AN ULTRAVIOLET MULTIPLET TABLE

The Spectra of Molybdenum, Technetium, Ruthenium, Rhodium, Palladium, Silver, Cadmium, Indium, Tin, Antimony, Tellurium, Iodine, Xenon, Cesium, Barium, Lanthanum; Hafnium, Tantalum, Tungsten, Rhenium, Osmium, Iridium, Platinum, Gold, Mercury, Thallium, Lead, Bismuth, Polonium, Radon, and Radium

Circular 488, Section 3

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards Circular series was discontinued in July 1959 with the inauguration of the NBS Monograph series. However, since the first two Sections of Circular 488 were published before 1959, the Circular designation is being retained for the remaining three Sections of this Circular.

UNITED STATES DEPARTMENT OF COMMERCE, Luther H. Hodges, Secretary
NATIONAL BUREAU OF STANDARDS, A. V. Astin, Director

AN ULTRAVIOLET MULTIPLET TABLE

The Spectra of Molybdenum, Technetium, Ruthenium, Rhodium, Palladium, Silver, Cadmium, Indium, Tin, Antimony, Tellurium, Iodine, Xenon, Cesium, Barium, Lanthanum; Hafnium, Tantalum, Tungsten, Rhenium, Osmium, Iridium, Platinum, Gold, Mercury, Thallium, Lead, Bismuth, Polonium, Radon, and Radium

By Charlotte E. Moore

Circular of the National Bureau of Standards 488, Section 3

Issued April 6, 1962

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.
Price 60 cents

Foreword

The present Section of NBS Circular 488, *An Ultraviolet Multiplet Table,* is the third of a series that has been prepared in connection with the program on Atomic Energy Levels in progress at the National Bureau of Standards. This Section contains the leading multiplets of 78 spectra of 31 elements in the range from molybdenum through lanthanum ($Z = 42$ to 57), and hafnium through radium ($Z = 72$ to 88). It parallels Volume III of NBS Circular 467, *Atomic Energy Levels,* which was published in 1958.

Circular 488 in its entirety provides an ultraviolet multiplet table covering the periodic chart of the elements except for the two groups of rare-earth elements, $Z = 58$ to 71 and $Z = 90$ to 103. These groups will be treated separately when the observation, description, and analyses of rare-earth spectra in various stages of ionization have been carried further.

Section 1 of an *Ultraviolet Multiplet Table,* issued in 1950, includes multiplets of 79 spectra of the first 23 elements in the periodic table, hydrogen through vanadium. Section 2, issued in 1952, contains multiplets of 46 spectra of the elements chromium through niobium. Section 4 is a finding list containing all lines in Sections 1 and 2 listed in order of wavelength; Section 5 is a similar finding list for the present Section and will conclude the series.

This program could not have been brought to its present stage of completion without the cordial collaboration of many spectroscopists, both in the Bureau and in other laboratories at home and abroad. Their interest and support are gratefully acknowledged.

A. V. Astin, *Director.*

Washington, D. C., *September 15, 1961.*

Contents

Element	Z	Spectrum	Page
Molybdenum	42	Mo I	1
		Mo II	3
		Mo III	9
		Mo IV	9
		Mo V	10
Technetium	43	Tc I	12
		Tc II	12
Ruthenium	44	Ru I	13
		Ru II	18
		Ru III	26
Rhodium	45	Rh I	27
		Rh II	28
Palladium	46	Pd I	31
		Pd II	32
		Pd III	33
Silver	47	Ag I	37
		Ag II	37
		Ag III	39
Cadmium	48	Cd I	40
		Cd II	40
		Cd III	41
		Cd IV	42
Indium	49	In I	43
		In II	44
		In III	45
Tin	50	Sn I	46
		Sn II	46
		Sn III	47
		Sn IV	48
		Sn V	48
Antimony	51	Sb I	49
		Sb II	50
		Sb III	50
Tellurium	52	Te I	51
		Te II	51
Iodine	53	I I	52
		I II	53
Xenon	54	Xe I	55
		Xe II	55
		Xe III	56
Cesium	55	Cs I	57
		Cs II	57
Barium	56	Ba I	58
		Ba II	58
Lanthanum	57	La I	59
		La II	59
		La III	60
		• • • • •	
Hafnium	72	Hf I	61
		Hf II	61
Tantalum	73	Ta I	63
		Ta II	65
Tungsten	74	W I	67
		W II	69
Rhenium	75	Re I	71
		Re II	73
Osmium	76	Os I	74
		Os II	76
Iridium	77	Ir I	77
Platinum	78	Pt I	78
		Pt II	78
Gold	79	Au I	80
		Au II	81
		Au III	82
Mercury	80	Hg I	84
		Hg II	85
		Hg III	86
Thallium	81	Tl I	87
		Tl II	87
Lead	82	Pb I	88
		Pb II	88
		Pb III	89
Bismuth	83	Bi I	90
		Bi II	90
		Bi III	91
Polonium	84	Po I	92
Radon	86	Rn I	93
Radium	88	Ra I	94
		Ra II	94

1. Arrangement

The present Section is a continuation of the ultraviolet multiplet table, arranged similarly to Sections 1 and 2, which were published in 1950 and 1952, respectively. Most of the lines listed are short of 3000 A. Only a limited number of multiplets are included for a given spectrum. These have been selected on the basis of anticipated astrophysical importance and also of possible importance in spectrochemical analysis. No attempt has been made to include all known multiplets of all known spectra.

The heading for each spectrum includes the ionization potential, a grade indicating the present state of the analysis, a grade indicating roughly how many of the known multiplets are listed, and the date of completion of the manuscript. The grades A, B, C, etc., indicate respective decrease in completeness. For example, Grade A, List A denotes that the spectrum is well analyzed and that all known classified lines are listed.

For consistency, the excitation and ionization potentials have been obtained, as before, by using the multiplication factor 0.00012345 to convert energy levels and limits in cm^{-1} to electron volts. The revised conversion factor 0.00012395 [1] has been used in deriving the ionization potentials in "Atomic Energy Levels", and is preferable for future work.

Following the bibliographies are letters denoting the reference sources used for the tabular data, and indicating also, the general content of the reference. These letters have the following meaning:

IP	Ionization potential
WL	Wavelength
I	Intensity
(I)	Intensity from a different reference than is denoted by "I"
T	Term analysis
CL	Classified lines
ZE	Zeeman effect

2. Symbols

The symbols have, in general, the same meaning as in Sections 1 and 2. They are as follows:

* denotes a blend. If an asterisk precedes the wavelength and no symbol follows the wavelength, the line is blended with another in the same spectrum.

§ follows a wavelength (with an asterisk always preceding), to denote that the line is blended with one in a neighboring spectrum of the same element, i.e. first and second spectra, second and third spectra, etc. of a given element.

§§ special symbols following the wavelength (with an asterisk always preceding) used for blends not described by the above symbols. They are explained below the references for a given spectrum.

‡ follows the wavelength of the *raie ultime* for first and second spectra as given by Meggers [2] or taken from later analyses.

[1] a special note regarding the excitation potentials of Mo III and Tc II.

† follows the multiplet designation to indicate that not all of the lines observed in the multiplet are listed here.

[ ] wavelengths in brackets represent forbidden transitions.

"m" precedes the wavelength when the line is masked. The predicted position of the line is given, as indicated by the letter "P" in the reference column; the masking spectrum is indicated in the intensity column.

The letters in the intensity column have the usual meanings. These are summarized in the general notation recommended for the description of spectral lines [3].

3. Acknowledgments

This work has been greatly enhanced in value because of the cordial collaboration of spectroscopists throughout the world. Within this Bureau W. F. Meggers has generously furnished unpublished data for several spectra (Tc I, Tc II, Sb II, Hf I, Hf II, Pb I). C. C. Kiess has, also, willingly contributed in advance of publication, extensive monographs on highly complex spectra (Mo I, Ta I, Ta II). M. M. Harvey (Mo I); C. H. Corliss and W. R. Bozman (Tc I, Tc II); and H. K. Kiess (Ta I) have assisted with analyses.

A. G. Shenstone at Princeton University has supported the program continuously and furnished a number of manuscripts for use here (Ru III, Pd I, Pd III, Sn I, Sn II, Sn III, Sn IV, Sn V).

F. R. Rico and the late M. A. Catalán have advanced material on Tc II and Rh II. Unpublished data on Ir I from the late W. Albertson have been utilized. Other material has come from R. Nodwell (In III); M. Bernarda Handrup and J. S. Ross (Te II); D. D. Laun (W I, W II); and J. N. P. Hume and M. F. Crawford (Pb III).

Many details of compilation have been handled most skillfully by Mrs. Isabel D. Murray. The writer is also especially indebted to J. E. Carpenter for special consultation and to Mrs. Betty L. Arnold whose competence in handling the publication details has been invaluable. She wishes to record here not only her sincere thanks but also the pleasure she has experienced from the cooperation of all who have so generously contributed to this extensive project.

[1] See Trans. Joint Commission for Spectroscopy, J. Opt. Soc. Am. 43, 412 (1952).

[2] W. F. Meggers, J. Opt. Soc. Am. 31, 44 (1941), first spectra; ibid. 31, 606 (1941), second spectra.

[3] See Trans. Joint Commission for Spectroscopy, J. Opt. Soc. Am. 43, 423 (1952).

MOLYBDENUM, $Z = 42$

I P 7.07 Anal A List C October 1960

REFERENCE

A C. C. Kiess and M. M. Harvey, unpublished material (1960). W L, I, T

Mo I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2944.214	A	8	0.00	4.19	3–3	$a\ ^7S - y\ ^5P^\circ$ (1)
3002.197	A	20	0.00	4.11	3–2	
2225.437	A	65R	0.00	5.55	3–3	$a\ ^7S - y\ ^3D^\circ$ (2)
*2801.484	A	15d?	1.33	5.74	2–3	$a\ ^5S - v\ ^5F^\circ$† (3)
*2801.484	A	15d?	1.33	5.74	2–2	
2756.266	A	15	1.33	5.81	2–1	$a\ ^5S$ −10° (4)
2754.286	A	15	1.33	5.81	2–3	$a\ ^5S$ −12° (5)
2745.078	A	20	1.33	5.82	2–2	$a\ ^5S - y\ ^5G^\circ$ (6)
2471.962	A	10R	1.33	6.32	2–3	$a\ ^5S - w\ ^5P^\circ$ (7)
2567.051	A	5R	1.33	6.14	2–2	
2582.157	A	4R	1.33	6.11	2–1	
*2474.703	A	10	1.33	6.32	2–1	$a\ ^5S$ −40° (8)
2981.517	A	30	1.46	5.60	3–2	$a\ ^5D$ −4°† (9)
2946.03	A	20	1.41	5.60	2–2	
2985.15	A	10	1.52	5.66	4–5	$a\ ^5D - x\ ^3G^\circ$† (10)
3010.258	A	20	1.52	5.62	4–4	
2982.130	A	5	1.52	5.66	4–4	$a\ ^5D - w\ ^5F^\circ$† (11)
2959.812	A	7	1.46	5.63	3–3	
2942.860	A	8	1.41	5.61	2–2	
2978.28	A	30	1.46	5.61	3–2	
2916.112	A	10	1.38	5.61	1–2	
2881.656	A	8	1.38	5.66	1–1	$a\ ^5D - z\ ^3S^\circ$† (12)
2864.647	A	10	1.46	5.77	3–4	$a\ ^5D - v\ ^5F^\circ$† (13)
2905.260	A	10	1.52	5.77	4–4	
2931.092	A	8	1.52	5.74	4–3	
2889.829	A	8	1.46	5.74	3–2	

Mo I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2834.784	A	10	1.41	5.77	2–1	$a\ ^5D$ −7° (14)
2809.94	A	10	1.38	5.77	1–1	
2796.052	A	8	1.35	5.77	0–1	
2850.776	A	10	1.46	5.79	3–3	$a\ ^5D - w\ ^3F^\circ$† (15)
2869.567	A	6	1.52	5.82	4–3	$a\ ^5D - w\ ^3D^\circ$† (16)
2835.906	A	10	1.46	5.82	3–2	
2829.946	A	18	1.46	5.82	3–3	
2797.921	A	10	1.41	5.82	2–3	
2808.383	A	10d	1.41	5.81	2–2	$a\ ^5D$ −11°† (17)
2807.362	A	40	1.41	5.81	2–3	$a\ ^5D$ −12°† (18)
2851.171	A	10	1.52	5.85	4–4	$a\ ^5D - y\ ^5G^\circ$† (19)
2797.775	A	10	1.41	5.82	2–2	
2829.788	A	20	1.46	5.82	3–2	
2755.36	A	10	1.35	5.83	0–1	$a\ ^5D$ −14°† (20)
*2757.09	A	10	1.38	5.85	1–1	$a\ ^5D$ −17°† (21)
2798.029	A	10	1.46	5.88	3–2	$a\ ^5D$ −19°† (22)
*2757.09	A	10	1.41	5.89	2–1	$a\ ^5D$ −21°† (23)
2787.832	A	6	1.52	5.95	4–3	$a\ ^5D - v\ ^3D^\circ$† (24)
2759.575	A	10	1.46	5.94	3–2	
2746.883	A	10	1.41	5.91	2–3	$a\ ^5D$ −22°† (25)
2761.533	A	5	1.52	5.99	4–5	$a\ ^5D - u\ ^5F^\circ$† (26)
2751.470	A	15	1.46	5.95	3–4	
2725.150	A	5	1.38	5.90	1–2	
2697.805	A	5	1.35	5.93	0–1	

Mo I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2679.855	A	5R	1.52	6.13	4–5	$a\ ^5D - t\ ^5F°$†
2649.466	A	5R	1.46	6.12	3–4	(27)
2629.852	A	10R?	1.41	6.11	2–3	
*2616.792	A	5R	1.38	6.09	1–2	
2615.398	A	5	1.35	6.07	0–1	
2658.114	A	10	1.46	6.11	3–3	
2627.56	A	8R?	1.38	6.07	1–1	
2666.750	A	8	1.46	6.09	3–2	
2572.336	A	5R	1.52	6.32	4–3	$a\ ^5D - w\ ^5P°$
2640.989	A	5R	1.46	6.14	3–2	(28)
2628.74	A	10R?	1.41	6.11	2–1	
2540.431	A	50	1.46	6.32	3–3	
2613.087	A	5R	1.41	6.14	2–2	
2607.381	A	5	1.38	6.11	1–1	
2514.603	A	3w	1.41	6.32	2–3	
2591.982	A	4R?	1.38	6.14	1–2	
2595.407	A	8R	1.35	6.11	0–1	
2655.027	A	5R	1.52	6.17	4–3	$a\ ^5D - v\ ^5P°$† (29)
2162.34	A	20	1.46	7.17	3–4	$a\ ^5D - 110°$ (30)
2180.48	A	10	1.52	7.18	4–3	$a\ ^5D - 111°$
2157.54	A	10	1.46	7.18	3–3	(31)
2760.003	A	10	2.07	6.54	5–4	$a\ ^5G - 67°$† (32)
2746.404	A	10	2.07	6.57	6–6	$a\ ^5G - 69°$ (33)
2745.394	A	10	2.07	6.57	6–5	$a\ ^5G - 70°$† (34)
*2474.703	A	10	2.07	7.05	4–3	$a\ ^5G - 108°$† (35)
2420.245	A	10	2.07	7.17	5–4	$a\ ^5G - 110°$† (36)
2826.752	A	10	2.25	6.62	3–3	$a\ ^5P - 78°$
2836.970	A	8	2.27	6.62	2–3	(37)
2997.402	A	10	2.48	6.60	1–1	$b\ ^5D - 76°$†
2983.035	A	10	2.46	6.60	0–1	(38)
3001.425	A	10	2.50	6.62	2–2	$b\ ^5D - 77°$†
2987.904	A	20	2.48	6.62	1–2	(39)
2989.78	A	50	2.49	6.62	4–3	$b\ ^5D - 78°$
3007.124	A	5	2.51	6.62	3–3	(40)
3000.854	A	60	2.50	6.62	2–3	

Mo I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2977.26	A	8	2.49	6.63	4–3	$b\ ^5D - 81°$†
*2988.225	A	20	2.50	6.63	2–3	(41)
2971.547	A	20	2.49	6.64	4–4	$b\ ^5D - 82°$
2988.676	A	25	2.51	6.64	3–4	(42)
2906.051	A	10	2.48	6.73	1–1	$b\ ^5D - 90°$
2892.567	A	8	2.46	6.73	0–1	(43)
2915.389	A	10	2.50	6.74	2–1	$b\ ^5D - 91°$
2902.621	A	8	2.48	6.74	1–1	(44)
2882.545	A	8	2.49	6.77	4–3	$b\ ^5D - 94°$
2898.644	A	10	2.51	6.77	3–3	(45)
2945.680	A	20	2.59	6.78	2–3	$a\ ^3D - 95°$† (46)
2936.504	A	8	2.64	6.84	5–5	$a\ ^3G - 100°$ (47)
2876.530	A	10	2.61	6.90	4–4	$a\ ^3G - 102°$†
2859.574	A	8	2.59	6.90	3–4	(48)
2886.599	A	10	2.64	6.91	5–5	$a\ ^3G - 103°$
2870.903	A	8	2.61	6.91	4–5	(49)
2837.904	A	10	2.61	6.96	4–3	$a\ ^3G - 104°$† (50)
2752.145	A	10	2.90	7.39	4–5	$a\ ^3F - 118°$ (51)
2864.299	A	10	2.98	7.28	4–5	$a\ ^3H - 113°$† (52)
2828.794	A	10	2.98	7.34	4–5	$a\ ^3H - 116°$† (53)
2873.636	A	8	3.06	7.36	6–6	$a\ ^3H - 117°$
2844.396	A	20	3.02	7.36	5–6	(54)
2796.777	A	10	2.98	7.39	4–5	$a\ ^3H - 118°$† (55)
2985.835	A	10	3.15	7.28	5–5	$a\ ^3I - 113°$ (56)
2915.253	A	8	3.15	7.39	6–5	$a\ ^3I - 118°$ (57)
2893.226	A	10	3.16	7.43	7–6	$a\ ^3I - 119°$† (58)

Mo I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Strongest Unclassified Lines of Mo I						
Air						
2972.95	A	10				
2970.08	A	20				
2962.884	A	10				
2937.67	A	10				
2930.39	A	10				
2913.531	A	10				
2902.235	A	8				
2876.91	A	10				
2871.897	A	8				
2862.830	A	10				
2803.138	A	10				
2794.744	A	10				
2758.633	A	10				
2750.79	A	10				
2661.220	A	20				
2644.138	A	30				
2639.685	A	40				
2633.686	A	12				
2437.43	A	10				
2304.32	A	10				

Mo I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2279.496	A	10				
2262.07	A	20b				
2249.934	A	40				
2246.139	A	12				
2245.95	A	10				
2237.864	A	15				
2232.778	A	22				
2223.924	A	100R				
2220.26	A	100R				
2202.88	A	25				
2196.26	A	15				
2191.109	A	10				
2184.077	A	10				
2104.29	A	22				
2067.81	A	15				
2065.67	A	15				
2063.44	A	10b				
2060.29	A	10				
2049.38	A	20d				
2022.27	A	10				

Mo II

I P 16.09 Anal A List B July 1958

REFERENCE

A C. C. Kiess, J. Research Nat. Bur. Std. **60**, 375, RP2856 (1958). W L, I, T, I P

Mo II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2045.98	A	75	0.00	6.03	2½–2½	$a\,^6S - z\,^4P°$ (1)
2081.67	A	25	0.00	5.93	2½–1½	
2020.32	A	100r	0.00	6.11	2½–3½	$a\,^6S - z\,^6P°$ (2)
2015.12	A	50	0.00	6.12	2½–2½	
2038.46	A	75r	0.00	6.05	2½–1½	
Vac						
1987.97	A	20	0.00	6.21	2½–3½	$a\,^6S - z\,^6D°$ (3)
1977.17	A	20	0.00	6.24	2½–2½	
1992.35	A	10	0.00	6.20	2½–1½	

Mo II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2816.153‡	A	150	1.66	6.04	4½–5½	$a\,^6D - z\,^6F°$ (4)
2848.238	A	175	1.59	5.93	3½–4½	
2871.506	A	125	1.53	5.83	2½–3½	
2890.995	A	100	1.49	5.75	1½–2½	
2909.108	A	75	1.45	5.70	0½–1½	
2894.446	A	80	1.66	5.93	4½–4½	
2911.915	A	125	1.59	5.83	3½–3½	
2923.387	A	100	1.53	5.75	2½–2½	
2930.478	A	100	1.49	5.70	1½–1½	
2934.293	A	100	1.45	5.66	0½–0½	
2960.228	A	50	1.66	5.83	4½–3½	
2965.276	A	60	1.59	5.75	3½–2½	
2963.786	A	75	1.53	5.70	2½–1½	
2956.057	A	30	1.49	5.66	1½–0½	

Mo II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2780.022	A	50	1.59	6.03	3½−2½	$a\,^6D - z\,^4P°$†
*2807.750	A	100	1.53	5.93	2½−1½	(5)
2842.148	A	40	1.49	5.83	1½−0½	
2743.185	A	25	1.53	6.03	2½−2½	
2777.86	A	15	1.49	5.93	1½−1½	
2822.035	A	12	1.45	5.83	0½−0½	
2775.386	A	50	1.66	6.11	4½−3½	$a\,^6D - z\,^6P°$†
2729.680	A	20	1.53	6.05	2½−1½	(6)
2732.889	A	15	1.59	6.11	3½−3½	
2687.994	A	60	1.53	6.12	2½−2½	
2701.409	A	50	1.49	6.05	1½−1½	
2660.581	A	100	1.49	6.12	1½−2½	
*2683.234	A	50	1.45	6.05	0½−1½	
2684.148	A	60	1.66	6.26	4½−4½	$a\,^6D - z\,^6D°$
2672.84	A	60	1.59	6.21	3½−3½	(7)
2619.759	A	15	1.53	6.24	2½−2½	
2619.340	A	30	1.45	6.17	0½−0½	
2713.501	A	30	1.66	6.21	4½−3½	
2653.348	A	60	1.59	6.24	3½−2½	
2646.487	A	60	1.53	6.20	2½−1½	
2636.672	A	50	1.49	6.17	1½−0½	
2644.343	A	50	1.59	6.26	3½−4½	
2638.768	A	100	1.53	6.21	2½−3½	
*2593.707	A	50	1.49	6.24	1½−2½	
2602.802	A	80	1.45	6.20	0½−1½	
2538.444	A	200	1.66	6.52	4½−4½	$a\,^6D - z\,^4F°$†
2542.668	A	50	1.59	6.45	3½−3½	(8)
2542.783	A	30	1.53	6.39	2½−2½	
2541.251	A	10	1.49	6.34	1½−1½	
2579.437	A	20	1.66	6.45	4½−3½	
2574.425	A	30	1.59	6.39	3½−2½	
*2566.257	A	30	1.53	6.34	2½−1½	
2835.342	A	30	1.91	6.26	5½−4½	$a\,^4G - z\,^6D°$†
2836.307	A	10	1.89	6.24	3½−2½	(9)
2856.900	A	10	1.88	6.20	2½−1½	
*2673.27	A	40	1.91	6.52	5½−4½	$a\,^4G - z\,^4F°$†
2717.357	A	100	1.90	6.45	4½−3½	(10)
2746.305	A	35	1.89	6.39	3½−2½	
2763.626	A	20	1.88	6.34	2½−1½	
*2671.86	A	40	1.90	6.52	4½−4½	
2710.207	A	15	1.89	6.45	3½−3½	
*2269.708§	A	150	1.91	7.34	5½−6½	$a\,^4G - z\,^4H°$
2306.990	A	50	1.90	7.25	4½−5½	(11)
2332.131	A	40	1.89	7.18	3½−4½	
2341.57	A	40	1.88	7.15	2½−3½	
2307.994	A	30	1.91	7.25	5½−5½	
2337.432	A	15	1.90	7.18	4½−4½	
2348.832	A	20	1.89	7.15	3½−3½	
2338.482	A	10	1.91	7.18	5½−4½	
*2354.186	A	20	1.90	7.15	4½−3½	
2188.96	A	25	1.91	7.54	5½−5½	$a\,^4G - z\,^4G°$†
2231.49	A	18	1.90	7.44	4½−4½	(12)
2232.44	A	30	1.91	7.44	5½−4½	
2188.04	A	40	1.90	7.54	4½−5½	
2163.78	A	25	1.91	7.61	5½−6½	$a\,^4G - z\,^4I°$
2197.27	A	25	1.90	7.52	4½−5½	(13)
2254.146	A	15	1.89	7.37	3½−4½	
2260.07	A	20	1.91	7.37	5½−4½	
2236.04	A	50	1.90	7.42	4½−3½	$a\,^4G - z\,^2G°$†
*2194.94	A	12	1.90	7.53	4½−4½	(14)
2224.64	A	35	1.88	7.42	2½−3½	

Mo II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2124.09	A	25	1.90	7.71	4½−3½	$a\,^4G - x\,^4D°$
2126.46	A	15	1.89	7.70	3½−2½	(15)
2111.18	A	20d?	1.88	7.72	2½−1½	
2119.71	A	25	1.89	7.71	3½−3½	
2120.53	A	15	1.88	7.70	2½−2½	
2115.10	A	25	1.89	7.73	3½−2½	$a\,^4G - 1°$
2109.23	A	18	1.88	7.73	2½−2½	(16)
2068.20	A	12	1.91	7.87	5½−4½	$a\,^4G - y\,^4F°$
2079.98	A	10	1.89	7.83	3½−2½	(17)
2091.23	A	25	1.88	7.78	2½−1½	
2067.36	A	20	1.90	7.87	4½−4½	
2092.53	A	30	1.89	7.79	3½−3½	
2074.31	A	30	1.88	7.83	2½−2½	
2063.20	A	10	1.89	7.87	3½−4½	
2086.77	A	20	1.88	7.79	2½−3½	
*2100.83	A	50	1.90	7.78	4½−3½	$a\,^4G - 2°$
2096.55	A	12	1.89	7.78	3½−3½	(18)
2093.11	A	50	1.91	7.80	5½−5½	$a\,^4G - y\,^4G°$†
2103.43	A	18	1.90	7.77	4½−4½	(19)
2100.70	A	30	1.89	7.77	3½−3½	
2089.53	A	40	1.88	7.78	2½−2½	
2105.03	A	40	1.90	7.77	4½−3½	
2095.29	A	35	1.89	7.78	3½−2½	
2099.14	A	12	1.89	7.77	3½−4½	
2052.21	A	10	1.90	7.92	4½−5½	$a\,^4G - y\,^4H°$†
2075.43	A	10	1.89	7.84	3½−4½	(20)
2084.07	A	18	1.89	7.81	3½−3½	
2080.47	A	40	1.91	7.84	5½−4½	
2088.30	A	30	1.90	7.81	4½−3½	
2059.23	A	20	1.89	7.89	3½−3½	$a\,^4G - z\,^2F°$†
2032.04	A	20	1.88	7.95	2½−2½	(21)
2046.94	A	18	1.89	7.92	3½−2½	$a\,^4G - x\,^4F°$†
2044.38	A	40	1.90	7.94	4½−4½	(22)
2045.48	A	20	1.89	7.93	3½−3½	
2041.45	A	20	1.88	7.92	2½−2½	
2002.12	A	18	1.89	8.06	3½−3½	$a\,^4G - y\,^2F°$† (23)
2000.24	A	20	1.91	8.08	5½−5½	$a\,^4G - y\,^2H°$† (24)
Vac						
1949.44	A	35	1.91	8.24	5½−5½	$a\,^4G - x\,^4G°$†
1962.18	A	15	1.90	8.20	4½−4½	(25)
1978.91	A	15	1.88	8.11	2½−2½	
1984.06	A	10	1.89	8.11	3½−2½	
1948.71	A	12	1.90	8.24	4½−5½	
1958.45	A	10	1.89	8.20	3½−4½	
Air						
2865.64	A	10	1.94	6.24	2½−2½	$a\,^4P - z\,^6D°$†
*2935.196	A	15	1.96	6.17	0½−0½	(26)
2897.627	A	35	1.94	6.20	2½−1½	
2918.835	A	40	1.94	6.17	1½−0½	
*2498.280	A	40	1.94	6.88	2½−3½	$a\,^4P - z\,^4D°$†
2529.807	A	40	1.94	6.82	1½−2½	(27)

Mo II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2220.99	A	65	1.94	7.49	2½–3½	$a\,^4P - y\,^4D^\circ$ (28)
*2290.311	A	50	1.94	7.33	1½–2½	
2366.105	A	25	1.96	7.18	0½–1½	
2289.890	A	25	1.94	7.33	2½–2½	
2355.460	A	30	1.94	7.18	1½–1½	
*2413.017	A	50	1.96	7.08	0½–0½	
2355.022	A	15	1.94	7.18	2½–1½	
2401.940	A	40	1.94	7.08	1½–0½	
2184.73	A	12	1.94	7.59	1½–1½	$a\,^4P - y\,^4P^\circ$† (29)
2209.56	A	25	1.96	7.55	0½–0½	
2184.36	A	100	1.94	7.59	2½–1½	
*2200.25	A	22	1.94	7.55	1½–0½	
2139.45	A	25	1.94	7.71	1½–2½	
2136.04	A	22	1.94	7.71	2½–3½	$a\,^4P - x\,^4D^\circ$† (30)
*2143.25§	A	40	1.94	7.70	1½–2½	
2142.44	A	22	1.96	7.72	0½–1½	
2116.77	A	55	1.94	7.77	2½–3½	$a\,^4P - y\,^4G^\circ$ (31)
2037.67	A	20	1.94	7.99	2½–1½	$a\,^4P - z\,^4S^\circ$ (32)
2038.02	A	25	1.94	7.99	1½–1½	
*2045.98	A	75	1.96	7.99	0½–1½	
2961.327	A	65	2.09	6.26	3½–4½	$a\,^4D - z\,^6D^\circ$† (33)
3033.24	A	20	2.14	6.21	2½–3½	
*2992.840	A	75	2.12	6.24	1½–2½	
2993.501	A	35	2.07	6.20	0½–1½	
2972.607	A	150	2.09	6.24	3½–2½	
3043.438	A	30	2.14	6.20	2½–1½	
2784.990	A	50	2.09	6.52	3½–4½	$a\,^4D - z\,^4F^\circ$† (34)
2866.705	A	35	2.14	6.45	2½–3½	
2892.817	A	60	2.12	6.39	1½–2½	
2891.290	A	25	2.07	6.34	0½–1½	
2834.416	A	40	2.09	6.45	3½–3½	
2907.113	A	30	2.14	6.39	2½–2½	
2923.215	A	10	2.12	6.34	1½–1½	
2380.008	A	25	2.14	7.33	2½–2½	$a\,^4D - y\,^4D^\circ$† (35)
2440.265	A	45	2.12	7.18	1½–1½	
2466.971	A	40	2.07	7.08	0½–0½	
2305.673	A	30	2.14	7.49	2½–3½	
2370.410	A	35	2.12	7.33	1½–2½	
2417.964	A	30	2.07	7.18	0½–1½	
*2290.311	A	50	2.14	7.53	2½–2½	$a\,^4D - z\,^2D^\circ$† (36)
*2198.15	A	30d	2.09	7.71	3½–2½	$a\,^4D - y\,^4P^\circ$† (37)
2266.224	A	10	2.14	7.59	2½–1½	
2217.52	A	10	2.14	7.71	2½–2½	
2238.42	A	18	2.07	7.59	0½–1½	
2206.84	A	30	2.07	7.67	0½–0½	$a\,^4D - z\,^2P^\circ$† (38)
*2194.94	A	12	2.09	7.71	3½–3½	$a\,^4D - x\,^4D^\circ$ (39)
2221.63	A	20	2.14	7.70	2½–2½	
2166.58	A	18	2.07	7.77	0½–0½	
2211.39	A	10w	2.14	7.72	2½–1½	
2184.46	A	20	2.12	7.77	1½–0½	
2214.26	A	30	2.14	7.71	2½–3½	
2213.26	A	12	2.12	7.70	1½–2½	
2184.89	A	25	2.07	7.72	0½–1½	
2190.00	A	20	2.09	7.73	3½–2½	$a\,^4D - 1^\circ$† (40)
*2200.99	A	40d	2.12	7.73	1½–2½	

