 7	$a^2F_{3\frac{1}{2}}-y^2G_{4\frac{1}{2}}$
30	1998. 988	50025. 3	$a^4F_{3\frac{1}{2}}-z^6P_{3\frac{1}{2}}$	3	2133. 029	46866. 9	-----
	λ (air)		-----	30	2135. 40?	46814. 9	$a^4H_{3\frac{1}{2}}-w^4D_{2\frac{1}{2}}$
20	2002. 168	49929. 7	-----	2	2137. 661	46765. 4	$a^2F_{3\frac{1}{2}}-x^4G_{2\frac{1}{2}}$
2	2003. 860	49887. 6	$a^2H_{4\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	30	2140. 120	46711. 6	$a^4F_{4\frac{1}{2}}-z^6D_{3\frac{1}{2}}$
3	2005. 278	49852. 3	-----	1	2140. 29?	46707. 9	$a^2F_{2\frac{1}{2}}-y^2G_{3\frac{1}{2}}$
2	2008. 180	49780. 2	-----	5	2143. 697	46633. 7	$a^4D_{3\frac{1}{2}}-z^2F_{3\frac{1}{2}}$
10	2010. 542	49721. 8	$a^2H_{3\frac{1}{2}}-z^4I_{3\frac{1}{2}}$	3	2145. 793	46588. 1	$a^4D_{2\frac{1}{2}}-x^4D_{1\frac{1}{2}}$
5	2010. 774	49716. 0	$a^2F_{3\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	2	2145. 989	46583. 9	$a^4D_{2\frac{1}{2}}-z^2F_{2\frac{1}{2}}$
			$a^4F_{1\frac{1}{2}}-z^6P_{3\frac{1}{2}}$	10	2148. 103	46538. 1	$a^4P_{2\frac{1}{2}}-z^4F_{3\frac{1}{2}}$
30	2013. 189	49656. 4	$a^4F_{3\frac{1}{2}}-z^6F_{3\frac{1}{2}}$	2	2151. 124	46472. 7	$a^4G_{3\frac{1}{2}}-w^2F_{3\frac{1}{2}}$
10	2013. 979	49636. 6	$a^2F_{3\frac{1}{2}}-y^2H_{3\frac{1}{2}}$	2	2152. 124	46451. 1	$b^4D_{3\frac{1}{2}}-v^2F_{3\frac{1}{2}}$
5	2014. 977	49612. 3	-----	30	2154. 427	46401. 5	$a^4D_{0\frac{1}{2}}-x^4D_{0\frac{1}{2}}$
5	2018. 433	49527. 4	$a^4D_{3\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	5	2155. 028	46388. 5	$a^2F_{2\frac{1}{2}}-y^4G_{2\frac{1}{2}}$
100	2026. 838	49322. 1	$a^4F_{3\frac{1}{2}}-z^6F_{4\frac{1}{2}}$	1	2155. 337	46381. 9	$a^6S_{2\frac{1}{2}}-w^4P_{1\frac{1}{2}}$
10	2030. 979	49221. 5	$a^2F_{2\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	1	2157. 188	46342. 1	$a^2F_{2\frac{1}{2}}-y^4D_{1\frac{1}{2}}$
5	2031. 804	49201. 5	$a^2H_{4\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	20	2158. 373	46316. 6	$a^4P_{1\frac{1}{2}}-z^4F_{3\frac{1}{2}}$
1	2032. 35	49188. 3	$a^2H_{5\frac{1}{2}}-z^4G_{4\frac{1}{2}}$	3	2160. 766	46265. 4	$b^4F_{4\frac{1}{2}}-x^2G_{3\frac{1}{2}}$
1	2033. 77	49154. 0	$b^4F_{2\frac{1}{2}}-y^2P_{1\frac{1}{2}}$	1	2161. 270	46254. 6	$a^4D_{0\frac{1}{2}}-y^4D_{1\frac{1}{2}}$
10	2034. 348	49140. 0	$a^4D_{2\frac{1}{2}}-y^4H_{3\frac{1}{2}}$	20	2164. 480	46186. 0	$a^4P_{1\frac{1}{2}}-z^4D_{1\frac{1}{2}}$
			-----	20	2166. 828	46135. 9	$a^4D_{2\frac{1}{2}}-x^4D_{2\frac{1}{2}}$
5	2034. 732	49130. 7	$a^4D_{2\frac{1}{2}}-x^4F_{5\frac{1}{2}}?$	3	2169. 076	46088. 1	$a^2F_{2\frac{1}{2}}-y^4G_{3\frac{1}{2}}$
1	2036. 187	49095. 6	-----	3	2169. 401	46081. 2	-----
5	2036. 506	49087. 9	$a^2H_{4\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	100	2174. 713	45968. 7	$a^4P_{2\frac{1}{2}}-z^4F_{3\frac{1}{2}}$
5	2037. 867	49055. 1	$a^4F_{2\frac{1}{2}}-z^6P_{3\frac{1}{2}}$	10	2176. 070	45940. 0	$a^2F_{3\frac{1}{2}}-x^4D_{3\frac{1}{2}}$
10	2039. 626	49012. 8	$a^2F_{2\frac{1}{2}}-y^2D_{2\frac{1}{2}}$	30	2176. 476	45931. 4	-----
			-----	1	2179. 574	45866. 2	$a^4D_{3\frac{1}{2}}-z^2D_{2\frac{1}{2}}$
20	2043. 301	48924. 7	$a^2H_{5\frac{1}{2}}-z^4H_{5\frac{1}{2}}$	3	2179. 683	45863. 9	$a^6S_{2\frac{1}{2}}-w^4P_{2\frac{1}{2}}$
2	2044. 800	48888. 9	$a^4D_{2\frac{1}{2}}-x^4F_{3\frac{1}{2}}$	15	2180. 063	45855. 9	$a^4D_{1\frac{1}{2}}-x^4D_{1\frac{1}{2}}$
30	2047. 561	48822. 7	$a^4F_{2\frac{1}{2}}-z^6F_{1\frac{1}{2}}$	20	2181. 254	45830. 8	$a^2F_{3\frac{1}{2}}-z^2H_{4\frac{1}{2}}$
200	2049. 111	48786. 0	$a^4P_{1\frac{1}{2}}-z^4P_{0\frac{1}{2}}$	30	2181. 622	45823. 1	$a^4D_{2\frac{1}{2}}-y^4D_{3\frac{1}{2}}$
5	2060. 257	48522. 1	$a^4D_{3\frac{1}{2}}-x^4F_{4\frac{1}{2}}$	10	2182. 081	45813. 5	$a^6D_{2\frac{1}{2}}-z^4P_{1\frac{1}{2}}$
			-----	10	2184. 536	45762. 0	$a^4F_{3\frac{1}{2}}-z^6D_{2\frac{1}{2}}$
2	2062. 992	48457. 8	-----	2	2186. 692	45716. 9	-----
100	2065. 110	48408. 1	$a^4P_{2\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	1	2189. 554	45657. 1	-----
5	2065. 474	48399. 6	$a^4D_{1\frac{1}{2}}-x^4F_{3\frac{1}{2}}$	20	2191. 923	45607. 8	$a^4P_{0\frac{1}{2}}-z^4D_{0\frac{1}{2}}$
30	2070. 515	48281. 8	$a^2F_{3\frac{1}{2}}-y^2D_{2\frac{1}{2}}$	10	2192. 419	45597. 5	$b^4F_{4\frac{1}{2}}-w^4F_{3\frac{1}{2}}$
15	2070. 768	48275. 8	$a^4F_{1\frac{1}{2}}-z^6F_{0\frac{1}{2}}$	200	2192. 889	45587. 7	$a^4P_{1\frac{1}{2}}-z^4D_{2\frac{1}{2}}$
3	2072. 151	48243. 6	$a^2H_{5\frac{1}{2}}-z^4H_{4\frac{1}{2}}$	20	2194. 970	45544. 5	$a^6D_{3\frac{1}{2}}-z^4P_{2\frac{1}{2}}$
200	2074. 581	48187. 3	$a^4P_{1\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	5	2195. 130	45541. 2	$a^2F_{2\frac{1}{2}}-z^2F_{2\frac{1}{2}}$
100	2078. 455	48097. 3	$a^2F_{2\frac{1}{2}}-y^4H_{3\frac{1}{2}}$	5	2195. 185	45540. 0	-----
50	2079. 967	48062. 3	$a^2F_{2\frac{1}{2}}-x^4F_{1\frac{1}{2}}$	20	2199. 165	45457. 6	$a^4D_{0\frac{1}{2}}-x^4D_{1\frac{1}{2}}$
30	2082. 916	47994. 3	$a^2F_{2\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	10	2201. 736	45404. 5	$a^4D_{1\frac{1}{2}}-x^4D_{2\frac{1}{2}}$

TABLE 6. *The second spectrum of ruthenium (Ru II)*—Continued

1	2	3	4	1	2	3	4
Intensity	λ (air)	σ	Term combination	Intensity	λ (vacuum)	σ	Term combination
	A	K			A	K	
10	2203. 837	45361. 3	$a^6D_{1\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	100	2276. 43	43914. 9	$a^6D_{3\frac{1}{2}}-z^4D_{3\frac{1}{2}}$
20	2204. 055	45356. 8	$a^2F_{3\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	10	2278. 84	43868. 4	$b^4P_{2\frac{1}{2}}-y^2D_{1\frac{1}{2}}$
20	2205. 108	45335. 2	$b^4F_{3\frac{1}{2}}-w^4D_{3\frac{1}{2}}$	10	2281. 15	43824. 0	$b^2D_{1\frac{1}{2}}-w^2D_{1\frac{1}{2}}$
100	2207. 328	45289. 5	$a^4P_{1\frac{1}{2}}-z^4D_{1\frac{1}{2}}$	300	2281. 72	43813. 1	$a^6D_{4\frac{1}{2}}-z^4F_{3\frac{1}{2}}$
30	2209. 067	45253. 9	$b^4F_{1\frac{1}{2}}-w^4D_{0\frac{1}{2}}$	30	2283. 02	43788. 1	$b^2D_{2\frac{1}{2}}-w^2D_{1\frac{1}{2}}$
							$b^2G_{4\frac{1}{2}}-v^2F_{3\frac{1}{2}}$
10	2209. 218	45250. 8	$a^4H_{0\frac{1}{2}}-y^2H_{3\frac{1}{2}}$				
1	2210. 997	45214. 4	$a^4F_{2\frac{1}{2}}-z^6D_{1\frac{1}{2}}$	4	2283. 41	43780. 6	$b^2F_{3\frac{1}{2}}-w^2D_{2\frac{1}{2}}$
10	2211. 325	45207. 7	$a^4P_{1\frac{1}{2}}-z^6P_{1\frac{1}{2}}$	2	2283. 71	43774. 9	
10	2212. 845	45176. 6	$b^4F_{2\frac{1}{2}}-w^4D_{1\frac{1}{2}}$	2h	2284. 31	43763. 4	
20	2213. 161	45170. 2		7h	2285. 10	43748. 3	
				2	2286. 20	43727. 2	$b^4F_{2\frac{1}{2}}-x^4P_{1\frac{1}{2}}$
5	2214. 392	45145. 0	$b^4F_{2\frac{1}{2}}-w^4D_{3\frac{1}{2}}$				
5	2216. 945	45093. 1	$\{a^2F_{2\frac{1}{2}}-x^4D_{3\frac{1}{2}}$	1H	2286. 39	43723. 6	$a^2F_{3\frac{1}{2}}-z^2F_{3\frac{1}{2}}$
			$\{a^4H_{3\frac{1}{2}}-y^2H_{3\frac{1}{2}}$	3	2287. 21	43707. 7	$a^2P_{1\frac{1}{2}}-z^4P_{1\frac{1}{2}}$
5	2217. 371	45084. 4	$a^4H_{4\frac{1}{2}}-y^2H_{3\frac{1}{2}}$	15	2287. 51	43702. 2	$b^2H_{4\frac{1}{2}}-w^2H_{3\frac{1}{2}}$
5	2217. 766	45076. 4	$b^2F_{3\frac{1}{2}}-v^2F_{3\frac{1}{2}}$	10	2288. 32	43686. 7	$a^2F_{2\frac{1}{2}}-z^2D_{3\frac{1}{2}}$
3	2217. 880	45074. 1	$a^6D_{4\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	15	2288. 80	43677. 5	$a^6D_{1\frac{1}{2}}-z^4D_{0\frac{1}{2}}$
3	2218. 312	45065. 3		10	2289. 80	43658. 5	$b^4F_{4\frac{1}{2}}-y^2H_{3\frac{1}{2}}$
500	2218. 552	45060. 4	$a^4P_{2\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	10	2289. 98	43654. 9	$a^2F_{2\frac{1}{2}}-z^2G_{3\frac{1}{2}}$
15	2218. 887	45053. 6		5	2290. 52	43644. 8	$b^4D_{3\frac{1}{2}}-w^2F_{3\frac{1}{2}}$
10	2220. 194	45027. 1	$a^4G_{0\frac{1}{2}}-x^2G_{4\frac{1}{2}}$	50	2291. 82	43620. 2	$a^6D_{0\frac{1}{2}}-z^4F_{1\frac{1}{2}}$
3	2220. 483	45021. 2	$b^4F_{3\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	15	2294. 10	43576. 6	
10	2222. 774	44974. 8	$b^2D_{2\frac{1}{2}}-v^2F_{3\frac{1}{2}}$	10	2295. 09	43557. 9	$b^2P_{1\frac{1}{2}}-y^2P_{1\frac{1}{2}}$
3	2224. 173	44946. 6	$a^4F_{3\frac{1}{2}}-z^6D_{1\frac{1}{2}}$	30	2295. 71	43546. 1	
50	2229. 284	44843. 5	$a^6D_{2\frac{1}{2}}-z^4P_{2\frac{1}{2}}$				
5	2230. 449	44820. 0	$b^4F_{1\frac{1}{2}}-w^4D_{1\frac{1}{2}}$	150	2296. 18	43537. 2	$\{a^4H_{3\frac{1}{2}}-y^4H_{3\frac{1}{2}}$
1	2231. 004	44808. 9					$\{a^4H_{4\frac{1}{2}}-y^4H_{4\frac{1}{2}}$
							$\{a^4H_{4\frac{1}{2}}-y^4H_{3\frac{1}{2}}$
3	2231. 144	44806. 1		15	2296. 64	43528. 5	$\{a^4H_{3\frac{1}{2}}-y^4H_{3\frac{1}{2}}$
1	2232. 770	44773. 5		30	2297. 97	43503. 3	$\{a^4H_{3\frac{1}{2}}-y^4H_{4\frac{1}{2}}$
30	2237. 73	44674. 3	$b^2D_{2\frac{1}{2}}-3^3P_{3\frac{1}{2}}$				
80	2243. 27	44564. 0	$a^4P_{2\frac{1}{2}}-z^6P_{2\frac{1}{2}}$	40	2298. 45	43494. 1	$a^4H_{4\frac{1}{2}}-y^4H_{4\frac{1}{2}}$
2	2246. 21	44505. 6	$b^2F_{2\frac{1}{2}}-v^2F_{3\frac{1}{2}}$	90	2298. 63	43490. 8	$a^6D_{1\frac{1}{2}}-z^4F_{2\frac{1}{2}}$
				1	2301. 46	43437. 3	
1	2247. 87	44472. 8	$a^4D_{3\frac{1}{2}}-z^4G_{4\frac{1}{2}}$	1	2301. 64	43433. 9	$a^4H_{4\frac{1}{2}}-x^4G_{3\frac{1}{2}}$
2	2248. 79	44454. 6	$a^2F_{2\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	100	2304. 63	43377. 6	$a^6D_{0\frac{1}{2}}-z^4D_{0\frac{1}{2}}$
7	2252. 20	44387. 3					
1	2252. 96	44372. 3	$a^6P_{2\frac{1}{2}}-z^4F_{1\frac{1}{2}}$	200	2304. 82	43374. 0	$a^6D_{2\frac{1}{2}}-z^4F_{3\frac{1}{2}}$
100	2254. 45	44343. 0	$a^4P_{1\frac{1}{2}}-z^6P_{2\frac{1}{2}}$	200	2305. 61	43359. 1	$\{a^6D_{1\frac{1}{2}}-z^4D_{1\frac{1}{2}}$
							$\{a^4H_{0\frac{1}{2}}-y^4H_{3\frac{1}{2}}$
100	2256. 07	44311. 1	$a^4P_{0\frac{1}{2}}-z^6P_{1\frac{1}{2}}$	10H	2306. 68	43339. 0	
20	2256. 25	44307. 6	$a^4P_{1\frac{1}{2}}-z^4P_{0\frac{1}{2}}$	10H	2306. 88	43335. 3	
50	2256. 67	44299. 6	$b^4F_{3\frac{1}{2}}-x^2F_{3\frac{1}{2}}$	3	2307. 76	43318. 7	$b^2F_{2\frac{1}{2}}-w^2D_{1\frac{1}{2}}$
80	2257. 12	44290. 5	$\{b^4F_{1\frac{1}{2}}-2^1I_{\frac{1}{2}}$	40	2308. 63	43302. 4	$b^2H_{3\frac{1}{2}}-y^2I_{3\frac{1}{2}}$
60	2260. 03	44233. 5	$\{b^2H_{4\frac{1}{2}}-w^2F_{3\frac{1}{2}}$	70	2309. 14	43292. 9	$a^4P_{2\frac{1}{2}}-z^6P_{3\frac{1}{2}}$
			$a^4D_{2\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	10	2309. 38	43288. 2	$b^2G_{3\frac{1}{2}}-v^2F_{3\frac{1}{2}}$
				50	2309. 52	43285. 9	$a^4H_{4\frac{1}{2}}-x^4F_{3\frac{1}{2}}$
15	2261. 56	44203. 6	$b^4P_{2\frac{1}{2}}-x^4P_{3\frac{1}{2}}$	40H	2311. 21	43254. 1	
100	2261. 78	44199. 1	$a^4G_{3\frac{1}{2}}-w^4F_{4\frac{1}{2}}$				
10	2262. 11	44192. 8	$b^4P_{1\frac{1}{2}}-w^4D_{3\frac{1}{2}}$	60H	2312. 01	43239. 1	$b^2H_{4\frac{1}{2}}-y^2I_{5\frac{1}{2}}?$
300	2263. 51	44165. 5	$a^6D_{4\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	10H	2312. 74	43225. 5	
400	2268. 14	44075. 4	$a^6D_{3\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	3	2313. 18	43217. 2	$a^4D_{1\frac{1}{2}}-y^4F_{3\frac{1}{2}}?$
				150	2313. 37	43213. 7	$a^6D_{2\frac{1}{2}}-z^4D_{2\frac{1}{2}}$
30H	2272. 76	43985. 8		50	2314. 02	43201. 6	$a^4H_{3\frac{1}{2}}-y^4H_{0\frac{1}{2}}$
2	2273. 19	43977. 4					
3h	2273. 66	43968. 4	$b^4F_{3\frac{1}{2}}-y^2H_{4\frac{1}{2}}$	50	2314. 78	43187. 2	$a^4H_{3\frac{1}{2}}-y^4H_{3\frac{1}{2}}$
150	2275. 00	43942. 5	$a^6D_{2\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	2	2315. 04	43182. 5	
100	2276. 14	43920. 5	$a^6D_{1\frac{1}{2}}-z^4F_{1\frac{1}{2}}$	10	2315. 27	43178. 2	$a^4H_{3\frac{1}{2}}-x^4F_{2\frac{1}{2}}$