Mo II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2134.43	A	8	2.09	7.87	3½–4½	$a\,^4D - y\,^4F^\circ$ (41)
*2184.59	A	10	2.14	7.79	2½–3½	
2162.96	A	10	2.12	7.83	1½–2½	
*2163.54	A	10	2.07	7.78	0½–1½	
2165.80	A	22	2.09	7.79	3½–3½	
2170.94	A	20	2.14	7.83	2½–2½	
2181.36	A	22	2.12	7.78	1½–1½	
2147.52	A	10	2.09	7.84	3½–4½	$a\,^4D - y\,^4H^\circ$ (42)
2175.40	A	12	2.14	7.81	2½–3½	
2156.74	A	30	2.09	7.81	3½–3½	
2109.94	A	25	2.09	7.94	3½–4½	$a\,^4D - x\,^4F^\circ$† (43)
2133.39	A	25	2.14	7.93	2½–3½	
2127.27	A	18	2.12	7.92	1½–2½	
2122.13	A	20	2.07	7.89	0½–1½	
2115.44	A	20	2.09	7.93	3½–3½	
2139.29	A	10	2.12	7.89	1½–1½	
2108.74	A	22	2.14	7.99	2½–1½	$a\,^4D - z\,^4S^\circ$ (44)
2101.21	A	15	2.12	7.99	1½–1½	
2084.64	A	20	2.07	7.99	0½–1½	
Vac						
*1969.79	A	20	2.09	8.36	3½–2½	$a\,^4D - x\,^4P^\circ$† (45)
1957.04	A	30	2.14	8.45	2½–1½	
1927.69	A	25	2.12	8.52	1½–0½	
1950.55	A	15	2.12	8.45	1½–1½	
1913.74	A	18	2.07	8.52	0½–0½	
1939.54	A	25	2.14	8.51	2½–1½	$a\,^4D - y\,^2P^\circ$† (46)
1731.54	A	50	2.12	9.25	1½–2½	$a\,^4D - t\,^2F^\circ$† (47)
Air						
2699.404	A	30	2.77	7.34	2½–3½	$a\,^2D - z\,^4G^\circ$ (48)
2593.378	A	50	2.77	7.53	2½–2½	$a\,^2D - z\,^2D^\circ$† (49)
*2673.27	A	40	2.77	7.39	2½–1½	
*2543.611	A	40	2.77	7.62	2½–1½	$a\,^2D - z\,^2P^\circ$† (50)
*2548.212	A	10	2.82	7.67	1½–0½	
2496.280	A	30	2.77	7.71	2½–3½	$a\,^2D - x\,^4D^\circ$† (51)
2532.295	A	50	2.82	7.70	1½–2½	
2505.642	A	15	2.77	7.70	2½–2½	
2494.682	A	20	2.82	7.77	1½–0½	
2458.655	A	40	2.77	7.79	2½–3½	$a\,^2D - y\,^4F^\circ$† (52)
2466.671	A	50	2.82	7.83	1½–2½	
*2462.482	A	40	2.77	7.78	2½–2½	$a\,^2D - y\,^4G^\circ$ (53)
2412.837	A	40	2.77	7.89	2½–3½	$a\,^2D - z\,^2F^\circ$† (54)
2407.151	A	50	2.82	7.95	1½–2½	
2396.020	A	15	2.77	7.92	2½–2½	$a\,^2D - x\,^4F^\circ$† (55)
2435.941	A	50	2.82	7.89	1½–1½	
2411.272	A	40	2.77	7.89	2½–1½	
2290.870	A	40	2.77	8.16	2½–2½	$a\,^2D - y\,^2D^\circ$ (56)
2347.802	A	30	2.82	8.08	1½–1½	
2324.876	A	50	2.77	8.08	2½–1½	
2313.154	A	10	2.82	8.16	1½–2½	
2133.06	A	40	2.82	8.61	1½–2½	$a\,^2D - w\,^2F^\circ$† (57)

Mo II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2516.092	A	50	2.87	7.77	6½–6½	$a\,^2I - z\,^2I^\circ$ (58)
2515.101	A	50	2.84	7.74	5½–5½	
2499.253	A	20	2.84	7.77	5½–6½	
2387.819	A	15	2.87	8.04	6½–6½	$a\,^2I - y\,^4H^\circ$ (59)
2444.735	A	30	2.87	7.92	6½–5½	
2467.350	A	50	2.84	7.84	5½–4½	
*2372.642	A	10	2.84	8.04	5½–6½	
2390.102	A	20	2.87	8.03	6½–5½	$a\,^2I - z\,^2H^\circ$ (60)
2429.390	A	50	2.84	7.92	5½–4½	
2374.900	A	20	2.84	8.03	5½–5½	
2340.41	A	35	2.84	8.11	5½–4½	$a\,^2I - y\,^2G^\circ$ (61)
2370.250	A	40	2.87	8.08	6½–5½	$a\,^2I - y\,^2H^\circ\dagger$ (62)
2355.309	A	15	2.84	8.08	5½–5½	
2182.76	A	10	2.87	8.52	6½–7½	$a\,^2I - z\,^2K^\circ$ (63)
2226.06	A	20	2.84	8.38	5½–6½	
2239.42	A	50	2.87	8.38	6½–6½	
2189.40	A	50	2.87	8.51	6½–6½	$a\,^2I - y\,^2I^\circ\dagger$ (64)
2197.48	A	100	2.84	8.45	5½–5½	
2108.04	A	50	2.87	8.72	6½–5½	$a\,^2I - x\,^2H^\circ$ (65)
2125.92	A	75	2.84	8.64	5½–4½	
2069.80	A	20	2.87	8.83	6½–5½	$a\,^2I - w\,^2H^\circ$ (66)
2042.66	A	40	2.84	8.88	5½–4½	
2681.373	A	40	2.94	7.54	4½–5½	$a\,^4F - z\,^4G^\circ\dagger$ (67)
2863.20	A	18	2.98	7.29	1½–2½	
2846.632	A	15	2.95	7.29	2½–2½	
2695.217	A	35	2.94	7.52	4½–5½	$a\,^4F - z\,^4I^\circ\dagger$ (68)
2790.427	A	30	2.94	7.37	3½–4½	
2591.776	A	30	2.94	7.71	3½–2½	$a\,^4F - y\,^4P^\circ\dagger$ (69)
2585.966	A	20	2.94	7.71	4½–3½	$a\,^4F - x\,^4D^\circ\dagger$ (70)
2597.392	A	40	2.94	7.70	3½–2½	
2588.788	A	30	2.95	7.72	2½–1½	
*2576.565	A	30	2.98	7.77	1½–0½	
2592.782	A	25	2.95	7.71	2½–3½	
2533.580	A	40	2.95	7.83	2½–2½	$a\,^4F - y\,^4F^\circ\dagger$ (71)
2572.241	A	30	2.98	7.78	1½–1½	
2545.600	A	20	2.94	7.79	4½–3½	
2528.383	A	30	2.94	7.83	3½–2½	
2558.867	A	40	2.95	7.78	2½–1½	
2552.193	A	20	2.95	7.79	2½–3½	
2556.756	A	40	2.94	7.77	3½–4½	$a\,^4F - y\,^4G^\circ\dagger$ (72)
2555.420	A	50	2.94	7.77	4½–4½	
2559.121	A	30	2.94	7.77	3½–3½	
2556.309	A	15	2.95	7.78	2½–2½	
2480.193	A	10	2.94	7.92	4½–5½	$a\,^4F - y\,^4H^\circ\dagger$ (73)
2521.683	A	30	2.94	7.84	3½–4½	
2520.392	A	20	2.94	7.84	4½–4½	
2534.41	A	10	2.94	7.81	3½–3½	
2496.520	A	30	2.94	7.89	4½–3½	$a\,^4F - z\,^2F^\circ\dagger$ (74)
2465.879	A	30	2.94	7.95	3½–2½	
2497.80	A	50	2.94	7.89	3½–3½	

Mo II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2468.790	A	70	2.94	7.94	4½–4½	$a\,^4F - x\,^4F^\circ$ (75)
*2477.570	A	100	2.94	7.93	3½–3½	
2484.752	A	40	2.95	7.92	2½–2½	
2513.950	A	20	2.98	7.89	1½–1½	
2479.75	A	10	2.94	7.92	3½–2½	
2470.043	A	50	2.94	7.94	3½–4½	
2482.566	A	60	2.95	7.93	2½–3½	
2497.371	A	35	2.98	7.92	1½–2½	
2423.988	A	70	2.94	8.03	4½–5½	$a\,^4F - z\,^2H^\circ$ (76)
2482.075	A	20	2.94	7.92	3½–4½	
2438.356	A	15	2.94	8.01	3½–3½	$a\,^4F - y\,^2G^\circ\dagger$ (77)
2389.250	A	40	2.94	8.11	3½–4½	
2443.188	A	45	2.95	8.01	2½–3½	
*2419.011	A	45	2.95	8.06	2½–3½	$a\,^4F - y\,^2F^\circ\dagger$ (78)
2430.272	A	25	2.98	8.06	1½–2½	
*2403.60§	A	50	2.94	8.08	4½–5½	$a\,^4F - y\,^2H^\circ$ (79)
*2413.017	A	50	2.94	8.06	3½–4½	
2411.836	A	40	2.94	8.06	4½–4½	
2408.337	A	20	2.95	8.08	2½–1½	$a\,^4F - y\,^2D^\circ\dagger$ (80)
2420.180	A	45	2.98	8.08	1½–1½	
2383.371	A	20	2.98	8.16	1½–2½	
2329.708	A	50	2.94	8.24	4½–5½	$a\,^4F - x\,^4G^\circ\dagger$ (81)
2350.120	A	25	2.94	8.20	3½–4½	
2371.58	A	20	2.95	8.16	2½–3½	
2403.428	A	40	2.98	8.11	1½–2½	
2349.005	A	10	2.94	8.20	4½–4½	
2367.028	A	10	2.94	8.16	3½–3½	
2391.743	A	45	2.95	8.11	2½–2½	
2381.480	A	40	2.94	8.13	3½–3½	$a\,^4F - 3^\circ$ (82)
2386.07	A	45	2.95	8.13	2½–3½	
2246.980	A	40	2.94	8.43	4½–4½	$a\,^4F - w\,^4F^\circ\dagger$ (83)
2255.290	A	7	2.94	8.42	3½–3½	
2165.19	A	75	2.94	8.64	4½–4½	$a\,^4F - x\,^2H^\circ$ (84)
2564.334	A	40	3.13	7.94	3½–4½	$b\,^4D - x\,^4F^\circ$ (85)
2557.378	A	30	3.10	7.93	2½–3½	
2530.327	A	50	3.04	7.92	1½–2½	
2528.852	A	50	3.01	7.89	0½–1½	
2572.475	A	10	3.13	7.93	3½–3½	
2559.688	A	30	3.10	7.92	2½–2½	
2547.34	A	50	3.04	7.89	1½–1½	
2490.018	A	50	3.10	8.06	2½–3½	$b\,^4D - y\,^2F^\circ\dagger$ (86)
*2453.798	A	25	3.13	8.16	3½–2½	$b\,^4D - y\,^2D^\circ$ (87)
2478.672	A	30	3.10	8.08	2½–1½	
2440.05	A	40	3.10	8.16	2½–2½	
2433.970	A	15	3.01	8.08	0½–1½	
2416.182	A	20	3.13	8.24	3½–3½	$b\,^4D - w\,^4D^\circ$ (88)
*2419.011	A	45	3.13	8.23	3½–2½	
2798.910	A	10	3.03	7.44	3½–4½	$a\,^2F - z\,^4G^\circ\dagger$ (89)
2885.789	A	25	3.07	7.34	2½–3½	
2842.492	A	35	3.03	7.37	3½–4½	$a\,^2F - z\,^4I^\circ$ (90)

Mo II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2539.436	A	40	3.03	7.89	3½–3½	$a\ ^2F - z\ ^2F°$†
2527.135	A	50	3.07	7.95	2½–2½	(91)
2560.669	A	20	3.07	7.89	2½–3½	
*2539.436	A	40	3.07	7.93	2½–3½	$a\ ^2F - x\ ^4F°$†
2518.53	A	20	3.03	7.93	3½–3½	(92)
2427.289	A	25	3.03	8.11	3½–4½	$a\ ^2F - y\ ^2G°$
*2498.280	A	40	3.07	8.01	2½–3½	(93)
2478.008	A	30	3.03	8.01	3½–3½	
2453.143	A	45	3.03	8.06	3½–3½	$a\ ^2F - y\ ^2F°$† (94)
2404.680	A	50	3.03	8.16	3½–2½	$a\ ^2F - y\ ^2D°$
2461.805	A	50	3.07	8.08	2½–1½	(95)
2423.720	A	15	3.07	8.16	2½–2½	
*2386.96§	A	25	3.03	8.20	3½–4½	$a\ ^2F - x\ ^4G°$†
2444.482	A	45	3.07	8.11	2½–2½	(96)
2438.574	A	40	3.07	8.13	2½–3½	$a\ ^2F - 3°$† (97)
2940.090	A	50	3.35	7.54	6½–5½	$a\ ^4H - z\ ^4G°$†
2985.309	A	8	3.30	7.44	5½–4½	(98)
3030.315	A	18	3.27	7.34	4½–3½	
2989.855	A	50	3.21	7.34	3½–3½	
2886.982	A	15	3.27	7.54	4½–5½	
2853.220	A	150	3.35	7.67	6½–7½	$a\ ^4H - z\ ^4I°$†
2863.801	A	90	3.30	7.61	5½–6½	(99)
2903.055	A	125	3.27	7.52	4½–5½	
2971.904	A	125	3.21	7.37	3½–4½	
2924.320	A	65	3.30	7.52	5½–5½	
3011.948	A	35	3.27	7.37	4½–4½	
3034.922	A	40	3.30	7.37	5½–4½	
2730.212	A	25	3.27	7.79	4½–3½	$a\ ^4H - y\ ^4F°$†
2676.489	A	20	3.21	7.83	3½–2½	(100)
2769.762	A	25	3.35	7.80	6½–5½	$a\ ^4H - y\ ^4G°$†
2760.537	A	18	3.30	7.77	5½–4½	(101)
2744.193	A	25	3.27	7.77	4½–3½	
2701.875	A	20	3.21	7.78	3½–2½	
2741.314	A	15	3.30	7.80	5½–5½	
2710.928	A	15	3.21	7.77	3½–3½	
2630.741	A	80	3.35	8.04	6½–6½	$a\ ^4H - y\ ^4H°$†
*2683.234	A	50	3.21	7.81	3½–3½	(102)
2605.079	A	50	3.30	8.04	5½–6½	
2633.52	A	100	3.35	8.03	6½–5½	$a\ ^4H - z\ ^2H°$†
2624.643	A	30	3.21	7.92	3½–4½	(103)
*2566.257	A	30	3.30	8.11	5½–4½	$a\ ^4H - y\ ^2G°$
2605.826	A	10	3.27	8.01	4½–3½	(104)
2575.807	A	10	3.21	8.01	3½–3½	
2521.059	A	30	3.21	8.11	3½–4½	
2578.347	A	40	3.27	8.06	4½–3½	$a\ ^4H - y\ ^2F°$†
*2548.212	A	10	3.21	8.06	3½–2½	(105)
*2593.707	A	50	3.30	8.06	5½–4½	$a\ ^4H - y\ ^2H°$†
2567.507	A	15	3.27	8.08	4½–5½	(106)
2547.562	A	30	3.21	8.06	3½–4½	
2522.590	A	30	3.35	8.24	6½–5½	$a\ ^4H - x\ ^4G°$†
2518.700	A	20	3.21	8.11	3½–2½	(107)
2483.383	A	20	3.27	8.24	4½–5½	
*2422.185§	A	35	3.27	8.37	4½–3½	$a\ ^4H - x\ ^2G°$†
2396.260	A	25	3.21	8.37	3½–3½	(108)
2231.08	A	40	3.30	8.83	5½–5½	$a\ ^4H - w\ ^2H°$† (109)

Mo II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2955.828	A	50	3.26	7.44	3½–4½	$a\ ^2G - z\ ^4G°$†
3022.748	A	10	3.26	7.34	3½–3½	(110)
2992.250	A	20	3.22	7.34	4½–3½	
2868.116	A	25	3.22	7.52	4½–5½	$a\ ^2G - z\ ^4I°$†
3004.45	A	60	3.26	7.37	3½–4½	(111)
2726.983	A	100	3.22	7.74	4½–5½	$a\ ^2G - z\ ^2I°$ (112)
2522.84	A	40	3.22	8.11	4½–4½	$a\ ^2G - y\ ^2G°$†
2600.233	A	20	3.26	8.01	3½–3½	(113)
2550.740	A	40	3.22	8.06	4½–3½	$a\ ^2G - y\ ^2F°$
2572.873	A	10	3.26	8.06	3½–3½	(114)
2540.133	A	40	3.22	8.08	4½–5½	$a\ ^2G - y\ ^2H°$
2571.447	A	20	3.26	8.06	3½–4½	(115)
2549.351	A	10	3.22	8.06	4½–4½	
2457.771	A	100	3.22	8.24	4½–5½	$a\ ^2G - x\ ^4G°$†
2479.239	A	50	3.22	8.20	4½–4½	(116)
2498.088	A	40	3.22	8.16	4½–3½	
2542.041	A	20	3.26	8.11	3½–2½	
2381.14	A	40	3.22	8.40	4½–4½	$a\ ^2G - x\ ^2G°$†
2417.367	A	20	3.26	8.37	3½–3½	(117)
*2992.840	A	75	3.58	7.71	2½–2½	$b\ ^4P - y\ ^4P°$†
*2955.154	A	20	3.41	7.59	1½–1½	(118)
2895.137	A	10	3.28	7.55	0½–0½	
*3082.224	A	60	3.58	7.59	2½–1½	
2983.590	A	35	3.41	7.55	1½–0½	
2868.334	A	25	3.28	7.59	0½–1½	
2986.897	A	50	3.58	7.71	2½–3½	$b\ ^4P - x\ ^4D°$†
*2879.75	A	10	3.41	7.70	1½–2½	(119)
*3000.290	A	60	3.58	7.70	2½–2½	
2977.760	A	50	3.58	7.73	2½–2½	$b\ ^4P - 1°$
2859.002	A	15	3.41	7.73	1½–2½	(120)
2323.96	A	50	3.58	8.89	2½–1½	$b\ ^4P - w\ ^2D°$
*2200.25	A	22	3.28	8.89	0½–1½	(121)
*2976.898	A	30	3.38	7.53	3½–2½	$b\ ^2F - z\ ^2D°$
3127.817	A	25	3.44	7.39	2½–1½	(122)
2978.607	A	50	3.38	7.53	3½–4½	$b\ ^2F - z\ ^2G°$
3099.249	A	35	3.44	7.42	2½–3½	(123)
2500.425	A	40	3.38	8.32	3½–3½	$b\ ^2F - x\ ^2F°$
2513.12	A	30	3.38	8.35	3½–2½	(124)
2459.762	A	70	3.38	8.40	3½–4½	$b\ ^2F - x\ ^2G°$
2506.684	A	40	3.44	8.37	2½–3½	(125)
*2477.570	A	100	3.38	8.37	3½–3½	
2388.703	A	35	3.44	8.61	2½–2½	$b\ ^2F - w\ ^2F°$† (126)
2827.752	A	100	3.41	7.77	5½–6½	$a\ ^2H - z\ ^2I°$
2856.009	A	20	3.42	7.74	4½–5½	(127)
2626.099	A	40	3.41	8.11	5½–4½	$a\ ^2H - y\ ^2G°$
2692.63	A	20	3.42	8.01	4½–3½	(128)
2632.855	A	10	3.42	8.11	4½–4½	
2578.910	A	50	3.41	8.20	5½–4½	$a\ ^2H - x\ ^4G°$†
2562.078	A	40	3.42	8.24	4½–5½	(129)
2623.408	A	45	3.42	8.13	4½–3½	$a\ ^2H - 3°$ (130)

Mo II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2497.020	A	35	3.42	8.37	4½–3½	$a\ ^2H - x\ ^2G^\circ$† (131)
*2304.261§	A	80	3.41	8.77	5½–4½	$a\ ^2H - w\ ^2G^\circ$ (132)
2309.485	A	20	3.42	8.77	4½–4½	
2276.198	A	40	3.41	8.83	5½–5½	$a\ ^2H - w\ ^2H^\circ$ (133)
2261.981	A	30	3.42	8.88	4½–4½	
2256.982	A	15	3.41	8.88	5½–4½	
2987.960	A	50	3.58	7.71	4½–3½	$b\ ^4F - x\ ^4D^\circ$† (134)
2997.326	A	50	3.58	7.70	3½–2½	
2968.775	A	40	3.56	7.72	2½–1½	
2935.698	A	18	3.57	7.77	1½–0½	
*2983.955	A	75d	3.58	7.71	3½–3½	
2966.985	A	30	3.58	7.74	4½–5½	$b\ ^4F - z\ ^2I^\circ$ (135)
2938.292	A	40	3.58	7.78	3½–3½	$b\ ^4F - 2^\circ$† (136)
2925.416	A	50	3.58	7.80	4½–5½	$b\ ^4F - y\ ^4G^\circ$ (137)
2943.364	A	40	3.58	7.77	3½–4½	
2936.773	A	40	3.56	7.77	2½–3½	
2926.743	A	20	3.57	7.78	1½–2½	
2947.290	A	125	3.58	7.77	4½–4½	
*2955.154	A	20	3.58	7.77	3½–3½	
2926.15	A	20	3.56	7.78	2½–2½	
2900.780	A	40	3.58	7.84	4½–4½	$b\ ^4F - y\ ^4H^\circ$† (138)
2913.82	A	30	3.58	7.81	3½–3½	
2544.456	A	40	3.58	8.43	4½–4½	$b\ ^4F - w\ ^4F^\circ$† (139)
*2543.611	A	40	3.56	8.42	2½–3½	
2055.68	A	40	3.58	9.59	4½–5½	$b\ ^4F - w\ ^4G^\circ$† (140)
2100.36	A	10	3.58	9.45	3½–4½	
2102.36	A	12	3.58	9.45	4½–4½	
2134.01	A	10	3.58	9.36	3½–3½	
2174.08	A	15	3.56	9.24	2½–2½	
2502.216	A	50	3.57	8.51	0½–1½	$a\ ^2S - y\ ^2P^\circ$ (141)
2518.43	A	30	3.57	8.47	0½–0½	
2392.327	A	40	3.57	8.73	0½–1½	$a\ ^2S - x\ ^2D^\circ$ (142)
2320.090	A	30	3.57	8.89	0½–1½	$a\ ^2S - w\ ^2D^\circ$ (143)
2216.60	A	40	3.57	9.14	0½–1½	$a\ ^2S - w\ ^2P^\circ$† (144)
2879.046	A	100	3.75	8.04	5½–6½	$b\ ^4G - y\ ^4H^\circ$† (145)
2946.692	A	125	3.73	7.92	4½–5½	
2986.147	A	100	3.71	7.84	3½–4½	
2975.390	A	75	3.67	7.81	2½–3½	
2962.212	A	15	3.75	7.92	5½–5½	

Mo II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2945.946	A	100	3.75	7.94	5½–4½	$b\ ^4G - x\ ^4F^\circ$† (146)
2941.214	A	80	3.73	7.93	4½–3½	
2927.542	A	50	3.71	7.92	3½–2½	
2922.732	A	22	3.67	7.89	2½–1½	
2897.42	A	15*s*	3.67	7.93	2½–3½	
2836.721	A	30	3.71	8.06	3½–3½	$b\ ^4G - y\ ^2F^\circ$† (147)
2750.027	A	40	3.75	8.24	5½–5½	$b\ ^4G - x\ ^4G^\circ$† (148)
2763.305	A	7	3.73	8.20	4½–4½	
2771.710	A	12	3.71	8.16	3½–3½	
2774.401	A	20	3.67	8.11	2½–2½	
2791.553	A	50	3.71	8.13	3½–3½	$b\ ^4G - 3^\circ$† (149)
*2576.565	A	30	4.25	9.04	1½–1½	$a\ ^2P - x\ ^2P^\circ$ (150)
2509.148	A	40	3.97	8.88	0½–0½	
2609.215	A	50	4.06	8.79	2½–3½	$b\ ^2D - w\ ^2G^\circ$ (151)
2831.442	A	40	4.15	8.51	5½–6½	$b\ ^2H - y\ ^2I^\circ$ (152)
2821.843	A	18	4.08	8.45	4½–5½	
2866.82	A	12	4.15	8.45	5½–5½	
2696.839	A	30	4.15	8.72	5½–5½	$b\ ^2H - x\ ^2H^\circ$ (153)
2704.928	A	10	4.08	8.64	4½–4½	
2657.005	A	20	4.08	8.72	4½–5½	
2872.880	A	60	4.11	8.40	4½–4½	$b\ ^2G - x\ ^2G^\circ$ (154)
2888.171	A	50	4.09	8.37	3½–3½	
*2671.86	A	40	4.11	8.72	4½–5½	$b\ ^2G - x\ ^2H^\circ$† (155)
2712.346	A	20	4.09	8.64	3½–4½	
2874.847	A	10	4.14	8.43	3½–4½	$c\ ^4D - w\ ^4F^\circ$† (156)
2913.74	A	40	4.18	8.42	2½–3½	
2898.477	A	15	4.14	8.40	1½–2½	
2944.814	A	150	4.33	8.52	6½–7½	$b\ ^2I - z\ ^2K^\circ$ (157)
3077.660	A	250	4.37	8.38	5½–6½	
3048.888	A	50	4.33	8.38	5½–6½	
2956.915	A	75	4.33	8.51	6½–6½	$b\ ^2I - y\ ^2I^\circ$ (158)
3023.303	A	125	4.37	8.45	5½–5½	
*2995.528	A	12	4.33	8.45	6½–5½	
*2983.955	A	75d	4.37	8.51	5½–6½	
2214.39	A	45	5.11	10.69	2½–3½	$d\ ^2D - s\ ^2F^\circ$ (159)
*2208.18§	A	40	5.11	10.70	2½–2½	$d\ ^2D - t\ ^2D^\circ$ (160)

Strongest Unclassified Lines of Mo II

Air			Air		
2987.347	A	50	2511.29	A	40
2979.787	A	35	2503.594	A	50
2756.065	A	50	2390.783	A	50
2606.60	A	50	2273.240	A	40
2600.104	A	80	2235.68	A	35
2570.847	A	50w	2230.07	A	35
2527.25	A	40	2060.33	A	40

Mo III

I P 27.0 Anal D List B October 1960

REFERENCES

A F. R. Rico, An. Real Soc. Esp. Fys. y Quim. (Madrid) [A] **50,** 185 (1954). W. L, I, T
* and §=Blend of Mo III and Mo II
B F. R. Rico, An. Real Soc. Esp. Fys. y Quim. (Madrid) [A] **53,** 185 (1957). W L, I

Mo III

I A	Ref	Int	E P[1] Low	E P[1] High	J	Multiplet No.
Vac						
1274.359	B	100	(0.19)	(9.87)	4–5	$4d^4\,{}^5D - 5p\,{}^5F^\circ$ (1)
1278.401	B	200	(0.19)	(9.84)	4–4	
1288.100	B	50	(0.19)	(9.77)	4–3	
1288.278	B	50	(0.19)	(9.77)	4–4	$4d^4\,{}^5D - 5p\,{}^5D^\circ$ (2)
Air						
2294.970	A	200	(4.29)	(9.67)	5–6	$5s\ {}^5F - 5p\,{}^5G^\circ$† (3)
2330.929	A	150	(4.18)	(9.47)	4–5	
2359.755	A	100	(4.08)	(9.31)	3–4	
*2386.962§	A	80	(4.01)	(9.18)	2–3	
2412.708	A	70	(3.96)	(9.07)	1–2	
2381.136	A	40	(4.29)	(9.47)	5–5	
*2403.605§	A	50	(4.18)	(9.31)	4–4	
*2422.183§	A	50	(4.08)	(9.18)	3–3	
2437.688	A	40	(4.01)	(9.07)	2–2	

Mo III

I A	Ref	Int	E P[1] Low	E P[1] High	J	Multiplet No.
Air						
2253.182	A	100	(4.29)	(9.77)	5–4	$5s\ {}^5F - 5p\,{}^5D^\circ$† (4)
*2269.708§	A	150	(4.18)	(9.62)	4–3	
*2304.262§	A	80	(4.08)	(9.44)	3–2	
2317.914	A	30	(4.01)	(9.33)	2–1	
2323.931	A	50	(3.96)	(9.27)	1–0?	
*2208.182§	A	40	(4.18)	(9.77)	4–4	
2230.542	A	20	(4.08)	(9.62)	3–3	
2272.347	A	20	(4.01)	(9.44)	2–2	
2295.314	A	8	(3.96)	(9.33)	1–1	
2171.108	A	25	(4.08)	(9.77)	3–4	
*2211.013	A	100	(4.29)	(9.87)	5–5	$5s\ {}^5F - 5p\,{}^5F^\circ$ (5)
*2179.366§	A	75	(4.18)	(9.84)	4–4	
2170.572	A	75	(4.08)	(9.77)	3–3	
*2211.013	A	100	(4.01)	(9.59)	2–2	
2206.060	A	18	(3.96)	(9.55)	1–1	
2223.188	A	50	(4.29)	(9.84)	5–4	
2207.622	A	20	(4.18)	(9.77)	4–3	
2241.191	A	20	(4.08)	(9.59)	3–2	
2226.927	A	40	(4.01)	(9.55)	2–1	
2167.668	A	45	(4.18)	(9.87)	4–5	
*2143.251§	A	40	(4.08)	(9.84)	3–4	
2142.237	A	40	(4.01)	(9.77)	2–3	
2190.444	A	40	(3.96)	(9.59)	1–2	

[1] Parentheses indicate that the excitation potentials have been derived from levels whose values have been estimated relative to the ground state.