TABLE 6. *The second spectrum of ruthenium (Ru II)*—Continued

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combina- tion	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
50	2315. 90	43166. 5	$\left\{ \begin{array}{l} a \ ^6D_{3/2} - z \ ^4D_{3/2} \\ b \ ^2H_{3/2} - y \ ^2F_{5/2} \end{array} \right.$	---	---	---	---	---	---
20 <i>H</i>	2316. 52	43154. 9	---	---	---	---	---	---	---
5	2316. 88	43148. 2	$a \ ^4D_{3/2} - z \ ^4H_{3/2}$	---	---	---	---	---	---
5	2317. 07	43144. 7	$a \ ^4H_{3/2} - y \ ^4H_{3/2}$	---	---	---	---	---	---
50	2318. 46	43118. 8	$a \ ^4G_{4/2} - w \ ^4F_{3/2}$	---	---	---	---	---	---
50 <i>h</i>	2319. 28	43103. 6	$b \ ^4F_{1/2} - y \ ^2F_{3/2}$	---	---	---	---	---	---
80	2321. 66	43059. 5	$\left\{ \begin{array}{l} a \ ^6D_{0/2} - z \ ^4D_{1/2} \\ a \ ^4P_{2/2} - z \ ^6F_{1/2} \\ a \ ^4G_{4/2} - w \ ^4F_{3/2} \end{array} \right.$	---	---	---	---	---	---
20	2322. 57	43042. 5	---	---	---	---	---	---	---
2	2322. 74	43039. 4	$b \ ^2H_{3/2} - w \ ^2H_{3/2}$	---	---	---	---	---	---
60	2322. 83	43037. 7	$a \ ^2F_{3/2} - y \ ^4F_{3/2}$	5	---	(1. 141)	1. 17	0	1. 29
3	2323. 50	43025. 4	$b \ ^2D_{1/2} - w \ ^2D_{3/2}$	---	---	---	---	---	---
3	2323. 66	43022. 3	$a \ ^4G_{2/2} - w \ ^4D_{1/2}$	---	---	---	---	---	---
40	2323. 76	43020. 5	---	---	---	---	---	---	---
6	2325. 41	42990. 0	$b \ ^2D_{2/2} - w \ ^2D_{3/2}$	---	---	---	---	---	---
10	2325. 51	42988. 1	$b \ ^2G_{3/2} - 3\ ^3_{3/2}$	---	---	---	---	---	---
5	2326. 21	42974. 8	$b \ ^2H_{4/2} - w \ ^2H_{3/2}$	---	---	---	---	---	---
40	2328. 16	42939. 2	$b \ ^2F_{3/2} - w \ ^2F_{3/2}$	---	---	---	---	---	---
40	2328. 33	42936. 0	$a \ ^4H_{3/2} - x \ ^4F_{3/2}$	---	---	---	---	---	---
150	2329. 02	42923. 4	$\left\{ \begin{array}{l} a \ ^4P_{2/2} - z \ ^6F_{3/2} \\ a \ ^4G_{3/2} - x \ ^2H_{3/2} \end{array} \right.$	6	0. 27	(1. 57)	1. 30	0. 67	1. 43
30	2330. 14	42902. 7	$a \ ^4P_{1/2} - z \ ^6F_{5/2}$	5	---	---	---	1. 08	2. 75
40 <i>H</i>	2331. 70	42874. 0	---	---	---	---	---	---	---
50 <i>H</i>	2332. 31	42862. 8	---	---	---	---	---	---	---
5	2332. 90	42851. 9	---	---	---	---	---	---	---
20	2333. 30	42844. 6	$a \ ^4G_{3/2} - w \ ^4D_{3/2}$	---	---	---	---	---	---
150	2333. 57	42839. 7	$a \ ^4P_{1/2} - z \ ^4F_{1/2}$	---	---	---	---	---	---
200	2333. 89	42833. 8	$a \ ^6D_{2/2} - z \ ^6P_{1/2}$	4	0. 722	1. 660	2. 382	0. 361	0. 577
8	2334. 27	42826. 8	$b \ ^4P_{0/2} - w \ ^4D_{3/2}$	---	---	---	---	---	---
300	2334. 96	42814. 2	$a \ ^6D_{3/2} - z \ ^4F_{3/2}$	4	. 229	1. 575	1. 346	. 111	0. 543
60	2335. 88	42797. 2	$a \ ^4H_{3/2} - x \ ^4G_{3/2}$	---	---	---	---	---	---
25	2336. 38	42788. 2	$a \ ^4H_{4/2} - x \ ^4G_{3/2}$	---	---	---	---	---	---
200 <i>H</i>	2336. 83	42779. 9	---	---	---	---	---	---	---
0	2337. 09	42775. 1	$b \ ^4P_{1/2} - x \ ^4P_{1/2}$	---	---	---	---	---	---
100	2337. 84	42761. 4	$a \ ^6D_{1/2} - z \ ^4D_{3/2}$	4	. 494	(1. 843)	1. 349	. 247	?
20	2338. 74	42745. 0	$b \ ^2H_{4/2} - w \ ^2G_{3/2}$	---	---	---	---	---	---
20	2339. 10	42738. 4	$a \ ^2P_{1/2} - z \ ^4P_{3/2}$	---	---	---	---	---	---
15	2339. 92	42723. 5	$b \ ^2H_{3/2} - w \ ^2G_{3/2}$	---	---	---	---	---	---
60	2339. 95	42722. 9	---	---	---	---	---	---	---
5	2339. 98	42722. 3	---	---	---	---	---	---	---
30	2340. 51	42712. 7	$a \ ^4H_{3/2} - y \ ^2G_{3/2}$	---	---	---	---	---	---
100	2341. 06	42702. 6	$\left\{ \begin{array}{l} a \ ^4P_{1/2} - z \ ^6F_{3/2} \\ a \ ^4G_{3/2} - w \ ^4F_{3/2} \end{array} \right.$	4	. 36	1. 68	1. 32	. 18	0. 78
10	2342. 37	42679. 4	---	---	---	---	---	---	---
300	2342. 85	42670. 0	$a \ ^6D_{3/2} - z \ ^6P_{3/2}$	4	. 254	1. 576	1. 830	. 126	0. 942
30	2343. 43	42659. 4	$b \ ^2H_{4/2} - w \ ^2G_{3/2}$	---	---	---	---	---	---
20	2344. 46	42640. 7	$b \ ^4F_{2/2} - y \ ^2D_{1/2}$	---	---	---	---	---	---
100 <i>H</i>	2344. 84	42633. 8	---	---	---	---	---	---	---
12	2345. 48	42622. 1	$b \ ^4F_{3/2} - y \ ^2D_{3/2}$	---	---	---	---	---	---
150	2346. 38	42605. 8	$a \ ^4P_{2/2} - z \ ^6F_{3/2}$	---	---	---	---	---	---
3	2348. 74	42563. 0	---	---	---	---	---	---	---
5 <i>h</i>	2350. 08	42538. 8	---	---	---	---	---	---	---
200	2350. 53	42530. 6	$a \ ^4G_{3/2} - w \ ^4F_{3/2}$	7*	---	---	---	0	1. 032
10	2350. 59	42529. 5	---	---	---	---	---	---	---
15	2351. 07	42520. 8	$b \ ^2F_{2/2} - w \ ^2D_{3/2}$	---	---	---	---	---	---
3	2351. 63	42510. 7	---	---	---	---	---	---	---
3	2351. 79	42507. 8	$b \ ^4P_{1/2} - y \ ^2F_{3/2}$	---	---	---	---	---	---
4	2352. 25	42499. 5	$b \ ^2D_{1/2} - y \ ^2P_{1/2}$	---	---	---	---	---	---

TABLE 6. *The second spectrum of ruthenium (Ru II)*—Continued

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	A	K							
3	2352.63	42492.7	$\left\{ \begin{array}{l} b \ ^4P_{2\frac{1}{2}}-x \ ^4F_{3\frac{1}{2}} \\ a \ ^4G_{2\frac{1}{2}}-2\ ^2D_{1\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
40	2354.24	42463.6	$\left\{ \begin{array}{l} a \ ^2P_{0\frac{1}{2}}-z \ ^4P_{0\frac{1}{2}} \\ b \ ^2D_{2\frac{1}{2}}-y \ ^2P_{1\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
5h	2354.43	42460.1	$a \ ^2P_{3\frac{1}{2}}-y \ ^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2355.63	42438.4	$a \ ^4H_{3\frac{1}{2}}-x \ ^4G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2355.97	42432.4	$b \ ^4F_{2\frac{1}{2}}-y \ ^2D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
6H	2356.47	42423.4	$a \ ^2S_{0\frac{1}{2}}-w \ ^4P_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
600	2357.92	42397.4	$a \ ^6D_{4\frac{1}{2}}-z \ ^6P_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
400	2358.79	42381.7	$a \ ^6D_{1\frac{1}{2}}-z \ ^6P_{1\frac{1}{2}}$	6	0.517	1.844	2.361	0.770	2.102
150	2359.10	42376.0	$a \ ^4H_{6\frac{1}{2}}-x \ ^4G_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40H	2360.61	42349.0	$b \ ^2F_{3\frac{1}{2}}-w \ ^2H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5H	2361.91	42325.7	-----	-----	-----	-----	-----	-----	-----
6	2363.02	42305.8	$a \ ^4H_{3\frac{1}{2}}-y \ ^4D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5H	2363.32	42300.4	-----	-----	-----	-----	-----	-----	-----
5H	2363.92	42289.7	-----	-----	-----	-----	-----	-----	-----
50	2364.23	42284.2	$b \ ^4F_{1\frac{1}{2}}-y \ ^2D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3h	2366.01	42252.3	-----	-----	-----	-----	-----	-----	-----
150	2367.22	42230.7	$a \ ^4G_{2\frac{1}{2}}-w \ ^4F_{1\frac{1}{2}}$	5	0.161	0.642	0.480	0.080	0.884
15	2367.88	42219.0	$a \ ^4H_{5\frac{1}{2}}-x \ ^4G_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2368.37	42210.2	$a \ ^4H_{4\frac{1}{2}}-x \ ^4G_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2369.65	42187.4	-----	-----	-----	-----	-----	-----	-----
10	2369.83	42184.2	$a \ ^4G_{5\frac{1}{2}}-y \ ^2H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
80	2371.84	42148.5	$\left\{ \begin{array}{l} a \ ^4G_{4\frac{1}{2}}-x \ ^2F_{3\frac{1}{2}} \\ b \ ^2D_{2\frac{1}{2}}-w \ ^2F_{3\frac{1}{2}} \end{array} \right\}$	5	-----	(1.167)	1.14	w	1.24
100	2371.91	42147.2	$a \ ^4H_{4\frac{1}{2}}-y \ ^2G_{3\frac{1}{2}}$	5	-----	(1.14)	1.06	o	1.41
2H	2373.05	42127.0	-----	-----	-----	-----	-----	-----	-----
20	2373.96	42110.8	$\left\{ \begin{array}{l} a \ ^4H_{4\frac{1}{2}}-x \ ^4D_{3\frac{1}{2}} \\ b \ ^4F_{4\frac{1}{2}}-y \ ^4H_{3\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
7	2374.67	42098.3	$b \ ^4D_{2\frac{1}{2}}-x \ ^2D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
400	2375.63	42081.3	$a \ ^6D_{0\frac{1}{2}}-z \ ^6P_{1\frac{1}{2}}$	4	0.920	3.271	2.351	0.460	1.890
30	2376.23	42070.6	$c \ ^2G_{4\frac{1}{2}}-3\ ^3\ ^2P_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2376.35	42068.5	$b \ ^4F_{4\frac{1}{2}}-y \ ^4H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
4h	2378.84	42024.5	$a \ ^2P_{1\frac{1}{2}}-z \ ^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2379.07	42020.4	-----	-----	-----	-----	-----	-----	-----
100	2379.60	42011.0	$a \ ^4H_{5\frac{1}{2}}-z \ ^2H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
100	2379.84	42006.8	$a \ ^4P_{0\frac{1}{2}}-z \ ^6F_{0\frac{1}{2}}$	6	3.21	2.61	-0.60	1.60	1.00
1	2380.39	41997.1	-----	-----	-----	-----	-----	-----	-----
400	2381.99	41968.9	$a \ ^6D_{2\frac{1}{2}}-z \ ^6P_{2\frac{1}{2}}$	6	0.189	1.646	1.835	0.475	1.741
10	2382.74	41955.7	$a \ ^4G_{2\frac{1}{2}}-x \ ^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
90	2383.42	41943.8	$a \ ^4P_{0\frac{1}{2}}-z \ ^6F_{1\frac{1}{2}}$	4	1.55	2.61	1.06	.77	0.30
5	2383.96	41934.2	-----	-----	-----	-----	-----	-----	-----
1	2384.95	41916.8	-----	-----	-----	-----	-----	-----	-----
2	2385.29	41910.8	$a \ ^4G_{4\frac{1}{2}}-y \ ^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10h	2386.19	41895.0	-----	-----	-----	-----	-----	-----	-----
20H	2386.71	41885.9	-----	-----	-----	-----	-----	-----	-----
10	2388.04	41862.5	$b \ ^4P_{2\frac{1}{2}}-y \ ^4D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2388.23	41859.3	$b \ ^4F_{4\frac{1}{2}}-x \ ^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3h	2388.53	41854.0	-----	-----	-----	-----	-----	-----	-----
2h	2388.67	41851.5	-----	-----	-----	-----	-----	-----	-----
2	2389.47	41837.5	$a \ ^2P_{1\frac{1}{2}}-z \ ^4F_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
15	2390.09	41826.7	$a \ ^4G_{4\frac{1}{2}}-y \ ^2H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2390.32	41822.6	$c \ ^2G_{3\frac{1}{2}}-v \ ^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2391.10	41809.1	$a \ ^4G_{3\frac{1}{2}}-x \ ^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	2391.44	41803.0	-----	-----	-----	-----	-----	-----	-----
60	2391.77	41797.4	$a \ ^4H_{3\frac{1}{2}}-y \ ^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2392.59	41784.7	$b \ ^4D_{3\frac{1}{2}}-x \ ^2D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
200	2393.84	41761.1	$a \ ^4H_{3\frac{1}{2}}-x \ ^4D_{3\frac{1}{2}}$	6	0.202	(0.753)	0.955	0.707	?
600	2396.71	41711.2	$a \ ^6D_{4\frac{1}{2}}-z \ ^6F_{3\frac{1}{2}}$	5	-----	(1.54)	1.47	0	1.78

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
80	2396. 97	41706. 6	$\{a \ ^2P_{1\frac{1}{2}}-z \ ^4D_{1\frac{1}{2}}\}$	-----	-----	-----	-----	-----	-----
40	2397. 49	41697. 6	$\{b \ ^4F_{3\frac{1}{2}}-y \ ^4H_{3\frac{1}{2}}\}$	-----	-----	-----	-----	-----	-----
100	2397. 69	41694. 1	$b \ ^4F_{3\frac{1}{2}}-x \ ^4F_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2399. 52	41662. 3	$a \ ^6D_{4\frac{1}{2}}-z \ ^6F_{4\frac{1}{2}}$	6 <i>us</i>	-----	-----	-----	-----	-----
5	2400. 10	41652. 2	$\{a \ ^2F_{3\frac{1}{2}}-z \ ^4G_{3\frac{1}{2}}\}$	-----	-----	-----	-----	-----	-----
			$\{a \ ^4H_{3\frac{1}{2}}-z \ ^2H_{4\frac{1}{2}}\}$	-----	-----	-----	-----	-----	-----
3 <i>H</i>	2400. 44	41646. 4	-----	-----	-----	-----	-----	-----	-----
20	2401. 02	41636. 4	$b \ ^4F_{4\frac{1}{2}}-y \ ^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2401. 26	41632. 1	$b \ ^4D_{0\frac{1}{2}}-x \ ^2D_{1\frac{1}{2}}?$	-----	-----	-----	-----	-----	-----
40	2401. 85	41621. 9	-----	-----	-----	-----	-----	-----	-----
800	2402. 72	41606. 9	$a \ ^6D_{4\frac{1}{2}}-z \ ^6F_{5\frac{1}{2}}$	4	(0. 10)	(1. 54)	1. 44	0. 48 <i>w</i>	0. 97+
3	2404. 66	41573. 2	$\{a \ ^4G_{2\frac{1}{2}}-x \ ^4P_{1\frac{1}{2}}\}$	-----	-----	-----	-----	-----	-----
10	2404. 79	41571. 0	$\{b \ ^4D_{2\frac{1}{2}}-x \ ^2D_{1\frac{1}{2}}\}$	-----	-----	-----	-----	-----	-----
			$a \ ^4G_{3\frac{1}{2}}-y \ ^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2405. 28	41562. 6	$a \ ^2F_{3\frac{1}{2}}-z \ ^4G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2 <i>h</i>	2405. 65	41556. 2	-----	-----	-----	-----	-----	-----	-----
20	2406. 06	41549. 1	$a \ ^4H_{0\frac{1}{2}}-z \ ^2H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
4	2406. 65	41538. 8	-----	-----	-----	-----	-----	-----	-----
20	2407. 31	41527. 5	$a \ ^4H_{4\frac{1}{2}}-y \ ^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
300	2407. 92	41517. 1	$a \ ^6D_{1\frac{1}{2}}-z \ ^6P_{3\frac{1}{2}}$	7	-----	(1. 843)	1. 88	0	1. 82
50	2408. 44	41508. 0	$b \ ^4F_{2\frac{1}{2}}-x \ ^4F_{2\frac{1}{2}}$	6	(0. 04)	0. 94	0. 98	0. 12	0. 96
2	2409. 34	41492. 5	$a \ ^4H_{3\frac{1}{2}}-y \ ^4G_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2409. 68	41486. 7	$a \ ^4G_{3\frac{1}{2}}-y \ ^2H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
150	2410. 15	41478. 6	$a \ ^4H_{3\frac{1}{2}}-y \ ^4G_{3\frac{1}{2}}$	5	(0. 07)	(0. 753)	. 68	. 17 <i>w</i>	. 92-
100	2411. 51	41455. 2	$b \ ^4F_{3\frac{1}{2}}-x \ ^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2413. 40	41422. 8	$b \ ^2H_{3\frac{1}{2}}-x \ ^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20 <i>H</i>	2413. 80	41415. 9	-----	-----	-----	-----	-----	-----	-----
20	2413. 92	41413. 8	$b \ ^4F_{2\frac{1}{2}}-x \ ^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
150	2414. 82	41398. 4	$a \ ^6D_{3\frac{1}{2}}-z \ ^6P_{3\frac{1}{2}}$	7	-----	(1. 576)	1. 592	0	1. 584
120	2415. 20	41391. 9	$a \ ^4H_{3\frac{1}{2}}-z \ ^2H_{5\frac{1}{2}}$	6 <i>us</i>	-----	-----	-----	-----	1. 36
100	2415. 72	41383. 0	$a \ ^4H_{4\frac{1}{2}}-z \ ^2H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2416. 06	41377. 1	$b \ ^4F_{0\frac{1}{2}}-x \ ^4P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
120	2416. 96	41361. 7	$b \ ^4F_{4\frac{1}{2}}-x \ ^4G_{4\frac{1}{2}}$	6	(0. 04)	1. 17	1. 21	. 16-	1. 19
60	2418. 96	41327. 6	$b \ ^2H_{5\frac{1}{2}}-x \ ^2H_{4\frac{1}{2}}$	7	-----	(1. 053)	1. 05	0	1. 04
15	2420. 10	41308. 0	$b \ ^2F_{3\frac{1}{2}}-w \ ^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2420. 24	41305. 6	$a \ ^4G_{2\frac{1}{2}}-y \ ^2F_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2421. 28	41288. 0	-----	-----	-----	-----	-----	-----	-----
5 <i>H</i>	2422. 08	41274. 3	-----	-----	-----	-----	-----	-----	-----
3	2422. 68	41264. 0	$b \ ^2H_{4\frac{1}{2}}-x \ ^2H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2422. 84	41261. 3	$b \ ^4D_{3\frac{1}{2}}-w \ ^4D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5 <i>H</i>	2423. 62	41248. 1	-----	-----	-----	-----	-----	-----	-----
70	2424. 56	41232. 0	$b \ ^4F_{3\frac{1}{2}}-y \ ^2G_{4\frac{1}{2}}$	4	-----	(1. 093)	1. 06	0	1. 00+
3 <i>H</i>	2425. 46	41216. 8	-----	-----	-----	-----	-----	-----	-----
50	2426. 59	41197. 6	$b \ ^2P_{0\frac{1}{2}}-y \ ^2P_{1\frac{1}{2}}$	5	0. 408	0. 890	1. 298	0. 204	1. 502
40	2426. 99	41190. 8	-----	6	-----	-----	-----	. 59	?
60	2427. 75	41177. 9	$a \ ^4H_{3\frac{1}{2}}-y \ ^4G_{3\frac{1}{2}}$	6	. 26	. 76	1. 02	. 920	0. 89
10	2428. 86	41159. 0	$a \ ^4G_{3\frac{1}{2}}-y \ ^2F_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2429. 01	41156. 6	-----	-----	-----	-----	-----	-----	-----
60	2430. 40	41133. 0	$c \ ^2G_{3\frac{1}{2}}-v \ ^2F_{2\frac{1}{2}}$	7	-----	(0. 942)	0. 96	0	. 900
3 <i>h</i>	2430. 72	41127. 6	-----	-----	-----	-----	-----	-----	-----
50	2430. 94	41123. 9	$\{b \ ^2H_{4\frac{1}{2}}-x \ ^2G_{3\frac{1}{2}}\}$	6	. 20	0. 415	. 62	0. 40	?
			$\{b \ ^4F_{1\frac{1}{2}}-x \ ^4F_{1\frac{1}{2}}\}$	-----	-----	-----	-----	-----	-----
2 <i>h</i>	2431. 21	41119. 3	$a \ ^6S_{2\frac{1}{2}}-w \ ^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2431. 82	41109. 0	$a \ ^2P_{1\frac{1}{2}}-z \ ^4D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2432. 16	41103. 2	$a \ ^4G_{4\frac{1}{2}}-y \ ^2H_{5\frac{1}{2}}$	4*	-----	-----	-----	. 30 <i>w</i>	0. 76+
40	2433. 58	41079. 2	$b \ ^2F_{3\frac{1}{2}}-x \ ^2D_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	2433. 86	41074. 4	-----	-----	-----	-----	-----	-----	-----
2	2434. 03	41071. 7	-----	-----	-----	-----	-----	-----	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
6	2434. 74	41059. 6	$b^4P_{1\frac{1}{2}}-1^1\dot{1}_{\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
80	2434. 98	41055. 7	$a^4H_{5\frac{1}{2}}-y^4G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
4	2435. 33	41049. 8	-----	-----	-----	-----	-----	-----	-----
200	2435. 51	41046. 8	$a^4H_{4\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	6us	-----	-----	-----	. 38	1. 37±
2	2436. 23	41034. 6	$b^4P_{2\frac{1}{2}}-y^4G_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2436. 55	41029. 3	$a^6D_{3\frac{1}{2}}-z^6F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1h	2438. 94	40989. 0	$b^4P_{2\frac{1}{2}}-y^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2h	2439. 15	40985. 5	-----	-----	-----	-----	-----	-----	-----
150H	2439. 69	40976. 3	-----	-----	-----	-----	-----	-----	-----
2	2440. 13	40969. 0	$a^2F_{2\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
80	2440. 80	40957. 7	$b^4F_{3\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
70	2441. 37	40948. 3	-----	-----	-----	-----	-----	0. 25w	?
30	2441. 61	40944. 1	$b^4F_{1\frac{1}{2}}-z^2P_{0\frac{1}{2}}$	4	0. 42	0. 42	0. 84	. 21	0. 21
100Hw	2443. 30	40915. 8	$b^4F_{2\frac{1}{2}}-x^4G_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40H	2445. 55	40878. 2	-----	-----	-----	-----	-----	-----	-----
8	2446. 55	40861. 5	$b^4D_{1\frac{1}{2}}-w^4D_{0\frac{1}{2}}?$	-----	-----	-----	-----	-----	-----
8	2446. 77	40857. 8	$b^2P_{1\frac{1}{2}}-x^2D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2448. 36	40831. 4	-----	-----	-----	-----	-----	-----	-----
10	2448. 91	40822. 1	$\left\{ \begin{array}{l} a^4G_{2\frac{1}{2}}-x^4P_{3\frac{1}{2}} \\ c^2D_{2\frac{1}{2}}-v^2F_{3\frac{1}{2}} \\ z^6D_{3\frac{1}{2}}-e^4D_{2\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
200H	2449. 58	40811. 0	-----	-----	-----	-----	-----	-----	-----
30	2450. 88	40789. 3	$b^4D_{0\frac{1}{2}}-w^4D_{0\frac{1}{2}}$	6	. 43	. 13	. 56	. 216	. 34?
40	2451. 23	40783. 5	$b^4F_{4\frac{1}{2}}-x^4G_{5\frac{1}{2}}$	4	(0. 04)	1. 20	1. 16	. 19w	. 96+
10	2451. 66	40776. 3	-----	-----	-----	-----	-----	-----	-----
5	2452. 53	40761. 9	-----	-----	-----	-----	-----	-----	-----
60	2453. 82	40740. 5	$b^2H_{5\frac{1}{2}}-x^2H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2454. 16	40734. 8	$b^4P_{2\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2454. 99	40721. 0	$b^4F_{4\frac{1}{2}}-y^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
600	2455. 53	40712. 0	$a^6D_{3\frac{1}{2}}-z^6F_{3\frac{1}{2}}$	6us	(0. 11)	1. 58	1. 47	. 39-	1. 53±
500	2456. 44	40697. 0	$a^6D_{2\frac{1}{2}}-z^6P_{3\frac{1}{2}}$	4	-----	(1. 637)	1. 57	w	1. 39+
500	2456. 57	40694. 8	$a^6D_{3\frac{1}{2}}-z^6F_{4\frac{1}{2}}$	4	-----	(1. 576)	1. 43	. 39w	0. 93+
20	2457. 19	40684. 6	$b^4F_{4\frac{1}{2}}-x^4D_{3\frac{1}{2}}$	5	0. 24	(1. 200)	0. 96	. 12	-----
10	2459. 24	40650. 7	-----	-----	-----	-----	-----	-----	-----
20	2459. 42	40647. 6	-----	-----	-----	-----	-----	-----	-----
20	2460. 18	40635. 2	$b^4F_{2\frac{1}{2}}-y^4D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2460. 43	40631. 1	$a^4H_{3\frac{1}{2}}-z^2F_{2\frac{1}{2}}$	4	-----	(0. 753)	. 82	w	. 60
20	2460. 59	40628. 4	$a^4G_{5\frac{1}{2}}-y^4H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2461. 54	40612. 8	-----	-----	-----	-----	-----	-----	-----
20	2462. 17	40602. 3	$b^2D_{2\frac{1}{2}}-w^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2462. 65	40594. 4	$a^4G_{5\frac{1}{2}}-y^4H_{4\frac{1}{2}}$	5	0. 243	(1. 237)	0. 994	0. 122	?
1	2463. 86	40574. 4	-----	-----	-----	-----	-----	-----	-----
2	2464. 24	40568. 1	-----	-----	-----	-----	-----	-----	-----
100	2464. 76	40559. 7	$b^4F_{1\frac{1}{2}}-x^4G_{2\frac{1}{2}}$	5	2. 74	0. 442	. 716	. 141	1. 127
25	2465. 00	40555. 6	$\left\{ \begin{array}{l} b^4P_{1\frac{1}{2}}-x^4F_{3\frac{1}{2}} \\ b^2F_{3\frac{1}{2}}-w^4D_{3\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
1	2465. 52	40547. 1	$b^4P_{0\frac{1}{2}}-z^2S_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2466. 61	40529. 2	$b^4P_{1\frac{1}{2}}-x^4F_{1\frac{1}{2}}?$	-----	-----	-----	-----	-----	-----
1	2467. 05	40522. 0	$c^2D_{2\frac{1}{2}}-3^3\dot{3}_{\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	2467. 33	40517. 4	-----	-----	-----	-----	-----	-----	-----
2H	2468. 71	40494. 7	-----	-----	-----	-----	-----	-----	-----
20	2469. 25	40485. 9	$a^4G_{2\frac{1}{2}}-y^2D_{1\frac{1}{2}}?$	-----	-----	-----	-----	-----	-----
40	2469. 77	40477. 4	$b^4D_{3\frac{1}{2}}-x^2G_{3\frac{1}{2}}$	6	. 275	(1. 397)	1. 122	. 963	-----
60	2470. 51	40465. 3	$a^6D_{2\frac{1}{2}}-z^6F_{1\frac{1}{2}}$	5	. 582	1. 629	1. 047	. 294	2. 502
30	2471. 05	40456. 4	$b^2H_{4\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	*	-----	-----	-----	w	1. 36
3H	2471. 76	40444. 8	-----	-----	-----	-----	-----	-----	-----
20	2472. 44	40433. 7	-----	6	-----	-----	-----	. 28	0. 98
30	2472. 83	40427. 2	$b^4D_{1\frac{1}{2}}-w^4D_{1\frac{1}{2}}$	7	-----	(1. 200)	1. 214	0	1. 207