Mo IV

I P 46.2 Anal D List A October 1960

REFERENCES

A F. R. Rico, An. Real Soc. Esp. Fis. y Quim. (Madrid) [A] **53,** 185 1957). W L, I
B A. Y. Eliason, Phys. Rev. **43, 745** (1933). I P, T, W L, (I)
* and §=Blend of Mo III and Mo IV

Mo IV

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
884.786	A	10	0.35	14.30	$4\frac{1}{2}-5\frac{1}{2}$	$4d^3\ {}^4F-5p\ {}^4G^\circ$ (1)
895.354	A	10	0.22	14.00	$3\frac{1}{2}-4\frac{1}{2}$	
913.900	A	10	0.00	13.51	$1\frac{1}{2}-2\frac{1}{2}$	
920.496	A	20	0.10	13.51	$2\frac{1}{2}-2\frac{1}{2}$	
884.207	A	50	0.35	14.31	$4\frac{1}{2}-4\frac{1}{2}$	$4d^3\ {}^4F-5p\ {}^4F^\circ$ (2)
885.982	A	30	0.22	14.15	$3\frac{1}{2}-3\frac{1}{2}$	
891.674	A	30	0.10	13.94	$2\frac{1}{2}-2\frac{1}{2}$	
*894.762	A	20	0.00	13.80	$1\frac{1}{2}-1\frac{1}{2}$	
*894.762	A	20	0.35	14.15	$4\frac{1}{2}-3\frac{1}{2}$	
875.674	B	(2)	0.22	14.31	$3\frac{1}{2}-4\frac{1}{2}$	
878.402	A	5	0.10	14.15	$2\frac{1}{2}-3\frac{1}{2}$	
885.537	A	5	0.00	13.94	$1\frac{1}{2}-2\frac{1}{2}$	
867.925	A	20	0.35	14.58	$4\frac{1}{2}-3\frac{1}{2}$	$4d^3\ {}^4F-5p\ {}^4D^\circ$ (3)
863.209	A	10	0.22	14.52	$3\frac{1}{2}-2\frac{1}{2}$	
863.509	A	10	0.10	14.39	$2\frac{1}{2}-1\frac{1}{2}$	
863.623	A	10	0.00	14.29	$1\frac{1}{2}-0\frac{1}{2}$	
859.692	A	1	0.22	14.58	$3\frac{1}{2}-3\frac{1}{2}$	
855.968	A	3	0.10	14.52	$2\frac{1}{2}-2\frac{1}{2}$	
857.722	A	10	0.00	14.39	$1\frac{1}{2}-1\frac{1}{2}$	
852.636	A	2	0.10	14.58	$2\frac{1}{2}-3\frac{1}{2}$?	

Mo IV

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1929.256	A	500	7.91	14.30	$4\frac{1}{2}-5\frac{1}{2}$	$5s\ {}^4F-5p\ {}^4G^\circ$ (4)
1971.092	A	500	7.74	14.00	$3\frac{1}{2}-4\frac{1}{2}$	
Air						
2011.57	B	(70)	7.61	13.74	$2\frac{1}{2}-3\frac{1}{2}$	
2061.03	B	(50)	7.52	13.51	$1\frac{1}{2}-2\frac{1}{2}$	
2024.43	B	(20)	7.91	14.00	$4\frac{1}{2}-4\frac{1}{2}$	
2056.29	B	(25)	7.74	13.74	$3\frac{1}{2}-3\frac{1}{2}$	
2092.54	B	(15)	7.61	13.51	$2\frac{1}{2}-2\frac{1}{2}$	
2114.43	B	(10)	7.91	13.74	$4\frac{1}{2}-3\frac{1}{2}$	
2140.98	B	(5)	7.74	13.51	$3\frac{1}{2}-2\frac{1}{2}$	
Vac						
*1926.261	A	500	7.91	14.31	$4\frac{1}{2}-4\frac{1}{2}$	$5s\ {}^4F-5p\ {}^4F^\circ$ (5)
*1926.261	A	500	7.74	14.15	$3\frac{1}{2}-3\frac{1}{2}$	
*1949.515§	A	300	7.61	13.94	$2\frac{1}{2}-2\frac{1}{2}$	
1966.082	A	100	7.52	13.80	$1\frac{1}{2}-1\frac{1}{2}$	
1977.204	A	500	7.91	14.15	$4\frac{1}{2}-3\frac{1}{2}$	
1991.391	A	100	7.74	13.94	$3\frac{1}{2}-2\frac{1}{2}$	
1994.669	A	100	7.61	13.80	$2\frac{1}{2}-1\frac{1}{2}$	
1877.711	A	20	7.74	14.31	$3\frac{1}{2}-4\frac{1}{2}$	
1886.795	A	40	7.61	14.15	$2\frac{1}{2}-3\frac{1}{2}$	
1922.134	A	20	7.52	13.94	$1\frac{1}{2}-2\frac{1}{2}$	
1850.701	A	100	7.91	14.58	$4\frac{1}{2}-3\frac{1}{2}$	$5s\ {}^4F-5p\ {}^4D^\circ$ (6)
*1821.641	A	100	7.74	14.52	$3\frac{1}{2}-2\frac{1}{2}$	
1819.521	A	100	7.61	14.39	$2\frac{1}{2}-1\frac{1}{2}$	
*1821.641	A	100	7.52	14.29	$1\frac{1}{2}-0\frac{1}{2}$	
1805.976	A	20	7.74	14.58	$3\frac{1}{2}-3\frac{1}{2}$	
1786.420	A	20	7.61	14.52	$2\frac{1}{2}-2\frac{1}{2}$	
1795.628	A	10	7.52	14.39	$1\frac{1}{2}-1\frac{1}{2}$	
1771.40	B	(3)	7.61	14.58	$2\frac{1}{2}-3\frac{1}{2}$	
1763.439	A	5	7.52	14.52	$1\frac{1}{2}-2\frac{1}{2}$	

Strongest Unclassified Lines of Mo IV

Air			Air		
1976.853	A	100	1387.212	A	50
1974.517	A	50	1384.613	A	50
1973.623	A	50	1355.995	A	50
1969.212	A	50	1352.825	A	50
1962.530	A	200	1351.259	A	50
1954.440	A	100	1350.709	A	50
1944.251	A	50	1346.007	A	50
1935.866	A	100	1344.128	A	50
1932.273	A	100	1342.757	A	50
1930.511	A	50	1341.348	A	50
1883.560	A	60	1339.939	A	50
1865.980	A	60	1338.377	A	50
1846.127	A	50	1336.696	A	50
1845.700	A	50	1336.163	A	50
1668.948	A	50	1318.597	A	50
1667.480	A	70	1200.800	A	50
1666.654	A	70	1166.070	A	50
1665.845	A	50	1163.636	A	50
1665.545	A	50	1109.028	A	50
1476.859	A	50	1096.448	A	50
1440.838	A	50	1082.551	A	50
1406.562	A	50	1038.636	A	50
1393.670	A	100	930.855	A	100

Mo V

I P 61 Anal C List B October 1960

REFERENCES

A F. R. Rico, An. Real Soc. Esp. (Madrid) [A] **53**, 185 (1957). W L, I

B M. W. Trawick, Phys. Rev. 48, 223 (1935). I P, W L, (I), T

Mo v

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
*725.748	A	20	0.41	17.42	4 −3	$4d^2\ ^3F - 5p\ ^1F^\circ$ (1)
668.09	B	(10)	0.41	18.89	4 −3	$4d^2\ ^3F - 5p\ ^3D^\circ$ (2)
668.32	B	(10)	0.20	18.67	3 −2	
671.37	B	(6)	0.00	18.39	2 −1	
660.28	B	(1)	0.20	18.89	3 −3	
661.33	B	(4)	0.00	18.67	2 −2	
659.31	B	(7)	0.41	19.14	4 −4	$4d^2\ ^3F - 5p\ ^3F^\circ$ (3)
668.39	B	(10)	0.20	18.67	3 −3	
665.14	B	(6)	0.00	18.56	2 −2	
676.42	B	(6)	0.41	18.67	4 −3	
672.24	B	(6)	0.20	18.56	3 −2	
651.68	B	(2)	0.20	19.14	3 −4	
661.40	B	(4)	0.00	18.67	2 −3	
420.61	B	(5)	0.41	29.77	4 −4	$4d^2\ ^3F - 4f\ ^3F^\circ$ (4)
428.63	B	(3)	0.20	29.00	3 −3	
431.55	B	(6)	0.00	28.61	2 −2	
434.52	B	(6)	0.20	28.61	3 −2	
417.49	B	(6)	0.20	29.77	3 −4	
425.77	B	(0)	0.00	29.00	2 −3	
412.42	B	(5)	0.41	30.35	4 −5	$4d^2\ ^3F - 4f\ ^3G^\circ$† (5)
411.08	B	(8)	0.20	30.23	3 −4	
410.35	B	(5)	0.00	30.08	2 −3	
414.11	B	(0)	0.41	30.23	4 −4	
716.184	A	10	1.66	18.89	2 −3	$4d^2\ ^3P - 5p\ ^3D^\circ$ (6)
717.331	A	5	1.46	18.67	1 −2	
*725.748	A	20	1.38	18.39	0 −1	
729.172	A	2	1.46	18.39	1 −1	
*725.748	A	20	1.66	18.67	2 −3	$4d^2\ ^3P - 5p\ ^3F^\circ$ (7)
721.834	A	20	1.46	18.56	1 −2	
730.280	A	5	1.66	18.56	2 −2	
692.263	A	30	1.66	19.49	2 −2	$4d^2\ ^3P - 5p\ ^3P^\circ$ (8)
690.551	A	30	1.46	19.33	1 −1	
698.284	A	30	1.66	19.33	2 −1	
688.422	A	30	1.46	19.39	1 −0	
684.702	A	30	1.46	19.49	1 −2	
687.489	A	20	1.38	19.33	0 −1	
1748.973	A	5	10.37	17.42	2 −3	$5s\ ^1D - 5p\ ^1F^\circ$ (9)
1581.257	A	1	10.37	18.17	2 −1	$5s\ ^1D - 5p\ ^1P^\circ$ (10)
1487.18	B	0	10.37	18.67	2 −2	$5s\ ^1D - 5p\ ^3D^\circ$† (11)
1538.702	A	1	10.37	18.39	2 −1	
1475.187	A	1	10.37	18.73	2 −2	$5s\ ^1D - 5p\ ^1D^\circ$ (12)
Air						
2076.84	B	(5d)	11.49	17.42	2 −3	$5s\ ^3D - 5p\ ^1F^\circ$† (13)

Mo v

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1718.033	A	5	11.71	18.89	3 −3	$5s\ ^3D - 5p\ ^3D^\circ$ (14)
1721.288	A	2	11.49	18.67	2 −2	
1767.767	A	4	11.40	18.39	1 −1	
1773.676	A	1	11.71	18.67	3 −2	
1790.889	A	10	11.49	18.39	2 −1	
1668.669	A	50	11.49	18.89	2 −3	
1699.735	A	10	11.40	18.67	1 −2	
1661.230	A	100	11.71	19.14	3 −4	$5s\ ^3D - 5p\ ^3F^\circ$ (15)
1721.808	A	1	11.49	18.67	2 −3	
1725.350	A	2	11.40	18.56	1 −2	
1774.246	A	10	11.71	18.67	3 −3	
1747.198	A	20	11.49	18.56	2 −2	
1801.435	A	10	11.71	18.56	3 −2	
1756.802	A	5	11.71	18.73	3 −2	$5s\ ^3D - 5p\ ^1D^\circ$ (16)
1705.299	A	5	11.49	18.73	2 −2	
1684.16	B	(00)	11.40	18.73	1 −2	
1586.875	A	40	11.71	19.49	3 −2	$5s\ ^3D - 5p\ ^3P^\circ$ (17)
1574.680	A	30	11.49	19.33	2 −1	
1546.063	A	5	11.40	19.39	1 −0	
1544.616	A	5	11.49	19.49	2 −2	
1556.817	A	30	11.40	19.33	1 −1	
1527.44	B	(0)	11.40	19.49	1 −2	
1399.097	A	10	17.42	26.25	3 −2	$5p\ ^1F^\circ - 5d\ ^1D$ (18)
1528.734	A	5	18.17	26.25	1 −2	$5p\ ^1P^\circ - 5d\ ^1D$ (19)
1456.271	A	10	18.17	26.65	1 −1	$5p\ ^1P^\circ - 5d\ ^1P$ (20)
1644.671	A	20	18.89	26.40	3 −3	$5p\ ^3D^\circ - 5d\ ^3D$ (21)
1575.819	A	10	18.67	26.50	2 −2	
1518.758	A	5	18.39	26.52	1 −1	
1596.688	A	10	18.67	26.40	2 −3	
1521.407	A	10	18.39	26.50	1 −2	
1622.55	B	(0)	18.89	26.50	3 −2	
1572.96	B	(3)	18.67	26.52	2 −1	
1605.682	A	10	18.56	26.25	2 −2	$5p\ ^3F^\circ - 5d\ ^1D$ (22)
1148.517	A	4	19.14	29.89	4 −4	$5p\ ^3F^\circ - 5d\ ^3F$† (23)
1137.963	A	1	18.67	29.51	3 −3	
1157.85	B	(4d)	18.56	29.22	2 −2	
1189.96	B	(2)	19.14	29.51	4 −3	
1169.325	A	100	18.67	29.22	3 −2	
1099.97	B	(0)	18.67	29.89	3 −4	
1127.07	B	(0)	18.56	29.51	2 −3	
1643.108	A	10	18.73	26.25	2 −2	$5p\ ^1D^\circ - 5d\ ^1D$ (24)

Strongest Unclassified Lines of Mo v

Vac							Vac					
1783.355	A	20					1752.002	A	10			
1775.582	A	10					1727.351	A	20			
1772.002	A	10					1726.995	A	50			
1762.614	A	10					1590.370	A	30			
1752.689	A	10										

TECHNETIUM, $Z = 43$

Tc I

I P 7.25 Anal C List B November 1960

REFERENCES

A W. R. Bozman, C. H. Corliss, and W. F. Meggers, unpublished material (1956). W L, I
W. F. Meggers and B. F. Scribner, J. Research Nat. Bur. Std. 45, 476, RP2161 (1950). W L, I
W. F. Meggers, J. Research Nat. Bur. Std. 47, 7, RP2221 (1951). T, C. L
W. F. Meggers and W. R. Bozman, unpublished material (1957). I P, T, C L, Z E

Tc I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2896.340	A	1000	0.00	4.26	2½–2½	$a\ ^6S - y\ ^4P°$ (1)
2860.988	A	15	0.00	4.31	2½–1½	
2614.233	A	1500	0.00	4.72	2½–3½	$a\ ^6S - x\ ^6P°$ (2)
2615.873	A	1000	0.00	4.72	2½–2½	
2608.855	A	500	0.00	4.73	2½–1½	

Tc I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2802.810	A	1000	0.32	4.72	4½–3½	$a\ ^6D - x\ ^6P°$ (3)
2859.110	A	2000c	0.40	4.72	3½–2½	
2887.734	A	1000	0.46	4.73	2½–1½	
2857.128	A	500	0.40	4.72	3½–3½	
*2896.340	A	1000	0.46	4.72	2½–2½	
2913.147	A	1000	0.49	4.73	1½–1½	
2894.322	A	200	0.46	4.72	2½–3½	
2921.912	A	500	0.49	4.72	1½–2½	
2928.198	A	1000	0.52	4.73	0½–1½	

Tc II

I P 15.2 Anal C List B November 1960

REFERENCES

A W. R. Bozman, C. H. Corliss, and W. F. Meggers, unpublished material (1956). W L, I
W. F. Meggers and B. F. Scribner, J. Research Nat. Bur. Std. 45, 476, RP2161 (1950). W L, I
W. F. Meggers, J. Research Nat. Bur. Std. 47, 7, RP2221 (1951). T, C L
M. A. Catalán y F. R. Rico, letter (December 1956). I P
M. A. Catalán and C. E. Moore, unpublished material (June 1957). T, C L

Tc II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2543.227‡	A	5000c	0.00	4.85	3–4	$a\ ^7S - z\ ^7P°$ (1)
2609.993	A	2000c	0.00	4.73	3–3	
2647.011	A	3000c	0.00	4.66	3–2	
2298.080	A	30	0.00	5.37	3–3	$a\ ^7S - z\ ^5P°$ (2)
2285.451	A	15	0.00	5.40	3–2	
2496.767	A	500	0.43	5.37	4–3	$a\ ^5D - z\ ^5P°$ (3)
2529.340	A	400	0.52	5.40	3–2	
2547.930	A	150	0.58	5.42	2–1	
2544.807	A	400	0.52	5.37	3–3	
2558.606	A	300	0.58	5.40	2–2	
2567.034	A	250	0.61	5.42	1–1	
2574.442	A	30c	0.58	5.37	2–3	
2577.861	A	40	0.61	5.40	1–2	
2576.281	A	90	0.63	5.42	0–1	

Tc II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2795.778	A	500	(2.96	7.38)[1]	6–6	$a^5G - z\ ^5G°$ (4)
2811.614	A	1000	(2.97	7.36)	5–5	
2821.352	A	500	(2.96	7.33)	4–4	
2831.180	A	600	(2.95	7.31)	3–3	
2840.375	A	400	(2.94	7.29)	2–2	
2809.646	A	150c	(2.96	7.36)	6–5	
2825.042	A	80c	(2.97	7.33)	5–4	
2836.117	A	150	(2.96	7.31)	4–3	
2797.730	A	10	(2.97	7.38)	5–6	
2807.915	A	15d	(2.96	7.36)	4–5	
2816.515	A	10h	(2.95	7.33)	3–4	
2634.909	A	1000	(2.96	7.65)	6–7	$a\ ^5G - z\ ^5H°$ (5)
2652.351	A	600	(2.97	7.62)	5–6	
2682.699	A	200cw	(2.96	7.56)	4–5	
2725.656	A	400c	(2.95	7.48)	3–4	
2724.193	A	200w	(2.94	7.47)	2–3	
2650.603	A	20h	(2.96	7.62)	6–6	
2686.023	A	8	(2.97	7.56)	5–5	
2730.225	A	6	(2.96	7.48)	4–4	
2684.234	A	6	(2.96	7.56)	6–5	
2644.496	A	500c	(2.96	7.63)	6–5	$a\ ^5G - z\ ^5F°$ (6)
2673.412	A	200	(2.97	7.58)	5–4	
2675.223	A	200c	(2.96	7.57)	4–3	
2693.744	A	40	(2.95	7.53)	3–2	
2711.481	A	5	(2.94	7.49)	2–1	
2646.245	A	100	(2.97	7.63)	5–5	
2670.110	A	20	(2.96	7.58)	4–4	
2670.818	A	3	(2.95	7.57)	3–3	
2688.033	A	3	(2.94	7.53)	2–2	
2643.006	A	200	(2.96	7.63)	4–5	
2665.733	A	70	(2.95	7.58)	3–4	

[1] Parentheses indicate that the excitation potentials have been derived from an estimated value of $a\ ^5G_6$ relative to the ground state.

RUTHENIUM, $Z = 44$

Ru I

I P 7.334 Anal A List B June 1959

REFERENCES

A K. G. Kessler, J. Res. Nat. Bur. Std. [A] 63, 213 (1959). W L, I, T, I P, C L
K. G. Kessler and W. F. Meggers, J. Research Nat. Bur. Std. 55, 97 RP2609 (1955). W L, I

* and §=Blend with Ru II

Ru I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2874.984	A	1000R	0.00	4.29	5−5	$a\,^5F - y\,^5F°$ (1)
2916.251	A	150	0.15	4.38	4−4	
2965.168	A	150	0.26	4.42	3−3	
3006.588	A	300	0.34	4.44	2−2	
3017.235	A	200	0.38	4.47	1−1	
2818.359	A	200	0.00	4.38	5−4	
2887.993	A	70	0.15	4.42	4−3	
2951.401	A	60	0.26	4.44	3−2	
2981.934	A	75	0.34	4.47	2−1	
2976.923	A	100	0.15	4.29	4−5	
2994.967	A	150	0.26	4.38	3−4	
3020.871	A	150	0.34	4.42	2−3	
3042.480	A	100	0.38	4.44	1−2	
2735.727	A	250	0.00	4.51	5−4	$a\,^5F - x\,^5D°$† (2)
2763.413	A	200	0.15	4.61	4−3	
2810.029	A	150	0.26	4.65	3−2	
2817.092	A	100	0.34	4.72	2−1	
2881.273	A	60	0.38	4.67	1−0	
2827.857	A	100	0.15	4.51	4−4	
2833.999	A	80	0.26	4.61	3−3	
2860.014	A	100	0.34	4.65	2−2	
2848.586	A	80	0.38	4.72	1−1	
m2901.816	P	Ru I	0.26	4.51	3−4	
2884.843	A	80	0.34	4.61	2−3	
2810.551	A	250	0.15	4.54	4−3	$a\,^5F - y\,^3D°$† (3)
2866.653	A	150	0.26	4.56	3−2	
2883.594	A	75	0.26	4.54	3−3	
2896.523	A	100	0.38	4.64	1−1	
2936.247	A	30	0.34	4.54	2−3	
2952.489	A	80	0.38	4.56	1−2	
2854.075	A	200	0.26	4.58	3−2	$a\,^5F - z\,^3P°$ (4)
2886.528	A	150	0.34	4.61	2−1	
2908.883	A	150	0.38	4.63	1−0	
2905.651	A	75	0.34	4.58	2−2	
2919.604	A	75	0.38	4.61	1−1	
2939.135	A	75	0.38	4.58	1−2	
*2614.055	A	100	0.00	4.72	5−4	$a\,^5F - y\,^3F°$† (5)
*2614.055	A	100	0.15	4.87	4−3	
2607.348	A	50	0.26	4.99	3−2	
2570.093	A	30	0.00	4.80	5−6	$a\,^5F - z\,^3H°$† (6)
2664.761	A	100	0.15	4.78	4−3	$a\,^5F - y\,^5P°$† (7)
2707.969	A	100	0.26	4.82	3−2	
2697.510	A	50	0.34	4.91	2−1	
2730.325	A	80	0.26	4.78	3−3	
2612.895	A	20	0.15	4.87	4−5	$a\,^5F - y\,^3G°$† (8)

Ru I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2655.221	A	30	0.26	4.91	3−2	$a\,^5F - y\,^3P°$ (9)
2687.138	A	40	0.34	4.93	2−1	
2717.401	A	100	0.38	4.92	1−0	
2699.793	A	20	0.34	4.91	2−2	
2715.773	A	75	0.38	4.93	1−1	
2472.09	A	40	0.00	4.99	5−4	$a\,^5F - 1°$† (10)
2504.51	A	20	0.26	5.19	3−2	$a\,^5F - x\,^3D°$† (11)
2514.45	A	30	0.15	5.06	4−3	$a\,^5F - z\,^1F°$
2614.585	A	75	0.34	5.06	2−3	(12)
2474.846	A	30	0.34	5.32	2−1	$a\,^5F - y\,^3S°$ (13)
2238.35	A	50	0.00	5.51	5−4	$a\,^5F - y\,^3H°$† (14)
2293.044	A	30	0.00	5.38	5−5	$a\,^5F - y\,^1H°$ (15)
2285.382	A	60	0.00	5.40	5−5	$a\,^5F - w\,^3G°$
2342.72	A	80	0.15	5.42	4−4	(16)
2349.338	A	150	0.15	5.40	4−5	
2393.249	A	90	0.26	5.42	3−4	
2450.359	A	30	0.38	5.42	1−2	$a\,^5F - y\,^1D°$ (17)
2272.091	A	100	0.00	5.43	5−6	$a\,^5F - 2°$ (18)
2259.529	A	100	0.00	5.46	5−4	$a\,^5F - w\,^5D°$
2278.198	A	50	0.15	5.56	4−3	(19)
2287.695	A	60	0.26	5.65	3−2	
2299.289	A	60	0.34	5.70	2−1	
2305.517	A	70	0.38	5.74	1−0	
2322.009	A	80	0.15	5.46	4−4	
2325.952	A	60	0.26	5.56	3−3	
2320.699	A	60	0.34	5.65	2−2	
2320.23	A	40	0.38	5.70	1−1	
2360.093	A	90	0.34	5.56	2−3	
2342.02	A	40	0.38	5.65	1−2	
2255.53	A	80	0.00	5.47	5−5	$a\,^5F - x\,^5F°$† (20)
2302.533	A	100	0.15	5.51	4−4	
2340.696	A	100	0.26	5.53	3−3	
2331.43	A	60	0.34	5.63	2−2	
2241.075	A	50	0.00	5.51	5−4	
2292.333	A	40	0.15	5.53	4−3	
2317.784	A	80	0.15	5.47	4−5	
2351.33	A	200	0.26	5.51	3−4	
2375.272	A	100	0.34	5.53	2−3	

Ru I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2395.721	A	80	0.34	5.49	2–3	$a\,^5F\ -4^\circ$ (21)
2335.738	A	40	0.26	5.54	3–2	$a\,^5F\ -5^\circ$ (22)
2370.169	A	80	0.34	5.54	2–2	
2392.425	A	150	0.38	5.54	1–2	
2318.905	A	40	0.26	5.58	3–3	$a\,^5F\ -x\,^1F^\circ$ (23)
2254.71	A	30	0.15	5.62	4–4	$a\,^5F\ -x\,^1G^\circ$† (24)
2253.65	A	50	0.15	5.62	4–3	$a\,^5F\ -7^\circ$ (25)
2243.23	A	60	0.15	5.65	4–4	$a\,^5F\ -w\,^3F^\circ$† (26)
2264.696	A	20	0.38	5.83	1–2	
2331.770	A	40	0.38	5.68	1–1	$a\,^5F\ -8^\circ$ (27)
2227.640	A	25	0.15	5.69	4–4	$a\,^5F\ -10^\circ$† (28)
2256.187	A	40	0.26	5.73	3–4	$a\,^5F\ -13^\circ$† (29)
2194.428	A	15	0.15	5.77	4–3	$a\,^5F\ -x\,^5P^\circ$† (30)
2235.836	A	25	0.26	5.78	3–2	
2232.08	A	30	0.34	5.86	2–1	
2270.322	A	20	0.34	5.77	2–3	
2268.34	A	40	0.38	5.82	1–0	$a\,^5F\ -18^\circ$ (31)
2209.08	A	40	0.26	5.84	3–2	$a\,^5F\ -20^\circ$† (32)
2934.173	A	75	0.81	5.01	4–5	$a\,^3F\ -z\,^1H^\circ$ (33)
2861.408	A	125	0.81	5.12	4–3	$a\,^3F\ -w\,^3D^\circ$ (34)
2901.937	A	50	1.00	5.25	3–2	
2993.273	A	100	1.00	5.12	3–3	
2997.613	A	50	1.13	5.25	2–2	
*2743.934§	A	80	0.81	5.31	4–5	$a\,^3F\ -z\,^3I^\circ$ (35)
2840.537	A	80	0.81	5.15	4–5	$a\,^3F\ -x\,^3G^\circ$ (36)
2868.183	A	25	1.00	5.30	3–4	
2873.370	A	50	1.13	5.43	2–3	
2746.885	A	75	0.81	5.30	4–4	
2785.334	A	75	1.00	5.43	3–3	
2968.952	A	100	1.00	5.16	3–2	$a\,^3F\ -z\,^1D^\circ$ (37)
3069.181	A	50	1.13	5.16	2–2	
2829.149	A	200	0.81	5.17	4–3	$a\,^3F\ -y\,^3D^\circ$ (38)
2871.642	A	100	1.00	5.30	3–2	
2957.996	A	100	1.00	5.17	3–3	
2863.324	A	20	1.00	5.31	3–3	$a\,^3F\ -y\,^1F^\circ$ (39)
2822.034	A	100	1.00	5.37	3–2	$a\,^3F\ -u\,^3D^\circ$ (40)
2884.500	A	50	1.13	5.41	2–1	
2912.433	A	50	1.13	5.37	2–2	

Ru I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2879.358	A	25	1.13	5.42	2–2	$a\,^3F\ -y\,^1D^\circ$ (41)
2651.839	A	30	0.81	5.46	4–4	$a\,^3F\ -w\,^5D^\circ$ (42)
2702.833	A	80	1.00	5.56	3–3	
2730.932	A	100	1.13	5.65	2–2	
2594.855	A	100	0.81	5.56	4–3	
2651.289	A	40	1.00	5.65	3–2	
2701.337	A	70	1.13	5.70	2–1	
2764.714	A	70	1.00	5.46	3–4	
2785.649	A	80	1.13	5.56	2–3	
2846.750	A	30	1.13	5.47	2–1	$a\,^3F\ -3^\circ$ (43)
2626.478	A	50	0.81	5.51	4–4	$a\,^3F\ -x\,^5F^\circ$† (44)
2693.653	A	30	1.00	5.58	3–2	$a\,^3F\ -y\,^5S^\circ$ (45)
2575.242	A	30	0.81	5.60	4–4	$a\,^3F\ -y\,^1G^\circ$ (46)
2567.893	A	40	0.81	5.61	4–3	$a\,^3F\ -6^\circ$
2673.605	A	80	1.00	5.61	3–3	(47)
*2754.603	A	60	1.13	5.61	2–3	
2668.342	A	40	1.00	5.62	3–3	$a\,^3F\ -7^\circ$† (48)
2549.56	A	300	0.81	5.65	4–4	$a\,^3F\ -w\,^3F^\circ$† (49)
2572.412	A	100	1.00	5.80	3–3	
2626.356	A	20	1.13	5.83	2–2	
2647.314	A	75	1.13	5.80	2–3	
2717.001	A	30	1.13	5.68	2–1	$a\,^3F\ -8^\circ$ (50)
*2609.062	A	125	1.00	5.73	3–4	$a\,^3F\ -13^\circ$? (51)
2502.37	A	25	0.81	5.74	4–5	$a\,^3F\ -x\,^1H^\circ$ (52)
2676.969	A	20	1.13	5.74	2–1	$a\,^3F\ -y\,^1P^\circ$ (53)
2489.92	A	70	0.81	5.76	4–4	$a\,^3F\ -14^\circ$ (54)
2581.911	A	50	1.00	5.78	3–2	$a\,^3F\ -x\,^5P^\circ$†
2585.739	A	30	1.00	5.77	3–3	(55)
2658.391	A	80	1.13	5.78	2–1	$a\,^3F\ -15^\circ$ (56)
2640.324	A	60	1.13	5.81	2–3	$a\,^3F\ -16^\circ$† (57)
2558.540	A	100	1.00	5.82	3–4	$a\,^3F\ -17^\circ$ (58)
2551.72	A	60	1.00	5.83	3–4	$a\,^3F\ -19^\circ$† (59)
2450.560	A	100	0.81	5.84	4–3	$a\,^3F\ -s\,^3D^\circ$†
*2533.23	A	100	1.00	5.87	3–2	(60)
2546.668	A	150*l*	1.00	5.84	3–3	
2605.853	A	100	1.13	5.87	2–2	
2619.666	A	50	1.13	5.84	2–2	$a\,^3F\ -20^\circ$† (61)
2445.43	A	50	0.81	5.86	4–5	$a\,^3F\ -21^\circ$ (62)

Ru I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2432.915	A	90	0.81	5.88	4−3	$a\,^3F$ −23°† (63)
2423.877	A	30	0.81	5.90	4−3	$a\,^3F$ −25°
2589.569	A	150	1.13	5.90	2−3	(64)
2419.205	A	30	0.81	5.91	4−3	$a\,^3F$ −28°
2512.81	A	100	1.00	5.91	3−3	(65)
2405.180	A	50	0.81	5.94	4−4	$a\,^3F$ −30°
2497.680	A	40	1.00	5.94	3−4	(66)
2403.173	A	25	0.81	5.94	4−4	$a\,^3F$ −31° (67)
2467.576	A	40	1.00	6.00	3−4	$a\,^3F$ −38° (68)
2525.63	A	50	1.13	6.02	2−3	$a\,^3F$ −40°† (69)
2434.879	A	40	1.00	6.07	3−3	$a\,^3F$ −46°
2501.885	A	60	1.13	6.07	2−3	(70)
2433.477	A	25	1.00	6.07	3−4	$a\,^3F$ −47° (71)
2491.76	A	60	1.13	6.09	2−3	$a\,^3F$ −48°† (72)
2294.054	A	50	0.81	6.19	4−5	$a\,^3F - v\,^3G°$
2387.881	A	100	1.00	6.17	3−4	(73)
2437.790	A	50	1.13	6.20	2−1	$a\,^3F$ −57° (74)
*2909.212	A	30	1.06	5.30	3−4	$a\,^5D - x\,^3G°$†
2863.003	A	30	1.12	5.43	2−3	(75)
2906.315	A	60	0.92	5.17	4−3	$a\,^5D - v\,^3D°$
2912.745	A	10	1.06	5.30	3−2	(76)
3001.634	A	60	1.06	5.17	3−3	
*3045.715	A	125	1.12	5.17	2−3	
2955.593	A	20	1.12	5.30	1−2	
2996.891	A	75	1.12	5.24	2−1	$a\,^5D - z\,^1P°$
*3036.463§	A	40	1.17	5.24	0−1	(77)
2814.862	A	25	0.92	5.31	4−3	$a\,^5D - y\,^1F°$† (78)
2936.005	A	60	1.12	5.32	2−1	$a\,^5D - y\,^3S°$
2937.336	A	30	1.12	5.32	1−1	(79)
2973.976	A	100	1.17	5.32	0−1	
2861.718	A	40	1.06	5.37	3−2	$a\,^5D - u\,^3D°$†
2874.050	A	25	1.12	5.41	2−1	(80)
2901.784	A	25	1.12	5.37	2−2	
2903.074	A	40	1.12	5.37	1−2	
2910.425	A	20	1.17	5.41	0−1	
2770.296	A	50	1.06	5.51	3−4	$a\,^5D - y\,^3H°$
2688.888	A	70	0.92	5.51	4−4	(81)
2757.064	A	30	0.92	5.40	4−5	$a\,^5D - w\,^3G°$
*2747.963§	A	40	0.92	5.42	4−4	(82)
2870.213	A	40	1.12	5.42	1−2	$a\,^5D - y\,^1D°$† (83)
2803.496	A	40	1.06	5.46	3−2	$a\,^5D - x\,^3P°$†
2843.170	A	70	1.12	5.46	1−2	(84)

Ru I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2719.51	A	250	0.92	5.46	4−4	$a\,^5D - w\,^5D°$
2739.217	A	150	1.06	5.56	3−3	(85)
2721.562	A	70	1.12	5.65	2−2	
2693.30	A	150	1.12	5.70	1−1	
2659.617	A	100	0.92	5.56	4−3	
2686.291	A	175	1.06	5.65	3−2	
2673.477	A	80	1.12	5.74	1−0	
2802.805	A	125	1.06	5.46	3−4	
2775.902	A	80	1.12	5.56	2−3	
2722.693	A	50	1.12	5.65	1−2	
2724.066	A	100	1.17	5.70	0−1	
2836.569	A	70	1.12	5.47	2−1	$a\,^5D$ −3°† (86)
2713.728	A	50	0.92	5.47	4−5	$a\,^5D - x\,^5F°$†
2774.480	A	125	1.06	5.51	3−4	(87)
2737.463	A	20	1.12	5.63	1−2	
2692.842	A	80	0.92	5.51	4−4	
2759.682	A	100	1.06	5.53	3−3	
2700.671	A	25	1.06	5.63	3−2	
2766.223	A	50	1.12	5.58	2−2	$a\,^5D - y\,^5S°$† (88)
2650.395	A	30	0.92	5.58	4−3	$a\,^5D - x\,^1F°$†
2729.455	A	60	1.06	5.58	3−3	(89)
2631.304	A	100	0.92	5.61	4−3	$a\,^5D$ −6°
2709.198	A	125	1.06	5.61	3−3	(90)
2745.074	A	75	1.12	5.61	2−3	
2627.650	A	100	0.92	5.62	4−4	$a\,^5D - x\,^1G°$† (91)
2626.205	A	30	0.92	5.62	4−3	$a\,^5D$ −7°
2703.796	A	50	1.06	5.62	3−3	(92)
2612.06	A	150	0.92	5.65	4−4	$a\,^5D - w\,^3F°$
2605.347	A	100	1.06	5.80	3−3	(93)
2617.677	A	20	1.12	5.83	2−2	
*2533.23	A	100	0.92	5.80	4−3	
2638.515	A	75	1.12	5.80	2−3	
2618.737	A	20	1.12	5.83	1−2	
2708.841	A	25	1.12	5.68	1−1	$a\,^5D$ −8°† (94)
2651.874	A	25	1.06	5.71	3−4	$a\,^5D$ −12° (95)
2568.772	A	75	0.92	5.73	4−4	$a\,^5D$ −13°
2642.946	A	200	1.06	5.73	3−4	(96)
2667.969	A	50	1.12	5.74	2−1	$a\,^5D - y\,^1P°$† (97)
2549.470	A	300	0.92	5.76	4−4	$a\,^5D$ −14° (98)
2546.14	A	15	0.92	5.77	4−3	$a\,^5D - x\,^5P°$
2615.093	A	75	1.06	5.78	3−2	(99)
2619.014	A	70	1.06	5.77	3−3	
2649.575	A	20	1.12	5.78	1−2	
2630.231	A	160	1.17	5.86	0−1?	
2649.506	A	25	1.12	5.78	2−1	$a\,^5D$ −15°† (100)
2526.82	A	200	0.92	5.81	4−3	$a\,^5D$ −16°
2598.574	A	20	1.06	5.81	3−3	(101)
2631.569	A	100	1.12	5.81	2−3	
2591.116	A	100	1.06	5.82	3−4	$a\,^5D$ −17° (102)
2584.136	A	100	1.06	5.83	3−4	$a\,^5D$ −19°† (103)

Ru I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2508.270	A	100	0.92	5.84	4−3	$a\,^5D - s\,^3D°$
2565.188	A	20	1.06	5.87	3−2	(104)
2578.948	A	20	1.06	5.84	3−3	
2597.322	A	75	1.12	5.87	2−2	
2598.361	A	25	1.12	5.87	1−2	
2578.571	A	100	1.06	5.84	3−2	$a\,^5D - 20°$
2611.045	A	80	1.12	5.84	2−2	(105)
2496.56	A	50	0.92	5.87	4−3	$a\,^5D - 22°$†
*2566.590§	A	30	1.06	5.87	3−3	(106)
2489.77	A	30	0.92	5.88	4−3	$a\,^5D - 23°$†
						(107)
2480.298	A	15	0.92	5.90	4−3	$a\,^5D - 25°$
2581.140	A	125	1.12	5.90	2−3	(108)
2580.803	A	100	1.12	5.90	1−1	$a\,^5D - 26°$†
*2609.062	A	125	1.17	5.90	0−1	(109)
2475.395	A	200	0.92	5.91	4−3	$a\,^5D - 28°$
2544.22	A	300	1.06	5.91	3−3	(110)
2460.73	A	30	0.92	5.94	4−4	$a\,^5D - 30°$
2528.71	A	50	1.06	5.94	3−4	(111)
2458.622	A	100	0.92	5.94	4−4	$a\,^5D - 31°$
						(112)
2525.17	A	30	1.06	5.95	3−2	$a\,^5D - 32°$
2556.316	A	50	1.12	5.95	2−2	(113)
2545.76	A	30	1.12	5.97	2−2	$a\,^5D - 33°$†
						(114)
2442.934	A	50	0.92	5.98	4−3	$a\,^5D - 34°$
						(115)
2431.51	A	40	0.92	6.00	4−4	$a\,^5D - 38°$
2497.866	A	30	1.06	6.00	3−4	(116)
2528.874	A	75	1.12	6.00	1−1	$a\,^5D - 39°$
2556.004	A	40	1.17	6.00	0−1	(117)
2517.62	A	80	1.12	6.02	2−3	$a\,^5D - 40°$†
						(118)
2470.71	A	30	1.06	6.05	3−2	$a\,^5D - 44°$†
2501.48	A	70	1.12	6.05	1−2	(119)
2500.835	A	30	1.12	6.06	1−1	$a\,^5D - 45°$†
						(120)
2399.750	A	80	0.92	6.07	4−3	$a\,^5D - 46°$
2464.366	A	20	1.06	6.07	3−3	(121)
2494.022	A	80	1.12	6.07	2−3	
2462.943	A	100	1.06	6.07	3−4	$a\,^5D - 47°$†
						(122)
2366.743	A	25	0.92	6.14	4−4	$a\,^5D - 52°$
2429.594	A	80	1.06	6.14	3−4	(123)
2415.005	A	20	1.06	6.17	3−2	$a\,^5D - 55°$†
2444.38	A	60	1.12	6.17	1−2	(124)
2456.279	A	30	1.17	6.20	0−1	$a\,^5D - 57°$
						(125)
2422.574	A	50	1.12	6.21	1−1	$a\,^5D - 58°$
2447.439	A	40	1.17	6.21	0−1	(126)
2392.963	A	60	1.06	6.22	3−3	$a\,^5D - 59°$†
						(127)

Ru I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2782.205	A	80	0.99	5.43	2−3	$a\,^5P - x\,^3G°$†
						(128)
2868.310	A	30	0.99	5.30	2−2	$a\,^5P - v\,^3D°$†
2929.434	A	40	1.08	5.30	3−2	(129)
2877.826	A	50	1.08	5.37	3−2	$a\,^5P - u\,^3D°$†
2792.641	A	75	0.99	5.41	2−1	(130)
2818.809	A	40	0.99	5.37	2−2	
2845.537	A	25	1.08	5.42	3−2	$a\,^5P - y\,^1D°$
						(131)
2818.950	A	75	1.08	5.46	3−2	$a\,^5P - x\,^3P°$
2762.304	A	100	0.99	5.46	2−2	(132)
2699.882	A	40	0.99	5.56	2−3	$a\,^5P - w\,^5D°$†
2763.900	A	50	1.19	5.65	1−2	(133)
2648.451	A	50	0.99	5.65	2−2	
2733.578	A	125	1.19	5.70	1−1	
2700.477	A	30	1.08	5.65	3−2	
2620.607	A	80	0.99	5.70	2−1	
2713.192	A	75	1.19	5.74	1−0	
2744.448	A	125	1.08	5.58	3−2	$a\,^5P - y\,^5S°$†
						(134)
2690.382	A	40	0.99	5.58	2−3	$a\,^5P - x\,^1F°$
						(135)
2731.903	A	30	1.08	5.60	3−4	$a\,^5P - y\,^1G°$
						(136)
2569.729	A	50	0.99	5.80	2−3	$a\,^5P - w\,^3F°$†
2549.965	A	30	0.99	5.83	2−2	(137)
*2690.810	A	25	1.08	5.67	3−2	$a\,^5P - t\,^3D°$†
						(138)
2629.925	A	40	0.99	5.69	2−1	$a\,^5P - 9°$
						(139)
2740.217	A	50	1.19	5.69	1−0	$a\,^5P - 11°$
						(140)
2665.719	A	25	1.08	5.71	3−4	$a\,^5P - 12°$
						(141)
2656.698	A	75	1.08	5.73	3−4	$a\,^5P - 13°$
						(142)
2708.635	A	25	1.19	5.74	1−1	$a\,^5P - y\,^1P°$†
						(143)
2632.496	A	75	1.08	5.77	3−3	$a\,^5P - x\,^5P°$†
2579.222	A	70	0.99	5.78	2−2	(144)
2639.121	A	75	1.19	5.86	1−1	
2628.536	A	25	1.08	5.78	3−2	
2583.033	A	70	0.99	5.77	2−3	
2688.583	A	50	1.19	5.78	1−2	
2563.157	A	50	0.99	5.81	2−3	$a\,^5P - 16°$
						(145)
2604.315	A	30	1.08	5.82	3−4	$a\,^5P - 17°$
						(146)
2661.861	A	50	1.19	5.82	1−0	$a\,^5P - 18°$
						(147)
2592.022	A	100	1.08	5.84	3−3	$a\,^5P - s\,^3D°$
2530.64	A	75	0.99	5.87	2−2	(148)
*2635.861§	A	20	1.19	5.87	1−2	
2591.637	A	40	1.08	5.84	3−2	$a\,^5P - 20°$†
2543.67	A	50	0.99	5.84	2−2	(149)

Ru I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2579.536	A	100	1.08	5.87	3–3	$a\,^5P$ −22°† (150)
2572.282	A	100	1.08	5.88	3–3	$a\,^5P$ −23° (151)
2515.27	A	80	0.99	5.90	2–3	$a\,^5P$ −25°† (152)
2617.790	A	70	1.19	5.90	1–1	$a\,^5P$ −26°† (153)
2560.265	A	125	1.08	5.90	3–4	$a\,^5P$ −27° (154)
2541.28	A	70	1.08	5.94	3–4	$a\,^5P$ −30° (155)
2476.869	A	100	0.99	5.98	2–3	$a\,^5P$ −34°† (156)
2471.48	A	50	0.99	5.99	2–3	$a\,^5P$ −35°† (157)
2510.13	A	30	1.08	6.00	3–4	$a\,^5P$ −38° (158)
2464.699	A	100	0.99	6.00	2–1	$a\,^5P$ −39°† (159)
2454.926	A	150	0.99	6.02	2–3	$a\,^5P$ −40° (160)
2444.828	A	30	0.99	6.04	2–3	$a\,^5P$ −43° (161)
2476.32	A	50	1.08	6.07	3–3	$a\,^5P$ −46° (162)
2474.029	A	80	1.19	6.18	1–2	$a\,^5P$ −56°† (163)
2939.676	A	25	1.32	5.51	3–4	$b\,^3F$ −$y\,^3H$°† (164)
2899.716	A	50	1.13	5.38	4–5	$b\,^3F$ −$y\,^1H$° (165)
2846.318	A	60	1.13	5.46	4–4	$b\,^3F$ −$w\,^5D$°†
2780.759	A	70	1.13	5.56	4–3	(166)
2770.698	A	100	1.13	5.58	4–3	$b\,^3F$ −$x\,^1F$°
2893.731	A	20	1.32	5.58	3–3	(167)
2961.685	A	75	1.41	5.58	2–3	
2728.836	A	80	1.13	5.65	4–4	$b\,^3F$ −$w\,^3F$°
*2754.603	A	60	1.32	5.80	3–3	(168)
*2690.810	A	25	1.13	5.71	4–4	$b\,^3F$ −12° (169)
2796.697	A	40	1.32	5.73	3–4	$b\,^3F$ −13° (170)
2808.221	A	50	1.41	5.81	2–3	$b\,^3F$ −16° (171)
2628.262	A	25	1.13	5.82	4–4	$b\,^3F$ −17° (172)
2585.340	A	25	1.13	5.90	4–3	$b\,^3F$ −25°† (173)
2653.693	A	25	1.32	5.97	3–2	$b\,^3F$ −33°† (174)

Ru I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2539.09	A	25	1.13	5.99	4–3	$b\,^3F$ −35° (175)
2521.61	A	80	1.13	6.02	4–3	$b\,^3F$ −40° (176)
2510.965	A	50	1.13	6.04	4–3	$b\,^3F$ −43°†
2666.829	A	20	1.41	6.04	2–3	(177)
2597.517	A	25	1.32	6.07	3–3	$b\,^3F$ −46°† (178)
2633.446	A	80	1.41	6.10	2–1	$b\,^3F$ −49° (179)
2579.022	A	40	1.32	6.10	3–2	$b\,^3F$ −50° (180)
2902.087	A	50	1.31	5.56	2–3	$a\,^3P$ −$w\,^5D$°†
2939.938	A	80	1.46	5.65	1–2	(181)
2902.854	A	25	1.45	5.70	0–1	
2842.749	A	20	1.31	5.65	2–2	
2810.695	A	20	1.31	5.70	2–1	
2968.468	A	30	1.31	5.47	2–1	$a\,^3P$ −3° (182)
2925.067	A	20	1.31	5.53	2–3	$a\,^3P$ −$x\,^5F$°† (183)
2992.120	A	40	1.46	5.58	1–2	$a\,^3P$ −$y\,^5S$° (184)
2891.130	A	50	1.31	5.58	2–3	$a\,^3P$ −$x\,^1F$° (185)
2752.262	A	60	1.31	5.80	2–3	$a\,^3P$ −$w\,^3F$° (186)
2928.487	A	50	1.46	5.67	1–2	$a\,^3P$ −$t\,^3D$°†
2877.092	A	40	1.45	5.74	0–1	(187)
2920.949	A	30	1.45	5.68	0–1	$a\,^3P$ −8°† (188)
2917.132	A	40	1.46	5.69	1–1	$a\,^3P$ −9°†
2914.294	A	50	1.45	5.69	0–1	(189)
2913.163	A	60	1.46	5.69	1–0	$a\,^3P$ −11° (190)
2767.516	A	50w	1.31	5.77	2–3	$a\,^3P$ −$x\,^5P$°†
2796.543	A	20	1.45	5.86	0–1	(191)
2763.133	A	60	1.31	5.78	2–2	
2856.044	A	30	1.46	5.78	1–1	$a\,^3P$ −15°† (192)
2795.508	A	30	1.46	5.87	1–2	$a\,^3P$ −$s\,^3D$°†
2707.477	A	70	1.31	5.87	2–2	(193)
2689.894	A	70	1.31	5.90	2–3	$a\,^3P$ −25° (194)
2775.175	A	70	1.46	5.90	1–1	$a\,^3P$ −26°
2772.608	A	100	1.45	5.90	0–1	(195)
2748.045	A	40	1.46	5.95	1–2	$a\,^3P$ −32° (196)
2646.002	A	75	1.31	5.98	2–3	$a\,^3P$ −34° (197)

Ru I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2632.127	A	75	1.31	6.00	2–1	$a\,^3P$ −39°
2715.233	A	40	1.46	6.00	1–1	(198)
2609.476	A	75	1.31	6.04	2–3	$a\,^3P$ −43° (199)
2683.676	A	60	1.46	6.05	1–2	$a\,^3P$ −44° (200)
2657.163	A	75	1.46	6.10	1–1	$a\,^3P$ −49°†
2654.804	A	20	1.45	6.10	0–1	(201)
2576.954	A	20	1.31	6.10	2–2	$a\,^3P$ −50°
2656.563	A	75	1.46	6.10	1–2	(202)
2915.614	A	25	1.51	5.74	5–5	$a\,^3G$ −x ^1H°
2968.398	A	30	1.58	5.74	4–5	(203)
2860.369	A	20	1.51	5.82	5–4	$a\,^3G$ −17°† (204)
2895.802	A	15	1.58	5.84	4–3	$a\,^3G$ −s ^3D°
2971.757	A	25	1.69	5.84	3–3	(205)
2838.615	A	25	1.51	5.86	5–5	$a\,^3G$ −21°
2888.624	A	50	1.58	5.86	4–5	(206)
2955.348	A	50	1.69	5.87	3–3	$a\,^3G$ −22°† (207)
2871.186	A	40	1.58	5.88	4–3	$a\,^3G$ −23° (208)
*2784.516§	A	30	1.51	5.94	5–4	$a\,^3G$ −30°
2832.624	A	40	1.58	5.94	4–4	(209)
2750.345	A	50	1.58	6.07	4–4	$a\,^3G$ −47°† (210)
2760.155	A	30	1.69	6.16	3–3	$a\,^3G$ −54° (211)
2636.663	A	75	1.51	6.19	5–5	$a\,^3G$ −v ^3G°
2692.251	A	50	1.58	6.17	4–4	(212)
*2648.782§	A	40	1.51	6.17	5–4	
2679.763	A	50	1.58	6.19	4–5	
2757.798	A	80	1.69	6.17	3–4	
2593.700	A	50	1.58	6.34	4–4	$a\,^3G$ −61°† (213)

Ru I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2408.290	A	60	1.51	6.63	5–4	$a\,^3G$ −62°† (214)
2978.361	A	30	1.73	5.87	1–2	$b\,^3P$ −s ^3D°† (215)
2966.549	A	20	1.68	5.84	2–2	$b\,^3P$ −20° (216)
*2846.537	A	20	1.68	6.02	2–3	$b\,^3P$ −40° (217)
2794.678	A	20	1.68	6.10	2–2	$b\,^3P$ −50°
2821.171	A	30	1.73	6.10	1–2	(218)
2927.119	A	60	1.82	6.03	4–4	$a\,^1G$ −42° (219)
2920.254	A	20	1.82	6.04	4–3	$a\,^1G$ −43° (220)
2836.143	A	50	1.82	6.17	4–4	$a\,^1G$ −v ^3G° (221)
2726.969	A	50	1.82	6.34	4–4	$a\,^1G$ −61° (222)
*2909.212	A	30	1.86	6.10	2–2	$a\,^3D$ −50°† (223)
2842.527	A	20	2.00	6.34	3–4	$a\,^3D$ −61° (224)
2623.824	A	75	2.00	6.67	3–3	$a\,^3D$ −63° (225)
*2846.537	A	20	2.00	6.34	5–4	$a\,^3H$ −61° (226)
2684.089	A	60	2.10	6.67	2–3	$a\,^1D$ −63° (227)

Strongest Unclassified Lines of Ru I

Air			Air		
2812.817	A	100	2570.973	A	100
2753.433	A	125	2560.845	A	125
2735.669	A	250	2420.826	A	200
2601.456	A	100	2279.584	A	150

Ru II

I P 16.69 Anal A List B March 1959

REFERENCE

A A. G. Shenstone and W. F. Meggers, J. Research Nat. Bur. Std. **61**, 373, RP2908, 1958. I P, W L, I, T

* and §=Blend with Ru I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2140.120	A	30	0.00	5.77	4½–3½	$a\,^4F - z\,^6D°$†
2184.536	A	10	0.19	5.84	3½–2½	(1)
2026.838	A	100	0.19	6.28	3½–4½	$a\,^4F - z\,^6F°$†
Vac						(2)
1966.746	A	200	0.00	6.28	4½–4½	
1966.076	A	200	0.00	6.28	4½–3½	
Air						
2013.189	A	30	0.19	6.32	3½–2½	
2047.561	A	30	0.31	6.34	2½–1½	
2070.768	A	15	0.38	6.34	1½–0½	
Vac						
1939.911	A	5	0.00	6.36	4½–3½	$a\,^4F - z\,^6P°$†
1949.423	A	15	0.19	6.52	3½–2½	(3)
1998.988	A	30	0.19	6.36	3½–3½	
1888.045	A	500	0.00	6.54	4½–4½	$a\,^4F - z\,^4F°$
1897.437	A	100	0.19	6.69	3½–3½	(4)
1912.036	A	50	0.31	6.76	2½–2½	
1918.650	A	50	0.38	6.82	1½–1½	
1844.138	A	200	0.00	6.69	4½–3½	
1877.186	A	100	0.19	6.76	3½–2½	
1896.441	A	100	0.31	6.82	2½–1½	
1943.966	A	20	0.19	6.54	3½–4½	
1933.055	A	15	0.31	6.69	2½–3½	
1934.615	A	20	0.38	6.76	1½–2½	
1875.564	A	500	0.00	6.58	4½–3½	$a\,^4F - z\,^4D°$
1903.227	A	500	0.19	6.67	3½–2½	(5)
1916.829	A	200	0.31	6.75	2½–1½	
1927.623	A	100	0.38	6.79	1½–0½	
1930.717	A	100	0.19	6.58	3½–3½	
1939.056	A	200	0.31	6.67	2½–2½	
1939.521	A	200	0.38	6.75	1½–1½	
1967.610	A	20	0.31	6.58	2½–3½	
1962.285	A	20	0.38	6.67	1½–2½	
*1845.974	A	30	0.19	6.88	3½–2½	$a\,^4F - z\,^4P°$
*1845.974	A	30	0.31	7.00	2½–1½	(6)
1579.578	A	10	0.00	7.82	4½–5½	$a\,^4F - z\,^4H°$
1629.092	A	15	0.19	7.77	3½–4½	(7)
1589.645	A	15	0.00	7.77	4½–4½	
1599.309	A	15	0.00	7.72	4½–3½	
1574.337	A	500d?	0.00	7.84	4½–5½	$a\,^4F - z\,^4G°$
1604.405	A	100	0.19	7.88	3½–4½	(8)
1627.397	A	100	0.31	7.89	2½–3½	
1641.460	A	100	0.38	7.90	1½–2½	
1566.128	A	100	0.00	7.88	4½–4½	
1602.095	A	100	0.19	7.89	3½–3½	
1625.178	A	100	0.31	7.90	2½–2½	
*1563.928	A	15	0.00	7.89	4½–3½	
*1599.937	A	10	0.19	7.90	3½–2½	
1605.787	A	30	0.19	7.88	3½–2½	$a\,^4F - y\,^4P°$†
1647.615	A	20	0.38	7.88	1½–2½	(9)
1590.774	A	30	0.19	7.95	3½–4½	$a\,^4F - z\,^4I°$†
						(10)
1530.762	A	5	0.00	8.06	4½–4½	$a\,^4F - y\,^4F°$†
1581.636	A	10	0.19	7.99	3½–3½	(11)
1613.685	A	3	0.31	7.96	2½–2½	
1617.663	A	15	0.38	8.02	1½–1½	
1544.414	A	30	0.00	7.99	4½–3½	
1567.308	A	50	0.19	8.06	3½–4½	
1570.104	A	15	0.19	8.05	3½–3½	$a\,^4F - z\,^2G°$†
1533.435	A	10	0.00	8.05	4½–3½	(12)
1594.398	A	30	0.31	8.05	2½–3½	
1509.432	A	40	0.00	8.18	4½–5½	$a\,^4F - z\,^2I°$
						(13)
1524.937	A	15	0.19	8.28	3½–2½	$a\,^4F - z\,^2F°$†
1562.607	A	30	0.38	8.28	1½–2½	(14)

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
*1507.429	A	100d?	0.00	8.19	4½–3½	$a\,^4F - y\,^4D°$†
1486.957	A	500	0.19	8.49	3½–2½	(15)
1535.426	A	50	0.19	8.23	3½–2½	$a\,^4F - x\,^4D°$†
1547.756	A	30	0.31	8.28	2½–1½	(16)
1538.624	A	30	0.38	8.41	1½–0½	
1521.238	A	25	0.31	8.42	2½–3½	
1479.242	A	50	0.00	8.34	4½–5½	$a\,^4F - y\,^4G°$
1523.408	A	5	0.19	8.29	3½–4½	(17)
1534.860	A	20	0.31	8.35	2½–3½	
1542.188	A	15	0.38	8.39	1½–2½	
1488.855	A	1000	0.00	8.29	4½–4½	
1512.325	A	30	0.19	8.35	3½–3½	
1527.813	A	30	0.31	8.39	2½–2½	
1481.435	A	100	0.00	8.33	4½–5½	$a\,^4F - z\,^2H°$†
1467.977	A	100	0.00	8.41	4½–4½	(18)
1472.717	A	500	0.00	8.38	4½–4½	$a\,^4F - x\,^4F°$
1473.151	A	400	0.19	8.57	3½–3½	(19)
1489.136	A	500	0.31	8.60	2½–2½	
1503.401	A	30	0.38	8.60	1½–1½	
1440.820	A	5	0.00	8.57	4½–3½	
1467.933	A	30	0.19	8.60	3½–2½	
1489.734	A	20	0.31	8.60	2½–1½	
1506.515	A	50	0.19	8.38	3½–4½	
1494.524	A	500	0.31	8.57	2½–3½	
1502.802	A	30	0.38	8.60	1½–2½	
1445.491	A	15	0.00	8.54	4½–4½	$a\,^4F - y\,^2G°$
1498.289	A	50	0.19	8.43	3½–3½	(20)
1464.855	A	15	0.00	8.43	4½–3½	
1478.021	A	30	0.19	8.54	3½–4½	
1520.406	A	16	0.31	8.43	2½–3½	
1463.515	A	30	0.00	8.44	4½–5½	$a\,^4F - x\,^4G°$†
1484.035	A	300	0.19	8.51	3½–4½	(21)
1491.224	A	5	0.31	8.59	2½–3½	
*1516.256	A	30	0.38	8.52	1½–2½	
1451.224	A	100	0.00	8.51	4½–4½	
1469.941	A	100	0.19	8.59	3½–3½	
*1516.256	A	30	0.31	8.45	2½–1½	$a\,^4F - z\,^2P°$
1530.415	A	10	0.38	8.45	1½–1½	(22)
1468.660	A	10	0.19	8.59	3½–4½	$a\,^4F - y\,^4H°$
1467.723	A	30	0.19	8.60	3½–3½	(23)
1468.909	A	200	0.31	8.71	2½–2½	$a\,^4F - y\,^2D°$†
1477.632	A	100	0.38	8.74	1½–1½	(24)
1440.514	A	30	0.38	8.95	1½–1½	$a\,^4F - w\,^4F°$†
						(25)
*1246.887	A	50	0.19	10.09	3½–2½	$a\,^4F - w\,^4P°$
						(26)
Air						
2346.38	A	150	1.02	6.28	2½–3½	$a\,^4P - z\,^6F°$
*2341.06	A	100	1.05	6.32	1½–2½	(27)
2383.42	A	90	1.16	6.34	0½–1½	
*2329.02	A	150	1.02	6.32	2½–2½	
2333.57	A	150	1.05	6.34	1½–1½	
2379.84	A	100	1.16	6.34	0½–0½	
*2321.66	A	80	1.02	6.34	2½–1½	
2330.14	A	30	1.05	6.34	1½–0½	
2309.14	A	70	1.02	6.36	2½–3½	$a\,^4P - z\,^6P°$
2254.45	A	100	1.05	6.52	1½–2½	(28)
2256.07	A	100	1.16	6.63	0½–1½	
2243.27	A	80	1.02	6.52	2½–2½	
2211.325	A	10	1.05	6.63	1½–1½	
2174.713	A	100	1.02	6.69	2½–3½	$a\,^4P - z\,^4F°$†
2158.373	A	20	1.05	6.76	1½–2½	(29)

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2218.552	A	500	1.02	6.58	2½–3½	$a\,^4P - z\,^4D^\circ$ (30)
2192.889	A	200	1.05	6.67	1½–2½	
2207.328	A	100	1.16	6.75	0½–1½	
2164.480	A	20	1.05	6.75	1½–1½	
2191.923	A	20	1.16	6.79	0½–0½	
2107.322	A	500	1.02	6.88	2½–2½	$a\,^4P - z\,^4P^\circ$ (31)
2074.581	A	200	1.05	7.00	1½–1½	
2087.463	A	20	1.16	7.07	0½–0½	
2065.110	A	100	1.02	7.00	2½–1½	
2049.111	A	200	1.05	7.07	1½–0½	
2117.190	A	100	1.05	6.88	1½–2½	
2113.895	A	200	1.16	7.00	0½–1½	
Vac						
1845.368	A	100	1.02	7.71	2½–1½	$a\,^4P - z\,^4S^\circ$ (32)
1884.154	A	10?	1.16	7.71	0½–1½?	
1800.470	A	15	1.02	7.88	2½–2½	$a\,^4P - y\,^4P^\circ\dagger$ (33)
1753.441	A	30	1.05	8.09	1½–1½	
1731.415	A	50	1.02	8.15	2½–3½	$a\,^4P - z\,^2F^\circ\dagger$ (34)
1699.442	A	20	1.02	8.28	2½–2½?	
1590.882	A	30	1.02	8.78	2½–2½	$a\,^4P - x\,^4P^\circ$ (35)
1577.573	A	10	1.05	8.87	1½–1½	
1572.089	A	20	1.02	8.87	2½–1½	
1545.152	A	15	1.05	9.04	1½–0½	
1596.482	A	10	1.05	8.78	1½–2½	
*1600.183	A	30	1.16	8.87	0½–1½	
1584.256	A	30	1.05	8.84	1½–2½	$a\,^4P - y\,^2F^\circ\dagger$ (36)
1578.728	A	30	1.02	8.84	2½–2½	
*1507.429	A	100d?	1.02	9.21	2½–3½	$a\,^4P - w\,^4D^\circ\dagger$ (37)
1543.042	A	10	1.05	9.05	1½–2½	
*1563.928	A	15	1.16	9.05	0½–1½	
1537.806	A	20	1.02	9.05	2½–2½	
1542.293	A	15	1.05	9.05	1½–1½	
1488.618	A	200	1.02	9.31	2½–3½?	$a\,^4P - w\,^2G^\circ$ (38)
1442.147	A	30	1.05	9.61	1½–2½	$a\,^4P - w\,^2D^\circ$ (39)
Air						
2678.759	A	800	1.13	5.74	4½–4½	$a\,^6D - z\,^6D^\circ$ (40)
2734.345	A	500	1.25	5.77	3½–3½	
*2743.934§	A	60	1.34	5.84	2½–2½	
2746.068	A	20	1.40	5.89	1½–1½	
*2747.963§	A	50	1.43	5.92	0½–0½	
2661.610	A	300	1.13	5.77	4½–3½	
2692.120	A	400	1.25	5.84	3½–2½	
2712.409	A	300	1.34	5.89	2½–1½	
2725.465	A	300	1.40	5.92	1½–0½	
2752.447	A	30	1.25	5.74	3½–4½	
2787.823	A	200	1.34	5.77	2½–3½	
2778.388	A	150	1.40	5.84	1½–2½	
2768.926	A	250	1.43	5.89	0½–1½	
2402.72‡	A	800	1.13	6.27	4½–5½	$a\,^6D - z\,^6F^\circ$ (41)
2456.57	A	500	1.25	6.28	3½–4½	
2498.58	A	200	1.34	6.28	2½–3½	
2507.00	A	300	1.40	6.32	1½–2½	
2517.32	A	200	1.43	6.34	0½–1½	
2397.69	A	100	1.13	6.28	4½–4½	
2455.53	A	600	1.25	6.28	3½–3½	
2478.93	A	500	1.34	6.32	2½–2½	
2498.41	A	200	1.40	6.34	1½–1½	
2513.32	A	150	1.43	6.34	0½–0½	
2396.71	A	600	1.13	6.28	4½–3½	
2436.55	A	5	1.25	6.32	3½–2½	
2470.51	A	60	1.34	6.34	2½–1½	
2494.48	A	40	1.40	6.34	1½–0½	