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combina- tion	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
8	2472. 99	40424. 7	$a \ ^2P_{0\frac{1}{2}}-z \ ^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2473. 57	40415. 1	-----	-----	-----	-----	-----	-----	-----
5 h	2473. 83	40410. 9	-----	-----	-----	-----	-----	-----	-----
30	2474. 76	40395. 7	$b \ ^4D_{1\frac{1}{2}}-w \ ^4D_{3\frac{1}{2}}$	5	-----	(1. 200)	1. 30	w	1. 44
4	2476. 15	40373. 1	$b \ ^2G_{4\frac{1}{2}}-w \ ^2H_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2477. 17	40356. 4	$b \ ^4F_{4\frac{1}{2}}-x \ ^4F_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	2477. 26	40355. 0	$b \ ^4D_{0\frac{1}{2}}-w \ ^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
8	2477. 98	40343. 3	-----	-----	-----	-----	-----	-----	-----
20	2478. 36	40337. 2	-----	-----	-----	-----	-----	-----	-----
500	2478. 93	40327. 9	$a \ ^6D_{2\frac{1}{2}}-z \ ^6F_{3\frac{1}{2}}$	6	0. 334	1. 635	1. 301	0. 851	1. 468
5	2480. 20	40307. 0	$\left\{ \begin{array}{l} b \ ^4F_{2\frac{1}{2}}-z \ ^2P_{1\frac{1}{2}} \\ b \ ^4D_{1\frac{1}{2}}-x \ ^4P_{0\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
30	2480. 81	40297. 1	$a \ ^4H_{6\frac{1}{2}}-z \ ^2I_{5\frac{1}{2}}$	5	. 181	(1. 23)	1. 05	. 09	2. 16?
200	2481. 11	40292. 4	$a \ ^4G_{5\frac{1}{2}}-y \ ^4H_{6\frac{1}{2}}$	4	-----	(1. 237)	1. 20	. 20 w	1. 02+
15	2481. 85	40280. 4	$b \ ^4F_{3\frac{1}{2}}-x \ ^4D_{3\frac{1}{2}}$	6	-----	-----	-----	-----	-----
60	2482. 78	40265. 2	$b \ ^4D_{2\frac{1}{2}}-w \ ^4D_{3\frac{1}{2}}$	6	(0. 044)	1. 345	1. 301	. 110	1. 323
1	2483. 20	40258. 5	-----	-----	-----	-----	-----	-----	-----
3	2483. 54	40253. 0	-----	-----	-----	-----	-----	-----	-----
50	2483. 96	40246. 2	$a \ ^4H_{6\frac{1}{2}}-z \ ^4I_{6\frac{1}{2}}$	6	(0. 10)	1. 23	1. 03	. 67-	1. 13±
5	2484. 49	40237. 5	$a \ ^2F_{3\frac{1}{2}}-z \ ^4H_{3\frac{1}{2}}$	6	-----	-----	-----	-----	-----
10	2484. 67	40234. 6	$b \ ^4D_{0\frac{1}{2}}-x \ ^4P_{0\frac{1}{2}}$	6	1. 62	0. 14	1. 76	. 81	0. 95
8	2487. 20	40193. 7	$b \ ^4D_{2\frac{1}{2}}-y \ ^6P_{3\frac{1}{2}}$	5*	0. 268	1. 306	1. 574	. 135	2. 244?
4 H	2487. 51	40188. 7	$b \ ^4P_{2\frac{1}{2}}-z \ ^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2487. 90	40182. 4	$a \ ^4H_{3\frac{1}{2}}-x \ ^4D_{3\frac{1}{2}}?$	-----	-----	-----	-----	-----	-----
30	2488. 57	40171. 6	$b \ ^4F_{3\frac{1}{2}}-z \ ^2H_{3\frac{1}{2}}$	4	-----	(1. 093)	1. 02	. 23 w	0. 76+
3	2488. 88	40166. 6	-----	-----	-----	-----	-----	-----	-----
50	2489. 34	40159. 2	$a \ ^2I_{5\frac{1}{2}}-w \ ^2H_{3\frac{1}{2}}$	4	-----	(0. 90)	0. 91	w	. 87
6	2490. 54	40139. 8	$a \ ^4H_{5\frac{1}{2}}-z \ ^4I_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	2491. 08	40131. 2	$a \ ^4G_{3\frac{1}{2}}-y \ ^2D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2491. 10	40130. 8	$a \ ^4H_{4\frac{1}{2}}-z \ ^2I_{5\frac{1}{2}}$	5	-----	(0. 943)	1. 028	w	1. 24-
5	2491. 34	40127. 0	$b \ ^4F_{2\frac{1}{2}}-y \ ^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2491. 56	40123. 4	$b \ ^4D_{2\frac{1}{2}}-w \ ^4F_{3\frac{1}{2}}$	7, 4	-----	(1. 344)	1. 32	0	1. 26
5	2493. 59	40090. 9	$b \ ^4F_{2\frac{1}{2}}-x \ ^4D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
300	2493. 68	40089. 2	$a \ ^4H_{5\frac{1}{2}}-z \ ^4I_{6\frac{1}{2}}$	7*	-----	-----	-----	0	1. 124
10	2494. 16	40081. 6	$b \ ^4D_{1\frac{1}{2}}-w \ ^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2494. 48	40076. 4	$a \ ^6D_{1\frac{1}{2}}-z \ ^6F_{0\frac{1}{2}}$	5	2. 50	1. 83	-0. 67	1. 25	3. 08
2 h	2495. 35	40062. 4	-----	-----	-----	-----	-----	-----	-----
200	2495. 69	40057. 0	$b \ ^4F_{4\frac{1}{2}}-y \ ^4G_{3\frac{1}{2}}$	4	-----	(1. 200)	1. 17	w	1. 03+
2 h	2495. 94	40053. 0	-----	-----	-----	-----	-----	-----	-----
25	2496. 86	40038. 2	-----	6	-----	-----	-----	0. 26-	0. 98±
1	2497. 36	40030. 2	$b \ ^4D_{3\frac{1}{2}}-x \ ^2H_{3\frac{1}{2}}?$	-----	-----	-----	-----	-----	-----
200	2498. 41	40013. 4	$a \ ^6D_{1\frac{1}{2}}-z \ ^6F_{1\frac{1}{2}}$?	-----	-----	-----	-----	-----
200	2498. 58	40010. 7	$a \ ^6D_{2\frac{1}{2}}-z \ ^6F_{3\frac{1}{2}}$	4	0. 180	1. 637	1. 457	. 091	1. 007
8	2499. 38	39997. 8	$b \ ^4F_{3\frac{1}{2}}-y \ ^4G_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2499. 56	39994. 9	-----	-----	-----	-----	-----	-----	-----
50	2500. 14	39985. 6	$a \ ^2I_{6\frac{1}{2}}-y \ ^2I_{5\frac{1}{2}}$	5	(0. 08)	1. 08	1. 00	. 41 w	1. 52-
100	2501. 95	39956. 8	$b \ ^4F_{4\frac{1}{2}}-z \ ^2H_{3\frac{1}{2}}$	4	(0. 06)	1. 20	1. 14	. 25 w	0. 87+
40 h	2502. 30	39951. 3	$\left\{ \begin{array}{l} b \ ^4D_{2\frac{1}{2}}-w \ ^4F_{3\frac{1}{2}} \\ b \ ^4D_{3\frac{1}{2}}-w \ ^4D_{3\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
5 H	2503. 22	39936. 5	-----	-----	-----	-----	-----	-----	-----
10	2504. 92	39909. 5	$b \ ^2G_{4\frac{1}{2}}-y \ ^2I_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2505. 64	39897. 9	$\left\{ \begin{array}{l} a \ ^2G_{4\frac{1}{2}}-z \ ^6F_{3\frac{1}{2}} \\ b \ ^4D_{1\frac{1}{2}}-2\ ^2I_{\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
15	2505. 89	39894. 0	$a \ ^4H_{4\frac{1}{2}}-z \ ^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2506. 25	39888. 2	$a \ ^4G_{5\frac{1}{2}}-x \ ^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2506. 42	39885. 5	$b \ ^4D_{3\frac{1}{2}}-w \ ^4F_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
300	2507. 00	39876. 3	$a \ ^6D_{1\frac{1}{2}}-z \ ^6F_{3\frac{1}{2}}$	4	0. 536	1. 869	1. 333	. 267	0. 592
4	2507. 50	39868. 4	-----	-----	-----	-----	-----	-----	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
100	2508. 67	39849. 8	$a \ ^2I_{6\frac{1}{2}}-y \ ^2I_{6\frac{1}{2}}$	7	(0. 00)	1. 08	1. 08	0	1. 08
3	2509. 42	39837. 8	$c \ ^2G_{3\frac{1}{2}}-w \ ^2D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
6 <i>H</i>	2511. 22	39809. 3	$b \ ^4D_{3\frac{1}{2}}-w \ ^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2511. 59	39803. 4	-----	-----	-----	-----	-----	-----	-----
5 <i>H</i>	2512. 52	39788. 7	-----	-----	-----	-----	-----	-----	-----
150	2513. 32	39776. 0	$a \ ^6D_{0\frac{1}{2}}-z \ ^6F_{0\frac{1}{2}}$	6	3. 87	3. 28	-0. 59	1. 935	1. 347
1	2513. 61	39771. 5	$b \ ^2F_{3\frac{1}{2}}-x \ ^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3 <i>h</i>	2514. 16	39762. 8	$b \ ^2D_{2\frac{1}{2}}-x \ ^2D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
8	2515. 63	39739. 5	$b \ ^4P_{2\frac{1}{2}}-x \ ^4D_{2\frac{1}{2}}$	6 <i>us</i>	-----	-----	-----	-----	-----
10	2516. 71	39722. 4	$a \ ^2I_{6\frac{1}{2}}-w \ ^2H_{6\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
200	2517. 32	39712. 8	$a \ ^6D_{0\frac{1}{2}}-z \ ^6F_{1\frac{1}{2}}$	4	2. 21	3. 26	1. 05	1. 11	-0. 06?
100	2518. 41	39695. 6	$a \ ^2I_{6\frac{1}{2}}-y \ ^2I_{5\frac{1}{2}}$	6	(0. 05)	0. 90	0. 95	0. 29	. 93
75	2519. 20	39683. 2	$b \ ^4P_{1\frac{1}{2}}-y \ ^4D_{2\frac{1}{2}}$	4	0. 327	1. 634	1. 307	. 164	. 817
10	2520. 57	39661. 6	$b \ ^4P_{0\frac{1}{2}}-1 \ ^1I_{1\frac{1}{2}}$	6 <i>us</i>	-----	-----	-----	-----	-----
40	2520. 82	39657. 6	$a \ ^4H_{4\frac{1}{2}}-z \ ^2G_{4\frac{1}{2}}$	6 <i>us</i>	-----	1. 14	1. 00	. 20	1. 07
3	2522. 26	39634. 9	$b \ ^4D_{1\frac{1}{2}}-w \ ^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2522. 59	39629. 9	-----	-----	-----	-----	-----	0	1. 101
1	2522. 74	39627. 5	-----	-----	-----	-----	-----	-----	-----
8	2523. 16	39620. 9	$b \ ^4F_{4\frac{1}{2}}-y \ ^4G_{4\frac{1}{2}}$	6	(0. 05)	(1. 200)	1. 15	0. 23	?
1	2523. 72	39612. 1	-----	-----	-----	-----	-----	-----	-----
20	2524. 39	39601. 7	$b \ ^4F_{1\frac{1}{2}}-x \ ^4D_{0\frac{1}{2}}$	7	-----	(0. 415)	0. 40	0	0. 42
100	2524. 85	39594. 4	$a \ ^4H_{6\frac{1}{2}}-z \ ^2I_{6\frac{1}{2}}$	6	(0. 08)	1. 20	1. 12	0. 51	1. 16±
200 <i>H</i>	2525. 42	39585. 5	-----	-----	-----	-----	-----	-----	-----
25	2526. 88	39562. 5	$b \ ^4D_{0\frac{1}{2}}-w \ ^4F_{1\frac{1}{2}}$	5	0. 368	0. 131	0. 499	. 184	0. 683
20	2527. 07	39559. 6	$a \ ^2I_{5\frac{1}{2}}-y \ ^2I_{6\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2527. 30	39556. 0	$a \ ^4G_{4\frac{1}{2}}-y \ ^4H_{3\frac{1}{2}}$	4	-----	-----	-----	-----	-----
200	2527. 86	39547. 2	$a \ ^4G_{4\frac{1}{2}}-y \ ^4H_{5\frac{1}{2}}$	4	(0. 06)	1. 17	1. 11	0. 29 <i>w</i>	. 84+
100	2528. 05	39544. 3	$c \ ^2G_{4\frac{1}{2}}-w \ ^2F_{3\frac{1}{2}}$	7	-----	-----	-----	0	1. 04
20	2529. 61	39520. 0	$a \ ^4H_{6\frac{1}{2}}-z \ ^4I_{5\frac{1}{2}}$	5	0. 184?	(1. 23)	1. 05	0. 09	?
10	2530. 04	39513. 2	$a \ ^4G_{4\frac{1}{2}}-y \ ^4H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
70	2530. 41	39507. 4	$b \ ^4F_{2\frac{1}{2}}-y \ ^4G_{3\frac{1}{2}}$	5	(0. 08)	0. 92	1. 00	. 19 <i>w</i>	1. 20-
2	2531. 68	39487. 6	-----	-----	-----	-----	-----	-----	-----
10	2533. 03	39466. 6	-----	-----	-----	-----	-----	-----	-----
6	2533. 39	39461. 0	$b \ ^2P_{1\frac{1}{2}}-x \ ^4P_{0\frac{1}{2}}$	4	0. 56	(1. 188)	1. 748	0. 28	?
100	2533. 97	39451. 9	$b \ ^4F_{1\frac{1}{2}}-y \ ^4G_{2\frac{1}{2}}$	5	. 268	0. 426	0. 694	. 134	1. 096
80	2534. 92	39437. 1	$a \ ^4H_{5\frac{1}{2}}-z \ ^2I_{6\frac{1}{2}}$?	-----	-----	-----	-----	-----
50	2535. 23	39432. 4	$a \ ^2I_{5\frac{1}{2}}-w \ ^2H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
100	2535. 60	39426. 6	$b \ ^4P_{2\frac{1}{2}}-y \ ^4D_{3\frac{1}{2}}$	4	0. 226	1. 565	1. 339	0. 111	0. 774
5	2536. 30	39415. 7	$b \ ^2G_{4\frac{1}{2}}-w \ ^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2536. 68	39409. 8	-----	-----	-----	-----	-----	-----	-----
10 <i>Hw</i>	2537. 34	39399. 5	-----	-----	-----	-----	-----	-----	-----
100	2539. 72	39362. 6	$\left\{ \begin{array}{l} a \ ^4H_{5\frac{1}{2}}-z \ ^4I_{5\frac{1}{2}} \\ a \ ^4G_{2\frac{1}{2}}-y \ ^4H_{3\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
100	2540. 30	39353. 6	$a \ ^4H_{4\frac{1}{2}}-z \ ^4I_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2540. 84	39345. 2	-----	-----	-----	-----	-----	-----	-----
1	2541. 80	39330. 4	$b \ ^2G_{4\frac{1}{2}}-w \ ^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2542. 04	39326. 7	$a \ ^4G_{2\frac{1}{2}}-x \ ^4F_{1\frac{1}{2}}$	7	(0. 00)	0. 648	0. 648	0	. 648
20	2542. 23	39323. 7	$b \ ^2H_{4\frac{1}{2}}-y \ ^2F_{3\frac{1}{2}}$	4	0. 172	. 958	1. 130	0. 086	?
100	2542. 146	39309. 6	$a \ ^4G_{5\frac{1}{2}}-x \ ^4G_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
100	2543. 216	39308. 5	$a \ ^4H_{3\frac{1}{2}}-z \ ^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
300	2543. 272	39307. 6	$a \ ^4H_{6\frac{1}{2}}-z \ ^4I_{7\frac{1}{2}}$	4	(0. 03)	1. 235	1. 205	. 20 <i>w</i>	1. 02+
100	2543. 47	39304. 6	$a \ ^4G_{4\frac{1}{2}}-x \ ^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2544. 18	39293. 6	$b \ ^2F_{2\frac{1}{2}}-x \ ^2D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2545. 29	39276. 5	-----	-----	-----	-----	-----	-----	-----
3 <i>Hw</i>	2545. 81	39268. 4	-----	-----	-----	-----	-----	-----	-----
2 <i>H</i>	2546. 40	39259. 3	$a \ ^4G_{2\frac{1}{2}}-x \ ^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	A	K							
20	2547.66	39239.9	$b^2H_{4\frac{1}{2}}-y^2H_{4\frac{1}{2}}$	7	-----	0.95	0.96	0	0.955
8	2547.95	39235.5	$b^2P_{1\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	4	0.184	1.168	.984	0.092	0.709
2	2548.31	39229.9	$b^4D_{2\frac{1}{2}}-x^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2548.78	39222.7	-----	-----	-----	-----	-----	-----	-----
50	2549.121	39217.4	$a^4H_{3\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
100	2549.171	39216.7	$b^4F_{3\frac{1}{2}}-y^4G_{4\frac{1}{2}}$	5us	-----	-----	-----	w	-----
80	2549.79	39207.1	$a^4G_{3\frac{1}{2}}-x^4F_{3\frac{1}{2}}$	7, 5	-----	(1.021)	1.00	0	1.06
5	2551.56	39179.8	$b^2F_{3\frac{1}{2}}-w^4F_{4\frac{1}{2}}$	5	.22	1.06	1.28	0.11	2.05?
150	2551.98	39173.5	$a^4G_{3\frac{1}{2}}-y^4H_{4\frac{1}{2}}$	5us	-----	(1.021)	1.00	w	0.96
8	2553.49	39150.4	$b^4F_{3\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1h	2554.29	39138.1	-----	-----	-----	-----	-----	-----	-----
1h	2554.82	39130.0	$b^4P_{0\frac{1}{2}}-x^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2555.70	39116.6	$a^2I_{3\frac{1}{2}}-w^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	2555.93	39113.0	$a^4G_{3\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	7	(0.00)	1.00	1.00	0	1.00
30	2556.08	39110.7	$a^4G_{2\frac{1}{2}}-x^4F_{3\frac{1}{2}}$	5	0.40	0.65	1.054	0.20	2.05
15	2556.72	39100.9	$b^4P_{2\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	4	.38	1.584	1.204	.191	0.254
15	2557.15	39094.2	$a^4H_{4\frac{1}{2}}-z^2G_{3\frac{1}{2}}?$	7us	-----	-----	-----	w	1.13
3	2558.02	39081.0	$a^4G_{4\frac{1}{2}}-y^2G_{4\frac{1}{2}}$	6	(0.107)	1.16	1.05	0.48-	1.11±
15	2559.56	39057.6	-----	7	-----	-----	-----	0	0.874
3	2559.96	39051.4	$b^2P_{1\frac{1}{2}}-2^2I_{1\frac{1}{2}}$	6	0.16	1.18	1.34	0.24	1.26
1	2561.22	39032.2	-----	-----	-----	-----	-----	-----	-----
1	2561.45	39028.7	$a^4P_{2\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2562.94	39026.0	$b^2P_{1\frac{1}{2}}-y^4P_{1\frac{1}{2}}$	6*	.42	2.07	2.49	.64	2.28
1	2563.28	39000.8	-----	-----	-----	-----	-----	-----	-----
1	2563.61	38995.8	$c^2G_{3\frac{1}{2}}-w^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
8	2563.91	38991.2	$b^4D_{2\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	4	.225	1.345	1.120	0.114	0.558
1	2564.83	38977.2	$b^4D_{1\frac{1}{2}}-x^4P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2565.69	38964.2	$b^4F_{2\frac{1}{2}}-x^4D_{1\frac{1}{2}}$	4	.252	0.940	1.192	1.25	.562
5	2565.94	38960.4	$b^4F_{2\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2566.25	38955.7	$c^2G_{4\frac{1}{2}}-w^2H_{4\frac{1}{2}}$	6	(0.14)	(1.078)	0.94	.62-	?
20	2566.59	38950.5	$b^4P_{0\frac{1}{2}}-z^2P_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
100	2568.88	38915.9	$b^4D_{3\frac{1}{2}}-x^2F_{3\frac{1}{2}}$	6	0.250	1.39	1.14	.877	1.27
1	2569.41	38907.7	-----	-----	-----	-----	-----	-----	-----
8	2569.58	38905.3	$\left\{ \begin{array}{l} b^4D_{0\frac{1}{2}}-x^4P_{1\frac{1}{2}} \\ c^2D_{1\frac{1}{2}}-w^2D_{1\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
150	2571.09	38882.3	$a^4G_{3\frac{1}{2}}-x^4F_{4\frac{1}{2}}$	5	-----	(1.237)	1.20	w	1.39-
1	2571.44	38877.1	-----	-----	-----	-----	-----	-----	-----
1	2571.73	38872.6	-----	-----	-----	-----	-----	-----	-----
10	2572.67	38858.5	$a^4H_{3\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	5	0.400	0.752	1.152	0.200	2.552
3Hw	2573.11	38851.8	-----	-----	-----	-----	-----	-----	-----
50	2573.44	38846.9	$b^4D_{2\frac{1}{2}}-x^4P_{1\frac{1}{2}}$	4	.225	1.335	1.560	.114	0.997
25	2574.06	38837.5	$c^2D_{2\frac{1}{2}}-w^2D_{3\frac{1}{2}}$	6	(0.10)	1.17	1.07	.297-	1.12±
5	2574.53	38830.4	$b^2G_{3\frac{1}{2}}-w^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1h	2575.58	38814.6	-----	-----	-----	-----	-----	-----	-----
2	2575.93	38809.2	$b^4P_{1\frac{1}{2}}-y^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	2576.09	38806.9	$a^4G_{4\frac{1}{2}}-x^4G_{4\frac{1}{2}}$	7	(0.00)	1.19	1.19	0	1.185
10	2576.99	38793.4	$b^4F_{4\frac{1}{2}}-y^4D_{3\frac{1}{2}}$	4	(0.14)	1.20	1.34	0.51w	0.71+
5	2577.31	38788.5	$b^2P_{1\frac{1}{2}}-w^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2578.11	38776.5	$a^4H_{3\frac{1}{2}}-z^2D_{3\frac{1}{2}}$	4	0.56	(0.753)	1.31	.28	?
60	2579.10	38761.7	$a^4G_{2\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	6	(0.044)	0.666	0.710	.108	.688
5	2580.22	38744.8	$a^4H_{3\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2580.45	38741.3	$a^4G_{3\frac{1}{2}}-y^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2581.43	38726.6	-----	-----	-----	-----	-----	.31	?
3	2582.54	38710.0	$b^4D_{1\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	7	-----	(1.200)	1.20	0	1.19?
10	2582.90	38704.7	$b^4F_{4\frac{1}{2}}-z^2I_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2583.07	38702.0	$b^4F_{3\frac{1}{2}}-x^4D_{2\frac{1}{2}}$	4	0.19	1.10	1.29	0.093	0.633

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combina- tion	Type	Δg	g	g	Strong p	Strong n
	A	K							
10H	2586. 83	38645. 8	-----	-----	-----	-----	-----	-----	-----
75	2587. 87	38630. 2	$a^4H_{4\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2588. 68	38618. 2	-----	-----	-----	-----	-----	-----	-----
2	2588. 88	38615. 2	$a^4G_{3\frac{1}{2}}-x^4G_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
100w	2589. 43	38607. 0	$b^4F_{1\frac{1}{2}}-x^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
75	2591. 04	38583. 0	$a^4G_{5\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	6	(0. 07)	1. 23	1. 16	. 37-	1. 19±
75	2591. 26	38579. 7	$\left\{ \begin{array}{l} b^2H_{5\frac{1}{2}}-y^2H_{5\frac{1}{2}} \\ b^4D_{2\frac{1}{2}}-y^2F_{3\frac{1}{2}} \\ a^2G_{3\frac{1}{2}}-z^6F_{4\frac{1}{2}} \end{array} \right\}$	-----	-----	-----	-----	-----	-----
1	2593. 15	38551. 6	-----	-----	-----	-----	-----	-----	-----
50H	2594. 41	38532. 9	-----	-----	-----	-----	-----	-----	-----
4	2595. 54	38516. 1	$b^2H_{4\frac{1}{2}}-y^2H_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	2595. 81	38512. 1	$b^4F_{2\frac{1}{2}}-x^4D_{2\frac{1}{2}}$	6	0. 338	0. 942	1. 28	0. 854	1. 111
1	2596. 81	38497. 3	$b^2P_{0\frac{1}{2}}-x^2D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2597. 14	38492. 4	$c^2G_{4\frac{1}{2}}-y^2I_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2597. 79	38482. 8	$a^4G_{5\frac{1}{2}}-z^2H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
15	2598. 80	38467. 7	$b^4F_{4\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	7	-----	(1. 200)	1. 20	0	1. 220
15	2599. 68	38454. 7	$\left\{ \begin{array}{l} b^2D_{2\frac{1}{2}}-w^4D_{2\frac{1}{2}}? \\ a^4P_{2\frac{1}{2}}-z^6D_{3\frac{1}{2}} \end{array} \right\}$	7	-----	(1. 57)	1. 56	0	1. 550
30	2602. 26	38416. 6	-----	4	-----	-----	-----	0. 24w	1. 03+
5	2602. 88	38407. 4	$c^2G_{3\frac{1}{2}}-w^2H_{4\frac{1}{2}}$	7, 5	-----	(0. 942)	0. 948	0	0. 967
1	2603. 25	38402. 1	$b^2D_{1\frac{1}{2}}-x^4P_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2604. 13	38389. 1	$b^4F_{3\frac{1}{2}}-y^4D_{3\frac{1}{2}}$	6	. 254	1. 094	1. 348	0. 902	1. 221
10Hw	2606. 21	38358. 4	-----	7	-----	-----	-----	0	0. 861
5	2606. 91	38348. 1	-----	-----	-----	-----	-----	-----	-----
1	2607. 49	38339. 6	-----	-----	-----	-----	-----	-----	-----
5	2607. 79	38335. 2	$a^4P_{0\frac{1}{2}}-z^6D_{1\frac{1}{2}}$	-----	. 73	2. 57	(1. 84)	0. 365	?
20	2607. 92	38333. 4	$b^4P_{2\frac{1}{2}}-z^2D_{2\frac{1}{2}}$	6	. 246	1. 573	1. 327	. 626	1. 450
1	2609. 30	38312. 9	$b^2D_{2\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2610. 09	38301. 4	$b^4P_{2\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	4	. 547	1. 608	1. 060	. 276	-0. 310
40	2611. 50	38280. 7	$a^4H_{3\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	6	. 300	0. 798	1. 042	1. 064	. 890
3	2611. 84	38275. 7	$a^4H_{5\frac{1}{2}}-z^4I_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2612. 44	38266. 9	$a^4H_{4\frac{1}{2}}-z^4I_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2612. 52	38265. 8	$b^4D_{3\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	5	. 192	1. 385	1. 193	0. 094	1. 865
5H	2613. 31	38254. 2	-----	-----	-----	-----	-----	-----	-----
50	2614. 86	38231. 5	$b^4F_{4\frac{1}{2}}-z^2G_{4\frac{1}{2}}$	6	0. 203	1. 200	0. 994	0. 927	-----
75	2615. 05	38228. 8	$\left\{ \begin{array}{l} a^4G_{4\frac{1}{2}}-x^4G_{3\frac{1}{2}} \\ c^2G_{4\frac{1}{2}}-w^2H_{5\frac{1}{2}} \\ a^2P_{1\frac{1}{2}}-z^6F_{2\frac{1}{2}} \end{array} \right\}$	4	-----	(1. 167)	1. 15	w	1. 074
1	2615. 43	38223. 2	-----	-----	-----	-----	-----	-----	-----
25	2616. 33	38210. 1	$b^2F_{3\frac{1}{2}}-x^2F_{3\frac{1}{2}}$	6	(0. 05)	(1. 083)	1. 13	0. 17	?
40	2617. 08	38199. 2	$b^4F_{2\frac{1}{2}}-y^4D_{3\frac{1}{2}}$	5	0. 410	0. 933	1. 343	. 206	2. 368
10	2617. 45	38193. 7	-----	-----	-----	-----	-----	-----	-----
1h	2618. 59	38177. 0	$b^2D_{1\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	2619. 35	38166. 0	$a^4G_{4\frac{1}{2}}-y^2G_{3\frac{1}{2}}$	5	. 138	1. 166	1. 028	. 067	1. 649
5	2620. 06	38155. 6	$b^4F_{1\frac{1}{2}}-x^4D_{2\frac{1}{2}}$	5	. 91	0. 38	1. 29	. 46	2. 65
20	2620. 69	38146. 5	$a^4G_{5\frac{1}{2}}-y^4G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2621. 28	38138. 0	$b^4F_{1\frac{1}{2}}-y^4D_{0\frac{1}{2}}$	4	. 372	0. 421	0. 793	. 186	0. 235
3	2621. 74	38131. 3	$b^2P_{1\frac{1}{2}}-x^4P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2621. 85	38129. 6	$a^4G_{4\frac{1}{2}}-x^4D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3Hw	2622. 26	38123. 7	-----	-----	-----	-----	-----	-----	-----
10Hw	2623. 43	38106. 6	$c^2D_{1\frac{1}{2}}-w^2D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2624. 17	38095. 9	$b^4D_{2\frac{1}{2}}-x^4P_{2\frac{1}{2}}$	6	(0. 09)	1. 34	1. 25	. 22-	1. 30±
5	2624. 71	38088. 1	-----	-----	-----	-----	-----	-----	-----
25	2625. 39	38078. 2	$b^2G_{3\frac{1}{2}}-w^4D_{3\frac{1}{2}}$	6	0. 248	0. 886	1. 134	. 877	1. 010
10	2625. 58	38075. 5	$b^4D_{0\frac{1}{2}}-z^2S_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	2626. 41	38063. 4	$b^4F_{3\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	6	(0. 106)	1. 095	1. 201	. 37-	1. 148±
15	2627. 31	38050. 3	-----	7	-----	-----	-----	0	1. 20
5	2627. 82	38043. 0	-----	7	-----	-----	-----	0	0. 861
5Hw	2628. 15	38038. 2	-----	-----	-----	-----	-----	-----	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	A	K							
75	2628.75	38029.5	$b^2G_{4\frac{1}{2}}-x^2G_{4\frac{1}{2}}$	7*	-----	-----	-----	d?	1.08
5	2629.37	38020.6	$a^4G_{4\frac{1}{2}}-z^2H_{4\frac{1}{2}}$	6	0.159	(1.167)	1.008	0.716	?
150	2630.04	38010.9	$a^2I_{6\frac{1}{2}}-x^2H_{5\frac{1}{2}}$	7, 4	-----	(1.08)	1.09	0	1.051
20	2631.09	37995.7	$a^4H_{3\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	4	.259	0.758	1.017	0.126	0.110
25	2632.73	37972.0	$a^4G_{2\frac{1}{2}}-y^2G_{3\frac{1}{2}}$	5	0.381	0.652	1.035	0.191	1.604
5	2633.50	37961.0	-----	-----	-----	-----	-----	-----	-----
20	2633.82	37956.4	$b^4P_{0\frac{1}{2}}-z^2P_{1\frac{1}{2}}$	4	1.372	2.541	1.169	.686	0.483
10	2635.21	37936.3	$a^4G_{2\frac{1}{2}}-x^4D_{3\frac{1}{2}}$	5	0.305	0.647	0.953	.154	1.718
10	2635.34	37934.4	$b^2G_{4\frac{1}{2}}-x^2H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
70	2635.84	37927.2	$b^4F_{4\frac{1}{2}}-z^4I_{5\frac{1}{2}}$	4	.165	1.207	1.042	.082	0.300
100	2636.54	37917.2	$a^4H_{3\frac{1}{2}}-z^4I_{4\frac{1}{2}}$	5	.200	0.748	0.948	.100	1.648
20	2636.84	37912.9	$c^2G_{4\frac{1}{2}}-w^2G_{4\frac{1}{2}}$	6	(0.06)	1.09	1.03	.27-	1.065 \pm
10	2638.35	37891.2	$b^4D_{1\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	6	0.457	1.205	0.748	.697	0.977
1	2639.34	37877.0	-----	-----	-----	-----	-----	-----	-----
15	2639.58	37873.5	$b^4F_{2\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	5	.254	1.193	.939	.127	1.828
50	2641.63	37844.2	$b^2F_{2\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	7	-----	-----	-----	0	1.038
5	2642.10	37837.4	$b^4P_{2\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	4	.525	(1.572)	1.047	0.262	-----
20	2642.80	37827.4	$b^4F_{3\frac{1}{2}}-z^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	2642.88	37826.2	$a^4G_{3\frac{1}{2}}-y^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2643.14	37822.6	$a^4H_{4\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2643.40	37818.7	$b^4D_{0\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2643.60	37815.9	$a^2I_{5\frac{1}{2}}-x^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2644.62	37801.4	$a^4G_{4\frac{1}{2}}-x^4F_{4\frac{1}{2}}$	6	-----	(1.167)	1.19	<i>w</i>	1.18 \pm
75	2645.97	37782.0	$b^4F_{4\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	6	-----	1.20	1.15	.23-	1.18 \pm
100	2648.78	37742.0	$a^4H_{5\frac{1}{2}}-z^4G_{4\frac{1}{2}}$	-----	-----	-----	-----	<i>us</i>	1.16 us
3	2650.26	37720.9	$a^2I_{5\frac{1}{2}}-x^2H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2652.94	37682.8	$b^4D_{1\frac{1}{2}}-y^2D_{3\frac{1}{2}}$	4	-----	(1.200)	1.15	<i>us</i>	1.07 us
8	2653.10	37680.6	$a^4G_{3\frac{1}{2}}-z^2H_{3\frac{1}{2}}$	7	-----	(1.021)	1.016	0	1.006
25	2653.95	37668.5	$b^4F_{4\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	5	.170	1.202	1.032	0.086	1.797
1 <i>h</i>	2654.524	37660.33	-----	-----	-----	-----	-----	-----	-----
10	2654.876	37655.34	$b^2P_{0\frac{1}{2}}-w^4D_{0\frac{1}{2}}?$	-----	-----	-----	-----	-----	-----
5	2655.008	37653.47	$a^4G_{2\frac{1}{2}}-y^4G_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
300	2656.235	37636.07	$a^4H_{6\frac{1}{2}}-z^4H_{6\frac{1}{2}}$	6	(0.08)	1.22	1.14	0.51-	1.18 \pm
25	2657.198	37622.43	-----	-----	-----	-----	-----	-----	-----
10	2657.326	37620.62	-----	-----	-----	-----	-----	-----	-----
15	2658.244	37607.63	$b^4P_{0\frac{1}{2}}-x^4D_{0\frac{1}{2}}$	6	-----	2.53	0.37	1.08	1.45
1	2658.672	37601.58	-----	-----	-----	-----	-----	-----	-----
1	2658.922	37598.04	-----	-----	-----	-----	-----	-----	-----
1	2660.152	37580.66	$c^2D_{1\frac{1}{2}}-y^2P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
200	2661.169	37566.30	$a^4H_{6\frac{1}{2}}-z^4G_{5\frac{1}{2}}$	7	-----	(1.23)	1.24	0	1.143
300	2661.610	37560.07	$a^6D_{4\frac{1}{2}}-z^6D_{3\frac{1}{2}}$	7	-----	(1.54)	1.56	0	1.502
20	2661.82	37557.11	$a^4H_{3\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
15	2662.183	37551.99	$b^4D_{2\frac{1}{2}}-y^2D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2662.880	37542.16	$b^4P_{1\frac{1}{2}}-y^4D_{0\frac{1}{2}}$	5	0.856	1.652	0.796	0.428	2.080
10	2663.754	37529.84	$b^2G_{3\frac{1}{2}}-x^2G_{4\frac{1}{2}}$	4	.174	(0.883)	.709	.087	?
2	2665.376	37507.00	$a^4G_{3\frac{1}{2}}-y^4G_{2\frac{1}{2}}$	5	.330	(1.021)	.691	.162	?
100	2667.390	37478.68	$a^4H_{5\frac{1}{2}}-z^4H_{6\frac{1}{2}}$	4 <i>us</i>	-----	(1.16)	1.14	<i>w</i>	1.02
10	2667.79	37473.07	$a^4H_{3\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	6	.228	0.752	0.980	0.798	0.866
5	2668.632	37461.25	$a^4G_{3\frac{1}{2}}-x^4F_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
75	2669.43	37450.05	$c^2G_{3\frac{1}{2}}-w^2G_{3\frac{1}{2}}$	6	(0.031)	.943	.913	.107	.928
15	2670.527	37434.66	-----	6	-----	-----	-----	.117	1.120 \pm
25	2672.212	37411.06	$b^4P_{0\frac{1}{2}}-y^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2672.354	37409.07	$a^4H_{5\frac{1}{2}}-z^4G_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2672.880	37401.71	$a^4G_{4\frac{1}{2}}-z^2H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	2673.004	37399.98	$a^4H_{4\frac{1}{2}}-z^4G_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
10	2674. 219	37382. 99	$a^4H_{3\frac{1}{2}}-z^4G_{4\frac{1}{2}}$	5	0. 380	(0. 753)	1. 133	. 190	?
10	2675. 197	37369. 32	$b^4F_{2\frac{1}{2}}-y^4P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2675. 543	37364. 49	$c^2G_{3\frac{1}{2}}-w^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
100	2676. 183	37355. 55	$\{a^4H_{6\frac{1}{2}}-z^4H_{5\frac{1}{2}}$ $\{a^6S_{2\frac{1}{2}}-y^6P_{3\frac{1}{2}}$	5	0. 143	1. 24	1. 10	0. 79 w	2. 03-
4	2676. 775	37347. 29	$b^2G_{4\frac{1}{2}}-x^2H_{4\frac{1}{2}}$	6	. 104	(1. 067)	0. 96	. 47	?
3	2678. 054	37329. 46	$a^4H_{3\frac{1}{2}}-y^4P_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
800	2678. 759	37319. 63	$a^6D_{4\frac{1}{2}}-z^6D_{4\frac{1}{2}}$	7	-----	1. 532	(1. 530)	0	1. 531
5	2679. 450	37310. 01	-----	-----	-----	-----	-----	0	1. 55
100	2680. 585	37294. 21	$b^2G_{3\frac{1}{2}}-x^2G_{3\frac{1}{2}}$	6	. 221	0. 893	1. 114	0. 794	1. 003
2	2681. 293	37284. 36	$a^2S_{2\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2681. 417	37282. 64	-----	-----	-----	-----	-----	-----	-----
3	2682. 632	37265. 76	-----	-----	-----	-----	-----	-----	-----
5	2682. 754	37264. 06	$b^4F_{3\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	6	(0. 05)	1. 09	1. 04	. 19-	1. 07 \pm
3	2682. 894	37262. 12	$b^4D_{1\frac{1}{2}}-1\frac{1}{2}$	-----	-----	-----	-----	-----	-----
15	2684. 613	37238. 26	$b^4D_{3\frac{1}{2}}-y^2D_{2\frac{1}{2}}$	5	0. 249	1. 406	1. 157	. 125	2. 028
15	2685. 152	37230. 78	$a^4G_{5\frac{1}{2}}-z^2I_{5\frac{1}{2}}$	6	. 197	(1. 237)	1. 040	1. 084	?
2	2685. 581	37224. 84	$b^2F_{2\frac{1}{2}}-w^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2685. 893	37220. 51	$b^2P_{0\frac{1}{2}}-w^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2686. 418	37213. 24	-----	-----	-----	-----	-----	-----	-----
15	2686. 889	37206. 72	$a^4G_{3\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	4?	-----	(1. 021)	1. 03	w	1. 02+
25	2687. 071	37204. 20	$b^4F_{4\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	5	. 147	1. 186	1. 039	0. 072	1. 700-
100	2687. 494	37198. 34	$a^4H_{5\frac{1}{2}}-z^4H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
80	2688. 147	37189. 31	$a^4H_{4\frac{1}{2}}-z^4H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2689. 431	37171. 55	-----	-----	-----	-----	-----	-----	-----
10	2690. 208	37160. 81	$c^2G_{4\frac{1}{2}}-w^4D_{3\frac{1}{2}}$	4	-----	(1. 078)	1. 11	w	0. 97+
400	2692. 120	37134. 43	$a^6D_{3\frac{1}{2}}-z^6D_{2\frac{1}{2}}$	4	-----	(1. 576)	1. 71	w	1. 44+
1	2692. 716	37126. 21	$b^2G_{4\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2693. 628	37113. 64	$b^4F_{2\frac{1}{2}}-z^4G_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2694. 199	37105. 77	$b^4F_{2\frac{1}{2}}-z^2D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2694. 598	37100. 28	$b^2P_{0\frac{1}{2}}-x^4P_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2696. 495	37074. 18	$b^4F_{2\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2697. 07	37066. 3	$a^2S_{0\frac{1}{2}}-y^2P_{1\frac{1}{2}}$	4	0. 516	1. 284	1. 800	0. 258	1. 026
10	2697. 12	37065. 6	$a^4G_{4\frac{1}{2}}-y^4G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2698. 167	37051. 21	$a^6S_{2\frac{1}{2}}-y^6P_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2698. 268	37049. 82	-----	-----	-----	-----	-----	w	1. 16?
3 <i>h</i>	2698. 767	37042. 97	-----	-----	-----	-----	-----	-----	-----
5	2699. 228	37036. 64	$b^2D_{2\frac{1}{2}}-x^4P_{1\frac{1}{2}}$	4	. 480	(1. 102)	1. 582	0. 240	?
50	2700. 163	37023. 82	$b^2H_{5\frac{1}{2}}-y^4H_{6\frac{1}{2}}$	6	(0. 031)	1. 077	1. 108	. 172	1. 092
25	2700. 999	37012. 36	$b^4F_{1\frac{1}{2}}-y^4P_{1\frac{1}{2}}?$	-----	-----	-----	-----	-----	-----
10	2702. 639	36989. 90	$b^2H_{5\frac{1}{2}}-y^4H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
15	2704. 192	36968. 66	$b^2H_{4\frac{1}{2}}-y^4H_{3\frac{1}{2}}$	5	0. 146	0. 958	0. 812	. 073	1. 469
80	2704. 585	36963. 29	$a^2I_{6\frac{1}{2}}-z^2K_{7\frac{1}{2}}$	4	-----	(1. 08)	1. 07	w	0. 99+
10	2704. 830	36959. 94	$b^2H_{4\frac{1}{2}}-y^4H_{5\frac{1}{2}}$	5	. 160	0. 98	1. 14	0. 080	1. 70?
1	2705. 568	36949. 86	$b^2F_{2\frac{1}{2}}-x^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1 <i>h</i>	2706. 936	36931. 19	-----	-----	-----	-----	-----	-----	-----
50	2707. 310	36926. 09	$b^2H_{4\frac{1}{2}}-y^4H_{4\frac{1}{2}}$	6	(0. 04)	. 95	0. 99	. 19-	0. 97
2	2707. 555	36922. 74	-----	-----	-----	-----	-----	-----	-----
1	2709. 000	36903. 05	$a^6S_{2\frac{1}{2}}-y^6P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
100	2710. 228	36886. 33	$b^4F_{2\frac{1}{2}}-y^4P_{2\frac{1}{2}}$	6	0. 281	1. 576	1. 295	. 709	1. 436
300	2712. 409	36856. 67	$a^6D_{2\frac{1}{2}}-z^6D_{1\frac{1}{2}}$	4	. 201	1. 637	1. 838	. 101	1. 335
40	2713. 071	36847. 68	$b^2G_{3\frac{1}{2}}-x^2H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
40	2713. 585	36840. 70	$b^4F_{4\frac{1}{2}}-z^4I_{4\frac{1}{2}}$	6	. 247	1. 203	0. 956	1. 120	1. 080
1	2714. 717	36825. 34	-----	-----	-----	-----	-----	-----	-----
1	2715. 101	36820. 13	-----	-----	-----	-----	-----	-----	-----
30	2716. 132	36806. 16	$a^4G_{2\frac{1}{2}}-z^2F_{2\frac{1}{2}}$	6	. 19	0. 65	. 84	0. 46	0. 745