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2357.92	A	600	1.13	6.36	4½–3½	$a\,^6D - z\,^6P^\circ$ (42)
2342.85	A	300	1.25	6.52	3½–2½	
2333.89	A	200	1.34	6.63	2½–1½	
2414.82	A	150	1.25	6.36	3½–3½	
2381.99	A	400	1.34	6.52	2½–2½	
2358.79	A	400	1.40	6.63	1½–1½	
2456.44	A	500	1.34	6.36	2½–3½	
2407.92	A	300	1.40	6.52	1½–2½	
2375.63	A	400	1.43	6.63	0½–1½	
2281.72	A	300	1.13	6.54	4½–4½	$a\,^6D - z\,^4F^\circ\dagger$ (43)
2268.14	A	400	1.25	6.69	3½–3½	
2275.00	A	150	1.34	6.76	2½–2½	
2276.14	A	100	1.40	6.82	1½–1½	
2334.96	A	300	1.25	6.54	3½–4½	
2304.82	A	200	1.34	6.69	2½–3½	
2298.63	A	90	1.40	6.76	1½–2½	
2291.82	A	50	1.43	6.82	0½–1½	
2263.51	A	300	1.13	6.58	4½–3½	$a\,^6D - z\,^4D^\circ$ (44)
2276.43	A	100	1.25	6.67	3½–2½	
2288.80	A	15	1.40	6.79	1½–0½	
*2315.90	A	50	1.25	6.58	3½–3½	
2313.37	A	150	1.34	6.67	2½–2½	
*2305.61	A	200	1.40	6.75	1½–1½	
*2304.63§	A	100	1.43	6.79	0½–0½	
2337.84	A	100	1.40	6.67	1½–2½	
*2321.66	A	80	1.43	6.75	0½–1½	
2194.970	A	20	1.25	6.88	3½–2½	$a\,^6D - z\,^4P^\circ$ (45)
2182.081	A	10	1.34	7.00	2½–1½	
2229.284	A	50	1.34	6.88	2½–2½	
2203.837	A	10	1.40	7.00	1½–1½	
Vac						
1560.998	A	50	1.13	9.04	4½–3½	$a\,^6D - y\,^6P^\circ$ (46)
1593.403	A	40	1.25	9.00	3½–2½	
1615.267	A	20	1.34	8.98	2½–1½	
1585.740	A	30	1.25	9.04	3½–3½	
1611.415	A	50	1.34	9.00	2½–2½	
1627.138	A	50	1.40	8.98	1½–1½	
1603.572	A	10	1.34	9.04	2½–3½	
1623.231	A	20	1.40	9.00	1½–2½	
1635.129	A	30	1.43	8.98	0½–1½	
1234.347	A	100	1.13	11.13	4½–3½	$a\,^6D - x\,^6P^\circ$ (47)
1239.467	A	100	1.25	11.21	3½–2½	
1239.879	A	50	1.34	11.30	2½–1½	
1249.774	A	15	1.25	11.13	3½–3½	
1250.340	A	20	1.34	11.21	2½–2½	
*1246.887	A	50	1.40	11.30	1½–1½	
1260.817	A	20	1.34	11.13	2½–3½	
1257.443	A	40	1.40	11.21	1½–2½	
1251.582	A	15	1.43	11.30	0½–1½	
1990.720	A	200	1.52	7.72	3½–3½	$a\,^2G - z\,^4H^\circ\dagger$ (48)
1836.013	A	50	1.34	8.06	4½–4½	$a\,^2G - y\,^4F^\circ$ (49)
*1906.378	A	5	1.52	7.99	3½–3½	
*1885.559	A	50h	1.52	8.06	3½–4½	
1776.061	A	50	1.34	8.29	4½–4½	$a\,^2G - y\,^4G^\circ\dagger$ (50)
1806.599	A	15	1.52	8.35	3½–3½	
1761.030	A	20	1.34	8.35	4½–3½	
1765.525	A	20	1.34	8.33	4½–5½	$a\,^2G - z\,^2H^\circ$ (51)
1791.253	A	20	1.52	8.41	3½–4½	
*1746.446	A	30	1.34	8.41	4½–4½	
1740.114	A	15	1.34	8.44	4½–5½	$a\,^2G - x\,^4G^\circ\dagger$ (52)
*1746.446	A	30	1.52	8.59	3½–3½	

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1701.080	A	30	1.34	8.60	4½–5½	$a\,^2G - y\,^4H°$† (53)
1657.217	A	30	1.34	8.79	4½–5½	$a\,^2G - y\,^2H°$†
1637.591	A	40	1.34	8.88	4½–4½	(54)
1635.333	A	50	1.34	8.89	4½–3½	$a\,^2G - y\,^2F°$
1686.161	A	15e	1.52	8.84	3½–2½	(55)
1585.040	A	50	1.34	9.13	4½–5½	$a\,^2G - x\,^2H°$†
1637.446	A	30	1.52	9.06	3½–4½	(56)
1582.652	A	10	1.34	9.14	4½–4½	$a\,^2G - x\,^2G°$
1625.565	A	50	1.52	9.11	3½–3½	(57)
1619.365	A	20	1.52	9.14	3½–4½	
1550.740	A	30	1.34	9.30	4½–4½	$a\,^2G - w\,^2G°$
1583.819	A	200	1.52	9.31	3½–3½	(58)
1548.679	A	10	1.34	9.31	4½–3½	
1585.965	A	15	1.52	9.30	3½–4½	
1545.961	A	15	1.52	9.50	3½–3½	$a\,^2G - w\,^2F°$
1512.483	A	40	1.34	9.50	4½–3½	(59)
Air						
2339.10	A	20	1.60	6.88	1½–2½	$a\,^2P - z\,^4P°$†
*2354.24	A	40	1.83	7.07	0½–0½	(60)
2256.25	A	20	1.60	7.07	1½–0½	
Vac						
1912.484	A	30	1.60	8.05	1½–2½	$a\,^2P - z\,^2D°$ (61)
1741.262	A	20	1.80	8.89	2½–3½	$a\,^2D - y\,^2F°$
1832.144	A	20	2.10	8.84	1½–2½	(62)
1651.898	A	30	1.80	9.27	2½–2½	$a\,^2D - x\,^2D°$
1721.171	A	10	2.10	9.27	1½–2½	(63)
1594.603	A	30	1.80	9.54	2½–1½	$a\,^2D - y\,^2P°$ (64)
1581.328	A	15	1.80	9.61	2½–2½	$a\,^2D - w\,^2D°$†
1623.390	A	20	2.10	9.70	1½–1½	(65)
Air						
2043.301	A	20	1.81	7.85	5½–6½	$a\,^2H - z\,^4H°$†
2154.427	A	30	1.99	7.72	4½–3½	(66)
Vac						
1940.422	A	30	1.81	8.17	5½–6½	$a\,^2H - z\,^4I°$† (67)
1965.293	A	200	1.81	8.09	5½–6½	$a\,^2H - z\,^2I°$
1995.048	A	100	1.99	8.18	4½–5½	(68)
1863.404	A	500	1.81	8.44	5½–5½	$a\,^2H - x\,^4G°$† (69)
1686.691	A	100	1.81	9.13	5½–5½	$a\,^2H - x\,^2H°$
1703.562	A	50	1.81	9.06	5½–4½	(70)
1683.985	A	50	1.81	9.14	5½–4½	$a\,^2H - x\,^2G°$
1733.537	A	20	1.99	9.11	4½–3½	(71)
1639.371	A	20	1.81	9.34	5½–5½	$a\,^2H - w\,^2H°$
1659.364	A	100	1.99	9.43	4½–4½	(72)
1679.620	A	30	1.99	9.34	4½–5½	

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1635.948	A	100	1.81	9.36	5½–6½	$a\,^2H - y\,^2I°$
1672.225	A	30	1.99	9.37	4½–5½	(73)
1632.321	A	30	1.81	9.37	5½–5½	
1570.371	A	30	1.99	9.85	4½–3½	$a\,^2H - v\,^2F°$ (74)
Air						
2976.578	A	200	2.39	6.54	3½–4½	$a\,^4D - z\,^4F°$†
2965.554	A	200	2.53	6.69	2½–3½	(75)
2979.946	A	70	2.62	6.76	1½–2½	
2977.219	A	30	2.67	6.82	0½–1½	
2916.370	A	50	2.53	6.76	2½–2½	
2942.244	A	50	2.62	6.82	1½–1½	
2945.661	A	500	2.39	6.58	3½–3½	$a\,^4D - z\,^4D°$
2979.713	A	60	2.53	6.67	2½–2½	(76)
2991.621	A	70	2.62	6.75	1½–1½	
2998.886	A	75	2.67	6.79	0½–0½	
2882.112	A	200	2.39	6.67	3½–2½	
2927.535	A	200	2.53	6.75	2½–1½	
2963.398	A	60	2.62	6.79	1½–0½	
3047.702	A	25	2.53	6.58	2½–3½	
3046.132	A	10	2.62	6.67	1½–2½	
3027.780	A	30	2.67	6.75	0½–1½	
2752.763	A	50	2.39	6.88	3½–2½	$a\,^4D - z\,^4P°$
2765.429	A	100	2.53	7.00	2½–1½	(77)
2775.631	A	30	2.62	7.07	1½–0½	
2841.680	A	100	2.53	6.88	2½–2½	
2822.542	A	150	2.62	7.00	1½–1½	
2806.77	A	100	2.67	7.07	0½–0½	
2902.026	A	75	2.62	6.88	1½–2½	
2854.722	A	40	2.67	7.00	0½–1½	
2260.03	A	60	2.53	7.99	2½–3½	$a\,^4D - y\,^4F°$† (78)
2128.836	A	10	2.39	8.19	3½–3½	$a\,^4D - y\,^4D°$†
2181.622	A	30	2.53	8.19	2½–3½	(79)
2103.377	A	10	2.62	8.49	1½–2½	
2166.828	A	20	2.53	8.23	2½–2½	$a\,^4D - x\,^4D°$†
2180.063	A	15	2.62	8.28	1½–1½	(80)
2201.736	A	10	2.62	8.23	1½–2½	
2199.165	A	20	2.67	8.28	0½–1½	
Vac						
1604.029	A	30	2.39	10.09	3½–2½	$a\,^4D - w\,^4P°$†
1620.102	A	20	2.53	10.15	2½–1½	(81)
1628.541	A	10	2.62	10.20	1½–0½	
1633.802	A	10	2.53	10.09	2½–2½	
1639.530	A	15	2.62	10.15	1½–1½	
1639.209	A	15	2.67	10.20	0½–0½	
Air						
2322.83	A	60	2.75	8.06	3½–4½	$a\,^2F - y\,^4F°$† (82)
2181.254	A	30	2.75	8.41	3½–4½	$a\,^2F - z\,^2H°$ (83)
2079.967	A	50	2.66	8.60	2½–1½	$a\,^2F - x\,^4F°$† (84)
2131.898	A	100	2.75	8.54	3½–4½	$a\,^2F - y\,^2G°$† (85)
2082.916	A	30	2.66	8.59	2½–3½	$a\,^2F - x\,^4G°$† (86)
2078.455	A	100	2.66	8.60	2½–3½	$a\,^2F - y\,^4H°$† (87)

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2070.515	A	30	2.75	8.71	3½–2½	$a\,^2F - y\,^2D°$ (88)
2030.979	A	10	2.66	8.74	2½–1½	
2039.626	A	10	2.66	8.71	2½–2½	
Vac						
*1932.118	A	50	2.75	9.14	3½–4½	$a\,^2F - x\,^2G°$† (89)
1913.797	A	20	2.66	9.11	2½–3½	
1892.926	A	20	2.75	9.27	3½–2½	$a\,^2F - x\,^2D°$ (90)
*1885.559	A	50h	2.66	9.21	2½–1½	
1459.028	A	40	2.75	11.21	3½–2½	$a\,^2F - x\,^6P°$? (91)
Air						
2656.235	A	300	3.20	7.85	6½–6½	$a\,^4H - z\,^4H°$ (92)
2587.494	A	100	3.22	7.82	5½–5½	
2717.447	A	80	3.22	7.77	4½–4½	
2772.459	A	100	3.27	7.72	3½–3½	
*2676.183	A	100	3.20	7.82	6½–5½	
2716.78	A	1	3.22	7.77	5½–4½	
2745.827	A	50	3.22	7.72	4½–3½	
2667.390	A	100	3.22	7.85	5½–6½	
2688.147	A	80	3.22	7.82	4½–5½	
2743.513	A	25	3.27	7.77	3½–4½	
2661.169	A	200	3.20	7.84	6½–5½	$a\,^4H - z\,^4G°$ (93)
*2648.78§	A	100	3.22	7.88	5½–4½	
2643.14	A	20	3.22	7.89	4½–3½	
2661.82	A	20	3.27	7.90	3½–2½	
2672.354	A	25	3.22	7.84	5½–5½	
2667.79	A	10	3.27	7.89	3½–3½	
2673.004	A	30	3.22	7.84	4½–5½	
2674.219	A	10	3.27	7.88	3½–4½	
2543.272	A	300	3.20	8.06	6½–7½	$a\,^4H - z\,^4I°$† (94)
2493.68	A	300	3.22	8.17	5½–6½	
2540.30	A	100	3.22	8.08	4½–5½	
2636.54	A	100	3.27	7.95	3½–4½	
2483.96	A	50	3.20	8.17	6½–6½	
*2539.72	A	100	3.22	8.08	5½–5½	
2529.61	A	20	3.20	8.08	6½–5½	
2549.121	A	50	3.22	8.06	5½–4½	$a\,^4H - y\,^4F°$ (95)
2587.87	A	75	3.22	7.99	4½–3½	
2631.09	A	20	3.27	7.96	3½–2½	
2611.50	A	40	3.27	7.99	3½–3½	
2572.67	A	10	3.27	8.06	3½–4½	
2520.82	A	40	3.22	8.12	4½–4½	$a\,^4H - z\,^2G°$† (96)
2543.216	A	100	3.27	8.12	3½–4½	
2524.85	A	100	3.20	8.09	6½–6½	$a\,^4H - z\,^2I°$† (97)
2480.81	A	30	3.20	8.18	6½–5½	
2534.92	A	80	3.22	8.09	5½–6½	
*2491.10	A	40	3.22	8.18	4½–5½	
*2373.96	A	20	3.22	8.42	4½–3½	$a\,^4H - x\,^4D°$† (98)
2393.84	A	200	3.27	8.42	3½–3½	
2434.98	A	80	3.22	8.29	5½–4½	$a\,^4H - y\,^4G°$† (99)
2407.31	A	20	3.22	8.35	4½–3½	
2410.15	A	150	3.27	8.39	3½–2½	
2435.51	A	200	3.22	8.29	4½–4½	
2427.75	A	60	3.27	8.35	3½–3½	
2406.06	A	20	3.20	8.33	6½–5½	$a\,^4H - z\,^2H°$† (100)
2379.60	A	100	3.22	8.41	5½–4½	
2415.20	A	120	3.22	8.33	5½–5½	
2415.72	A	100	3.22	8.33	4½–5½	
2309.52	A	50	3.22	8.57	4½–3½	$a\,^4H - x\,^4F°$† (101)
2328.33	A	40	3.27	8.57	3½–3½	

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2371.91	A	100	3.22	8.43	4½–3½	$a\,^4H - y\,^2G°$ (102)
2391.77	A	60	3.27	8.43	3½–3½	
2340.51	A	30	3.27	8.54	3½–4½	
2359.10	A	150	3.20	8.44	6½–5½	$a\,^4H - x\,^4G°$† (103)
2335.88	A	60	3.22	8.51	5½–4½	
2336.38	A	25	3.22	8.51	4½–4½	
2355.63	A	25	3.27	8.51	3½–4½	
*2305.61	A	200	3.20	8.56	6½–6½	$a\,^4H - y\,^4H°$† (104)
*2296.18	A	150	3.22	8.60	5½–5½	
2298.45	A	40	3.22	8.59	4½–4½	
2314.78	A	50	3.27	8.60	3½–3½	
2297.97	A	30	3.22	8.59	5½–4½	
*2296.18	A	150	3.22	8.60	4½–3½	
2314.02	A	50	3.22	8.56	5½–6½	
2135.40?	A	30	3.27	9.05	3½–2½	$a\,^4H - w\,^4D°$ (105)
Vac						
1413.017	A	100	3.20	11.94	6½–5½	$a\,^4H - v\,^4G°$† (106)
1420.606	A	100	3.22	11.91	5½–4½	
1428.751	A	100	3.22	11.86	4½–3½	
1444.144	A	50	3.27	11.82	3½–2½	
Air						
2813.311	A	100	3.32	7.71	2½–1½	$b\,^4P - z\,^4S°$ (107)
2710.228	A	100	3.32	7.88	2½–2½	$b\,^4P - y\,^4P°$† (108)
2745.158	A	100	3.59	8.09	1½–1½	
2610.09	A	25	3.32	8.05	2½–3½	$b\,^4P - z\,^2G°$ (109)
2607.92	A	20	3.32	8.05	2½–2½	$b\,^4P - z\,^2D°$ (110)
2765.134	A	20	3.59	8.05	1½–2½	
2535.60	A	100	3.32	8.19	2½–3½	$b\,^4P - y\,^4D°$† (111)
2519.20	A	75	3.59	8.49	1½–2½	
2672.212	A	25	3.76	8.38	0½–1½	
2662.880	A	25	3.59	8.23	1½–0½	
*2566.59§	A	20	3.76	8.57	0½–0½	$b\,^4P - z\,^2P°$ (112)
2633.82	A	20	3.76	8.45	0½–1½	
Vac						
1461.699	A	50	3.32	11.77	2½–3½	$b\,^4P - v\,^4D°$† (113)
1316.573	A	50	3.32	12.70	2½–3½	$b\,^4P - v\,^2G°$ (114)
Air						
2913.999	A	20	3.47	7.71	2½–1½	$b\,^4F - z\,^4S°$ (115)
2857.780	A	50	3.40	7.72	4½–3½	$b\,^4F - z\,^4H°$† (116)
2778.975	A	30	3.40	7.84	4½–5½	$b\,^4F - z\,^4G°$ (117)
*2784.516§	A	40	3.45	7.88	3½–4½	
2792.32	A	100	3.47	7.89	2½–3½	
2813.694	A	60	3.52	7.90	1½–2½	
2753.508	A	20	3.40	7.88	4½–4½	
2777.54	A	50	3.45	7.89	3½–3½	
2785.741	A	75	3.47	7.90	2½–2½	
2746.695	A	25	3.40	7.89	4½–3½	
2771.060	A	50	3.45	7.90	3½–2½	

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2700.999	A	25	3.52	8.09	1½−1½?	$b\ ^4F - y\ ^4P°$†
2831.84	A	50	3.52	7.88	1½−2½	(118)
*2635.84 §	A	70	3.40	8.08	4½−5½	$b\ ^4F - z\ ^4I°$†
2713.585	A	40	3.40	7.95	4½−4½	(119)
2645.97	A	75	3.40	8.06	4½−4½	$b\ ^4F - y\ ^4F°$†
2716.580	A	10	3.45	7.99	3½−3½	(120)
2752.110	A	10	3.47	7.96	2½−2½	
2687.071	A	25	3.40	7.99	4½−3½	
2737.783	A	20	3.45	7.96	3½−2½	
2614.86	A	50	3.40	8.12	4½−4½	$b\ ^4F - z\ ^2G°$†
2653.95	A	25	3.40	8.05	4½−3½	(121)
2642.80	A	20	3.45	8.12	3½−4½	
2598.80	A	15	3.40	8.15	4½−3½	$b\ ^4F - z\ ^2F°$†
2553.49	A	8	3.45	8.28	3½−2½	(122)
2626.41	A	30	3.45	8.15	3½−3½	
2639.58	A	15	3.47	8.15	2½−3½	
2576.99	A	10	3.40	8.19	4½−3½	$b\ ^4F - y\ ^4D°$
2621.28	A	20	3.52	8.23	1½−0½	(123)
2604.13	A	10	3.45	8.19	3½−3½	
2460.18	A	20	3.47	8.49	2½−2½	
2617.08	A	40	3.47	8.19	2½−3½	
2457.19	A	20	3.40	8.42	4½−3½	$b\ ^4F - x\ ^4D°$†
2583.07	A	20	3.45	8.23	3½−2½	(124)
2565.69	A	40	3.47	8.28	2½−1½	
2524.39	A	20	3.52	8.41	1½−0½	
2481.85	A	15	3.45	8.42	3½−3½	
2595.81	A	50	3.47	8.23	2½−2½	
2589.43	A	100w	3.52	8.28	1½−1½	
2495.69	A	200	3.40	8.34	4½−5½	$b\ ^4F - y\ ^4G°$†
2549.171	A	100	3.45	8.29	3½−4½	(125)
2530.41	A	70	3.47	8.35	2½−3½	
2533.97	A	100	3.52	8.39	1½−2½	
2501.95	A	100	3.40	8.33	4½−5½	$b\ ^4F - z\ ^2H°$
2488.57	A	30	3.45	8.41	3½−4½	(126)
2477.17	A	10	3.40	8.38	4½−4½	$b\ ^4F - x\ ^4F°$
2411.51	A	100	3.45	8.57	3½−3½	(127)
2408.44	A	50	3.47	8.60	2½−2½	
*2430.94	A	50	3.52	8.60	1½−1½	
2388.23	A	40	3.40	8.57	4½−3½	
2397.49	A	40	3.45	8.60	3½−2½	
2401.02	A	20	3.40	8.54	4½−4½	$b\ ^4F - y\ ^2G°$†
2424.56	A	70	3.45	8.54	3½−4½	(128)
2451.23	A	40	3.40	8.44	4½−5½	$b\ ^4F - x\ ^4G°$
2440.80	A	80	3.45	8.51	3½−4½	(129)
2413.92	A	20	3.47	8.59	2½−3½	
2464.76	A	100	3.52	8.52	1½−2½	
2416.96	A	120	3.40	8.51	4½−4½	
2443.30	A	100Hw	3.47	8.52	2½−2½	
2441.61	A	30	3.52	8.57	1½−0½	$b\ ^4F - z\ ^2P°$†
						(130)
*2396.97	A	80	3.45	8.60	3½−3½	$b\ ^4F - y\ ^4H°$†
*2373.96	A	20	3.40	8.60	4½−3½	(131)
2344.46	A	20	3.47	8.74	2½−1½	$b\ ^4F - y\ ^2D°$†
2355.97	A	20	3.47	8.71	2½−2½	(132)
2364.23	A	50	3.52	8.74	1½−1½	
2319.28	A	50h	3.52	8.84	1½−2½	$b\ ^4F - y\ ^2F°$
						(133)
2256.67	A	50	3.45	8.92	3½−3½	$b\ ^4F - x\ ^2F°$
						(134)

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2257.12	A	80	3.52	8.98	1½−1½	$b\ ^4F - 2°$
						(135)
2205.108	A	20	3.45	9.05	3½−2½	$b\ ^4F - w\ ^4D°$†
2209.067	A	30	3.52	9.10	1½−0½	(136)
Vac						
1475.361	A	50	3.40	11.77	4½−3½	$b\ ^4F - v\ ^4D°$†
1466.039	A	50	3.47	11.89	2½−1½	(137)
1445.552	A	30	3.40	11.94	4½−5½	$b\ ^4F - v\ ^4G°$†
1458.721	A	20	3.45	11.91	3½−4½	(138)
1471.220	A	10	3.47	11.86	2½−3½	
1450.177	A	10	3.40	11.91	4½−4½	
1467.127	A	15	3.45	11.86	3½−3½	
1458.491	A	30	3.40	11.86	4½−3½?	
Air						
2897.713	A	40	3.58	7.84	5½−5½	$a\ ^4G - z\ ^4G°$†
2954.084	A	25	3.72	7.89	4½−3½	(139)
2991.453	A	10	3.72	7.84	4½−5½	
2992.083	A	15	3.76	7.88	3½−4½	
2826.230	A	50	3.72	8.08	4½−5½	$a\ ^4G - z\ ^4I°$
2742.401	A	25	3.58	8.08	5½−5½	(140)
2826.674	A	50	3.58	7.95	5½−4½	
2719.717	A	20	3.58	8.12	5½−4½	$a\ ^4G - z\ ^2G°$
2847.087	A	10	3.72	8.05	4½−3½	(141)
2802.152	A	30	3.72	8.12	4½−4½	
2829.092	A	20	3.76	8.12	3½−4½	
2862.848	A	10h	3.74	8.05	2½−3½	
2736.826	A	60	3.58	8.09	5½−6½	$a\ ^4G - z\ ^2I°$
2685.152	A	15	3.58	8.18	5½−5½	(142)
2716.132	A	30	3.74	8.28	2½−2½	$a\ ^4G - z\ ^2F°$†
2798.779	A	25	3.74	8.15	2½−3½	(143)
2760.745	A	20	3.76	8.23	3½−2½	$a\ ^4G - x\ ^4D°$†
2635.21	A	10	3.74	8.42	2½−3½	(144)
2591.04	A	75	3.58	8.34	5½−5½	$a\ ^4G - u\ ^4G°$†
2697.12	A	10	3.72	8.29	4½−4½	(145)
2686.889	A	15	3.76	8.35	3½−3½	
2620.69	A	20	3.58	8.29	5½−4½	
2571.09	A	150	3.58	8.38	5½−4½	$a\ ^4G - x\ ^4F°$†
2543.47	A	100	3.72	8.57	4½−3½	(146)
2549.79	A	80	3.76	8.60	3½−2½	
2542.04	A	25	3.74	8.60	2½−1½	
2644.62	A	40	3.72	8.38	4½−4½	
2556.08	A	30	3.74	8.57	2½−3½	
2619.35	A	50	3.72	8.43	4½−3½	$a\ ^4G - y\ ^2G°$†
2642.88	A	30	3.76	8.43	3½−3½	(147)
2632.73	A	25	3.74	8.43	2½−3½	
2542.146	A	100	3.58	8.44	5½−5½	$a\ ^4G - x\ ^4G°$†
2576.09	A	50	3.72	8.51	4½−4½	(148)
2555.93	A	30	3.76	8.59	3½−3½	
2579.10	A	60	3.74	8.52	2½−2½	
2506.25	A	25	3.58	8.51	5½−4½	
*2615.05	A	75	3.72	8.44	4½−5½	
2481.11	A	200	3.58	8.56	5½−6½	$a\ ^4G - y\ ^4H°$†
2527.86	A	200	3.72	8.60	4½−5½	(149)
2551.98	A	150	3.76	8.59	3½−4½	
*2539.72	A	100	3.74	8.60	2½−3½	
2460.59	A	20	3.58	8.60	5½−5½	
2462.65	A	25	3.58	8.59	5½−4½	

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2491.08	A	50	3.76	8.71	3½–2½	$a\ ^4G - y\ ^2D^\circ$ (150)
2469.25	A	20	3.74	8.74	2½–1½?	
2369.83	A	10	3.58	8.79	5½–5½	$a\ ^4G - y\ ^2H^\circ$ (151)
2390.09	A	15	3.72	8.88	4½–4½	
2432.16	A	40	3.72	8.79	4½–5½	
2409.68	A	25	3.76	8.88	3½–4½	
*2371.84	A	80	3.72	8.92	4½–3½	$a\ ^4G - x\ ^2F^\circ$† (152)
2391.10	A	20	3.76	8.92	3½–3½	
2261.78	A	100	3.58	9.04	5½–4½	$a\ ^4G - w\ ^4F^\circ$ (153)
2322.57	A	20	3.72	9.03	4½–3½	
2350.53	A	200	3.76	9.01	3½–2½	
2367.22	A	150	3.74	8.95	2½–1½	
2318.46	A	50	3.72	9.04	4½–4½	
*2341.06	A	100	3.76	9.03	3½–3½	
Vac						
1477.025	A	50	3.58	11.94	5½–5½	$a\ ^4G - v\ ^4G^\circ$ (154)
Air						
2977.471	A	25	4.03	8.17	5½–6½	$b\ ^2H - z\ ^4I^\circ$† (155)
*3036.463§	A	75	4.03	8.09	5½–6½	$b\ ^2H - z\ ^2I^\circ$†
2978.638	A	50	4.04	8.18	4½–5½	(156)
2999.789	A	50	4.04	8.15	4½–3½	$b\ ^2H - z\ ^2F^\circ$ (157)
2863.261	A	50h	4.04	8.34	4½–5½	$b\ ^2H - y\ ^4G^\circ$† (158)
2866.276	A	15	4.03	8.33	5½–5½	$b\ ^2H - z\ ^2H^\circ$†
2821.34	A	100	4.04	8.41	4½–4½	(159)
2871.493	A	30	4.04	8.33	4½–5½	
2833.806	A	50	4.03	8.38	5½–4½	$b\ ^2H - x\ ^4F^\circ$ (160)
2739.372	A	20	4.04	8.54	4½–4½	$b\ ^2H - y\ ^2G^\circ$ (161)
2755.258	A	20	4.03	8.51	5½–4½	$b\ ^2H - x\ ^4G^\circ$†
2804.903	A	50	4.04	8.44	4½–5½	(162)
2724.864	A	100	4.03	8.56	5½–6½	$b\ ^2H - y\ ^4H^\circ$
2704.830	A	10	4.04	8.60	4½–5½	(163)
2700.163	A	50	4.03	8.60	5½–5½	
2707.310	A	50	4.04	8.59	4½–4½	
2702.639	A	10	4.03	8.59	5½–4½	
2704.192	A	15	4.04	8.60	4½–3½	
*2591.26	A	75	4.03	8.79	5½–5½	$b\ ^2H - y\ ^2H^\circ$†
2547.66	A	20	4.04	8.88	4½–4½	(164)
2542.23	A	20	4.04	8.89	4½–3½	$b\ ^2H - y\ ^2F^\circ$ (165)
2471.05	A	30	4.04	9.03	4½–3½	$b\ ^2H - w\ ^4F^\circ$ (166)
2418.96	A	60	4.03	9.13	5½–5½	$b\ ^2H - x\ ^2H^\circ$†
2453.82	A	60	4.03	9.06	5½–4½	(167)
2413.40	A	40	4.03	9.14	5½–4½	$b\ ^2H - x\ ^2G^\circ$
*2430.94	A	50	4.04	9.11	4½–3½	(168)
2339.92	A	15	4.03	9.30	5½–4½	$b\ ^2H - w\ ^2G^\circ$
2338.74	A	20	4.04	9.31	4½–3½	(169)
2343.43	A	30	4.04	9.30	4½–4½	