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
10	2716. 580	36800. 09	$b \ ^4F_{3/2} - y \ ^4F_{3/2}$	6	(0. 03)	1. 09	1. 06	0. 10	1. 08 h
1	2716. 78	36797. 38	$a \ ^4H_{5/2} - z \ ^4H_{3/2}$	6	(0. 05)	1. 08	1. 03	. 22 w	1. 06 \pm
80	2717. 447	36788. 35	$a \ ^4H_{5/2} - z \ ^4H_{3/2}$	5	0. 514	0. 941	0. 427	. 257	1. 712
10	2717. 855	36782. 82	$b \ ^4F_{2/2} - y \ ^4F_{1/2}$	5	. 238	1. 218	. 982	. 118	2. 280
20	2719. 717	36757. 64	$a \ ^4G_{3/2} - z \ ^2G_{4/2}$	5					
1	2720. 336	36749. 28	$b \ ^4F_{1/2} - z \ ^2D_{3/2}$						
1	2722. 081	36725. 72	$a \ ^4G_{3/2} - y \ ^4G_{3/2}$						
20	2723. 126	36711. 63	$b \ ^2F_{2/2} - y \ ^2F_{3/2}$	5	. 165	0. 947	1. 112	. 082	1. 524
2	2723. 812	36702. 38	$b \ ^2G_{3/2} - w \ ^4F_{4/2}$						
2	2724. 630	36691. 36	$b \ ^2P_{0/2} - 2i_{1/2}$						
100	2724. 864	36688. 21	$b \ ^2H_{3/2} - y \ ^4H_{5/2}$	5	. 127	1. 053	1. 180	. 062	1. 878
300	2725. 465	36680. 13	$a \ ^6D_{1/2} - z \ ^6D_{5/2}$	4	1. 448	1. 840	3. 288	. 724	1. 116
20	2727. 03	36659. 08	$b \ ^4D_{0/2} - z \ ^4F_{1/2}$						
2	2728. 691	36636. 76	$b \ ^4D_{2/2} - y \ ^4H_{3/2}$						
2	2729. 39	36627. 38	$b \ ^4D_{2/2} - x \ ^4F_{2/2}$	6	0. 36	(1. 344)	0. 98	. 90	
5 w	2730. 413	36613. 65	$b \ ^4P_{0/2} - x \ ^4D_{1/2}$						
5	2730. 688	36609. 97	$b \ ^4F_{2/2} - y \ ^4F_{3/2}$						
3	2731. 389	36600. 58	$b \ ^4D_{2/2} - x \ ^4F_{1/2}$						
3	2732. 685	36583. 22							
500	2734. 345	36561. 01	$a \ ^6D_{3/2} - z \ ^6D_{3/2}$	7, 6		(1. 576)	1. 584	0	1. 580
40	2736. 456	36532. 81	$b \ ^2F_{3/2} - y \ ^2D_{3/2}$						
60	2736. 826	36527. 87	$a \ ^4G_{5/2} - z \ ^2I_{5/2}$	4	(0. 11)	1. 26	1. 15	0. 53 w	0. 62 $+$
1	2737. 384	36520. 42							
10	2737. 606	36517. 46	$c \ ^2G_{4/2} - x \ ^2H_{3/2}$	7		(1. 078)	1. 074	0	1. 056
20	2737. 783	36515. 10	$b \ ^4F_{3/2} - y \ ^4F_{2/2}$	5	(0. 07)	1. 09	1. 02	0. 17 w	1. 26 $-$
20	2739. 372	36493. 92	$b \ ^2H_{4/2} - y \ ^2G_{4/2}$	6	0. 12	0. 95	1. 07	. 53 $-$	1. 01 \pm
5 h	2741. 178	36469. 88							
25	2742. 401	36453. 61	$a \ ^4G_{3/2} - z \ ^4I_{5/2}$	6	. 195	1. 245	1. 050	1. 073	1. 148
1	2742. 691	36449. 76	$c \ ^2D_{2/2} - w \ ^2G_{3/2}$						
25	2743. 513	36438. 84	$a \ ^4H_{3/2} - z \ ^4H_{1/2}$	5	0. 265	0. 761	1. 026	0. 134	1. 953
5	2743. 700	36436. 36	$b \ ^4F_{3/2} - z \ ^4I_{4/2}$						
60	2743. 934	36433. 25	$a \ ^6D_{2/2} - z \ ^6D_{2/2}$	7		(1. 637)	1. 643	0	1. 640
1	2744. 29	36428. 5	$b \ ^2P_{0/2} - w \ ^4F_{1/2}$						
100	2745. 158	36417. 00	$b \ ^4P_{1/2} - y \ ^4P_{1/2}$						
50	2745. 827	36408. 15	$a \ ^4H_{4/2} - z \ ^4H_{3/2}$						
20	2746. 068	36404. 94	$a \ ^6D_{1/2} - z \ ^6D_{1/2}$	7, 6		(1. 843)	1. 80	0	1. 82?
25	2746. 695	36396. 63	$b \ ^4F_{4/2} - z \ ^4G_{3/2}$	5	. 219	1. 192	0. 973	0. 110	1. 958
10	2747. 563	36385. 13	$b \ ^4D_{2/2} - x \ ^4F_{3/2}$	4	. 297	1. 361	1. 064	. 148	0. 322
50	2747. 963	36379. 83	$a \ ^6D_{0/2} - z \ ^6D_{0/2}$	7		(3. 271)	3. 273	0	3. 272
5	2749. 100	36364. 79	$d \ ^2D_{1/2} - v \ ^2F_{2/2}$						
15	2749. 230	36363. 07		7				0	0. 93
5 h	2749. 64	36357. 65	$a \ ^4G_{2/2} - x \ ^4D_{3/2}$						
10	2752. 110	36325. 02	$b \ ^4F_{2/2} - y \ ^4F_{2/2}$	6	(0. 08)	1. 03	1. 11	0. 21 $-$	1. 07 \pm
30	2752. 447	36320. 57	$a \ ^6D_{3/2} - z \ ^6D_{3/2}$	4	(0. 04)	1. 59	1. 55	. 15 w	1. 39 $+$
50	2752. 763	36316. 40	$a \ ^4D_{3/2} - z \ ^4P_{2/2}$	4	0. 175	1. 399	1. 574	. 088	0. 961
20	2753. 508	36306. 58	$b \ ^4F_{4/2} - z \ ^4G_{4/2}$	6	(0. 08)	1. 26	1. 18	. 35 $-$	1. 22 \pm
2	2753. 831	36302. 32							
20	2755. 258	36283. 52	$b \ ^2H_{3/2} - x \ ^4G_{4/2}$	4	(0. 09)	1. 03	1. 12	. 39 w	0. 64 $+$
4	2755. 519	36280. 08	$b \ ^4D_{3/2} - y \ ^4H_{4/2}$						
1	2755. 748	36277. 07							
15	2756. 411	36268. 34							
1 h	2756. 899	36261. 92							
5	2758. 347	36242. 89	$b \ ^2D_{1/2} - z \ ^2S_{0/2}$	4	1. 087	0. 975	2. 062	. 544	. 431
2	2758. 692	36238. 35	$a \ ^4G_{4/2} - y \ ^4D_{3/2}$						
10	2759. 159	36232. 22	$b \ ^2G_{4/2} - x \ ^2F_{3/2}$	4	(0. 06)	1. 08	1. 14	. 21 w	. 87 $+$

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
8	2760. 115	36219. 67	$b^2H_{4\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	---	---	---	---	---	---
20	2760. 745	36211. 41	$a^4G_{3\frac{1}{2}}-x^4D_{3\frac{1}{2}}$	4	0. 260	1. 021	1. 281	. 130	. 371
3	2761. 473	36201. 86	---	---	---	---	---	---	---
40	2762. 071	36194. 03	$d^2D_{2\frac{1}{2}}-v^2F_{3\frac{1}{2}}$	4	0. 160	1. 206	1. 046	0. 080	0. 646
20	2765. 134	36153. 93	$b^4P_{1\frac{1}{2}}-z^2D_{3\frac{1}{2}}$	4	. 322	1. 643	1. 321	. 160	. 838
100	2765. 429	36150. 08	$a^4D_{2\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	4	. 372	1. 339	1. 711	. 186	. 781
15	2765. 889	36144. 06	$b^4P_{0\frac{1}{2}}-y^4D_{0\frac{1}{2}}$	---	---	---	---	---	---
80	2766. 563	36135. 26	$c^2D_{2\frac{1}{2}}-x^2D_{3\frac{1}{2}}$	7	---	(1. 18)	1. 20	0	1. 19
250	2768. 926	36104. 42	$a^6D_{0\frac{1}{2}}-z^6D_{1\frac{1}{2}}$	---	---	---	---	---	---
1	2770. 088	36089. 28	---	---	---	---	---	---	---
50	2771. 060	36076. 62	$b^4F_{3\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	5	. 446	1. 085	0. 639	. 223	2. 200
5	2771. 464	36071. 36	$b^4D_{3\frac{1}{2}}-x^4F_{3\frac{1}{2}}$	---	---	---	---	---	---
3	2772. 011	36064. 24	$c^2G_{3\frac{1}{2}}-x^2G_{4\frac{1}{2}}$	---	---	---	---	---	---
100	2772. 459	36058. 42	$a^4H_{3\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	6	. 200	0. 764	. 964	. 708	0. 864
10	2774. 197	36035. 83	$b^4D_{2\frac{1}{2}}-x^4G_{2\frac{1}{2}}$	---	---	---	---	---	---
30	2775. 631	36017. 21	$a^4D_{1\frac{1}{2}}-z^4P_{0\frac{1}{2}}$	4	1. 452	1. 189	2. 641	. 728	. 463
50	2777. 401	35994. 26	$b^2G_{4\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	4	---	(1. 067)	1. 10	<i>w</i>	. 95+
50	2777. 54	35992. 46	$b^4F_{3\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	6	0. 11	1. 10	0. 99	0. 38-	1. 05±
1	2778. 024	35986. 19	$b^2D_{1\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	---	---	---	---	---	---
150	2778. 388	35981. 48	$a^6D_{1\frac{1}{2}}-z^6D_{3\frac{1}{2}}$	4	. 210	1. 843	1. 633	. 105	1. 317
30	2778. 975	35973. 87	$b^4F_{4\frac{1}{2}}-z^4G_{5\frac{1}{2}}$	5	(0. 03)	1. 23	1. 26	. 14 <i>w</i>	1. 40-
15	2779. 406	35968. 30	$b^4F_{1\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	5	0. 614	0. 415	1. 029	. 308	1. 948?
8 <i>h</i>	2780. 817	35950. 05	$b^2D_{2\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	5	. 354	1. 107	. 753	. 177	1. 638
8	2782. 23	35931. 79	---	5	. 228	1. 053	. 825	. 114	1. 623
10	2782. 361	35930. 10	$c^2G_{4\frac{1}{2}}-x^2H_{3\frac{1}{2}}$	6	. 12	1. 08	. 96	. 53-	1. 02±
8	2783. 69	35912. 95	$a^4G_{4\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	7	---	(1. 167)	1. 18	0	1. 117
4	2783. 799	35911. 54	$b^2P_{1\frac{1}{2}}-x^4F_{3\frac{1}{2}}$	---	---	---	---	---	---
40	2784. 516	35902. 29	$b^4F_{3\frac{1}{2}}-z^4G_{4\frac{1}{2}}$	5	---	(1. 093)	1. 14	<i>w</i>	1. 23-
10	2785. 186	35893. 66	$d^2D_{2\frac{1}{2}}-3^2G_{3\frac{1}{2}}$	4	. 194	1. 227	1. 033	0. 097	0. 548
75	2785. 741	35886. 51	$b^4F_{2\frac{1}{2}}-z^4G_{2\frac{1}{2}}$	6	. 292	0. 944	0. 652	. 743	. 798
25	2785. 87	35884. 84	$b^2P_{1\frac{1}{2}}-x^4F_{1\frac{1}{2}}$	---	---	---	---	---	---
15	2786. 383	35878. 24	---	---	---	---	---	---	---
20	2787. 25	35867. 08	$d^2D_{1\frac{1}{2}}-w^2D_{1\frac{1}{2}}$	6	(0. 07)	0. 80	0. 87	0. 10-	0. 83±
200	2787. 823	35859. 71	$a^6D_{2\frac{1}{2}}-z^6D_{3\frac{1}{2}}$	4	(0. 08)	1. 68	1. 60	. 21 <i>w</i>	1. 39+
25	2788. 729	35848. 06	$b^4D_{3\frac{1}{2}}-y^2G_{3\frac{1}{2}}$	4	0. 333	(1. 397)	1. 063	. 167	?
3	2789. 453	35838. 75	---	---	---	---	---	---	---
5	2790. 082	35830. 67	$b^4P_{1\frac{1}{2}}-y^4F_{1\frac{1}{2}}$	---	---	---	---	---	---
15	2790. 240	35828. 65	$c^2G_{3\frac{1}{2}}-x^2G_{3\frac{1}{2}}$	---	---	---	---	---	---
5	2791. 193	35816. 41	$b^2F_{2\frac{1}{2}}-x^4P_{2\frac{1}{2}}$	---	---	---	---	---	---
100	2792. 32	35801. 96	$b^4F_{2\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	5	---	(0. 943)	0. 99	<i>w</i>	1. 09-
5	2794. 092	35779. 25	$b^2D_{1\frac{1}{2}}-y^2D_{2\frac{1}{2}}?$	---	---	---	---	---	---
20 <i>h</i>	2794. 278	35776. 87	---	5	. 182	1. 120	. 938	0. 092	1. 393
10	2795. 349	35763. 17	$b^4F_{4\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	4	. 134	(1. 200)	1. 064	. 068	?
8	2795. 555	35760. 53	---	---	---	---	---	---	---
5	2795. 993	35754. 93	$b^4D_{2\frac{1}{2}}-y^4D_{2\frac{1}{2}}$	---	---	---	---	---	---
8	2796. 461	35748. 94	---	---	---	---	---	---	---
2 <i>H</i>	2797. 077	35741. 07	$a^6S_{2\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	---	---	---	---	---	---
10	2797. 747	35732. 51	$b^2G_{3\frac{1}{2}}-x^2F_{3\frac{1}{2}}$	6	. 254	(0. 883)	1. 137	. 889	?
25	2798. 779	35719. 34	$a^4G_{2\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	5	. 545	0. 649	1. 194	. 274	2. 557
8	2799. 587	35709. 03	$c^2G_{4\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	---	---	---	---	---	---
15	2799. 927	35704. 70	$b^2P_{1\frac{1}{2}}-z^2P_{0\frac{1}{2}}$	5	. 363	1. 197	0. 829	. 186	1. 381
1	2800. 408	35698. 56	---	---	---	---	---	---	---
2	2800. 586	35696. 29	$a^2I_{5\frac{1}{2}}-y^2H_{4\frac{1}{2}}$	---	---	(0. 90)	. 91	<i>w</i>	0. 86 <i>h</i>
30	2802. 152	35676. 34	$a^4G_{4\frac{1}{2}}-z^2G_{4\frac{1}{2}}$	6	. 173	1. 168	. 995	0. 776	1. 082
3	2802. 717	35669. 15	---	---	---	---	---	---	---