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2315.90	A	50	4.03	9.36	5½–6½	$b\ ^2H - y\ ^2I^\circ$
2312.01	A	60H	4.04	9.37	4½–5½?	(170)
2308.63	A	40	4.03	9.37	5½–5½	
*2257.12	A	80	4.04	9.50	4½–3½	$b\ ^2H - w\ ^2F^\circ$ (171)
Vac						
1412.206	A	50	4.03	12.77	5½–4½	$b\ ^2H - v\ ^2G^\circ$
1424.934	A	50	4.04	12.70	4½–3½	(172)
Air						
2573.44	A	50	4.08	8.87	2½–1½	$b\ ^4D - x\ ^4P^\circ$†
2624.17	A	40	4.08	8.78	2½–2½	(173)
*2591.26	A	75	4.08	8.84	2½–2½	$b\ ^4D - y\ ^2F^\circ$†
2612.52	A	40	4.12	8.84	3½–2½	(174)
2568.88	A	100	4.12	8.92	3½–3½	$b\ ^4D - x\ ^2F^\circ$† (175)
2506.42	A	25	4.12	9.04	3½–4½	$b\ ^4D - w\ ^4F^\circ$†
2491.56	A	40	4.08	9.03	2½–3½	(176)
2526.88	A	25	4.07	8.95	0½–1½	
*2502.30	A	40h	4.08	9.01	2½–2½	
2422.84	A	40	4.12	9.21	3½–3½	$b\ ^4D - w\ ^4D^\circ$†
2482.78	A	60	4.08	9.05	2½–2½	(177)
2472.83	A	30	4.06	9.05	1½–1½	
2450.88	A	30	4.07	9.10	0½–0½	
*2502.30	A	40h	4.12	9.05	3½–2½	
2474.76	A	30	4.06	9.05	1½–2½	
2477.26	A	50	4.07	9.05	0½–1½	
2469.77	A	40	4.12	9.11	3½–3½	$b\ ^4D - x\ ^2G^\circ$ (178)
2785.87	A	25	4.16	8.60	1½–1½	$b\ ^2P - x\ ^4F^\circ$† (179)
2935.517	A	40	4.46	8.66	0½–1½	$b\ ^2P - 1^\circ$ (180)
2295.09	A	10	4.16	9.54	1½–1½	$b\ ^2P - y\ ^2P^\circ$
2426.59	A	50	4.46	9.54	0½–1½	(181)
2923.906	A	40	4.20	8.42	3½–3½	$b\ ^2F - x\ ^4D^\circ$
3035.792	A	15h	4.36	8.42	2½–3½	(182)
2933.232	A	50	4.20	8.41	3½–4½	$b\ ^2F - z\ ^2H^\circ$ (183)
2844.716	A	75	4.20	8.54	3½–4½	$b\ ^2F - y\ ^2G^\circ$
3032.442	A	7	4.36	8.43	2½–3½	(184)
2918.521	A	50	4.36	8.59	2½–3½	$b\ ^2F - x\ ^4G^\circ$†
2961.538	A	20	4.36	8.52	2½–2½	(185)
2854.980	A	15	4.20	8.52	3½–2½	
2909.750	A	25	4.36	8.60	2½–3½	$b\ ^2F - y\ ^4H^\circ$ (186)
2736.456	A	40	4.20	8.71	3½–2½	$b\ ^2F - y\ ^2D^\circ$†
2817.591	A	50	4.36	8.74	2½–1½	(187)
2616.33	A	25	4.20	8.92	3½–3½	$b\ ^2F - x\ ^2F^\circ$† (188)
2641.63	A	50	4.36	9.03	2½–3½	$b\ ^2F - w\ ^4F^\circ$† (189)

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2465.00	A	25	4.20	9.21	3½–3½	$b\ ^2F - w\ ^4D°$ (190)
2433.58	A	40	4.20	9.27	3½–2½	$b\ ^2F - x\ ^2D°$† (191)
2360.61	A	40H	4.20	9.43	3½–4½	$b\ ^2F - w\ ^2H°$ (192)
2328.16	A	40	4.20	9.50	3½–3½	$b\ ^2F - w\ ^2F°$ (193)
2870.573	A	30	4.30	8.60	2½–3½	$b\ ^2D - y\ ^4H°$ (194)
*2354.24	A	40	4.30	9.54	2½–1½	$b\ ^2D - y\ ^2P°$† (195)
2237.73	A	30	4.30	9.82	2½–3½	$b\ ^2D - 3°$ (196)
*2676.183	A	100	4.43	9.04	2½–3½	$a\ ^6S - y\ ^6P°$†
2698.167	A	10	4.43	9.00	2½–2½	(197)
Vac						
1841.375	A	15	4.43	11.13	2½–3½	$a\ ^6S - x\ ^6P°$†
1819.125	A	30	4.43	11.21	2½–2½	(198)
Air						
2704.585	A	80	4.44	9.00	6½–7½	$a\ ^2I - z\ ^2K°$
2810.649	A	250	4.47	8.86	5½–6½	(199)
2630.04	A	150	4.44	9.13	6½–5½	$a\ ^2I - x\ ^2H°$† (200)
2516.71	A	10	4.44	9.34	6½–5½	$a\ ^2I - w\ ^2H°$
2489.34	A	50	4.47	9.43	5½–4½	(201)
2535.23	A	50	4.47	9.34	5½–5½	
2508.67	A	100	4.44	9.36	6½–6½	$a\ ^2I - y\ ^2I°$
2518.41	A	100	4.47	9.37	5½–5½	(202)
2500.14	A	50	4.44	9.37	6½–5½	
2527.07	A	20	4.47	9.36	5½–6½	
2980.966	A	25	4.45	8.59	4½–3½	$b\ ^2G - x\ ^4G°$† (203)
2841.147	A	50	4.45	8.79	4½–5½	$b\ ^2G - y\ ^2H°$
2823.176	A	75	4.51	8.88	3½–4½	(204)
2777.401	A	50	4.45	8.89	4½–3½	$b\ ^2G - y\ ^2F°$
2849.591	A	15	4.51	8.84	3½–2½	(205)
2625.39	A	25	4.51	9.21	3½–3½	$b\ ^2G - w\ ^4D°$ (206)

Ru II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2635.34	A	10	4.45	9.13	4½–5½	$b\ ^2G - x\ ^2H°$†
2713.071	A	40	4.51	9.06	3½–4½	(207)
2628.75	A	75	4.45	9.14	4½–4½	$b\ ^2G - x\ ^2G°$†
2680.585	A	100	4.51	9.11	3½–3½	(208)
*2283.02	A	30	4.45	9.85	4½–3½	$b\ ^2G - v\ ^2F°$
2309.38	A	10	4.51	9.85	3½–3½	(209)
2945.098	A	10	4.69	8.88	3½–4½	$c\ ^2G - y\ ^2H°$
2898.242	A	40	4.62	8.88	4½–4½?	(210)
2737.606	A	10	4.62	9.13	4½–5½	$c\ ^2G - x\ ^2H°$†
2825.484	A	40	4.69	9.06	3½–4½	(211)
2636.84	A	20	4.62	9.30	4½–4½	$c\ ^2G - w\ ^2G°$
2669.43	A	75	4.69	9.31	3½–3½	(212)
2675.543	A	25	4.69	9.30	3½–4½	
*2615.05	A	75	4.62	9.34	4½–5½	$c\ ^2G - w\ ^2H°$†
2566.25	A	40	4.62	9.43	4½–4½	(213)
2528.05	A	100	4.62	9.50	4½–3½	$c\ ^2G - w\ ^2F°$† (214)
2430.40	A	60	4.69	9.77	3½–2½	$c\ ^2G - v\ ^2F°$
2390.32	A	20	4.69	9.85	3½–3½	(215)
2376.23	A	30	4.62	9.82	4½–3½	$c\ ^2G - 3°$ (216)
2807.200	A	25	4.81	9.21	2½–3½	$c\ ^2D - w\ ^4D°$
2937.043	A	25	4.90	9.10	1½–0½	(217)
2766.563	A	80	4.81	9.27	2½–2½	$c\ ^2D - x\ ^2D°$†
2866.096	A	15	4.90	9.21	1½–1½	(218)
2574.06	A	25	4.81	9.61	2½–2½	$c\ ^2D - w\ ^2D°$† (219)
2697.07	A	20	4.97	9.54	0½–1½	$a\ ^2S - y\ ^2P°$ (220)
2922.347	A	25	5.38	9.61	2½–2½	$d\ ^2D - w\ ^2D°$†
2787.25	A	20	5.28	9.70	1½–1½	(221)
2850.697	A	20	5.28	9.61	1½–2½	
2762.071	A	40	5.38	9.85	2½–3½	$d\ ^2D - v\ ^2F°$† (222)
2449.58	A	200H	5.77	10.80	3½–2½	$z\ ^6D° - e\ ^4D$ (223)

Strongest Unclassified Lines of Ru II

Air							Vac					
2525.42	A	200H					1463.215	A	100			
2439.69	A	150H					1348.385	A	200			
2344.84	A	100H					1278.543	A	300			
2336.83	A	200H					1273.344	A	200			
							1264.726	A	100			
Vac							1190.243	A	100			
1937.089	A	100										
1490.707	A	100h										

I P 28.3 Anal C List A December 1960

REFERENCES

A A. G. Shenstone, unpublished material (June 1955). I P, T, W L, I

B K. G. Kessler and W. F. Meggers, J. Research Nat. Bur. Std. **55**, 97, RP2609 (1955). W L, (I)
M. A. Catalán y F. R. Rico, An. Real Soc. Esp. (Madrid) [A] **53**, 85 (1957). I P

Ru III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1190.510	A	800	0.00	10.37	4 −3	$4d^6\ ^5D - 5p\ ^5P^\circ$ (1)
1200.067	A	500	0.14	10.43	3 −2	
1204.876	A	200	0.23	10.47	2 −1	
1207.173	A	500	0.14	10.37	3 −3	
1209.774	A	500	0.23	10.43	2 −2	
1211.306	A	300	0.28	10.47	1 −1	
1217.000	A	10	0.23	10.37	2 −3	
1216.238	A	10	0.28	10.43	1 −2	
1214.388	A	30	0.31	10.47	0 −1	
1941.346	A	500	3.35	9.71	3 −4	$5s\ ^7S - 5p\ ^7P^\circ$ (2)
Air						
2009.28	B	500	3.35	9.50	3 −3	
2044.59	B	(100)	3.35	9.39	3 −2	
Vac						
1759.49	A	200	3.35	10.37	3 −3	$5s\ ^7S - 5p\ ^5P^\circ$ (3)
1744.45	A	50	3.35	10.43	3 −2	
Air						
2331.06	B	(300)	5.08	10.37	2 −3	$5s\ ^5S - 5p\ ^5P^\circ$ (4)
*2304.630§	B	(100)	5.08	10.43	2 −2	
2287.05	B	(400)	5.08	10.47	2 −1	

Ru III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1699.84	A	200h?	9.71	16.97	4 −5	$5p\ ^7P^\circ - 5d\ ^7D$ (5)
1653.77	A	100h	9.50	16.96	3 −4	
1632.73	A	20h	9.39	16.95	2 −3	
1703.29	A	50	9.71	16.96	4 −4	
1655.95	A	30h	9.50	16.95	3 −3	
1634.13	A	30h	9.39	16.94	2 −2	
1657.40	A	15h	9.50	16.94	3 −2	
1634.99	A	15	9.39	16.94	2 −1?	
1700.42	A	50h?	9.71	16.97	4 −3	$5p\ ^7P^\circ - 6s\ ^7S$ (6)
1651.08	A	10h	9.50	16.97	3 −3	
1627.98	A	15h	9.39	16.97	2 −3	
1795.52	A	20h	10.37	17.25	3 −2	$5p\ ^5P^\circ - 6s\ ^5S$ (7)
1811.42	A	15h	10.43	17.25	2 −2	
1772.37	A	50h	10.37	17.33	3 −4	$5p\ ^5P^\circ - 5d\ ^5D$ (8)
1787.00	A	15h	10.43	17.34	2 −3	
1796.47	A	15h	10.47	17.34	1 −2	
1771.49	A	20h	10.37	17.34	3 −3	
1785.70	A	15h	10.43	17.34	2 −2	
1801.04	A	5h	10.47	17.33	1 −1?	
1790.25	A	5h	10.43	17.33	2 −1?	

RHODIUM, $Z = 45$

Rh I

I P 7.43 Anal B List C August 1953

REFERENCES

A J. P. Molnar and W. J. Hitchcock, J. Opt. Soc. Am. **30,** 523 (1940). W L, (I), T
See also *Atomic Energy Levels,* Circ. Nat. Bur. Std. 467, Vol. III, 29 (1958). I P
W. F. Meggers, C. H. Corliss and B. F. Scribner. Nat. Bur. Std. Monograph **32,** Part I, 273 (1962).
I multiplied by 10

Rh I (continued)

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2889.104	A	60	0.19	4.46	3½–3½	$a\,^4F - 1°$
2981.116	A	(5)	0.32	4.46	2½–3½	(1)
2717.513	A	60	0.00	4.54	4½–3½	$a\,^4F - y\,^4D°$
2819.626	A	(15)	0.19	4.57	3½–2½	(2)
2820.836	A	(8)	0.32	4.70	2½–1½	
2856.164	A	40	0.43	4.75	1½–0½	
2835.44	A	35	0.19	4.54	3½–3½	
2907.209	A	130	0.32	4.57	2½–2½	
2892.220	A	(30)	0.43	4.70	1½–1½	
2924.024	A	140	0.32	4.54	2½–3½	
2983.085	A	(35)	0.43	4.57	1½–2½	
*2728.946§	A	130	0.32	4.84	2½–1½	$a\,^4F - y\,^2P°$
2483.333	A	40	0.43	5.40	1½–0½	(3)
2795.702	A	(15)	0.43	4.84	1½–1½	
2652.662	A	320	0.32	4.97	2½–3½	$a\,^4F - y\,^2F°$†
2694.314	A	40	0.43	5.01	1½–2½	(4)
2382.89	A	100	0.00	5.18	4½–4½	$a\,^4F - 12°$
2473.086	A	100	0.19	5.18	3½–4½	(5)
2361.92	A	80	0.00	5.23	4½–4½	$a\,^4F - 13°$
						(6)
2448.835	A	50	0.32	5.36	2½–2½	$a\,^4F - x\,^2D°$
2509.697	A	280	0.32	5.24	2½–1½	(7)
2502.46	A	100	0.43	5.36	1½–2½	
2440.335	A	240	0.19	5.25	3½–3½	$a\,^4F - 14°$
2505.673	A	120	0.32	5.25	2½–3½	(8)
2322.58	A	60	0.00	5.31	4½–4½	$a\,^4F - 15°$
2408.186	A	12	0.19	5.31	3½–4½	(9)
2407.884	A	40	0.19	5.31	3½–3½	$a\,^4F - 16°$
2471.472	A	70	0.32	5.31	2½–3½	(10)
2427.685	A	80	0.32	5.40	2½–2½	$a\,^4F - x\,^2F°$
						(11)
2429.516	A	140	0.43	5.51	1½–1½	$a\,^4F - 18°$†
						(12)
2986.202	A	360	0.41	4.54	2½–3½	$a\,^2D - y\,^4D°$
3191.187	A	400	0.70	4.57	1½–2½	(13)
2968.663	A	180	0.41	4.57	2½–2½	
3087.415	A	25	0.70	4.70	1½–1½	
2878.658	A	90	0.41	4.70	2½–1½	
2864.404	A	50	0.41	4.72	2½–1½	$a\,^2D - z\,^2P°$
3152.603	A	40	0.70	4.61	1½–0½	(14)
3071.027	A	(20)	0.70	4.72	1½–1½	
2880.760	A	60	0.41	4.69	2½–3½	$a\,^2D - 3°$
						(15)
2827.312	A	25	0.41	4.77	2½–1½	$a\,^2D - 4°$
3028.406	A	40	0.70	4.77	1½–1½	(16)

Rh I (continued)

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2823.371	A	(25)	0.41	4.78	2½–2½	$a\,^2D - y\,^2D°$
2951.84	A	(1)	0.70	4.88	1½–1½	(17)
2760.442	A	(30)	0.41	4.88	2½–1½	
3023.911	A	100	0.70	4.78	1½–2½	
2791.158	A	20	0.41	4.83	2½–2½	$a\,^2D - 6°$
2986.989	A	70	0.70	4.83	1½–2½	(18)
2783.029	A	100	0.41	4.84	2½–1½	$a\,^2D - y\,^2P°$
2625.886	A	180	0.70	5.40	1½–0½	(19)
2977.679	A	130	0.70	4.84	1½–1½	
2740.554	A	(40)	0.41	4.91	2½–2½	$a\,^2D - 8°$
2929.107	A	100	0.70	4.91	1½–2½	(20)
2912.616	A	60	0.70	4.94	1½–2½	$a\,^2D - 9°$
						(21)
2703.733	A	320	0.41	4.97	2½–3½	$a\,^2D - y\,^2F°$†
2862.935	A	220	0.70	5.01	1½–2½	(22)
2492.299	A	25	0.41	5.36	2½–2½	$a\,^2D - x\,^2D°$
2718.546	A	140	0.70	5.24	1½–1½	(23)
2555.364	A	440	0.41	5.24	2½–1½	
2647.281	A	90	0.70	5.36	1½–2½	
2515.746	A	160	0.41	5.31	2½–3½	$a\,^2D - 16°$
						(24)
2462.69	A	(1)	0.41	5.42	2½–3½	$a\,^2D - x\,^2F°$
2622.576	A	120	0.70	5.40	1½–2½	(25)
2470.391	A	60	0.41	5.40	2½–2½	
2931.941	A	100	0.70	4.91	3½–2½	$a\,^2F - 8°$
3124.402	A	(5)	0.96	4.91	2½–2½	(26)
2915.419	A	70	0.70	4.94	3½–2½	$a\,^2F - 9°$†
						(27)
2889.841	A	60	0.70	4.97	3½–3½	$a\,^2F - y\,^2F°$†
3049.217	A	(5)	0.96	5.01	2½–2½	(28)
2649.593	A	(1)	0.70	5.36	3½–2½	$a\,^2F - x\,^2D°$
2885.975	A	60	0.96	5.24	2½–1½	(29)
2805.787	A	(20)	0.96	5.36	2½–2½	
2449.038	A	40	0.70	5.74	3½–4½	$a\,^2F - 22°$
						(30)
2882.366	A	110	1.14	5.42	2½–3½	$a\,^4P - x\,^2F°$†
2987.449	A	40	1.27	5.40	1½–2½	(31)
2826.677	A	140	1.14	5.50	2½–3½	$a\,^4P - 17°$
						(32)
2741.75	A	60	1.14	5.64	2½–2½	$a\,^4P - 20°$
2826.430	A	120	1.27	5.64	1½–2½	(33)
2779.538	A	60	1.27	5.71	1½–1½	$a\,^4P - 21°$
2834.121	A	60	1.36	5.71	0½–1½	(34)

Rh II

I P 18.0 Anal B List B December 1960

REFERENCES

A F. J. Sancho, An. Real Soc. Esp. (Madrid) [A] 54, 41, 65 (1958). T, I, W L
M. A. Catalán and F. R. Rico, unpublished material (December 1956). I P
* and § = Blend with Rh II.

Rh II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1768.42	A	100	0.00	6.98	4–4	$a\ ^3F - z\ ^5F^\circ$†
1787.07	A	40	0.30	7.20	3–3	(1)
1690.29	A	50	0.00	7.30	4–4	$a\ ^3F - z\ ^5D^\circ$†
1654.31	A	30	0.00	7.46	4–3	(2)
1761.80	A	20	0.30	7.30	3–4	
1674.22	A	100	0.00	7.37	4–5	$a\ ^3F - z\ ^5G^\circ$†
1701.50	A	20	0.30	7.55	3–4	(3)
1634.72	A	200	0.00	7.55	4–4	
1679.58	A	50	0.30	7.65	3–3	
1703.37	A	50	0.44	7.69	2–2	
1607.86	A	100	0.00	7.68	4–5	$a\ ^3F - z\ ^3G^\circ$
1624.47	A	200	0.30	7.90	3–4	(4)
1619.70	A	20	0.44	8.06	2–3	
1563.48	A	100	0.00	7.90	4–4	
1589.32	A	90	0.30	8.06	3–3	
1530.91	A	100	0.00	8.06	4–3	
1604.45	A	500	0.00	7.69	4–4	$a\ ^3F - z\ ^3F^\circ$
1637.88	A	200	0.30	7.83	3–3	(5)
1628.94	A	500	0.44	8.02	2–2	
1575.91	A	100	0.00	7.83	4–3	
1598.23	A	50	0.30	8.02	3–2	
*1668.76	A	100	0.30	7.69	3–4	
1670.19	A	90	0.44	7.83	2–3	
1542.74	A	100	0.00	8.00	4–3	$a\ ^3F - z\ ^3D^\circ$
1570.41	A	100	0.30	8.16	3–2	(6)
1582.57	A	90	0.44	8.24	2–1	
1602.10	A	40	0.30	8.00	3–3	
1600.06	A	50	0.44	8.16	2–2	
1632.96	A	100	0.44	8.00	2–3	
1408.34	A	90	0.00	8.77	4–4	$a\ ^3F - y\ ^5D^\circ$†
1493.40	A	40	0.44	8.71	2–1	(7)
*1412.74	A	100	0.30	9.03	3–3	$a\ ^3F - y\ ^3D^\circ$†
						(8)
1349.47	A	100	0.30	9.44	3–4	$a\ ^3F - x\ ^3G^\circ$†
1351.10	A	60	0.44	9.58	2–3	(9)
*1412.74	A	100	0.44	9.18	2–3	$a\ ^3F - z\ ^1F^\circ$†
						(10)
1342.13	A	200	0.00	9.20	4–5	$a\ ^3F - y\ ^3G^\circ$†
1332.79	A	30	0.00	9.26	4–3	(11)
1315.23	A	90	0.00	9.39	4–3	$a\ ^3F - w\ ^3D^\circ$†
1358.60	A	50	0.30	9.38	3–2	(12)
1358.11	A	50	0.30	9.39	3–3	
1749.58	A	100	1.01	8.06	2–3	$a\ ^1D - z\ ^3G^\circ$
						(13)

Rh II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1808.64	A	100	1.01	7.83	2–3	$a\ ^1D - z\ ^3F^\circ$
1760.37	A	50	1.01	8.02	2–2	(14)
1765.09	A	80	1.01	8.00	2–3	$a\ ^1D - z\ ^3D^\circ$
1726.69	A	90	1.01	8.16	2–2	(15)
1706.34	A	20	1.01	8.24	2–1	
1799.74	A	80	1.30	8.16	1–2	$a\ ^3P - z\ ^3D^\circ$†
1785.42	A	100	1.33	8.24	0–1	(16)
1777.62	A	80	1.30	8.24	1–1	
1584.00	A	90	1.30	9.09	1–1	$a\ ^3P - z\ ^3P^\circ$†
1623.01	A	100	1.30	8.90	1–2	(17)
1590.19	A	40	1.33	9.09	0–1	
1594.35	A	100	1.44	9.18	2–3	$a\ ^3P - z\ ^1F^\circ$
						(18)
1680.41	A	90	1.83	9.18	4–3	$a\ ^1G - z\ ^1F^\circ$
						(19)
1663.22	A	100	1.83	9.26	4–4	$a\ ^1G - y\ ^3G^\circ$
						(20)
1621.18	A	100	1.83	9.45	4–5	$a\ ^1G - z\ ^3I^\circ$
						(21)
1555.10	A	90	1.83	9.77	4–3	$a\ ^1G - x\ ^3F^\circ$
						(22)
1500.74	A	100	1.83	10.06	4–4	$a\ ^1G - y\ ^1G^\circ$
						(23)
*1471.10	A	100	1.83	10.23	4–5	$a\ ^1G - y\ ^1H^\circ$
						(24)
Air						
2490.79	A	150	2.08	7.04	5–5	$a\ ^5F - z\ ^5F^\circ$†
2630.33	A	100	2.29	6.98	4–4	(25)
2592.16	A	100	2.44	7.20	3–3	
2559.92	A	100	2.55	7.37	2–2	
2537.73	A	100	2.61	7.48	1–1	
2520.52	A	100	2.08	6.98	5–4	
2510.65	A	100	2.29	7.20	4–3	
2505.12	A	100	2.44	7.37	3–2	
2503.85	A	100	2.55	7.48	2–1	
2650.93	A	30	2.55	7.20	2–3	
*2595.40	A	60	2.61	7.37	1–2	

Rh II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2364.67	A	100	2.08	7.30	5−4	$a\ ^5F - z\ ^5D°$†
2385.45	A	200	2.29	7.46	4−3	(26)
2405.22	A	150	2.44	7.57	3−2	
2424.43	A	80	2.55	7.64	2−1	
2448.29	A	100	2.61	7.66	1−0	
2461.03	A	300	2.29	7.30	4−4	
*2458.90	A	300	2.44	7.46	3−3	
2455.71	A	200	2.55	7.57	2−2	
2456.18	A	100	2.61	7.64	1−1	
2488.29	A	50	2.61	7.57	1−2	
2334.77‡	A	1000	2.08	7.37	5−6	$a\ ^5F - z\ ^5G°$
2427.09	A	300	2.29	7.37	4−5	(27)
2415.84	A	500	2.44	7.55	3−4	
2421.00	A	500	2.55	7.65	2−3	
*2431.85	A	300	2.61	7.69	1−2	
2333.30	A	300	2.08	7.37	5−5	
2344.89	A	80	2.29	7.55	4−4	
2400.71	A	80	2.55	7.69	2−2	
2257.24	A	80	2.08	7.55	5−4	
2303.47	A	20	2.29	7.65	4−3	
2352.44	A	50	2.44	7.69	3−2	
2206.35	A	100	2.08	7.68	5−5	$a\ ^5F - z\ ^3G°$†
2201.02	A	100	2.29	7.90	4−4	(28)
2290.04	A	300	2.29	7.68	4−5	
2263.43	A	50	2.44	7.90	3−4	
2237.71	A	50	2.55	8.06	2−3	
2199.96	A	200	2.08	7.69	5−4	$a\ ^5F - z\ ^3F°$†
2212.79	A	80	2.44	8.02	3−2	(29)
2350.35	A	100	2.44	7.69	3−4	
2282.87	A	50	2.61	8.02	1−2	
*2192.78	A	100	2.61	8.24	1−1	$a\ ^5F - z\ ^3D°$†
2226.55	A	100	2.61	8.16	1−2	(30)
Vac						
1975.71	A	100	2.29	8.54	4−3	$a\ ^5F - z\ ^5P°$†
Air						(31)
2029.90	A	50	2.44	8.52	3−2	
Vac						
1881.36	A	100	2.08	8.65	5−4	$a\ ^5F - y\ ^3F°$†
*1941.82	A	50	2.29	8.65	4−4	(32)
Air						
2910.15	A	200	3.13	7.37	4−5	$b\ ^3F - z\ ^5G°$†
2963.54	A	200	3.39	7.55	3−4	(33)
3019.78	A	100	3.56	7.65	2−3	
2792.78	A	100	3.13	7.55	4−4	
*2897.63	A	100	3.39	7.65	3−3	
2715.27	A	150	3.13	7.68	4−5	$b\ ^3F - z\ ^3G°$†
2737.40	A	150	3.39	7.90	3−4	(34)
2739.92	A	150	3.56	8.06	2−3	
2705.60	A	150	3.13	7.69	4−4	$b\ ^3F - z\ ^3F°$†
2775.77	A	100	3.39	7.83	3−3	(35)
2766.54	A	100	3.56	8.02	2−2	
2625.41	A	150	3.13	7.83	4−3	
2663.69	A	100	3.39	8.02	3−2	
2534.57	A	90	3.13	8.00	4−3	$b\ ^3F - z\ ^3D°$
*2587.30	A	100	3.39	8.16	3−2	(36)
2635.28	A	100	3.56	8.24	2−1	
2674.43	A	100	3.39	8.00	3−3	
2684.21	A	100	3.56	8.16	2−2	
2778.15	A	100	3.56	8.00	2−3	

Rh II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2190.91	A	200	3.13	8.77	4−4	$b\ ^3F - y\ ^5D°$†
2258.27	A	80	3.39	8.85	3−3	(37)
2276.20	A	100	3.39	8.81	3−2	
2294.66	A	70	3.39	8.77	3−4	
*2298.26	A	150	3.56	8.93	2−1	$b\ ^3F - z\ ^3S°$
						(38)
2091.07	A	100	3.13	9.03	4−3	$b\ ^3F - y\ ^3D°$†
						(39)
Vac						
1974.15	A	100	3.13	9.39	4−3	$b\ ^3F - w\ ^3D°$†
Air						(40)
2119.21	A	100	3.56	9.38	2−2	
2764.83	A	100	3.43	7.90	3−4	$a\ ^5P - z\ ^3G°$
*2664.48	A	50	3.43	8.06	3−3	(41)
2803.95	A	80	3.43	7.83	3−3	$a\ ^5P - z\ ^3F°$†
2689.61	A	100	3.43	8.02	3−2	(42)
*2819.24	A	100	3.43	7.81	3−2	$a\ ^5P - z\ ^5S°$
2845.73	A	100	3.47	7.81	2−2	(43)
2924.10	A	200	3.59	7.81	1−2	
2700.61	A	90	3.43	8.00	3−3	$a\ ^5P - z\ ^3D°$†
2651.91	A	100	3.59	8.24	1−1	(44)
*2587.30	A	100	3.47	8.24	2−1	
2417.41	A	150	3.43	8.54	3−3	$a\ ^5P - z\ ^5P°$†
*2443.69	A	100	3.47	8.52	2−2	(45)
2444.74	A	100	3.47	8.52	2−1	
2436.86	A	100	3.47	8.54	2−3	
2366.88	A	100	3.43	8.65	3−4	$a\ ^5P - y\ ^3F°$†
2246.38	A	80	3.43	8.93	3−3	(46)
*2294.12	A	200	3.47	8.85	2−3	$a\ ^5P - y\ ^5D°$†
2276.89	A	150	3.43	8.85	3−3	(47)
*2312.65	A	150	3.47	8.81	2−2	
2410.69	A	200	3.59	8.71	1−1	
2430.80	A	100	3.59	8.67	1−0	
2255.25	A	60	3.43	8.90	3−2	$a\ ^5P - z\ ^3P°$†
2321.86	A	100	3.59	8.90	1−2	(48)
2202.71	A	50	3.43	9.03	3−3	$a\ ^5P - y\ ^3D°$†
2288.24	A	50	3.59	8.98	1−1	(49)
2232.98	A	50	3.43	8.96	3−2	
*2298.26	A	150	3.59	8.96	1−2	
2177.08	A	100	3.43	9.10	3−2	$a\ ^5P - y\ ^3P°$†
*2192.78	A	100	3.47	9.10	2−2	(50)
2198.79	A	100	3.59	9.20	1−1	
2420.18	A	100	4.18	9.28	3−2	$a\ ^3G - y\ ^3F°$†
						(51)
2545.36	A	100	3.92	8.77	5−4	$a\ ^3G - y\ ^5D°$†
2603.31	A	100	4.03	8.77	4−4	(52)
2475.63	A	300	3.92	8.90	5−6	$a\ ^3G - z\ ^3H°$†
2628.14	A	100	4.03	8.72	4−5	(53)
2609.17	A	100	4.18	8.91	3−4	
2569.10	A	70	3.92	8.72	5−5	
2429.95	A	200	3.92	9.00	5−4	$a\ ^3G - z\ ^1G°$
2482.73	A	100	4.03	9.00	4−4	(54)