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combina- tion	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
4	2803. 535	35658. 75	$b^4F_{2\frac{1}{2}}-y^4P_{2\frac{1}{2}}$	6	. 353	(0. 943)	1. 296	. 883	?
50	2804. 903	35641. 36	$b^2H_{4\frac{1}{2}}-x^4G_{5\frac{1}{2}}$	5	. 198	0. 954	1. 152	. 099	2. 043
100	2806. 77	35617. 65	$a^4D_{0\frac{1}{2}}-z^4P_{0\frac{1}{2}}$	6	2. 654	0	2. 654	1. 327	1. 327
25	2807. 200	35612. 19	$c^2D_{2\frac{1}{2}}-w^4D_{3\frac{1}{2}}$	4		1. 16	(1. 13)	<i>w</i>	1. 06 <i>h</i>
5	2807. 350	35610. 29	$\left\{ \begin{array}{l} a^2G_{4\frac{1}{2}}-z^6D_{3\frac{1}{2}} \\ c^2D_{2\frac{1}{2}}-x^2D_{1\frac{1}{2}} \end{array} \right.$	-----	-----	-----	-----	-----	-----
20	2807. 554	35607. 70	$b^2F_{3\frac{1}{2}}-x^4F_{3\frac{1}{2}}$	5	(0. 08)	1. 09	1. 01	0. 20 <i>w</i>	1. 29-?
8	2810. 249	35573. 56	$b^4D_{3\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
250	2810. 649	35568. 50	$a^2I_{3\frac{1}{2}}-z^2K_{1\frac{1}{2}}$	7	-----	(0. 90)	0. 91	0	0. 94
10	2811. 545	35557. 16	$b^4D_{1\frac{1}{2}}-z^2P_{1\frac{1}{2}}$	-----	-----	(1. 200)	1. 18	-----	1. 19
10	2811. 931	35552. 28	-----	-----	-----	-----	-----	-----	-----
1	2812. 689	35542. 70	$b^2H_{4\frac{1}{2}}-x^4D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
100	2813. 311	35534. 84	$b^4P_{2\frac{1}{2}}-z^4S_{1\frac{1}{2}}$	4	0. 234	1. 564	1. 798	0. 118	1. 213
60	2813. 694	35530. 00	$b^4F_{1\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	5	. 230	0. 418	0. 648	. 115	0. 994
2	2814. 952	35514. 13	$b^2F_{3\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2815. 685	35504. 88	$d^2D_{2\frac{1}{2}}-v^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2816. 281	35497. 37	$b^2H_{5\frac{1}{2}}-z^2H_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2817. 255	35485. 10	$b^4D_{0\frac{1}{2}}-z^2P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	2817. 591	35480. 87	$b^2F_{2\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	5	. 212	. 945	. 733	. 106	1. 263?
100	2821. 34	35433. 72	$b^2H_{4\frac{1}{2}}-z^2H_{3\frac{1}{2}}$	6	-----	. 95	1. 01	. 29-	0. 98±
1	2821. 883	35426. 90	$b^4D_{2\frac{1}{2}}-z^2P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
150	2822. 542	35418. 63	$a^4D_{1\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	6	. 528	1. 185	1. 713	. 795	1. 448
10	2822. 778	35415. 67	$a^4D_{3\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
75	2823. 176	35410. 68	$b^2G_{3\frac{1}{2}}-y^2H_{3\frac{1}{2}}$	5	. 05	0. 93	0. 98	. 19 <i>w</i>	1. 17-
1	2823. 596	35405. 41	$c^2D_{1\frac{1}{2}}-x^2D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	2825. 071	35386. 93	-----	5	. 168	1. 202	1. 034	. 085	1. 454
10	2825. 162	35385. 79	-----	-----	-----	-----	-----	-----	-----
40	2825. 484	35381. 75	$c^2G_{3\frac{1}{2}}-x^2H_{4\frac{1}{2}}$	5	-----	(0. 942)	0. 96	<i>w</i>	1. 02-
50	2826. 230	35372. 41	$a^4G_{4\frac{1}{2}}-z^4I_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	2826. 674	35366. 86	$a^4G_{5\frac{1}{2}}-z^4I_{4\frac{1}{2}}$	5	. 278	1. 234	. 956	0. 140	2. 485
2	2827. 053	35362. 12	$b^4F_{4\frac{1}{2}}-z^4H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2827. 433	35357. 36	$b^2D_{1\frac{1}{2}}-I_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2827. 604	35355. 23	-----	-----	-----	-----	-----	-----	-----
20	2829. 092	35336. 63	$a^4G_{3\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	7	-----	(1. 021)	1. 01	0	0. 975
50	2831. 84	35302. 34	$b^4F_{1\frac{1}{2}}-y^4P_{3\frac{1}{2}}$	5	0. 884	0. 405	1. 289	0. 442	2. 615
50	2833. 806	35277. 86	$b^2H_{5\frac{1}{2}}-x^4F_{3\frac{1}{2}}$	4	. 12	1. 04	1. 16	. 52 <i>w</i>	0. 52+
2 <i>h</i>	2834. 232	35272. 55	$b^2F_{2\frac{1}{2}}-y^2D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2 <i>h</i>	2836. 319	35246. 60	$b^4D_{2\frac{1}{2}}-y^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2837. 112	35236. 75	$c^2G_{3\frac{1}{2}}-w^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2837. 898	35226. 99	$a^4G_{4\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	-----	-----	(1. 167)	1. 39	<i>w</i>	1. 28 <i>h</i>
10 <i>h</i>	2838. 875	35214. 87	$a^4G_{2\frac{1}{2}}-y^4P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2839. 385	35208. 54	$b^4D_{1\frac{1}{2}}-x^4D_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	2841. 147	35186. 71	$b^2G_{4\frac{1}{2}}-y^2H_{5\frac{1}{2}}$	7	-----	(1. 067)	1. 315	0	1. 116
100	2841. 680	35180. 11	$a^4D_{2\frac{1}{2}}-z^4P_{3\frac{1}{2}}$	6	. 235	1. 339	1. 574	0. 592	1. 456
75	2844. 716	35142. 56	$b^2F_{3\frac{1}{2}}-y^2G_{3\frac{1}{2}}$	7	-----	(1. 083)	1. 07	0	1. 029
15	2845. 229	35136. 23	$b^4D_{0\frac{1}{2}}-x^4D_{0\frac{1}{2}}$	6	. 240	0. 145	0. 385	0. 120	0. 265
10	2847. 087	35113. 30	$a^4G_{4\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2847. 574	35107. 29	$a^2F_{2\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	4	. 850	. 86	1. 71	. 425	. 42
50 <i>d</i>	2849. 289	35086. 16	-----	-----	-----	-----	-----	. 45	. 45
15	2849. 591	35082. 45	$b^2G_{3\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	4	. 314	(0. 883)	1. 20	. 157	?
2	2850. 024	35077. 12	-----	-----	-----	-----	-----	-----	-----
20	2850. 697	35068. 83	$d^2D_{1\frac{1}{2}}-w^2D_{2\frac{1}{2}}$	5	. 265	0. 803	1. 068	. 133	1. 466
5	2852. 993	35040. 62	-----	-----	-----	-----	-----	-----	-----
10	2853. 126	35038. 98	$b^2P_{1\frac{1}{2}}-y^4D_{3\frac{1}{2}}$	5	. 12	1. 19	1. 31	. 17 <i>w</i>	1. 48-
40	2854. 722	35019. 39	$a^4D_{0\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	5	1. 730	-0. 030	1. 700	. 865	2. 565
15	2854. 980	35016. 23	$b^2F_{3\frac{1}{2}}-x^4G_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	A	K							
20	2855. 357	35011. 60	$b^4D_{1\frac{1}{2}}-y^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3h	2855. 710	35007. 28	$d^2D_{2\frac{1}{2}}-w^2D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	2856. 570	34996. 74	-----	4, 5	0. 162	-----	-----	. 081	?
10	2857. 240	34988. 53	$c^2G_{3\frac{1}{2}}-w^4F_{2\frac{1}{2}}$	4	(0. 04)	(0. 942)	0. 98	0. 11w	-----
2	2857. 590	34984. 25	-----	-----	-----	-----	-----	-----	-----
50	2857. 780	34981. 92	$b^4F_{4\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	5	0. 240	1. 205	. 965	. 120	2. 045
1	2858. 042	34978. 72	$b^2H_{5\frac{1}{2}}-y^4G_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	2858. 506	34973. 04	$a^2I_{5\frac{1}{2}}-y^2H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	2859. 622	34959. 39	$b^2H_{4\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	4	-----	(0. 958)	1. 03	w	0. 70+
10	2859. 749	34957. 84	$b^4F_{3\frac{1}{2}}-z^4H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
8	2861. 108	34941. 23	$b^2P_{0\frac{1}{2}}-z^2S_{0\frac{1}{2}}$	6	1. 165	0. 866	2. 031	0. 583	1. 448
5	2861. 686	34934. 17	$b^4P_{1\frac{1}{2}}-z^4G_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10h	2862. 848	34920. 00	$a^4G_{2\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	5	0. 376	. 658	1. 034	. 192	1. 974
50h	2863. 261	34914. 96	$b^2H_{4\frac{1}{2}}-y^4G_{5\frac{1}{2}}$	5	. 212	. 954	1. 166	. 106	2. 120
10	2865. 544	34887. 15	$a^4G_{3\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	5	. 14	1. 01	1. 15	. 070	1. 64?
15	2866. 096	34880. 43	$c^2D_{1\frac{1}{2}}-x^2D_{1\frac{1}{2}}$	-----	-----	(0. 789)	0. 87	0	0. 83h
15	2866. 276	34878. 24	$b^2H_{5\frac{1}{2}}-z^2H_{5\frac{1}{2}}$	6	(0. 06)	1. 08	1. 14	0. 36-	1. 11±
10	2867. 107	34868. 13	$b^2F_{3\frac{1}{2}}-x^4G_{4\frac{1}{2}}$	5	(0. 08)	(1. 083)	1. 16	. 27w	-----
2	2868. 832	34847. 16	$a^4D_{3\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	6	0. 12	(1. 403)	1. 28	. 42-	?
30	2870. 573	34826. 03	$b^2D_{2\frac{1}{2}}-y^4H_{3\frac{1}{2}}$	4	. 301	1. 098	0. 797	. 150	0. 044
30	2871. 493	34814. 87	$b^2H_{4\frac{1}{2}}-z^2H_{5\frac{1}{2}}$	5	. 188	0. 942	1. 130	. 093	1. 976
30	2873. 329	34792. 63	-----	4	-----	-----	-----	w	1. 15+
15	2873. 752	34787. 50	$b^4D_{3\frac{1}{2}}-z^2H_{4\frac{1}{2}}$	4	. 380	(1. 397)	1. 017	0. 190	?
6	2878. 056	34735. 48	$b^2F_{3\frac{1}{2}}-y^4D_{2\frac{1}{2}}$	4	. 228	1. 080	1. 308	. 114	0. 510
20	2879. 078	34723. 15	$b^2D_{2\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	4	(0. 01)	(1. 102)	0. 99	. 25w	. 72+
4	2880. 091	34710. 94	$b^2P_{1\frac{1}{2}}-z^2P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	2880. 440	34706. 74	$b^4P_{1\frac{1}{2}}-y^4P_{2\frac{1}{2}}$	4	0. 353	1. 655	1. 302	. 177	. 772
200	2882. 112	34686. 61	$a^4D_{3\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	5	-----	(1. 403)	1. 35	w	1. 53-
3	2885. 473	34646. 20	$b^2D_{1\frac{1}{2}}-z^2P_{0\frac{1}{2}}$	5	. 14	(0. 965)	0. 82	0. 07	?
4h	2887. 084	34626. 87	$b^4D_{2\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
8	2889. 396	34599. 17	$b^2G_{3\frac{1}{2}}-x^4P_{2\frac{1}{2}}$	4	0. 364	0. 884	1. 248	0. 180	-0. 026
20Hw	2890. 476	34586. 24	-----	-----	-----	-----	-----	-----	-----
20	2891. 219	34577. 35	$c^2G_{4\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2891. 987	34568. 17	$b^4D_{3\frac{1}{2}}-x^4F_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2894. 148	34542. 36	$\{b^2H_{5\frac{1}{2}}-y^4G_{4\frac{1}{2}}\}$ $\{d^2D_{1\frac{1}{2}}-y^2P_{1\frac{1}{2}}\}?$	-----	-----	-----	-----	-----	-----
40	2897. 713	34499. 86	$a^4G_{5\frac{1}{2}}-z^4G_{5\frac{1}{2}}$	7	-----	(1. 237)	1. 231	0	1. 234
40	2898. 242	34493. 57	$c^2G_{4\frac{1}{2}}-y^2H_{4\frac{1}{2}}?$	4	(0. 04)	1. 06	1. 02	0. 17w	1. 04+
10	2899. 502	34478. 58	$b^2H_{4\frac{1}{2}}-y^4G_{4\frac{1}{2}}$	6	0. 196	0. 962	1. 158	. 882	1. 06?
50	2900. 441	34467. 42	-----	4	-----	-----	-----	. 19w	1. 35-
10	2901. 431	34455. 66	$a^4G_{2\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	5	. 407	. 647	1. 054	. 203	2. 072
75	2902. 026	34448. 59	$a^4D_{1\frac{1}{2}}-z^4P_{2\frac{1}{2}}$	5	. 384	1. 182	1. 566	. 192	2. 142
2h	2902. 572	34442. 11	-----	-----	-----	-----	-----	-----	-----
3	2903. 394	34432. 36	$b^4P_{0\frac{1}{2}}-y^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2906. 937	34390. 40	-----	-----	-----	-----	-----	-----	-----
1	2907. 160	34387. 76	$b^4F_{2\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2909. 329	34362. 12	$b^2P_{1\frac{1}{2}}-x^4D_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	2909. 750	34357. 15	$b^2F_{2\frac{1}{2}}-y^4H_{3\frac{1}{2}}$	4	. 143	0. 926	0. 783	. 072	0. 426
25	2909. 845	34356. 03	-----	5	-----	-----	-----	w	1. 08-
1h	2912. 185	34328. 42	$a^2P_{1\frac{1}{2}}-z^6D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
8h	2912. 804	34321. 13	$b^2F_{2\frac{1}{2}}-x^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	2913. 462	34313. 38	$b^4D_{3\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	2913. 803	34309. 36	$a^4G_{3\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	2913. 999	34307. 06	$b^4F_{2\frac{1}{2}}-z^4S_{1\frac{1}{2}}$	4*	-----	-----	-----	0. 13w	1. 10+
50	2916. 370	34279. 17	$a^4D_{2\frac{1}{2}}-z^4F_{2\frac{1}{2}}$	6	. 261	1. 332	1. 071	. 651	1. 201
3	2917. 416	34266. 88	$c^2G_{3\frac{1}{2}}-x^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)*—Continued

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	A	K							
50	2918. 521	34253. 90	$b \ ^2F_{2\frac{1}{2}}-x \ ^4G_{3\frac{1}{2}}$	5	(0. 04)	0. 94	0. 98	. 11w	1. 09—
1h	2920. 514	34230. 53							
10	2920. 949	34225. 43	$b \ ^2D_{2\frac{1}{2}}-x \ ^4G_{3\frac{1}{2}}$	6	0. 402	1. 10	0. 70	1. 006	0. 90
3	2921. 880	34214. 53	$b \ ^4D_{1\frac{1}{2}}-x \ ^4D_{1\frac{1}{2}}$						
1h	2922. 192	34210. 87	$b \ ^4D_{1\frac{1}{2}}-z \ ^2F_{3\frac{1}{2}}$						
25	2922. 347	34209. 06	$d \ ^2D_{2\frac{1}{2}}-w \ ^2D_{3\frac{1}{2}}$	6	. 131	(1. 20)	1. 07	0. 328	?
10	2923. 112	34200. 11		7				0	0. 871
40	2923. 906	34190. 82	$b \ ^2F_{3\frac{1}{2}}-x \ ^4D_{3\frac{1}{2}}$	6	. 122	1. 086	0. 964	0. 423	1. 025
3H	2926. 519	34160. 29	$c \ ^2D_{2\frac{1}{2}}-w \ ^4F_{3\frac{1}{2}}$						
200	2927. 535	34148. 44	$a \ ^4D_{2\frac{1}{2}}-z \ ^4D_{1\frac{1}{2}}$	5	. 193	1. 337	1. 144	. 096	1. 626
2	2928. 063	34142. 28	$b \ ^4D_{0\frac{1}{2}}-x \ ^4D_{1\frac{1}{2}}$						
2	2928. 487	34137. 34	$a \ ^2F_{2\frac{1}{2}}-z \ ^4P_{3\frac{1}{2}}$						
20	2931. 209	34105. 64	$b \ ^2F_{2\frac{1}{2}}-x \ ^4F_{3\frac{1}{2}}$	5	(0. 09)	0. 97	1. 06	. 23w	1. 29—
3	2933. 059	34084. 13	$b \ ^4D_{2\frac{1}{2}}-x \ ^4D_{1\frac{1}{2}}$	5	0. 151	1. 333	1. 182	. 075	1. 56?
50	2933. 232	34082. 12	$b \ ^2F_{3\frac{1}{2}}-z \ ^2H_{4\frac{1}{2}}$	4	(0. 066)	(1. 083)	1. 02	. 23w	0. 78+
1	2933. 710	34076. 57							
40	2935. 517	34055. 59	$b \ ^2P_{0\frac{1}{2}}-1 \ ^1I_{\frac{1}{2}}$	5	0. 333	0. 876	1. 209	. 166	1. 375
25	2937. 043	34037. 89	$c \ ^2D_{1\frac{1}{2}}-w \ ^4D_{0\frac{1}{2}}$	5	. 242	. 794	0. 552	. 121	0. 915
1h	2938. 967	34015. 61							
5	2941. 979	33980. 79	$b \ ^2D_{1\frac{1}{2}}-y \ ^4D_{3\frac{1}{2}}$						
50	2942. 244	33977. 73	$a \ ^4D_{1\frac{1}{2}}-z \ ^4F_{1\frac{1}{2}}$	6	. 724	1. 192	. 468	1. 089	. 830
10	2945. 098	33944. 81	$c \ ^2G_{3\frac{1}{2}}-y \ ^2H_{4\frac{1}{2}}$	7		(0. 942)	. 95	0	. 970
500	2945. 661	33938. 32	$a \ ^4D_{3\frac{1}{2}}-z \ ^4D_{3\frac{1}{2}}$	7		(1. 403)	1. 397	0	1. 400
1h	2948. 279	33908. 18	$b \ ^2F_{3\frac{1}{2}}-y \ ^4G_{2\frac{1}{2}}$						
1	2948. 847	33901. 65							
20	2950. 028	33888. 08	$a \ ^4G_{3\frac{1}{2}}-z \ ^4H_{3\frac{1}{2}}$	5	. 211	1. 231	1. 020	0. 106	2. 181
10	2952. 246	33862. 62	$b \ ^2F_{3\frac{1}{2}}-x \ ^4F_{4\frac{1}{2}}$	5	. 13	1. 08	1. 21	. 47w	1. 54—
10	2952. 706	33857. 35							
25	2954. 084	33841. 55	$a \ ^4G_{4\frac{1}{2}}-z \ ^4G_{3\frac{1}{2}}$	5	. 184	1. 167	0. 983	. 093	1. 811
1	2954. 855	33832. 72	$e \ ^4D_{3\frac{1}{2}}-y \ ^4G_{4\frac{1}{2}}$						
25	2960. 216	33771. 45		4	0. 180	1. 367	1. 547	0. 091	0. 917
20	2961. 538	33756. 38	$b \ ^2F_{2\frac{1}{2}}-x \ ^4G_{2\frac{1}{2}}$	6	. 248	0. 953	0. 705	. 623	. 830
10H	2962. 08	33750. 20							
60	2963. 398	33735. 19	$a \ ^4D_{1\frac{1}{2}}-z \ ^4D_{0\frac{1}{2}}$	5	1. 200	1. 200	. 000	. 601	1. 800
200	2965. 554	33710. 67	$a \ ^4D_{2\frac{1}{2}}-z \ ^4F_{3\frac{1}{2}}$	4		(1. 337)	1. 28	w	1. 14+
5	2965. 879	33706. 98							
10	2966. 399	33701. 07	$a \ ^2I_{0\frac{1}{2}}-y \ ^4H_{3\frac{1}{2}}$	5					
10	2968. 022	33682. 64	$d \ ^2D_{2\frac{1}{2}}-y \ ^2P_{1\frac{1}{2}}$	4	(0. 08)	1. 21	1. 29	. 12w	1. 09+
4h	2970. 672	33652. 59	$b \ ^2D_{1\frac{1}{2}}-z \ ^2P_{1\frac{1}{2}}$	6	0. 21	(0. 965)	1. 17	. 31	?
2h	2971. 057	33648. 23	$a \ ^4G_{2\frac{1}{2}}-z \ ^4G_{3\frac{1}{2}}$	5	. 333	0. 645	0. 978	. 166	1. 811
15	2972. 466	33632. 28	$b \ ^4D_{2\frac{1}{2}}-x \ ^4D_{3\frac{1}{2}}$	6	(0. 07)	1. 35	1. 28	. 17—	1. 32±
10	2972. 578	33631. 02	$b \ ^2G_{4\frac{1}{2}}-y \ ^4H_{3\frac{1}{2}}$						
8	2972. 98	33626. 47	$b \ ^2H_{3\frac{1}{2}}-z \ ^2I_{3\frac{1}{2}}$	6	(0. 03)	1. 08	1. 05	. 16—	1. 06±
8h	2973. 826	33616. 90	$\left\{ \begin{array}{l} b \ ^2D_{2\frac{1}{2}}-z \ ^2P_{1\frac{1}{2}} \\ c \ ^2G_{3\frac{1}{2}}-y \ ^2F_{2\frac{1}{2}} \end{array} \right.$						
4	2974. 643	33607. 67	$b \ ^2F_{3\frac{1}{2}}-y \ ^4G_{3\frac{1}{2}}$	6	(0. 05)	1. 08	1. 03	. 19—	1. 05±
4	2974. 882	33604. 97		4, 5	0. 158			. 080	?
200	2976. 578	33585. 82	$a \ ^4D_{3\frac{1}{2}}-z \ ^4F_{4\frac{1}{2}}$	4	(0. 05)	1. 38	1. 33	. 19w	1. 14+
30	2977. 219	33578. 59	$a \ ^4D_{0\frac{1}{2}}-z \ ^4F_{1\frac{1}{2}}$	5	0. 46	0. 47	0. 01	. 229	0. 700?
25	2977. 471	33575. 75	$b \ ^2H_{3\frac{1}{2}}-z \ ^4I_{3\frac{1}{2}}$	4?	(0. 04)	1. 08	1. 12	. 21w	1. 33+
50	2978. 638	33562. 59	$b \ ^2H_{4\frac{1}{2}}-z \ ^2I_{3\frac{1}{2}}$	5	(0. 09)	0. 93	1. 02	. 42w	1. 45—
60	2979. 713	33550. 49	$a \ ^4D_{2\frac{1}{2}}-z \ ^4D_{3\frac{1}{2}}$	7		(1. 337)	1. 331	0	1. 334
70	2979. 946	33547. 87	$a \ ^4D_{1\frac{1}{2}}-z \ ^4F_{2\frac{1}{2}}$	4	0. 14	1. 26	1. 12	0. 22w	0. 90+
25	2980. 966	33536. 39	$b \ ^2G_{4\frac{1}{2}}-x \ ^4G_{3\frac{1}{2}}$	5	(0. 08)	1. 09	1. 01	. 27w	1. 36—?
10H	2982. 026	33524. 47	$b \ ^2P_{0\frac{1}{2}}-x \ ^4F_{1\frac{1}{2}}$						
1	2983. 781	33504. 75	$a \ ^4G_{2\frac{1}{2}}-y \ ^4P_{2\frac{1}{2}}$						

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	A	K							
5h	2985. 676	33483. 49	$c^2D_{1\frac{1}{2}}-x^4P_{0\frac{1}{2}}$	4	0. 940	0. 809	1. 749	. 471	0. 339
10	2991. 453	33418. 82	$a^4G_{4\frac{1}{2}}-z^4G_{5\frac{1}{2}}$	5	(0. 06)	1. 18	1. 24	. 28w	1. 52-
70	2991. 621	33416. 95	$a^4D_{1\frac{1}{2}}-z^4D_{1\frac{1}{2}}$	7	-----	(1. 188)	1. 156	0	1. 172
15	2992. 083	33411. 79	$a^4G_{3\frac{1}{2}}-z^4G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20h	2992. 601	33406. 01	$a^2F_{3\frac{1}{2}}-z^4P_{2\frac{1}{2}}$	4	0. 440	(1. 14)	1. 58	0. 220	?
10	2993. 142	33399. 97	$b^2D_{2\frac{1}{2}}-x^4D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5h	2994. 650	33383. 15	$a^2I_{5\frac{1}{2}}-y^4H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20h	2996. 002	33368. 09	$b^2P_{1\frac{1}{2}}-z^4D_{1\frac{1}{2}}$	7, 6	-----	(1. 188)	1. 21	0	1. 20
1	2996. 331	33364. 42	$b^2P_{1\frac{1}{2}}-z^2F_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3h	2998. 126	33344. 45	$b^2P_{0\frac{1}{2}}-z^2P_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
75	2998. 886	33336. 00	$a^4D_{0\frac{1}{2}}-z^4D_{0\frac{1}{2}}$	Unaffected			-----	0	0
50	2999. 789	33325. 96	$b^2H_{4\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	4	0. 248	0. 960	1. 208	0. 124	0. 092
10	3000. 465	33318. 46	$b^4D_{3\frac{1}{2}}-x^4D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	3005. 141	33266. 61	$c^2D_{2\frac{1}{2}}-x^2F_{3\frac{1}{2}}$	4	-----	1. 17	(1. 137)	w	1. 05+
1	3005. 891	33258. 31	$c^2D_{1\frac{1}{2}}-w^4F_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3006. 716	33249. 19	-----	7	-----	-----	-----	0	1. 27
2h	3007. 88	33236. 32	$a^2F_{2\frac{1}{2}}-z^4F_{2\frac{1}{2}}$	6	. 21	0. 86	(1. 07)	0. 105	?
30	3010. 450	33207. 95	$a^4G_{4\frac{1}{2}}-z^4H_{5\frac{1}{2}}$	4	(0. 09)	1. 13	1. 04	. 40w	0. 64+
1h	3014. 360	33164. 88	$b^2G_{4\frac{1}{2}}-y^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	3015. 410	33153. 33	$\{b^2H_{5\frac{1}{2}}-z^2G_{4\frac{1}{2}}\}$ $\{b^2D_{1\frac{1}{2}}-y^4G_{2\frac{1}{2}}\}$	5	(0. 06)	1. 05	0. 99	0. 29w	1. 32-
5	3015. 956	33147. 33	$b^2F_{2\frac{1}{2}}-z^2P_{1\frac{1}{2}}$	4	0. 200	0. 951	1. 151	. 100	0. 651
30	3017. 816	33126. 90	$b^2F_{3\frac{1}{2}}-y^4G_{4\frac{1}{2}}$	5	(0. 06)	1. 09	1. 15	. 22w	1. 37-
1h	3018. 690	33117. 31	$b^2D_{2\frac{1}{2}}-y^4G_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3019. 642	33106. 87	$b^2D_{1\frac{1}{2}}-y^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3019. 76	33105. 57	$a^2F_{2\frac{1}{2}}-z^4D_{1\frac{1}{2}}$	4	0. 270	0. 871	1. 141	. 134	0. 466
1	3020. 549	33096. 92	$b^2G_{3\frac{1}{2}}-y^4H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1h	3021. 23	33089. 47	$\{b^2H_{4\frac{1}{2}}-z^2G_{4\frac{1}{2}}\}$ $\{a^2S_{0\frac{1}{2}}-w^4D_{1\frac{1}{2}}\}$	-----	-----	-----	-----	-----	-----
1h	3021. 977	33081. 29	$a^2I_{5\frac{1}{2}}-y^4H_{6\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10h	3022. 61	33074. 36	$c^2D_{1\frac{1}{2}}-z^2I_{1\frac{1}{2}}$	6	-----	(0. 789)	0. 85	w	0. 82
10h	3022. 946	33070. 68	$b^2D_{2\frac{1}{2}}-y^4D_{1\frac{1}{2}}$	4	0. 133	1. 106	1. 239	0. 066	. 91
8	3023. 841	33060. 90	$b^2F_{3\frac{1}{2}}-z^2F_{2\frac{1}{2}}$	5	. 232	1. 087	0. 855	. 117	1. 667
8h	3026. 817	33028. 39	$c^2D_{2\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	3027. 780	33017. 88	$a^4D_{0\frac{1}{2}}-z^4D_{1\frac{1}{2}}$	5	1. 144	0. 000	1. 444	. 573	1. 716
1	3028. 271	33012. 53	-----	-----	-----	-----	-----	-----	-----
5	3028. 928	33005. 37	$b^4D_{3\frac{1}{2}}-y^4D_{3\frac{1}{2}}$	6	(0. 04)	1. 38	1. 34	. 13-	1. 36±
5	3032. 250	32969. 21	$a^2S_{0\frac{1}{2}}-x^4P_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
7	3032. 442	32967. 13	$b^2F_{2\frac{1}{2}}-y^2G_{3\frac{1}{2}}$	5	(0. 06)	0. 99	1. 05	. 15w	1. 20-
5	3032. 624	32965. 15	-----	-----	-----	-----	-----	-----	-----
8	3033. 911	32951. 16	$a^2I_{5\frac{1}{2}}-y^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
15h	3035. 792	32930. 75	$b^2F_{2\frac{1}{2}}-x^4D_{3\frac{1}{2}}$	7	-----	(0. 945)	0. 95	0	0. 967
75	3036. 463	32923. 47	$b^2H_{5\frac{1}{2}}-z^2I_{6\frac{1}{2}}$	5	(0. 07)	1. 08	1. 15	0. 36w	1. 51-
2h	3037. 116	32916. 40	$a^6S_{2\frac{1}{2}}-y^4D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
15	3038. 758	32898. 61	$b^2P_{1\frac{1}{2}}-y^4D_{0\frac{1}{2}}$	5	0. 410	1. 187	0. 777	. 205	1. 392
1h	3039. 50	32890. 58	$b^2G_{4\frac{1}{2}}-x^4G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3040. 096	32884. 13	$c^2D_{2\frac{1}{2}}-x^4P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3042. 367	32859. 58	$z^4D_{1\frac{1}{2}}-e^4D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1h	3043. 342	32849. 06	$b^2H_{5\frac{1}{2}}-z^4I_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3046. 132	32818. 97	$a^4D_{1\frac{1}{2}}-z^4D_{2\frac{1}{2}}$	5	. 155	1. 193	1. 348	. 077	1. 580
1h	3046. 827	32811. 49	$c^2D_{1\frac{1}{2}}-w^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3047. 223	32807. 22	$a^4G_{4\frac{1}{2}}-z^4H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
25	3047. 702	32802. 07	$a^4D_{2\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	5	-----	(1. 337)	1. 38	w	1. 50-
50	3049. 246	32785. 46	$b^2H_{4\frac{1}{2}}-z^4I_{5\frac{1}{2}}$	5	(0. 08)	0. 98	1. 06	0. 38w	1. 44-
1	3053. 80	32736. 57	-----	-----	-----	-----	-----	-----	-----
5H	3054. 563	32728. 39	$z^4F_{0\frac{1}{2}}-e^4D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
100	3056. 855	32703. 85	$b^2H_{5\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	4	(0. 08)	1. 07	1. 15	0. 35w	0. 72+

TABLE 6. *The second spectrum of ruthenium (Ru II)*—Continued

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
20	3059. 101	32679. 84	$b^4D_{3/2} - z^2F_{3/2}^o$	-----					
30	3060. 217	32667. 93	$a^2F_{2/2} - z^4F_{3/2}^o$	5	0. 416	0. 846	1. 262	. 209	2. 302
30	3060. 500	32664. 90	$b^2G_{3/2} - y^2G_{3/2}^o$	5	. 179	. 869	1. 048	. 089	1. 67?
8 <i>h</i>	3062. 07	32648. 16	$b^2F_{2/2} - y^4G_{3/2}^o$	6	. 260	. 942	0. 682	. 651	0. 812
1	3062. 819	32640. 17	$b^2H_{3/2} - y^4F_{3/2}^o$	-----					
1	3064. 366	32623. 69							
20	3066. 435	32601. 69	$b^2F_{2/2} - y^4D_{1/2}^o$	4	. 278	. 954	1. 232	. 139	. 537
3	3067. 575	32589. 57	$c^2G_{3/2} - y^2D_{2/2}^o$	-----					
4	3070. 317	32560. 47							
30	3072. 341	32539. 02	$b^2G_{3/2} - x^4G_{3/2}^o$	5	. 186	. 880	0. 694	. 093	1. 345
40	3073. 548	32526. 24	$b^2H_{3/2} - z^2G_{3/2}^o$	4	(0. 07)	. 92	. 99	. 26 <i>w</i>	0. 66+
20	3075. 33	32507. 39	$a^2F_{2/2} - z^4D_{3/2}^o$	6	0. 475	. 873	1. 348	1. 191	1. 111
4	3079. 120	32467. 38	$a^4G_{3/2} - z^4H_{3/2}^o$	7	-----	(1. 021)	1. 026	0	1. 043
25	3081. 396	32443. 40	$b^4D_{3/2} - z^2G_{3/2}^o$	4	. 391	1. 384	0. 993	-0. 197	-0. 386
10	3081. 847	32438. 65	$a^4D_{1/2} - z^6P_{1/2}^o$	-----					
1	3082. 963	32426. 91	$a^4G_{3/2} - z^4H_{3/2}^o$	-----					
25	3086. 624	32388. 45	$a^2I_{6/2} - x^4G_{3/2}^o$	4	(0. 07)	1. 04	1. 11	. 40 <i>w</i>	. 64+
1	3087. 924	32374. 82	$z^4D_{3/2} - e^4D_{3/2}^o$	-----					
10	3089. 689	32356. 32	$b^4D_{1/2} - z^2D_{2/2}^o$	-----					
5	3090. 523	32347. 59	$b^2F_{2/2} - y^4G_{3/2}^o$	-----					
100	3093. 902	32312. 26	$b^2G_{4/2} - x^4G_{3/2}^o$	5	(0. 08)	1. 06	1. 14	. 34 <i>w</i>	1. 48-
25	3094. 565	32305. 34	$a^4D_{2/2} - z^6P_{3/2}^o$	6	0. 500	1. 340	1. 840	1. 248	1. 591
20	3097. 960	32269. 94	$b^2D_{2/2} - z^2F_{2/2}^o$	6	. 26	(1. 102)	0. 84	0. 65	?
3	3099. 908	32249. 66	$b^2G_{4/2} - y^2G_{3/2}^o$	-----					
2 <i>h</i>	3101. 462	32233. 51	$a^4G_{2/2} - z^4H_{3/2}^o$	-----					
1 <i>h</i>	3102. 532	32222. 39	$c^2G_{4/2} - y^4H_{3/2}^o$	-----					
30	3103. 422	32213. 15	$b^2G_{4/2} - x^4D_{3/2}^o$	5	0. 116	1. 067	0. 951	0. 058	1. 473
30	3107. 586	32169. 99	$a^4D_{3/2} - z^6P_{3/2}^o$	6	. 178	1. 407	1. 585	. 626	1. 496
5 <i>h</i>	3111. 148	32133. 16	$c^2D_{2/2} - x^4P_{2/2}^o$	6	(0. 07)	1. 18	(1. 246)	. 18-	?
10 <i>H</i>	3113. 947	32104. 28	$b^2G_{4/2} - z^2H_{1/2}^o$	6	(0. 06)	1. 07	1. 01	. 26-	1. 04±
5 <i>h</i>	3115. 606	32087. 18	$a^4G_{3/2} - z^4H_{3/2}^o$	-----					
20?	3118. 03	32062. 2	$b^2H_{4/2} - y^4F_{3/2}^o$	4	0. 10	0. 93	1. 03	. 36 <i>w</i>	0. 58+
3	3120. 234	32039. 59	$a^4D_{0/2} - z^6P_{1/2}^o$	-----					
25	3120. 872	32033. 04	$b^4D_{1/2} - y^4F_{1/2}^o$	6	. 780	1. 200	0. 420	1. 169	. 810
10	3123. 892	32002. 07	$b^2P_{0/2} - x^4D_{0/2}^o$	6	. 51	0. 88	. 37	0. 254	. 627
25	3124. 678	31994. 02	$b^4D_{3/2} - y^4F_{1/2}^o$	-----					
20	3126. 613	31974. 22	$b^2F_{3/2} - z^2F_{3/2}^o$	6	. 116	1. 082	1. 198	. 415	1. 140
25	3127. 923	31960. 83	$b^4D_{0/2} - y^4F_{1/2}^o$	5	. 298	0. 139	0. 437	. 149	0. 586
10	3132. 701	31912. 09	$b^4D_{3/2} - z^2D_{3/2}^o$	5	(0. 06)	1. 40	1. 34	. 15 <i>w</i>	1. 55-
25	3134. 817	31890. 55	$a^2I_{5/2} - z^2H_{1/2}^o$	4	(0. 08)	0. 94	1. 02	. 37 <i>w</i>	0. 57+
10	3135. 199	31886. 66	$c^2D_{1/2} - y^2F_{3/2}^o$	-----					
25	3135. 807	31880. 48	$b^4D_{3/2} - z^2G_{3/2}^o$	6	0. 362	1. 391	1. 029	1. 270	1. 210
1	3138. 022	31857. 98	$b^2D_{1/2} - x^4D_{3/2}^o$	-----					
2	3139. 576	31842. 21	$d^2D_{1/2} - x^2D_{1/2}^o$	-----					
10	3141. 594	31821. 76	$b^2D_{2/2} - x^4D_{2/2}^o$	6	. 180	1. 097	1. 277	0. 453	1. 187
40	3143. 240	31805. 09	$b^2P_{0/2} - y^4D_{1/2}^o$	5	. 361	0. 868	1. 230	. 181	1. 411
60	3143. 650	31800. 94	$b^2F_{2/2} - z^2F_{2/2}^o$	6	. 12	0. 99	0. 87	. 29-	0. 93±
15	3146. 09	31776. 28	$a^2F_{3/2} - z^4D_{3/2}^o$	4	. 206	1. 139	1. 345	. 103	. 624
3	3146. 395	31773. 20	$b^2P_{1/2} - y^4P_{1/2}^o$	-----					
50	3147. 456	31762. 49	$b^2H_{3/2} - z^4I_{3/2}^o$	5	. 120	1. 06	0. 94	. 06	1. 60-
2	3148. 716	31749. 78	$b^2G_{3/2} - y^2G_{3/2}^o$	-----					
3	3148. 913	31747. 80	$c^2G_{4/2} - y^2G_{4/2}^o$	-----					
1	3149. 901	31737. 84	$b^2F_{3/2} - z^2G_{3/2}^o$	-----					
2	3152. 311	31713. 57	$b^2G_{3/2} - x^4D_{3/2}^o$	-----					
2	3157. 173	31664. 74	$c^2G_{3/2} - x^4F_{2/2}^o$	-----					

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	A	K							
75	3160. 631	31630. 10	$b^2G_{4\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	5	(0. 05)	1. 08	1. 03	0. 18w	1. 26-
100	3163. 188	31604. 53	$b^2G_{3\frac{1}{2}}-z^2H_{4\frac{1}{2}}$	5	0. 123	0. 896	1. 019	. 062	1. 451
10	3164. 719	31589. 24	$c^2D_{2\frac{1}{2}}-y^2D_{3\frac{1}{2}}$	6	(0. 04)	1. 18	1. 14	. 09h	1. 16h
50	3165. 071	31585. 73	$b^2G_{4\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	5	(0. 08)	1. 12	1. 20	. 36w	1. 56-
15	3166. 091	31575. 55	$b^4D_{1\frac{1}{2}}-y^4F_{2\frac{1}{2}}$	4	0. 174	1. 194	1. 020	. 087	0. 759
15	3166. 542	31571. 05	$c^2G_{3\frac{1}{2}}-x^4G_{3\frac{1}{2}}$	6	(0. 05)	0. 96	1. 01	. 18-	. 98±
75	3167. 458	31561. 92	$a^2I_{6\frac{1}{2}}-z^2H_{5\frac{1}{2}}$	4	(0. 06)	1. 05	1. 11	. 34w	. 71+
80	3172. 669	31510. 09	$b^2P_{1\frac{1}{2}}-z^2D_{2\frac{1}{2}}$	5	0. 140	1. 185	1. 325	0. 70	1. 536
5	3172. 946	31507. 34	$d^2D_{2\frac{1}{2}}-x^2D_{2\frac{1}{2}}$	7	0	1. 19	1. 19	0h	1. 19h
20	3175. 143	31485. 54	$b^2G_{4\frac{1}{2}}-z^2H_{5\frac{1}{2}}$	5	(0. 08)	0. 96	1. 04	0. 36w	1. 40-
10	3175. 312	31483. 86	$a^4D_{3\frac{1}{2}}-z^6F_{3\frac{1}{2}}$	---	---	---	---	---	---
150	3177. 048	31466. 66	$a^4D_{3\frac{1}{2}}-z^6F_{4\frac{1}{2}}$	5	---	(1. 403)	1. 42	w	1. 46-
10	3179. 24	31444. 96	$b^4D_{2\frac{1}{2}}-y^4F_{2\frac{1}{2}}$	---	---	---	---	---	---
1	3182. 144	31416. 27	$b^4D_{3\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	---	---	---	---	---	---
25	3183. 479	31403. 09	$c^2D_{1\frac{1}{2}}-x^4P_{2\frac{1}{2}}$	5	0. 457	0. 789	1. 246	0. 229	1. 932
1	3184. 177	31396. 21	---	---	---	---	---	---	---
10	3185. 294	31385. 20	$b^2G_{3\frac{1}{2}}-x^4F_{4\frac{1}{2}}$	5	. 304	(0. 883)	1. 187	. 152	?
2	3192. 568	31313. 69	---	---	---	---	---	---	---
100	3195. 148	31288. 41	$b^2F_{3\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	5	(0. 07)	1. 09	1. 16	. 24w	1. 40-
5	3195. 746	31282. 55	---	---	---	---	---	---	---
20	3198. 624	31254. 41	$b^2H_{4\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	4	(0. 03)	0. 94	0. 97	. 10w	0. 84+
50	3201. 260	31228. 68	$b^2H_{5\frac{1}{2}}-z^4G_{4\frac{1}{2}}$	4	(0. 03)?	. 96?	. 99?	. 13w	. 83+
10	3203. 555	31206. 30	$b^2F_{3\frac{1}{2}}-z^2D_{2\frac{1}{2}}$	4	0. 242	1. 083	1. 325	. 122	. 478
20	3204. 287	31199. 18	$c^2G_{3\frac{1}{2}}-y^2G_{4\frac{1}{2}}$	5	. 120	0. 942	1. 062	. 060	1. 482
2	3205. 567	31186. 72	$b^2P_{1\frac{1}{2}}-y^4F_{1\frac{1}{2}}$	---	---	---	---	---	---
50	3206. 799	31174. 74	$b^2F_{3\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	6	(0. 05)	1. 08	1. 03	0. 16-	1. 05±
10	3207. 421	31168. 69	$c^2D_{2\frac{1}{2}}-sI_{1\frac{1}{2}}$	7	---	1. 193	(1. 209)	0	1. 169
15	3207. 841	31164. 61	$b^2H_{4\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	6	0. 180	0. 956	1. 136	0. 811	1. 046
3	3209. 422	31149. 26	$b^2G_{4\frac{1}{2}}-y^4G_{4\frac{1}{2}}$	---	---	---	---	---	---
2	3210. 688	31136. 98	$b^4D_{1\frac{1}{2}}-z^4G_{2\frac{1}{2}}$	---	---	---	---	---	---
5	3211. 381	31130. 26	$b^2G_{3\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	---	---	---	---	---	---
10	3217. 863	31067. 55	$c^2D_{1\frac{1}{2}}-y^2D_{1\frac{1}{2}}$	6	(0. 06)	. 80	0. 74	. 088	0. 77±
50	3219. 418	31052. 55	$b^4D_{3\frac{1}{2}}-z^4I_{1\frac{1}{2}}$	4	0. 438	1. 416	. 978	-. 219	-. 555
25	3221. 360	31033. 83	$a^4D_{2\frac{1}{2}}-z^6P_{3\frac{1}{2}}$	5	. 241	1. 334	1. 575	. 122	2. 179
30	3221. 970	31027. 95	$a^2F_{3\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	6	. 254	1. 134	1. 388	. 889	1. 261?
4	3224. 041	31008. 02	$b^2P_{0\frac{1}{2}}-x^4D_{1\frac{1}{2}}$	---	---	---	---	---	---
15	3224. 938	30999. 40	$d^2D_{1\frac{1}{2}}-w^4D_{0\frac{1}{2}}$	---	---	---	---	---	---
3	3226. 526	30984. 14	$d^2D_{2\frac{1}{2}}-w^4D_{3\frac{1}{2}}$	---	---	---	---	---	---
150	3228. 49	30965. 29	$b^2H_{5\frac{1}{2}}-z^4H_{6\frac{1}{2}}$	5	(0. 07)	1. 06	1. 13	. 39w	1. 52-
10	3231. 586	30935. 63	$a^2I_{5\frac{1}{2}}-y^4G_{4\frac{1}{2}}$	4	0. 220	0. 938	(1. 158)	. 110	?
50	3234. 339	30909. 30	$b^4D_{1\frac{1}{2}}-y^4P_{2\frac{1}{2}}$	5	(0. 09)	1. 21	1. 30	. 13w	1. 43-
5	3235. 786	30895. 48	$b^2H_{5\frac{1}{2}}-z^4G_{5\frac{1}{2}}$	6	0. 17	(1. 053)	1. 22	. 929	?
25	3245. 611	30801. 95	$a^4D_{2\frac{1}{2}}-z^6F_{1\frac{1}{2}}$	5	. 272	1. 340	1. 068	. 138	1. 748
25	3246. 222	30796. 16	$c^2G_{4\frac{1}{2}}-x^4D_{3\frac{1}{2}}$	5	. 124	1. 078	0. 954	. 061	1. 512
3	3248. 04	30778. 92	$b^4D_{2\frac{1}{2}}-y^4P_{2\frac{1}{2}}?$	---	---	---	---	---	---
15	3253. 314	30729. 03	$b^2P_{1\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	4	. 160	1. 023	1. 183	. 080	0. 783
2	3257. 159	30692. 75	$b^4D_{3\frac{1}{2}}-z^4G_{2\frac{1}{2}}$	---	---	---	---	---	---
20	3257. 748	30687. 20	$c^2G_{4\frac{1}{2}}-z^2H_{4\frac{1}{2}}$	6	(0. 07)	1. 10	1. 03	. 33-	1. 06±
75	3258. 970	30675. 69	$a^2F_{3\frac{1}{2}}-z^4F_{4\frac{1}{2}}$	5	0. 203	1. 345	1. 142	. 101	2. 045
10	3260. 147	30664. 62	$a^4D_{2\frac{1}{2}}-z^6F_{2\frac{1}{2}}$	---	---	---	---	---	---
2	3261. 747	30649. 58	$b^2G_{3\frac{1}{2}}-y^4G_{4\frac{1}{2}}$	---	---	---	---	---	---
25	3264. 795	30620. 97	$b^2H_{4\frac{1}{2}}-z^4H_{5\frac{1}{2}}$	5	. 122	1. 071	0. 949	. 061	1. 620
8	3266. 112	30608. 62	$b^4D_{3\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	---	---	---	---	---	---
5	3267. 184	30598. 58	---	---	---	---	---	---	---
60	3268. 803	30583. 42	$b^2G_{3\frac{1}{2}}-z^2F_{2\frac{1}{2}}$	5 us	---	(0. 883)	0. 85	w	0. 97