Rh II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2463.44	A	150	4.03	9.03	4–3	$a\ ^3G - y\ ^3D^\circ$
2541.16	A	30	4.18	9.03	3–3	(55)
2396.55	A	300	3.92	9.07	5–5	$a\ ^3G - x\ ^3G^\circ\dagger$
2277.24	A	60	4.03	9.44	4–4	(56)
2285.00	A	50	4.18	9.58	3–3	
*2221.97	A	100	4.03	9.58	4–3	
2447.85	A	100	4.03	9.07	4–5	
*2336.84	A	150	3.92	9.20	5–5	$a\ ^3G - w\ ^3G^\circ\dagger$
2359.18	A	100	4.03	9.26	4–4	(57)
2626.62	A	100	4.23	8.93	2–3	$b\ ^3P - y\ ^3F^\circ$
*2443.69	A	100	4.23	9.28	2–2	(58)
*2728.94§	A	100	4.29	8.81	1–2	$b\ ^3P - y\ ^5D^\circ\dagger$
2754.09	A	80	4.23	8.71	2–1	(59)
2411.94	A	200	4.23	9.34	2–3	$b\ ^3P - x\ ^3D^\circ\dagger$
2361.96	A	80	4.23	9.45	2–2	(60)
*2221.97	A	100	4.29	9.84	1–2	$b\ ^3P - z\ ^1D^\circ$ (61)
2946.61	A	90	4.81	9.00	4–4	$a\ ^3H - z\ ^1G^\circ\dagger$ (62)
2654.76	A	80	4.42	9.07	6–5	$a\ ^3H - x\ ^3G^\circ$
2517.51	A	100	4.54	9.44	5–4	(63)
2586.41	A	100	4.81	9.58	4–3	
*2897.63	A	100	4.81	9.07	4–5	
2581.70	A	150	4.42	9.20	6–5	$a\ ^3H - y\ ^3G^\circ\dagger$
2774.18	A	80	4.81	9.26	4–4	(64)
2491.88	A	150	4.42	9.37	6–7	$a\ ^3H - z\ ^3I^\circ$
2659.10	A	100	4.81	9.45	4–5	(65)
2515.32	A	80	4.54	9.45	5–5	
2485.82	A	100	4.81	9.77	4–3	$a\ ^3H - x\ ^3F^\circ$ (66)
2408.73	A	200	4.54	9.67	5–6	$a\ ^3H - z\ ^1I^\circ\dagger$ (67)
2327.67	A	300	4.42	9.72	6–6	$a\ ^3H - y\ ^3H^\circ\dagger$
2346.43	A	200	4.54	9.80	5–5	(68)
2383.59	A	300	4.54	9.72	5–6	
2349.69	A	200	4.81	10.06	4–4	$a\ ^3H - y\ ^1G^\circ$ (69)
2781.82	A	100	4.49	8.93	2–3	$c\ ^3P - y\ ^3F^\circ\dagger$ (70)
2681.60	A	150	4.49	9.09	2–1	$c\ ^3P - z\ ^3P^\circ\dagger$ (71)
2761.28	A	100	4.49	8.96	2–2	$c\ ^3P - y\ ^3D^\circ\dagger$
2773.07	A	80	4.53	8.98	1–1	(72)
2676.28	A	100	4.49	9.10	2–2	$c\ ^3P - y\ ^3P^\circ\dagger$ (73)

Rh II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2305.95	A	100wh	4.49	9.84	2–2	$c\ ^3P - z\ ^1D^\circ\dagger$ (74)
*2312.65	A	150	4.53	9.87	1–2	$c\ ^3P - y\ ^1D^\circ\dagger$ (75)
2132.24	A	100	4.49	10.28	2–1	$c\ ^3P - x\ ^3P^\circ\dagger$ (76)
2926.80	A	100	4.50	8.72	4–5	$b\ ^1G - z\ ^3H^\circ$
2802.30	A	100	4.50	8.91	4–4	(77)
2747.63	A	100	4.50	9.00	4–4	$b\ ^1G - z\ ^1G^\circ$ (78)
*2431.85	A	300	4.50	9.58	4–3	$b\ ^1G - x\ ^3G^\circ\dagger$ (79)
2597.09	A	100	4.50	9.26	4–4	$b\ ^1G - y\ ^3G^\circ\dagger$
2593.66	A	80	4.50	9.26	4–3	(80)
2284.07	A	150	4.50	9.91	4–4	$b\ ^1G - y\ ^3H^\circ\dagger$ (81)
2221.42	A	100	4.50	10.06	4–4	$b\ ^1G - y\ ^1G^\circ$ (82)
2717.97	A	100	4.56	9.10	3–2	$a\ ^3D - y\ ^3P^\circ$ (83)
2797.01	A	100	4.77	9.18	2–3	$a\ ^3D - z\ ^1F^\circ\dagger$ (84)
2557.21	A	100	4.56	9.39	3–3	$a\ ^3D - w\ ^3D^\circ\dagger$
2669.20	A	90	4.78	9.40	1–1	(85)
2444.06	A	150	4.56	9.61	3–4	$a\ ^3D - x\ ^3F^\circ\dagger$
2466.15	A	100	4.77	9.77	2–3	(86)
*2336.84	A	150	4.56	9.84	3–2	$a\ ^3D - z\ ^1D^\circ\dagger$ (87)
2324.86	A	100	4.56	9.87	3–2	$a\ ^3D - y\ ^1D^\circ\dagger$ (88)
*2819.24	A	100	5.07	9.44	5–4	$a\ ^1H - x\ ^3G^\circ\dagger$ (89)
2683.58	A	150	5.07	9.67	5–6	$a\ ^1H - z\ ^1I^\circ$ (90)
2549.66	A	100	5.07	9.91	5–4	$a\ ^1H - y\ ^3H^\circ\dagger$ (91)
2471.89	A	100	5.07	10.06	5–4	$a\ ^1H - y\ ^1G^\circ$ (92)
2392.43	A	100	5.07	10.23	5–5	$a\ ^1H - y\ ^1H^\circ$ (93)
2713.30	A	90	5.29	9.84	2–2	$b\ ^1D - z\ ^1D^\circ$ (94)

PALLADIUM, $Z = 46$

Pd I

I P 8.30 Anal A List C March 1953

REFERENCES

A A. G. Shenstone, Proc. Roy. Soc. [A] **219,** 419 (March 1953). W L, I, T
B W. F. Meggers, see A. G. Shenstone, Phys. Rev. **36,** 669 (1930). W L, (I), I P

Pd I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air 2763.08	B	(100R)	0.00	4.47	0−1	$4d^{10}\ ^1S - 5p\ ^3P^\circ$ (1)
2476.43	B	(50R)	0.00	4.98	0−1	$4d^{10}\ ^1S - 5p\ ^3D^\circ$ (2)
2447.95	B	(10R)	0.00	5.04	0−1	$4d^{10}\ ^1S - 5p\ ^1P^\circ$ (3)
2922.50	B	(40)	0.81	5.03	3−2	$5s\ ^3D - 5p\ ^1D^\circ$
3027.92	B	(100)	0.96	5.03	2−2	(4)
3258.80	B	(300)	1.25	5.03	1−2	
2254.28	B	(15)	0.81	6.28	3−3	$5s\ ^3D - 5^\circ$ (5)
2178.29	A	150	0.81	6.48	3−3	$5s\ ^3D - 1^\circ$† (6)
2092.63	A	100	0.81	6.71	3−4	$5s\ ^3D - 6p\ ^3F^\circ$†
2172.95	A	50	0.96	6.64	2−3	(7)
Vac 1993.20	A	50	0.96	7.15	2−2	
1972.74	A	300	0.81	7.07	3−3	$5s\ ^3D - 9^\circ$ (8)
Air 2019.55	A	300	0.96	7.07	2−3	
Vac 1960.75	A	150	0.81	7.11	3−2	$5s\ ^3D - 10^\circ$ (9)
Air 2007.00	A	200	0.96	7.11	2−2	
2105.87	A	200	1.25	7.11	1−2	

Pd I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 1929.55	A	100h	0.81	7.21	3−3	$5s\ ^3D - 6p\ ^1F^\circ$
*1974.90	A	100	0.96	7.21	2−3	(10)
1973.93	A	100	0.96	7.21	2−2	$5s\ ^3D - 14^\circ$† (11)
1901.94	A	150	0.81	7.30	3−3	$5s\ ^3D - 15^\circ$
1945.99	A	200	0.96	7.30	2−3	(12)
Air 2019.82	A	200	1.25	7.36	1−1, 2	$5s\ ^3D - 16^\circ$† (13)
Vac 1923.95	A	100	0.96	7.37	2−2	$5s\ ^3D - 17^\circ$ (14)
1890.41	A	150	0.96	7.49	2−2	$5s\ ^3D - 29^\circ$ (15)
*1974.90	A	100	1.25	7.50	1−1, 2	$5s\ ^3D - 18^\circ$† (16)
1976.50	A	150	1.45	7.69	2−3	$5s\ ^1D - 5p'\ ^1F^\circ$ (17)
1968.33	A	200	1.45	7.72	2−2	$5s\ ^1D - 5p'\ ^1D^\circ$ (18)

Pd II

I P 19.34 Anal A List C March 1953

REFERENCES

A H. E. White, see A. G. Shenstone, Phys. Rev. 32, 30 (1928). W L, I, T

B F. Exner and E. Haschek, see Ref. A.
M. A. Catalán y F. A. Rico, An. Real Soc. Esp. Fis. y Quim. (Madrid) [A] 48, 328 (1952). I P

Pd II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1403.59	A	25	0.00	8.80	2½–3½	$4d^9\ ^2D - 5p\ ^4F°$† (1)
1437.29	A	30	0.44	9.03	1½–2½	
1367.76	A	25	0.00	9.03	2½–2½	
1453.25	A	10	0.44	8.93	1½–1½	
1315.57	A	25	0.00	9.17	2½–3½	$4d^9\ ^2D - 5p\ ^2G°$ (2)
1374.92	A	50	0.00	8.98	2½–2½	$4d^9\ ^2D - 5p\ ^2D°$† (3)
1397.46	A	15	0.44	9.27	1½–1½	
1363.76	A	20	0.00	9.05	2½–3½	$4d^9\ ^2D - 5p\ ^2F°$† (4)
1320.05	A	35	0.00	9.35	2½–2½	
1365.80	A	25	0.44	9.48	1½–1½	$4d^9\ ^2D - 5p'\ ^4P°$† (5)
1365.58	A	15	0.44	9.48	1½–2½	
1254.59	A	20	0.00	9.84	2½–3½	$4d^9\ ^2D - 5p''\ ^2F°$ (6)
1329.34	A	5	0.44	9.72	1½–2½	
1269.62	A	10	0.00	9.72	2½–2½	
1235.23	A	15	0.00	9.99	2½–1½	$4d^9\ ^2D - 5p''\ ^2P°$ (7)
1314.61	A	5	0.44	9.83	1½–0½?	
1218.66	A	15	0.00	10.13	2½–2½	$4d^9\ ^2D - 5p''\ ^2D°$† (8)
1273.60	A	10	0.44	10.07	1½–2½	
1204.00	A	30	0.00	10.25	2½–3½	$4d^9\ ^2D - 5p'\ ^4D°$† (9)
1267.27	A	10	0.44	10.18	1½–2½	
1214.58	A	10	0.00	10.16	2½–1½	
1237.12	A	15	0.44	10.42	1½–1½	$4d^9\ ^2D - 5p'\ ^2D°$† (10)
1245.92	A	5	0.44	10.35	1½–2½	
1174.37	A	20	0.00	10.51	2½–1½	$4d^9\ ^2D - 5p'\ ^2P°$ (11)
1183.45	A	20	0.44	10.87	1½–0½	
1225.33	A	10	0.44	10.51	1½–1½	
1162.20	A	15	0.00	10.62	2½–3½	$4d^9\ ^2D - 5p'''\ ^2F°$ (12)
1196.43	A	10	0.44	10.76	1½–2½	
Air						
2488.92	B	300	3.10	8.05	4½–3½	$5s\ ^4F - 5p\ ^4D°$† (13)
2446.17	B	150	3.34	8.39	3½–2½	
2426.87	B	100	3.57	8.66	2½–1½	
2424.49	B	75	3.70	8.79	1½–0½	
2296.53‡	B	200R	3.10	8.47	4½–5½	$5s\ ^4F - 5p\ ^4G°$† (14)
2486.52	B	250	3.34	8.31	3½–4½	
2457.29	B	100	3.57	8.59	2½–3½	
2430.94	B	100	3.70	8.77	1½–2½	

Pd II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2231.59	B	100R	3.10	8.63	4½–4½	$5s\ ^4F - 5p\ ^4F°$† (15)
2264.33	B	40	3.34	8.80	3½–3½	
2854.59	B	200	3.98	8.31	3½–4½	$5s\ ^2F - 5p\ ^4G°$† (16)
2841.02	B	30	4.25	8.59	2½–3½	
2658.75	B	150	3.98	8.63	3½–4½	$5s\ ^2F - 5p\ ^4F°$† (17)
2565.51	B	150	3.98	8.80	3½–3½	
2498.81	B	200	3.98	8.92	3½–4½	$5s\ ^2F - 5p\ ^2G°$† (18)
2505.73	B	150	4.25	9.17	2½–3½	
2471.18	B	100	3.98	8.98	3½–2½	$5s\ ^2F - 5p\ ^2D°$† (19)
2457.76	B	60	4.25	9.27	2½–1½	
2435.32	B	100	3.98	9.05	3½–3½	$5s\ ^2F - 5p\ ^2F°$† (20)
2418.72	B	75	4.25	9.35	2½–2½	
2569.56	B	100	4.25	9.05	2½–3½	
2469.29	B	150	4.48	9.48	2½–2½	$5s'\ ^4P - 5p'\ ^4P°$† (21)
2470.06	B	80	4.48	9.48	2½–1½	
2534.57	B	80	4.61	9.48	1½–0½	
2433.11	B	100	5.49	10.57	4½–5½	$5s'''\ ^2G - 5p'''\ ^2H°$† (22)
2551.84	B	150	5.51	10.34	3½–4½	
2776.85	B	150h	8.47	12.91	5½–4½	$5p\ ^4G° - 6s\ ^4F$† (23)
2630.30	B	20h	8.31	13.00	4½–3½	
2878.01	B	100h	8.63	12.91	4½–4½	$5p\ ^4F° - 6s\ ^4F$† (24)
2935.01	B	20h	8.80	13.00	3½–3½	
2787.92	B	100h	8.92	13.35	4½–3½	$5p\ ^2G° - 6s\ ^2F$† (25)
2807.59	B	50h	9.17	13.57	3½–2½	
2871.37	B	100h	9.05	13.35	3½–3½	$5p\ ^2F° - 6s\ ^2F$† (26)
2925.41	B	10h	9.35	13.57	2½–2½	

Pd III

I P 32.79 Anal B List B March 1961

REFERENCE

A A. G. Shenstone, unpublished material (February 1957). I P, T, W L, I, C L

* and § = Possibly a blend of Pd II and Pd III.

Pd III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
916.779	A	200	0.00	13.47	4−5	$a\ ^3F - z\ ^5G°$†
902.900	A	400	0.00	13.67	4−4?	(1)
922.492	A	200	0.40	13.78	3−3	
889.294	A	1000	0.00	13.88	4−4	$a\ ^3F - z\ ^3F°$
904.365	A	400	0.40	14.05	3−3	(2)
900.490	A	300	0.58	14.29	2−2	
878.732	A	400	0.00	14.05	4−3	
915.582	A	200	0.40	13.88	3−4	
916.467	A	100	0.58	14.05	2−3	
*888.842	A	500	0.00	13.89	4−5	$a\ ^3F - z\ ^3G°$
895.599	A	100	0.40	14.18	3−4	(3)
894.197	A	30	0.58	14.38	2−3	
870.437	A	150	0.00	14.18	4−4	
882.690	A	50	0.40	14.38	3−3	
858.238	A	100	0.00	14.38	4−3	
864.044	A	500	0.00	14.29	4−3	$a\ ^3F - z\ ^3D°$
880.590	A	500	0.40	14.42	3−2	(4)
885.913	A	300	0.58	14.51	2−1	
*888.842	A	500	0.40	14.29	3−3	
892.029	A	100	0.58	14.42	2−2	
873.057	A	200	0.58	14.72	2−1	$a\ ^3F - z\ ^5P°$†
						(5)
814.524	A	100	0.00	15.16	4−4	$a\ ^3F - z\ ^3H°$†
						(6)
825.345	A	500	0.00	14.96	4−4	$a\ ^3F - y\ ^3F°$†
*826.411	A	400	0.40	15.34	3−3	(7)
815.053	A	200	0.58	15.72	2−2	
847.943	A	50	0.40	14.96	3−4	
836.476	A	100	0.58	15.34	2−3	
820.342	A	75	0.00	15.05	4−4	$a\ ^3F - y\ ^5D°$†
845.268	A	50	0.58	15.18	2−2	(8)
809.695	A	150	0.00	15.25	4−3	
834.978	A	50	0.40	15.18	3−2	
854.354	A	100	0.58	15.03	2−1	
*803.665	A	500	0.00	15.36	4−4	$a\ ^3F - z\ ^1G°$
825.076	A	150	0.40	15.36	3−4	(9)
802.286	A	150	0.00	15.39	4−3	$a\ ^3F - y\ ^3D°$†
						(10)
*801.542	A	200	0.00	15.40	4−5	$a\ ^3F - y\ ^3G°$†
*801.542	A	200	0.40	15.80	3−4?	(11)
800.011	A	500	0.58	16.01	2−3	
797.517	A	500	0.00	15.48	4−5	$a\ ^3F - x\ ^3G°$†
787.950	A	100	0.00	15.67	4−4?	(12)
*807.827	A	150	0.40	15.68	3−3	
787.276	A	200	0.00	15.68	4−3?	
795.585	A	50	0.00	15.52	4−3	$a\ ^3F - z\ ^1F°$
*816.563	A	200	0.40	15.52	3−3	(13)
*826.411	A	400	0.58	15.52	2−3	

Pd III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
*813.989	A	150d?	0.40	15.56	3−2	$a\ ^3F - y\ ^3P°$
*816.563	A	200	0.58	15.70	2−1	(14)
783.344	A	100	0.00	15.76	4−3	$a\ ^3F - x\ ^3D°$
796.384	A	150	0.40	15.90	3−2	(15)
799.013	A	200	0.58	16.03	2−1	
*803.665	A	500	0.40	15.76	3−3	
805.725	A	40	0.58	15.90	2−2	
813.192	A	100	0.58	15.76	2−3	
*781.019§	A	1000l	0.00	15.81	4−3	$a\ ^3F - w\ ^3D°$
*800.095	A	500	0.40	15.83	3−2	(16)
807.672	A	50	0.58	15.86	2−1	
801.223	A	50	0.40	15.81	3−3	
809.536	A	100	0.58	15.83	2−2	
766.424	A	500l	0.00	16.11	4−4	$a\ ^3F - x\ ^3F°$†
776.315	A	100l	0.40	16.30	3−3	(17)
*794.078	A	500	0.58	16.13	2−2	
784.985	A	200	0.40	16.13	3−2	
785.883	A	150	0.40	16.11	3−4	
772.110	A	200l	0.40	16.39	3−2	$a\ ^3F - z\ ^1D°$
						(18)
738.793	A	150	0.00	16.71	4−3	$a\ ^3F - y\ ^1F°$
756.853	A	100	0.40	16.71	3−3	(19)
707.797	A	150	0.00	17.44	4−3	$a\ ^3F - v\ ^3D°$†
719.474	A	100	0.40	17.56	3−2	(20)
727.720	A	200l	0.58	17.54	2−1	
965.506	A	300	1.26	14.05	2−3	$a\ ^1D - z\ ^3F°$
947.795	A	300	1.26	14.29	2−2	(21)
917.442	A	100	1.26	14.72	2−1	$a\ ^1D - z\ ^5P°$†
						(22)
886.820	A	100	1.26	15.18	2−2	$a\ ^1D - y\ ^5D°$†
*896.813	A	200	1.26	15.03	2−1?	(23)
867.699	A	100	1.26	15.49	2−1	$a\ ^1D - z\ ^3P°$†
						(24)
837.146	A	200	1.26	16.01	2−3	$a\ ^1D - y\ ^3G°$
						(25)
866.075	A	150	1.26	15.52	2−3	$a\ ^1D - z\ ^1F°$
						(26)
863.200	A	200	1.26	15.56	2−2	$a\ ^1D - y\ ^3P°$
855.294	A	150	1.26	15.70	2−1	(27)
851.593	A	200	1.26	15.76	2−3	$a\ ^1D - x\ ^3D°$†
						(28)
848.868	A	200	1.26	15.81	2−3?	$a\ ^1D - w\ ^3D°$†
845.525	A	100	1.26	15.86	2−1	(29)

Pd III—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
820.012	A	100	1.26	16.32	2−1	$a\,^1D - y\,^3S°$ (30)
816.221	A	200	1.26	16.39	2−2	$a\,^1D - z\,^1D°$ (31)
*800.095	A	500	1.26	16.69	2−2	$a\,^1D - x\,^3P°$ (32)
799.202	A	200	1.26	16.71	2−3	$a\,^1D - y\,^1F°$ (33)
790.192	A	150	1.26	16.89	2−1	$a\,^1D - y\,^1P°$ (34)
787.837	A	100	1.26	16.93	2−3	$a\,^1D - x\,^1F°$ (35)
780.115	A	100l	1.26	17.09	2−2	$a\,^1D - w\,^3F°$ (36)
763.058	A	500l?	1.26	17.44	2−3	$a\,^1D - v\,^3D°$† (37)
758.308	A	100	1.26	17.54	2−1	
1008.385	A	150	1.81	14.05	2−3	$a\,^3P - z\,^3F°$ (38)
977.805	A	100	1.66	14.29	1−2	
989.103	A	100	1.81	14.29	2−3	$a\,^3P - z\,^3D°$ (39)
967.854	A	200	1.66	14.42	1−2	
962.753	A	100	1.69	14.51	0−1	
960.643	A	100	1.66	14.51	1−1	
892.793	A	150	1.66	15.49	1−1	$a\,^3P - z\,^3P°$† (40)
*896.813	A	200	1.66	15.43	1−1	$a\,^3P - y\,^3D°$ (41)
900.423	A	150	1.81	15.52	2−3	$a\,^3P - z\,^1F°$ (42)
867.087	A	100	1.66	15.90	1−2	$a\,^3P - x\,^3D°$† (43)
*871.491	A	75	1.66	15.83	1−2?	$a\,^3P - w\,^3D°$† (44)
871.061	A	100	1.69	15.86	0−1	
851.743	A	300	1.81	16.30	2−3?	$a\,^3P - x\,^3F°$† (45)
*853.610	A	50	1.81	16.13	2−2	
847.342	A	100	1.66	16.23	1−0?	$a\,^3P - z\,^1S°$ (46)
840.214	A	100	1.69	16.38	0−1	$a\,^3P - z\,^1P°$ (47)
836.948	A	100	1.66	16.41	1−2	$a\,^3P - y\,^1D°$ (48)
829.316	A	300	1.81	16.69	2−2	$a\,^3P - x\,^3P°$† (49)
806.317	A	50	1.66	16.97	1−1	
*813.989	A	150d?	1.81	16.97	2−1	
*807.827	A	150	1.69	16.97	0−1	
818.679	A	200	1.81	16.89	2−1	$a\,^3P - y\,^1P°$† (50)
*794.078	A	500	1.81	17.35	2−2?	$a\,^3P - x\,^1D°$† (51)
789.583	A	200	1.81	17.44	2−3	$a\,^3P - v\,^3D°$ (52)
776.681	A	150l	1.66	17.56	1−2	
778.783	A	50l	1.69	17.54	0−1	
783.805	A	150	1.81	17.56	2−2	
777.367	A	150l	1.66	17.54	1−1?	

Pd III—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
717.904	A	100	1.81	19.00	2−2	$a\,^3P - w\,^3P°$† (53)
711.944	A	100	1.66	19.00	1−2	
709.885	A	100	1.69	19.08	0−1	
972.682	A	100	2.21	14.90	4−5	$a\,^1G - z\,^3H°$ (54)
908.871	A	100	2.21	15.79	4−5	$a\,^1G - z\,^3I°$ (55)
930.142	A	100	2.21	15.48	4−5	$a\,^1G - x\,^3G°$† (56)
927.512	A	100	2.21	15.52	4−3	$a\,^1G - z\,^1F°$ (57)
914.858	A	100	2.21	15.70	4−5	$a\,^1G - z\,^1H°$ (58)
875.931	A	100	2.21	16.30	4−3	$a\,^1G - x\,^3F°$ (59)
873.977	A	200	2.21	16.33	4−5	$a\,^1G - y\,^3H°$ (60)
865.285	A	200	2.21	16.47	4−4	
856.470	A	500	2.21	16.62	4−4	$a\,^1G - y\,^1G°$ (61)
851.247	A	200	2.21	16.71	4−3	$a\,^1G - y\,^1F°$ (62)
840.579	A	500	2.21	16.89	4−5	$a\,^1G - y\,^1H°$ (63)
1914.616	A	4000	6.53	12.98	5−5	$a\,^5F - z\,^5F°$† (64)
Air						
2026.520	A	250	6.80	12.89	4−4	
Vac						
1993.956	A	200	7.00	13.20	3−3	
1968.639	A	150	7.14	13.41	2−2	
1951.117	A	200	7.23	13.55	1−1	
1941.639	A	2000	6.53	12.89	5−4	
1930.330	A	1000	6.80	13.20	4−3	
*1926.770	A	500	7.00	13.41	3−2	
1925.472	A	300	7.14	13.55	2−1	
1811.605	A	150	6.53	13.35	5−4	$a\,^5F - z\,^5D°$† (65)
1830.311	A	100	6.80	13.55	4−3	
1845.020	A	50	7.00	13.70	3−2	
1856.504	A	50	7.14	13.79	2−1	
1875.469	A	100	7.23	13.81	1−0	
1885.834	A	2000	6.80	13.35	4−4	
1887.398	A	1000	7.00	13.55	3−3	
1883.352	A	500	7.14	13.70	2−2	
1880.326	A	300	7.23	13.79	1−1	
1946.507	A	50	7.00	13.35	3−4	
1782.548	A	4000	6.53	13.46	5−6	$a\,^5F - z\,^5G°$† (66)
1852.274	A	2000	6.80	13.47	4−5	
1851.592	A	1500	7.00	13.67	3−4	
1859.206	A	1000	7.14	13.78	2−3	
1877.027	A	400	7.23	13.80	1−2	
1780.617	A	200	6.53	13.47	5−5	
1796.616	A	100	6.80	13.67	4−4	
1821.839	A	50	7.00	13.78	3−3	
1795.083	A	150	7.00	13.88	3−4	$a\,^5F - z\,^3F°$† (67)
1741.619	A	500	6.80	13.89	4−5	$a\,^5F - z\,^3G°$† (68)
1719.856	A	200	7.00	14.18	3−4	
1704.330	A	100	7.14	14.38	2−3	

Pd III—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1727.375	A	100	7.14	14.29	2–3	$a\ ^5F - z\ ^3D°$†
1716.367	A	50h	7.23	14.42	1–2	(69)
1535.308	A	300	6.80	14.84	4–3	$a\ ^5F - z\ ^5P°$†
1579.741	A	100	7.00	14.82	3–2	(70)
1449.625	A	100	6.53	15.05	5–4	$a\ ^5F - y\ ^5D°$†
1565.202	A	200	7.14	15.03	2–1	(71)
1584.160	A	50	7.23	15.02	1–0	
Air						
2149.143	A	500	7.72	13.47	4–5	$b\ ^3F - z\ ^5G°$†
2197.412	A	200	8.06	13.67	3–4	(72)
2074.546	A	200	7.72	13.67	4–4	
2123.684	A	200	8.06	13.87	3–2	$b\ ^3F - z\ ^5S°$† (73)
2003.827	A	1000	7.72	13.88	4–4	$b\ ^3F - z\ ^3F°$†
2059.227	A	150	8.06	14.05	3–3	(74)
Vac						
1951.500	A	400	7.72	14.05	4–3	
1980.882	A	200	8.06	14.29	3–2	
Air						
2001.516	A	1000	7.72	13.89	4–5	$b\ ^3F - z\ ^3G°$
2014.226	A	500	8.06	14.18	3–4	(75)
2022.013	A	300	8.28	14.38	2–3	
Vac						
1880.547	A	50	7.72	14.29	4–3?	$b\ ^3F - z\ ^3D°$
1940.447	A	50	8.06	14.42	3–2	(76)
1980.703	A	200	8.28	14.51	2–1	
1980.939	A	300	8.06	14.29	3–3	
Air						
2010.978	A	250	8.28	14.42	2–2	
Vac						
1819.274	A	150	8.06	14.84	3–3	$b\ ^3F - z\ ^5P°$† (77)
1765.403	A	200	8.06	15.05	3–4	$b\ ^3F - y\ ^5D°$† (78)
*1616.290	A	200d?	7.72	15.36	4–4?	$b\ ^3F - z\ ^1G°$
1689.838	A	50	8.06	15.36	3–4	(79)
1610.745	A	50h	7.72	15.39	4–3	$b\ ^3F - y\ ^3D°$†
1683.821	A	200h	8.06	15.39	3–3	(80)
Air						
2144.305	A	300	8.11	13.87	3–2	$a\ ^5P - z\ ^5S°$
2147.995	A	200	8.12	13.87	2–2	(81)
2212.809	A	100	8.29	13.87	1–2	
Vac						
1998.812	A	200	8.11	14.29	3–2	$a\ ^5P - z\ ^3F°$ (82)
Air						
2032.776	A	250	8.11	14.18	3–4	$a\ ^5P - z\ ^3G°$† (83)
Vac						
1998.880	A	200	8.11	14.29	3–3	$a\ ^5P - z\ ^3D°$† (84)
1834.386	A	200	8.11	14.84	3–3	$a\ ^5P - z\ ^5P°$†
1843.148	A	150	8.12	14.82	2–2	(85)
1840.438	A	50	8.11	14.82	3–2	
1871.263	A	100	8.12	14.72	2–1	
1837.073	A	200	8.12	14.84	2–3	