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	A	K							
3	3270. 155	30570. 78	$c \ ^2D_{3/2}-x \ ^4G_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
1	3272. 010	30553. 45	$a \ ^2S_{0/2}-y \ ^2D_{1/2}^{\circ}$	-----	-----	-----	-----	-----	-----
10	3273. 612	30538. 50	$b \ ^2P_{0/2}-y \ ^4D_{0/2}^{\circ}$	-----	-----	-----	-----	-----	-----
15	3275. 729	30518. 76	$b \ ^4D_{3/2}-z \ ^4G_{4/2}^{\circ}$	-----	-----	-----	-----	-----	-----
2	3276. 783	30508. 94	-----	-----	-----	-----	-----	-----	-----
2	3281. 193	30467. 94	$c \ ^2G_{4/2}-x \ ^4F_{4/2}^{\circ}$	-----	-----	-----	-----	-----	-----
8	3281. 518	30464. 93	$b \ ^4D_{3/2}-y \ ^4P_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
60	3282. 973	30451. 42	$b \ ^2D_{1/2}-z \ ^2D_{3/2}^{\circ}$	5	0. 367	(0. 965)	1. 332	0. 184	?
30	3284. 343	30438. 72	$c \ ^2D_{1/2}-1 \ ^1_{1/2}$	-----	-----	-----	-----	-----	-----
2	3285. 762	30425. 58	$b \ ^2F_{3/2}-y \ ^4F_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
1	3286. 114	30422. 32	$c \ ^2D_{3/2}-x \ ^4F_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
2	3286. 840	30415. 60	$b \ ^2D_{3/2}-z \ ^2D_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
300	3294. 232	30347. 35	$a \ ^4D_{2/2}-z \ ^6F_{3/2}^{\circ}$	5 <i>us</i>	-----	-----	-----	. 49 <i>w</i>	1. 82—
5	3298. 321	30309. 73	$a \ ^2I_{0/2}-z \ ^2I_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
2	3300. 115	30293. 25	-----	-----	-----	-----	-----	-----	-----
15	3301. 14	30283. 85	$\left\{ \begin{array}{l} b \ ^2H_{5/2}-z \ ^4H_{4/2}^{\circ} \\ c \ ^2G_{3/2}-y \ ^2G_{3/2}^{\circ} \end{array} \right.$	5	(0. 04)	1. 10	1. 06	. 16 <i>w</i>	1. 26—?
15	3301. 219	30283. 12	-----	-----	-----	-----	-----	-----	-----
3	3308. 102	30220. 11	$\left\{ \begin{array}{l} b \ ^2H_{4/2}-z \ ^4H_{4/2}^{\circ} \\ d \ ^2D_{1/2}-w \ ^4F_{3/2}^{\circ} \end{array} \right.$	-----	-----	-----	-----	-----	-----
10	3308. 885	30212. 96	$c \ ^2G_{4/2}-y \ ^4G_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
10	3309. 233	30209. 79	$b \ ^2F_{2/2}-y \ ^4P_{1/2}^{\circ}$	-----	-----	-----	-----	-----	-----
15	3310. 283	30200. 21	$d \ ^2D_{3/2}-x \ ^2G_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
10	3312. 831	30176. 98	-----	6	0. 265	-----	-----	. 397	?
1	3313. 010	30175. 35	-----	-----	-----	-----	-----	-----	-----
1	3313. 738	30168. 72	$c \ ^2G_{4/2}-y \ ^4G_{5/2}^{\circ}$	-----	-----	-----	-----	-----	-----
3	3317. 015	30138. 91	$c \ ^2G_{3/2}-z \ ^2H_{4/2}^{\circ}$	-----	-----	-----	-----	-----	-----
3	3317. 402	30135. 40	$b \ ^2G_{3/2}-x \ ^4D_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
5	3317. 591	30133. 68	$a \ ^4D_{1/2}-z \ ^6F_{0/2}^{\circ}$	-----	-----	-----	-----	-----	-----
3	3322. 784	30086. 59	-----	-----	-----	-----	-----	-----	-----
2	3324. 553	30070. 58	$a \ ^4D_{1/2}-z \ ^6F_{1/2}^{\circ}$	-----	-----	-----	-----	-----	-----
1	3324. 800	30068. 35	$c \ ^2G_{4/2}-z \ ^2H_{5/2}^{\circ}$	-----	-----	-----	-----	-----	-----
25	3325. 407	30062. 86	$b \ ^2P_{1/2}-y \ ^4P_{2/2}^{\circ}$	5	0. 108	1. 189	1. 297	0. 052	1. 459—
1	3335. 852	29968. 73	$a \ ^2I_{5/2}-z \ ^4I_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
1	3338. 329	29946. 49	$b \ ^2F_{2/2}-z \ ^2D_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
75	3339. 788	29933. 41	$a \ ^4D_{1/2}-z \ ^6F_{2/2}^{\circ}$	5	. 126	1. 177	1. 303	. 064	1. 492
1	3340. 404	29927. 89	-----	-----	-----	-----	-----	-----	-----
2	3340. 789	29924. 45	$a \ ^2S_{0/2}-1 \ ^1_{1/2}$	-----	-----	-----	-----	-----	-----
1	3341. 34	29919. 51	$\left\{ \begin{array}{l} b \ ^2D_{2/2}-y \ ^4F_{3/2}^{\circ} \\ c \ ^2G_{3/2}-x \ ^4F_{4/2}^{\circ} \end{array} \right.$	-----	-----	-----	-----	-----	-----
2	3342. 665	29907. 65	$c \ ^2D_{1/2}-x \ ^4F_{1/2}^{\circ}$	-----	-----	-----	-----	-----	-----
50	3343. 200	29902. 87	$b \ ^2F_{3/2}-z \ ^4G_{3/2}^{\circ}$	6	. 10	1. 08	0. 98	. 34—	1. 03±
100	3350. 246	29839. 98	$b \ ^2H_{4/2}-z \ ^4H_{3/2}^{\circ}$	7	-----	(0. 958)	. 964	0	0. 937
8	3353. 29	29812. 89	$b \ ^2F_{3/2}-z \ ^4G_{4/2}^{\circ}$	-----	-----	-----	-----	-----	-----
15	3359. 230	29760. 17	$b \ ^2G_{4/2}-z \ ^2G_{4/2}^{\circ}$	-----	-----	-----	-----	-----	-----
15	3359. 324	29759. 34	$b \ ^2F_{3/2}-y \ ^4P_{3/2}^{\circ}$	4	. 20	0. 86	(1. 058)	0. 099?	?
			$a \ ^2F_{2/2}-z \ ^6F_{1/2}^{\circ}$	-----	-----	-----	-----	-----	-----
5	3359. 985	29753. 49	$b \ ^4P_{2/2}-z \ ^4P_{1/2}^{\circ}$	-----	-----	-----	-----	-----	-----
8	3362. 140	29734. 42	$a \ ^4D_{0/2}-z \ ^6F_{0/2}^{\circ}$	-----	-----	-----	-----	-----	-----
2	3365. 384	29705. 76	$d \ ^2D_{2/2}-w \ ^4D_{1/2}^{\circ}$	-----	-----	-----	-----	-----	-----
40	3369. 288	29671. 34	$a \ ^4D_{0/2}-z \ ^6F_{1/2}^{\circ}$	5	1. 06	. 00	1. 06	. 53	1. 59
30	3370. 061	29664. 53	$c \ ^2G_{3/2}-y \ ^4G_{3/2}^{\circ}$	6	(0. 08)	. 95	1. 03	. 27—	0. 99±
2	3373. 472	29634. 54	$b \ ^2D_{3/2}-y \ ^4F_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
2	3376. 624	29606. 88	$a \ ^2I_{0/2}-z \ ^2I_{0/2}^{\circ}$	-----	-----	-----	-----	-----	-----
3	3380. 356	29574. 19	$b \ ^4D_{3/2}-z \ ^4H_{3/2}^{\circ}?$	-----	-----	-----	-----	-----	-----
2	3382. 229	29557. 82	$b \ ^4D_{1/2}-z \ ^4S_{1/2}^{\circ}$	-----	-----	-----	-----	-----	-----
3	3387. 963	29507. 79	$b \ ^4D_{2/2}-z \ ^4H_{3/2}^{\circ}$	4	0. 392	(1. 344)	0. 952	0. 196	?
2	3389. 208	29497. 0	$b \ ^2G_{3/2}-z \ ^2F_{3/2}^{\circ}$	-----	-----	-----	-----	-----	-----
1	3393. 904	29456. 14	$b \ ^2G_{4/2}-z \ ^4I_{5/2}^{\circ}$	-----	-----	-----	-----	-----	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combina- tion	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
8	3398. 862	29413. 17	$b^2P_{0\frac{1}{2}}-y^4P_{1\frac{1}{2}}$	5us	-----	-----	-----	. 84	1. 58
5	3401. 188	29393. 06	$a^2S_{0\frac{1}{2}}-x^4F_{3\frac{1}{2}}?$	-----	-----	-----	-----	-----	-----
1	3410. 03	29316. 85	$a^2I_{5\frac{1}{2}}-z^2I_{6\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	3410. 742	29310. 73	$b^2G_{4\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	6	(0. 08)	1. 07	1. 15	. 35-	1. 11+
10	3411. 43	29304. 8	$a^2F_{2\frac{1}{2}}-z^6F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3416. 612	29260. 37	$b^2G_{3\frac{1}{2}}-z^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3424. 018	29197. 08	$b^2G_{4\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3424. 131	29196. 12	$b^2D_{2\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3424. 381	29193. 99	$b^4D_{3\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
6	3427. 728	29165. 48	$b^2F_{2\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	6	(0. 06)	(0. 945)	1. 00	. 16	?
1	3433. 10	29119. 84	-----	-----	-----	-----	-----	-----	-----
2	3434. 02	29112. 04	$b^2D_{2\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3446. 750	29004. 53	$b^2D_{1\frac{1}{2}}-y^4P_{3\frac{1}{2}}$	5	0. 339	0. 954	1. 293	. 170	1. 801
10	3462. 983	28868. 57	$b^2F_{3\frac{1}{2}}-z^4H_{4\frac{1}{2}}$	4	(0. 04)	1. 04	1. 00	. 15w	0. 85+
10	3465. 405	28848. 39	$d^2D_{1\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3469. 269	28816. 26	$c^2G_{4\frac{1}{2}}-z^2I_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3469. 907	28810. 97	$b^2G_{3\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3473. 195	28783. 69	$b^4P_{2\frac{1}{2}}-z^4P_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3479. 339	28732. 87	$b^2G_{4\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	7	-----	(1. 067)	1. 03	0	1. 20
2	3480. 060	28725. 91	$b^2F_{2\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3481. 928	28711. 50	$b^2P_{1\frac{1}{2}}-z^4S_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3483. 649	28697. 32	$b^2G_{3\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3487. 672	28664. 22	$c^2D_{2\frac{1}{2}}-y^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3490. 277	28642. 82	$b^2F_{2\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3500. 86	28556. 24	$a^2F_{3\frac{1}{2}}-z^6F_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3504. 56	28526. 09	$b^4F_{2\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
200	3509. 217	28488. 24	$b^2F_{3\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	6	0. 121	1. 082	0. 961	0. 427	1. 021
2	3511. 40	28470. 53	-----	-----	-----	-----	-----	-----	-----
20	3520. 063	28400. 46	$d^2D_{2\frac{1}{2}}-y^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
6	3523. 917	28369. 40	$b^2G_{4\frac{1}{2}}-z^4I_{4\frac{1}{2}}$	6	. 12	(1. 067)	. 95	. 54-	?
20	3524. 480	28364. 87	$d^2D_{1\frac{1}{2}}-x^4P_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	3527. 183	28343. 13	$c^2G_{4\frac{1}{2}}-z^2G_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3542. 617	28219. 65	$a^2S_{0\frac{1}{2}}-z^2P_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3548. 508	28172. 81	$b^4P_{1\frac{1}{2}}-z^4P_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3556. 816	28107. 01	$a^4H_{4\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3565. 437	28039. 05	$c^2G_{4\frac{1}{2}}-z^4I_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3566. 452	28031. 07	$c^2G_{3\frac{1}{2}}-z^2F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
6	3577. 045	27948. 06	$b^2G_{3\frac{1}{2}}-y^4F_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3582. 395	27906. 32	$a^4D_{3\frac{1}{2}}-z^6D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
20	3584. 022	27893. 65	$c^2G_{4\frac{1}{2}}-y^4F_{4\frac{1}{2}}$	6	(0. 07)	1. 11	1. 18	. 31-	1. 15±
4	3585. 43	27882. 70	$b^4P_{2\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
30	3591. 518	27835. 44	$b^2G_{4\frac{1}{2}}-z^4G_{4\frac{1}{2}}$	6	(0. 05)	1. 05	1. 10	. 24-	1. 07±
2	3601. 613	27757. 42	$a^4H_{3\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3603. 059	27746. 28	$b^4F_{3\frac{1}{2}}-z^4P_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3612. 482	27673. 91	$a^2S_{0\frac{1}{2}}-y^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3615. 206	27653. 05	$b^2D_{1\frac{1}{2}}-z^4S_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3627. 896	27556. 33	$b^4F_{2\frac{1}{2}}-z^4P_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
4	3628. 629	27550. 76	-----	-----	-----	-----	-----	-----	-----
2	3645. 201	27425. 51	$b^2G_{3\frac{1}{2}}-z^4G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3649. 771	27391. 18	$c^2D_{1\frac{1}{2}}-x^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3652. 836	27368. 19	$a^2I_{0\frac{1}{2}}-z^4H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
60	3657. 571	27332. 76	$a^4D_{3\frac{1}{2}}-z^6D_{3\frac{1}{2}}$	6	0. 165	1. 403	1. 568	0. 579	1. 486
30	3660. 070	27314. 10	$b^4P_{2\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	4	. 296	1. 581	1. 285	. 149	0. 545?
1	3666. 07?	27291. 73	$b^2G_{4\frac{1}{2}}-z^4H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3666. 88	27263. 38	$c^2G_{3\frac{1}{2}}-z^2D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----

TABLE 6. *The second spectrum of ruthenium (Ru II)*—Continued

1	2	3	4	5	6	7	8	9	10
Intensity	λ (air)	σ	Term combination	Type	Δg	g	g	Strong p	Strong n
	<i>A</i>	<i>K</i>							
2	3675. 603	27198. 67	$a^4H_{4\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
4	3676. 289	27193. 60	$a^4D_{2\frac{1}{2}}-z^6D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3681. 658	27153. 95	$b^4P_{2\frac{1}{2}}-z^4D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
150	3690. 030	27092. 34	$a^4D_{3\frac{1}{2}}-z^6D_{3\frac{1}{2}}$	5	. 129	1. 401	1. 530	. 065	1. 981
10	3690. 995	27085. 26	$b^4F_{2\frac{1}{2}}-z^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
6	3707. 976	26961. 22	$d^2D_{2\frac{1}{2}}-y^2D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3709. 21	26952. 25	$c^2G_{4\frac{1}{2}}-z^4I_{4\frac{1}{2}}$	6	. 13	(1. 078)	0. 95	. 59	?
2	3710. 998	26939. 27	$c^2D_{1\frac{1}{2}}-x^4D_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3713. 432	26921. 61	$c^2D_{1\frac{1}{2}}-y^4D_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3720. 627	26869. 55	$d^2D_{1\frac{1}{2}}-x^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3722. 645	26854. 98	$a^4H_{5\frac{1}{2}}-z^4F_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	3734. 455	26770. 06	$a^4D_{2\frac{1}{2}}-z^6D_{3\frac{1}{2}}$	6	. 296	1. 338	1. 634	. 750	1. 486
4	3734. 834	26767. 34	$c^2G_{3\frac{1}{2}}-y^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3740. 230	26728. 73	$b^4F_{1\frac{1}{2}}-z^4F_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3746. 932	26680. 92	$b^4F_{4\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
5	3747. 453?	26677. 21	$a^2I_{5\frac{1}{2}}-z^4H_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
8	3750. 508	26655. 48	$b^4F_{2\frac{1}{2}}-z^4F_{2\frac{1}{2}}$	6	. 134	1. 083	0. 949	. 344	1. 016
2	3757. 730	26604. 25	$b^4P_{1\frac{1}{2}}-z^4P_{2\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3766. 72	26540. 76	$d^2D_{2\frac{1}{2}}-1_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3769. 012	26524. 62	$b^4F_{2\frac{1}{2}}-z^4D_{1\frac{1}{2}}$	4	. 207	0. 943	1. 151	. 103	0. 634
10	3774. 474	26486. 23	$b^4F_{1\frac{1}{2}}-z^4D_{0\frac{1}{2}}$	5	. 444	. 422	0. 022	. 222	. 644
6	3777. 923	26462. 05	$a^4D_{1\frac{1}{2}}-z^6D_{1\frac{1}{2}}$	6	0. 652	1. 189	1. 841	0. 978	1. 515
10	3784. 175	26418. 34	$c^2G_{4\frac{1}{2}}-z^4G_{4\frac{1}{2}}$	6	(0. 021)	(1. 078)	1. 099	. 094	?
4	3795. 691	26338. 19	$a^4D_{0\frac{1}{2}}-z^6D_{0\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3804. 572	26276. 71	$b^4F_{3\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	6	0. 193	(1. 093)	1. 286	. 675	?
5	3806. 567	26262. 93	$c^2D_{2\frac{1}{2}}-z^2D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
4	3811. 166	26231. 25	$c^2D_{2\frac{1}{2}}-z^2G_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
2	3811. 805	26226. 85	-----	-----	-----	-----	-----	-----	-----
2	3816. 207	26196. 60	$a^4D_{2\frac{1}{2}}-z^6D_{3\frac{1}{2}}$	5	. 233	(1. 337)	1. 570	. 118	?
5	3820. 386	26167. 94	$b^4F_{1\frac{1}{2}}-z^4D_{1\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
3	3827. 92	26116. 44	$b^4F_{3\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	4	. 255	(1. 093)	1. 348	. 126	?
5	3832. 272	26086. 78	$b^4F_{2\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
6	3843. 462	26010. 83	$b^2G_{3\frac{1}{2}}-z^4H_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3863. 68	25874. 73	$c^2G_{4\frac{1}{2}}-z^4H_{5\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
50	3879. 023	25772. 38	$b^4F_{4\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	4	. 186	1. 208	1. 394	0. 92	0. 557
2	3885. 823	25727. 28	$a^2F_{2\frac{1}{2}}-z^6D_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
1	3889. 43	25703. 42	$b^4P_{1\frac{1}{2}}-z^4F_{3\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
10	3932. 828	25419. 80	$b^4F_{4\frac{1}{2}}-z^4F_{4\frac{1}{2}}$	-----	-----	-----	-----	-----	-----
60	4002. 957	24974. 47	$b^4P_{1\frac{1}{2}}-z^4D_{3\frac{1}{2}}$	4	. 295	1. 645	1. 350	. 148	. 907
100	4009. 928	24931. 06	$a^4G_{2\frac{1}{2}}-z^4F_{1\frac{1}{2}}$	5	. 186	0. 654	0. 468	. 093	. 933

Observed at pole of arc				Observed at pole of arc			
Intensity	λ (vacuum)	σ	Term combination	Intensity	λ (vacuum)	σ	Term combination
3	4011. 30	24922. 6	-----	2	4093. 41	24422. 3	$a^2F_{3\frac{1}{2}}-z^6D_{3\frac{1}{2}}$
2	4016. 96	24887. 4	-----	20	4104. 80	24354. 9	$a^4G_{3\frac{1}{2}}-z^4F_{3\frac{1}{2}}$
5	4025. 28	24836. 0	$d^2D_{2\frac{1}{2}}-z^2P_{1\frac{1}{2}}$	5	4134. 10	24182. 3	$a^2F_{3\frac{1}{2}}-z^6D_{3\frac{1}{2}}$
10	4040. 25	24744. 0	$a^4H_{4\frac{1}{2}}-z^6F_{3\frac{1}{2}}$	10	4135. 466	24174. 3	$b^4P_{0\frac{1}{2}}-z^4D_{1\frac{1}{2}}$
15	4041. 56	24736. 0	$a^4H_{5\frac{1}{2}}-z^6F_{4\frac{1}{2}}$	10	4143. 74	24126. 0	$a^4G_{4\frac{1}{2}}-z^4F_{3\frac{1}{2}}$
2	4041. 72	24735. 0	$b^4P_{0\frac{1}{2}}-z^4F_{1\frac{1}{2}}$	1	4164. 76	24004. 2	$b^4F_{4\frac{1}{2}}-z^6P_{3\frac{1}{2}}$
20	4043. 04	24726. 9	$a^4H_{4\frac{1}{2}}-z^6F_{3\frac{1}{2}}$	10	4173. 991	23951. 13	$b^4P_{2\frac{1}{2}}-z^6F_{3\frac{1}{2}}$
1	4045. 55	24711. 6	$a^4H_{3\frac{1}{2}}-z^6F_{3\frac{1}{2}}$	20	4174. 912	23945. 85	$a^4G_{5\frac{1}{2}}-z^4F_{4\frac{1}{2}}$
2	4064. 81	24594. 5	$b^4P_{1\frac{1}{2}}-z^6P_{1\frac{1}{2}}$	3	4191. 95	23848. 6	-----
1	4081. 72	24492. 6	$b^4P_{0\frac{1}{2}}-z^4D_{0\frac{1}{2}}$	3	4204. 62	23776. 7	$b^4D_{1\frac{1}{2}}-z^4P_{1\frac{1}{2}}$

TABLE 6. *The second spectrum of ruthenium (Ru II)—Continued*

Observed at pole of arc				Observed at pole of arc			
Intensity	λ (vacuum)	σ	Term combination	Intensity	λ (vacuum)	σ	Term combination
1	4205.39	23772.4	$a^4G_{2\frac{1}{2}}-z^4D_{\frac{5}{2}}$	3	4563.77	21905.6	$b^4D_{1\frac{1}{2}}-z^4F_{\frac{3}{2}}$
2	4215.51	23715.3	-----	0	4578.44	21835.4	$b^2D_{2\frac{1}{2}}-z^4P_{1\frac{1}{2}}$
20	4227.831	23646.1	$b^4D_{2\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	4	4606.50	21702.4	$b^4D_{0\frac{1}{2}}-z^4D_{1\frac{1}{2}}$
10	4231.437	23626.0	$a^4G_{3\frac{1}{2}}-z^4D_{\frac{5}{2}}$	3	4607.44	21698.0	-----
1	4248.87	23529.1	$b^2P_{1\frac{1}{2}}-z^4P_{0\frac{1}{2}}$	3	4660.96	21448.8	$a^4G_{4\frac{1}{2}}-z^6P_{\frac{3}{2}}$
2	4257.19	23483.1	-----	2	4697.92	21280.1	-----
1	4287.33	23318.0	$b^4F_{4\frac{1}{2}}-z^6F_{\frac{3}{2}}$	2	4699.03	21275.1	$d^2D_{1\frac{1}{2}}-z^4G_{\frac{3}{2}}$
2	4302.51	23235.7	-----	5	4714.17	21206.7	$b^4D_{2\frac{1}{2}}-z^4F_{\frac{3}{2}}$
2	4303.39	23231.0	$b^4F_{3\frac{1}{2}}-z^6F_{\frac{3}{2}}$	3	4731.98	21126.9	-----
30	4305.885	23217.5	$a^4G_{4\frac{1}{2}}-z^4D_{\frac{3}{2}}$	20	4750.040	21046.57	$b^4D_{2\frac{1}{2}}-z^4D_{\frac{3}{2}}$
1	4306.59	23213.7	$b^4F_{4\frac{1}{2}}-z^6F_{\frac{3}{2}}$	5	4776.78	20928.8	$b^2P_{1\frac{1}{2}}-z^4D_{1\frac{1}{2}}$
2	4313.17	23178.3	$b^4F_{2\frac{1}{2}}-z^6F_{1\frac{1}{2}}$	2	4784.96	20893.0	$b^4D_{3\frac{1}{2}}-z^4F_{\frac{3}{2}}$
1	4338.89	23040.9	$b^4F_{2\frac{1}{2}}-z^6F_{\frac{3}{2}}$	1	4807.27	20796.0	$b^4D_{1\frac{1}{2}}-z^6P_{1\frac{1}{2}}$
3	4359.81	22930.3	$b^2P_{1\frac{1}{2}}-z^4P_{1\frac{1}{2}}$	0	4821.92	20732.8	$b^4D_{3\frac{1}{2}}-z^4D_{\frac{3}{2}}$
5	4362.98	22913.7	$b^4F_{3\frac{1}{2}}-z^6F_{\frac{3}{2}}$	3	4828.15	20706.1	-----
1	4368.51	22884.7	$b^4F_{1\frac{1}{2}}-z^6F_{0\frac{1}{2}}$	3	4922.12	20310.8	-----
2	4369.84	22877.7	$a^4G_{3\frac{1}{2}}-z^4D_{\frac{3}{2}}$	2	4934.08	20261.6	-----
1	4380.57	22821.7	$b^4F_{1\frac{1}{2}}-z^6F_{1\frac{1}{2}}$	20	5002.46	19984.6	$b^4D_{3\frac{1}{2}}-z^4D_{\frac{3}{2}}$
3	4406.78	22686.0	-----	5	5004.74	19975.5	-----
10	4407.49	22682.3	-----	2	5092.34	19631.9	$b^4D_{3\frac{1}{2}}-z^4F_{\frac{3}{2}}$
15	4408.62	22676.5	$b^4D_{2\frac{1}{2}}-z^4P_{\frac{3}{2}}$	3	5172.73	19326.8	-----
3	4434.95	22541.9	-----	2	5270.28	18969.1	-----
2	4435.67	22538.2	-----	50	5607.744	17827.45	$a^6S_{2\frac{1}{2}}-z^6P_{1\frac{1}{2}}$
5	4436.64	22533.3	-----	50	5893.612	16962.82	$a^6S_{2\frac{1}{2}}-z^6P_{\frac{3}{2}}$
15	4454.76	22441.6	-----	2	6018.00	16612.2	$a^4G_{4\frac{1}{2}}-z^6D_{\frac{3}{2}}$
100	4470.502	22362.58	$b^4D_{3\frac{1}{2}}-z^4P_{\frac{3}{2}}$	2	6290.63	15892.3	-----
3	4499.26	22219.7	$a^2S_{0\frac{1}{2}}-z^4S_{1\frac{1}{2}}$	50	6371.29	15691.07	$a^6S_{2\frac{1}{2}}-z^6P_{\frac{3}{2}}$
3	4518.95	22122.9	-----				
5	4525.06	22093.0	$b^4D_{1\frac{1}{2}}-z^4D_{0\frac{1}{2}}$				
20	4539.93	22020.6	$b^4D_{0\frac{1}{2}}-z^4D_{0\frac{1}{2}}$				

WASHINGTON, D. C. July 22, 1958.