Pd III—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1708.568	A	100	8.11	15.34	3–3	$a\ ^5P - y\ ^3F°$† (86)
1779.629	A	300	8.11	15.05	3–4	$a\ ^5P - y\ ^5D°$†
1732.634	A	250	8.12	15.25	2–3	(87)
1790.772	A	100	8.29	15.18	1–2	
1832.067	A	150	8.29	15.03	1–1	
1834.832	A	100	8.29	15.02	1–0?	
1585.033	A	50h	8.11	15.90	3–2	$a\ ^5P - x\ ^3D°$
*1616.290	A	200d?	8.12	15.76	2–3?	(88)
1622.114	A	50h	8.29	15.90	1–2	
1604.319	A	100h	8.11	15.81	3–3?	$a\ ^5P - w\ ^3D°$†
1601.893	A	100	8.12	15.83	2–2	(89)
1874.629	A	1500	8.64	15.23	5–6	$a\ ^3G - z\ ^3H°$† (90)
Air						
2013.831	A	500	8.77	14.90	4–5	
Vac						
*2000.553	A	300	8.99	15.16	3–4	
1972.296	A	300	8.64	14.90	5–5	
1954.039	A	300	8.64	14.96	5–4	$a\ ^3G - y\ ^3F°$†
1880.064	A	250	8.77	15.34	4–3	(91)
1831.753	A	200	8.99	15.72	3–2	
1995.443	A	150	8.77	14.96	4–4	
1943.000	A	50	8.99	15.34	3–3	
1836.672	A	250	8.64	15.36	5–4	$a\ ^3G - z\ ^1G°$
1873.197	A	200	8.77	15.36	4–4	(92)
1865.782	A	150	8.77	15.39	4–3	$a\ ^3G - y\ ^3D°$ (93)
1804.908	A	400	8.64	15.48	5–5	$a\ ^3G - x\ ^3G°$†
1789.987	A	200	8.77	15.67	4–4	(94)
1843.940	A	250	8.99	15.68	3–3	
1840.166	A	50	8.77	15.48	4–5	
1847.473	A	250	8.99	15.67	3–4	
1781.262	A	150	8.77	15.70	4–5	$a\ ^3G - z\ ^1H°$† (95)
Air						
2150.673	A	150	8.98	14.72	2–1	$b\ ^3P - z\ ^5P°$† (96)
Vac						
*1926.770	A	500	8.98	15.39	2–3	$b\ ^3P - y\ ^3D°$†
1944.123	A	50	9.01	15.36	1–2	(97)
1972.575	A	100	9.17	15.43	0–1	
1808.544	A	250	8.98	15.81	2–3	$b\ ^3P - w\ ^3D°$† (98)
1996.550	A	400	9.22	15.40	6–5	$a\ ^3H - y\ ^3G°$
1922.443	A	250	9.38	15.80	5–4	(99)
1956.892	A	150	9.70	16.01	4–3	
1891.341	A	1500	9.22	15.75	6–7	$a\ ^3H - z\ ^3I°$† (100)
Air						
2032.054	A	500	9.38	15.45	5–6	
2026.705	A	500	9.70	15.79	4–5	
Vac						
1971.752	A	200	9.22	15.48	6–5	$a\ ^3H - x\ ^3G°$†
1962.861	A	150	9.38	15.67	5–4	(101)

Pd III—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1818.464	A	200	9.38	16.17	5–6	$a\ ^3H - z\ ^1I^\circ$ (102)
1758.187	A	400	9.22	16.24	6–6	$a\ ^3H - y\ ^3H^\circ\dagger$
1775.162	A	300	9.38	16.33	5–5	(103)
1822.515	A	200	9.70	16.47	4–4	
1799.107	A	100	9.38	16.24	5–6	
Air						
2110.422	A	200	9.31	15.16	4–4	$b\ ^1G - z\ ^3H^\circ$ (104)
2038.970	A	100	9.31	15.36	4–4	$b\ ^1G - z\ ^1G^\circ$ (105)
2025.390	A	100	9.31	15.40	4–5	$b\ ^1G - y\ ^3G^\circ\dagger$ (106)
Vac						
*2000.553	A	300	9.31	15.48	4–5	$b\ ^1G - x\ ^3G^\circ\dagger$
1941.332	A	100	9.31	15.67	4–4	(107)
1988.426	A	200	9.31	15.52	4–3	$b\ ^1G - z\ ^1F^\circ$ (108)
1931.090	A	400	9.31	15.70	4–5	$b\ ^1G - z\ ^1H^\circ$ (109)
1722.735	A	150	9.31	16.47	4–4	$b\ ^1G - y\ ^3H^\circ\dagger$ (110)
*1999.101	A	100	9.31	15.49	2–1	$c\ ^3P - z\ ^3P^\circ\dagger$ (111)
Air						
2032.333	A	200	9.31	15.39	2–3	$c\ ^3P - y\ ^3D^\circ\dagger$
2040.802	A	100	9.31	15.36	2–2	(112)
Vac						
1975.354	A	150	9.31	15.56	2–2	$c\ ^3P - y\ ^3P^\circ\dagger$
1957.187	A	50	9.39	15.70	1–1	(113)
*1999.101	A	100	9.39	15.56	1–2	
1745.562	A	150	9.31	16.39	2–2	$c\ ^3P - z\ ^1D^\circ$ (114)
1620.629	A	100	9.31	16.93	2–3	$c\ ^3P - x\ ^1F^\circ$ (115)
Air						
2123.302	A	100	9.41	15.22	3–2?	$a\ ^3D - z\ ^3P^\circ\dagger$ (116)
2103.508	A	100	9.65	15.52	2–3	$a\ ^3D - z\ ^1F^\circ\dagger$ (117)
Vac						
1944.537	A	200	9.41	15.76	3–3	$a\ ^3D - x\ ^3D^\circ\dagger$
1975.190	A	200	9.65	15.90	2–2	(118)
1843.490	A	400	9.41	16.11	3–4	$a\ ^3D - x\ ^3F^\circ\dagger$
1856.161	A	200	9.65	16.30	2–3	(119)
1904.721	A	75	9.64	16.13	1–2	
1833.300	A	100	9.65	16.38	2–1	$a\ ^3D - z\ ^1P^\circ$ (120)

Pd III—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2118.887	A	150	9.98	15.80	5–4	$a\ ^1H - y\ ^3G^\circ$ (121)
Vac						
1993.845	A	400	9.98	16.17	5–6	$a\ ^1H - z\ ^1I^\circ$ (122)
1857.558	A	200	9.98	16.62	5–4	$a\ ^1H - y\ ^1G^\circ$ (123)
1784.367	A	300	9.98	16.89	5–5	$a\ ^1H - y\ ^1H^\circ$ (124)
1986.874	A	150	10.20	16.41	1–2	$a\ ^1P - y\ ^1D^\circ$ (125)
1922.522	A	100	10.27	16.69	2–2	$b\ ^1D - x\ ^3P^\circ\dagger$ (126)
1917.472	A	200	10.27	16.71	2–3	$b\ ^1D - y\ ^1F^\circ$ (127)
1815.574	A	250	10.71	17.51	4–5	$c\ ^3F - w\ ^3G^\circ\dagger$ (128)
Air						
2009.864	A	50	10.55	16.69	2–3	
Vac						
1913.729	A	150	10.71	17.17	4–4	
Air						
2066.985	A	150	10.71	16.69	4–3	
Vac						
1812.094	A	150	10.71	17.53	4–4	$c\ ^3F - w\ ^3F^\circ\dagger$
1830.063	A	150	10.60	17.34	3–3	(129)
1886.978	A	50	10.55	17.09	2–2	
1813.523	A	150	10.55	17.35	2–2	$c\ ^3F - x\ ^1D^\circ$ (130)
1811.975	A	200	10.60	17.41	3–4	$c\ ^3F - x\ ^1G^\circ$ (131)
1835.265	A	150	10.71	17.44	4–3	$c\ ^3F - v\ ^3D^\circ\dagger$
1803.315	A	150	10.60	17.44	3–3	(132)
Air						
2150.931	A	150	11.19	16.93	3–3	$a\ ^1F - x\ ^1F^\circ$ (133)
Vac						
1986.718	A	100	11.19	17.41	3–4	$a\ ^1F - x\ ^1G^\circ$ (134)
1917.281	A	150	12.89	19.33	3–3	$b\ ^3D - u\ ^3D^\circ$ (135)
1545.957	A	500	12.98	20.97	5–5	$z\ ^5F^\circ - e\ ^5F\dagger$
1517.185	A	200h	12.89	21.03	4–4	(136)
1534.092	A	100	12.98	21.03	5–4	
1526.252	A	100	13.35	21.44	4–4?	$z\ ^5D^\circ - e\ ^3F$ (137)

SILVER, $Z = 47$

Ag I

I P 7.54 Anal A List C July 1952

REFERENCE

A A. G. Shenstone, Phys. Rev. **57**, 897 (1940). W L, I, T, I P

Ag I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2061.168	A	200	0.00	5.99	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ ^2S - 6p\ ^2P^\circ$ (1)
2069.850	A	100	0.00	5.96	$0\frac{1}{2}-0\frac{1}{2}$	
Vac						
1847.73	A	20	0.00	6.68	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ ^2S - 7p\ ^2P^\circ$ (2)
1850.47	A	5	0.00	6.67	$0\frac{1}{2}-0\frac{1}{2}$	
1709.26	A	50	0.00	7.22	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ ^2S - 5p'\ ^4P^\circ$ (3)
1651.87	A	100u	0.00	7.47	$0\frac{1}{2}-0\frac{1}{2}$	
1766.20	A	10u	0.00	6.99	$0\frac{1}{2}-0\frac{1}{2}$	$5s\ ^2S - 8p\ ^2P^\circ$ (4)
1574.02	A	5	0.00	7.84	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ ^2S - 5p'\ ^4D^\circ$ (5)
1548.58	A	50RUU	0.00	7.97	$0\frac{1}{2}-0\frac{1}{2}$	
1515.63	A	100RUU	0.00	8.15	$0\frac{1}{2}-$	$5s\ ^2S - 5p'\ ^2P^\circ$ (6)
1507.37	A	50RUU	0.00	8.19	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ ^2S - 5p'\ ^2D^\circ$ (7)

Ag I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2824.39	A	100U	3.73	8.10	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ ^2D - 5p'\ ^2F^\circ$ (8)
2721.77	A	50	3.73	8.27	$2\frac{1}{2}-2\frac{1}{2}$	$5s^2\ ^2D - 5p'\ ^2D^\circ$ (9)
2375.02	A	50UU	3.73	8.93	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ ^2D - 5p''\ ^2F^\circ$ (10)
2312.60	A	10UU	3.73	9.07	$2\frac{1}{2}-1\frac{1}{2}$	$5s^2\ ^2D - 5p''\ ^2P^\circ$ (11)
2575.63	A	50U	4.29	9.08	$1\frac{1}{2}-2\frac{1}{2}$	$5s^2\ ^2D - 5p''\ ^2D^\circ$ (12)
2309.56	A	30U	3.73	9.08	$2\frac{1}{2}-2\frac{1}{2}$	

Ag II

I P 21.4 Anal A List C March 1952

REFERENCES

A A. G. Shenstone, Phys. Rev. **31**, 317 (1928); **36**, 174 (1930). W L, I, T, I P
B W. P. Gilbert, Phys. Rev. **47**, 847 (1935). W L, I, T, I P
C E. Rasmussen, Kgl. Danske Videnskab. Selskab., Math.-fys. Med. **18**, No. 5, p. 21 (1940). W L, I, T
D H. A. Blair, Phys. Rev. **36**, 174 (1930). W L, I, T
E F. Exner und E. Haschek, see References A and C above. W L
F H. E. White, see Ref. A. W L, (I)
G O. S. Duffendack and K. Thomson, see Ref. B. W L, (I), T

Ag II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1195.87	F	(50)	0.00	10.32	0−1	$4d^{10}\ ^1S - 5p\ ^3P^\circ$ (1)
1107.05	F	(25)	0.00	11.15	0−1	$4d^{10}\ ^1S - 5p\ ^3D^\circ$ (2)
1112.46	F	(80)	0.00	11.10	0−1	$4d^{10}\ ^1S - 5p\ ^1P^\circ$ (3)
752.80	G	(30)	0.00	16.40	0−1	$4d^{10}\ ^1S - 6p\ ^3P^\circ$ (4)
730.83	G	(25)	0.00	16.89	0−1	$4d^{10}\ ^1S - 6p\ ^1P^\circ$ (5)
Air						
2437.81	E	100R	4.83	9.90	3−2	$5s\ ^3D - 5p\ ^3P^\circ$ (6)
2331.40	E	80R	5.03	10.32	2−1	
2357.92	E	70	5.40	10.63	1−0	
2535.30	E	30	5.03	9.90	2−2	
2506.63	E	60	5.40	10.32	1−1	
2743.92	E	15	5.40	9.90	1−2	
2246.43‡	E	100R	4.83	10.33	3−4	$5s\ ^3D - 5p\ ^3F^\circ$ (7)
2413.23	E	90R	5.03	10.14	2−3	
2317.05	E	70R	5.40	10.73	1−2	
2324.68	E	70R	4.83	10.14	3−3	
2166.51	A	45	5.03	10.73	2−2	
2113.82	A	80R	4.83	10.67	3−3	$5s\ ^3D - 5p\ ^3D^\circ$† (8)
2248.74	A	75R	5.03	10.52	2−2	
2145.60	A	60	5.40	11.15	1−1	
2171.66	A	10	4.83	10.52	3−2	
2015.89	A	15	5.03	11.15	2−1	
2186.76	A	50	5.03	10.67	2−3	
2411.41	E	75	5.40	10.52	1−2	
2000.68	A	20	4.83	11.00	3−3	$5s\ ^3D - 5p\ ^1F^\circ$ (9)
2065.90	A	40	5.03	11.00	2−3	
2120.45	A	40	5.40	11.22	1−2	$5s\ ^3D - 5p\ ^1D^\circ$ (10)
Vac						
1994.32	A	20	5.03	11.22	2−2	
Air						
2929.37	E	30	5.68	9.90	2−2	$5s\ ^1D - 5p\ ^3P^\circ$ (11)
2660.49	E	60	5.68	10.32	2−1	
2767.54	E	75	5.68	10.14	2−3	$5s\ ^1D - 5p\ ^3F^\circ$ (12)
2447.93	E	80	5.68	10.73	2−2	
2473.84	E	80	5.68	10.67	2−3	$5s\ ^1D - 5p\ ^3D^\circ$† (13)
2320.29	E	80R	5.68	11.00	2−3	$5s\ ^1D - 5p\ ^1F^\circ$ (14)
2280.03	E	75	5.68	11.10	2−1	$5s\ ^1D - 5p\ ^1P^\circ$ (15)
2229.53	A	60	5.68	11.22	2−2	$5s\ ^1D - 5p\ ^1D^\circ$ (16)

Ag II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2477.25	E	25u	9.90	14.88	2−3	$5p\ ^3P^\circ - 6s\ ^3D$† (17)
2681.38	E	20u	10.32	14.93	1−2	
2202.09	A	40u	9.90	15.50	2−1	$5p\ ^3P^\circ - 5d\ ^3S$† (18)
2383.17	E	8u	10.32	15.50	1−1	
*2145.76	A	20u	9.90	15.65	2−2	$5p\ ^3P^\circ - 5d\ ^3P$† (19)
2226.02	A	15	10.32	15.87	1−0	
2125.50	A	18u	9.90	15.70	2−3	$5p\ ^3P^\circ - 5d\ ^3D$† (20)
2277.43	E	10u	10.32	15.74	1−2	
2203.64	A	15u	10.63	16.23	0−1	
2712.07	E	40u	10.33	14.88	4−3	$5p\ ^3F^\circ - 6s\ ^3D$ (21)
2580.77	E	35u	10.14	14.93	3−2	
2614.56	E	15u	10.73	15.45	2−1	
2606.14	E	15u	10.14	14.88	3−3	
2938.55	E	15u	10.73	14.93	2−2	
2325.12	E	40u	10.33	15.64	4−5	$5p\ ^3F^\circ - 5d\ ^3G$† (22)
2246.14	A	20u?	10.14	15.64	3−4	
2253.45	E	30u	10.73	16.20	2−3	
2275.32	E	25u	10.33	15.75	4−4	$5p\ ^3F^\circ - 5d\ ^3F$ (23)
2205.95	A	35u	10.14	15.74	3−3	
2208.49	A	15u	10.73	16.31	2−2	
2462.26	E	20u	10.73	15.74	2−3	
2934.24	E	30u	10.67	14.88	3−3	$5p\ ^3D^\circ - 6s\ ^3D$† (24)
2799.70	E	30u	10.52	14.93	2−2	
2873.62	E	20u	11.15	15.45	1−1	
2902.09	E	20u	10.67	14.93	3−2	
2170.87	A	25u	10.52	16.20	2−3	$5p\ ^3D^\circ - 5d\ ^3G$† (25)
2480.41	E	20u	10.67	15.65	3−2	$5p\ ^3D^\circ - 5d\ ^3P$ (26)
2405.00	E	8u	10.52	15.65	2−1	
2617.01	D	12	11.15	15.87	1−0	
2743.78	D	10	11.15	15.65	1−1	
2453.31	E	30u	10.67	15.70	3−3	$5p\ ^3D^\circ - 5d\ ^3D$† (27)
2362.20	E	20u	10.52	15.74	2−2	
2429.65	E	35u	10.67	15.75	3−4	$5p\ ^3D^\circ - 5d\ ^3F$† (28)
2364.01	E	30u	10.52	15.74	2−3	
2390.58	E	25u	11.15	16.31	1−2	
*2145.76	A	20u	10.52	16.27	2−2	$5p\ ^3D^\circ - 5d\ ^1D$ (29)
2411.59	D	20	11.15	16.27	1−2	
2756.48	E	35u	11.00	15.48	3−2	$5p\ ^1F^\circ - 6s\ ^1D$ (30)
2358.87	E	35u	11.00	16.23	3−4	$5p\ ^1F^\circ - 5d\ ^1G$ (31)
2815.57	E	20u	11.10	15.48	1−2	$5p\ ^1P^\circ - 6s\ ^1D$ (32)

Ag II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2711.21	E	15u	11.10	15.65	1–1	$5p\ ^1P^\circ - 5d\ ^3P$† (33)
2243.44	D	40	11.10	16.60	1–0	$5p\ ^1P^\circ - 5d\ ^1S$ (34)
2920.07	E	15u	11.22	15.45	2–1	$5p\ ^1D^\circ - 6s\ ^3D$† (35)
2896.50	E	20u	11.22	15.48	2–2	$5p\ ^1D^\circ - 6s\ ^1D$ (36)
Air						
2444.22	E	25u	11.22	16.27	2–2	$5p\ ^1D^\circ - 5d\ ^1D$ (37)
2420.11	E	30u	11.22	16.32	2–3	$5p\ ^1D^\circ - 5d\ ^1F$ (38)
2596.84	C	15	11.60	16.35	4–4	$5s^2\ ^3F - 6p\ ^3F^\circ$† (39)
2878.79	E	15	12.09	16.38	3–4	$5s^2\ ^3F - 1^\circ$ (40)

Ag III

I P 36.0 Anal B List C April 1953

REFERENCE

A W. P. Gilbert, Phys. Rev. 48, 338 (1935). W L, I, T, I P

Ag III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
808.88	A	30	0.00	15.26	2½–3½	$4d^9\ ^2D - 5p\ ^4F^\circ$† (1)
822.39	A	18	0.57	15.58	1½–2½	
792.35	A	25	0.00	15.58	2½–2½	
838.11	A	20	0.57	15.30	1½–1½	
799.41	A	40	0.00	15.44	2½–2½	$4d^9\ ^2D - 5p\ ^2D^\circ$† (2)
829.98	A	8	0.57	15.44	1½–2½	
789.08	A	20	0.00	15.65	2½–3½	$4d^9\ ^2D - 5p\ ^2F^\circ$† (3)
776.38	A	35	0.00	15.90	2½–2½	
730.04	A	35	0.00	16.91	2½–3½	$4d^9\ ^2D - 5p'\ ^4D^\circ$† (4)
755.73	A	15	0.57	16.90	1½–2½	
709.80	A	20	0.00	17.39	2½–3½	$4d^9\ ^2D - 5p'''\ ^2F^\circ$ (5)
726.96	A	30	0.57	17.55	1½–2½	
1917.08	A	60	7.81	14.25	4½–3½	$5s\ ^4F - 5p\ ^4D^\circ$† (6)
1873.45	A	40	8.12	14.71	3½–2½	
1856.33	A	15	8.41	15.06	2½–1½	
1849.93	A	12	8.56	15.23	1½–0½	
1751.03	A	75	7.81	14.86	4½–5½	$5s\ ^4F - 5p\ ^4G^\circ$† (7)
1916.92	A	40	8.12	14.56	3½–4½	
1889.57	A	30	8.41	14.95	2½–3½	
1880.36	A	25	8.56	15.13	1½–2½	
1828.83	A	35	7.81	14.56	4½–4½	
1808.23	A	30	8.12	14.95	3½–3½	
1838.64	A	15	8.41	15.13	2½–2½	
1693.51	A	50	7.81	15.10	4½–4½	$5s\ ^4F - 5p\ ^4F^\circ$† (8)
1728.14	A	25	8.12	15.26	3½–3½	
1722.27	A	20	8.41	15.58	2½–2½	
*1832.33	A	25	8.56	15.30	1½–1½	
1768.70	A	15	8.12	15.10	3½–4½	
1802.24	A	15	8.41	15.26	2½–3½	
Air						
2161.89	A	60	8.85	14.56	3½–4½	$5s\ ^2F - 5p\ ^4G^\circ$† (9)
2056.99	A	20	9.13	15.13	2½–2½	
Vac						
1966.89	A	40	8.85	15.13	3½–2½	
*1975.92	A	60	8.85	15.10	3½–4½	$5s\ ^2F - 5p\ ^4F^\circ$† (10)
Air						
2011.49	A	20	9.13	15.26	2½–3½	
Vac						
1925.30	A	20	8.85	15.26	3½–3½	
2000.24	A	60	9.13	15.30	2½–1½	
1867.12	A	35	8.85	15.46	3½–4½	$5s\ ^2F - 5p\ ^2G^\circ$† (11)
1858.91	A	12	9.13	15.77	2½–3½	
Air						
2562.87	A	10	9.43	14.25	2½–3½	$5s'\ ^4P - 5p\ ^4D^\circ$† (12)
2395.69	A	30	9.56	14.71	1½–2½	
Vac						
1977.03	A	50	10.52	16.76	1½–2½	$5s'\ ^2P - 5p''\ ^2D^\circ$† (13)
1840.14	A	40	10.57	17.28	4½–5½	$5s'''\ ^2G - 5p'''\ ^2H^\circ$† (14)
1957.62	A	70	10.58	16.89	3½–4½	

CADMIUM, $Z = 48$

Cd I

I P 8.955 Anal A List C June 1953

REFERENCES

A See A. Fowler, *Report on Series in Line Spectra* p. 142 (Fleetway Press, London, 1922). W L, I, T, I P
B A. E. Ruark, J. Opt. Soc. Am. **11**, 206 (1925). W L, I, T
C W. F. Meggers and K. Burns, Sci. Papers Bur. Std. 18, 185, No. 441 (1922). W L
D C. W. Hetzler, R. W. Boreman, and K. Burns, Phys. Rev. 48, 656 (1935). W L

Cd I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air 2288.018‡	D	10R	0.00	5.39	0−1	$5s^2\ ^1S - 5p\ ^1P^\circ$ (1)
Vac 1710.51	A	3	0.00	7.22	0−1	$5s^2\ ^1S - 6p\ ^2P^\circ$ (2)
1669.29	A	10	0.00	7.40	0−1	$5s^2\ ^1S - 6p\ ^1P^\circ$ (3)
1526.85	A	8	0.00	8.09	0−1	$5s^2\ ^1S - 7p\ ^1P^\circ$ (4)
1469.39	A	6	0.00	8.40	0−1	$5s^2\ ^1S - 8p\ ^1P^\circ$ (5)
Air 2980.6216	C	8R	3.93	8.07	2−3	$5p\ ^3P^\circ - 6d\ ^3D$ (6)
2880.77	A	8R	3.78	8.07	1−2	
2836.90	A	8R	3.72	8.07	0−1	
2981.34	A	4R	3.93	8.07	2−2	
2881.23	A	4R	3.78	8.07	1−1	
2981.89	A	1	3.93	8.07	2−1	

Cd I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air 2868.26	A	6r	3.93	8.23	2−1	$5p\ ^3P^\circ - 8s\ ^3S$ (7)
2775.047	D	6r	3.78	8.23	1−1	
2733.88	A	4r	3.72	8.23	0−1	
2763.89	A	6R	3.93	8.39	2−3	$5p\ ^3P^\circ - 7d\ ^3D$ (8)
*2677.64	A	8d	3.78	8.39	1−2	
2639.50	A	6R	3.72	8.39	0−1	
2764.19	A	2R	3.93	8.39	2−2	
*2677.64	A	8d	3.78	8.39	1−1	
2712.40	A	6r	3.93	8.48	2−1	$5p\ ^3P^\circ - 9s\ ^3S$ (9)
2629.06	A	4r	3.78	8.48	1−1	
2592.14	A	2r	3.72	8.48	0−1	
2660.40	A	4r	3.93	8.57	2−3	$5p\ ^3P^\circ - 8d\ ^3D$ (10)
2580.27	A	2n	3.78	8.57	1−2	
2544.72	A	2n	3.72	8.57	0−1	
2632.25	A	2r	3.93	8.62	2−1	$5p\ ^3P^\circ - 10s\ ^3S$ (11)
2553.53	A	—	3.78	8.62	1−1	
2518.70	A	—	3.72	8.62	0−1	
2267.46	B	5R	3.78	9.23	1−1	$5p\ ^3P^\circ - 5p^2\ ^3P'$ (12)
2329.27	B	10R	3.93	9.23	2−1	
2306.61	B	5R	3.78	9.13	1−0	
2239.86	B	5R	3.72	9.23	0−1	

Cd II

I P 16.835 Anal A List C February 1953

REFERENCE

A A. G. Shenstone and J. T. Pittenger, J. Opt. Soc. Am. 39, 220 (1949). W L, I, T, I P

Cd II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air 2144.408‡	A	1000R	0.00	5.76	0½−1½	$5s\ ^2S - 5p\ ^2P^\circ$ (1)
2265.018	A	1000	0.00	5.45	0½−0½	
Vac[3] 1048.38	A	40	0.00	11.78	0½−1½	$5s\ ^2S - 6p\ ^2P^\circ$ (2)
1055.83	A	25	0.00	11.69	0½−0½	
913.72	A	20	0.00	13.51	0½−1½	$5s\ ^2S - 5p'\ ^4P^\circ$ (3)
891.28	A	25	0.00	13.85	0½−0½	

Cd II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 860.38	A	30	0.00	14.35	0½−1½	$5s\ ^2S - 5p'\ ^4D^\circ$ (4)
847.52	A	25	0.00	14.57	0½−0½	
839.94	A	30	0.00	14.70	0½−1½	$5s\ ^2S - 5p'\ ^2P^\circ$ (5)
838.26	A	30	0.00	14.73	0½−0½	
Air 2748.549	A	1000	5.76	10.25	1½−0½	$5p\ ^2P^\circ - 6s\ ^2S$ (6)
2572.930	A	500	5.45	10.25	0½−0½	

Cd II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2312.766	A	1000	5.76	11.09	1½−2½	5p ²P° −5d ²D
2194.557	A	1000	5.45	11.07	0½−1½	(7)
2321.074	A	200	5.76	11.07	1½−1½	
Vac						
1647.93	A	60	5.76	13.25	1½−0½	5p ²P° −7s ²S
1583.17	A	50	5.45	13.25	0½−0½	(8)
1571.58	A	200	5.76	13.61	1½−2½	5p ²P° −6d ²D
1514.26	A	200	5.45	13.60	0½−1½	(9)
1573.42	A	50	5.76	13.60	1½−1½	
1404.11	A	75	5.76	14.57	1½−0½	5p ²P° −8s ²S
1353.08	A	40	5.45	14.57	0½−0½	(10)
1370.91	A	150	5.76	14.76	1½−2½	5p ²P° −7d ²D
1326.50	A	100	5.45	14.76	0½−1½	(11)
1371.65	A	50	5.76	14.76	1½−1½	
1296.43	A	150	5.76	15.28	1½−0½	5p ²P° −9s ²S
1256.00	A	100	5.45	15.28	0½−0½	(12)
Air						
2551.976	A	50	8.55	13.39	2½−3½	5s² ²D −4f ²F°
2552.827	A	15	8.55	13.38	2½−2½	(13)
2469.733	A	50	8.55	13.55	2½−3½	5s² ²D −5p′ ⁴F°†
2834.081	A	20	9.25	13.60	1½−2½	(14)
2495.584	A	40	9.25	14.19	1½−2½	5s² ²D −5p′ ⁴D°
2187.794	A	100	8.55	14.19	2½−2½	(15)
2418.694	A	50	9.25	14.35	1½−1½	
Vac						
1995.43	A	200	8.55	14.74	2½−3½	5s² ²D −5p′ ²F°
Air						(16)
2376.820	A	40	9.25	14.44	1½−2½	
2096.00	A	150	8.55	14.44	2½−2½	

Cd II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2032.44	A	50	8.55	14.62	2½−3½	5s² ²D −5f ²F°
2290.110	A	20	9.25	14.63	1½−2½	(17)
2028.26	A	20	8.55	14.63	2½−2½	
2007.49	A	100	8.55	14.70	2½−1½	5s² ²D −5p′ ²P°†
Vac						(18)
1922.23	A	300	8.55	14.97	2½−2½	5s² ²D −5p′ ²D°
Air						(19)
2209.653	A	20	9.25	14.83	1½−1½	
Vac						
1965.54	A	40	8.55	14.83	2½−1½	
Air						
2155.062	A	50	9.25	14.97	1½−2½	
Vac						
1943.54	A	100	8.55	14.90	2½−1½	5s² ²D −8p ²P°†
Air						(20)
2186.300	A	15	9.25	14.89	1½−0½	
Vac						
1827.70	A	100	8.55	15.30	2½−3½	5s² ²D −6f ²F°†
Air						(21)
2036.22	A	75	9.25	15.31	1½−2½	
Vac						
1785.84	A	100	8.55	15.46	2½−1½	5s² ²D −9p ²P°†
1986.89	A	30	9.25	15.46	1½−0½	(22)
1668.60	A	100	8.55	15.95	2½−3½	5s² ²D −5p″ ²F°
1759.78	A	20	9.25	16.26	1½−2½	(23)
1601.04	A	50	8.55	16.26	2½−2½	
Air						
2929.271	A	200	11.09	15.30	2½−3½	5d ²D −6f ²F°
2914.672	A	200	11.07	15.31	1½−2½	(24)
2927.867	A	50	11.09	15.31	2½−2½	

Cd III

I P 37.32 Anal B List B January 1961

REFERENCE

A A. G. Shenstone and J. T. Pittenger, J. Opt. Soc. Am. **39**, 219 (1949). I P, T, C L, W L, I

Cd III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
720.70	A	10	0.00	17.13	0−1	4d ¹S −5p ³P°
						(1)
677.39	A	8	0.00	18.22	0−1	4d ¹S −5p ³D°
						(2)
684.58	A	15	0.00	18.03	0−1	4d ¹S −5p ¹P°
						(3)
1874.08	A	150	9.93	16.52	3−2	5s ³D −5p ³P°†
1773.06	A	40	10.17	17.13	2−1	(4)
1789.19	A	30	10.64	17.54	1−0	
1707.16	A	40	9.93	17.16	3−4	5s ³D −5p ³F°
1856.67	A	200	10.17	16.82	2−3	(5)
1768.82	A	30	10.64	17.62	1−2	
1793.40	A	75	9.93	16.82	3−3	
1655.63	A	25	10.17	17.62	2−2	

Cd III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1601.59	A	40	9.93	17.64	3−3	5s ³D −5p ³D°†
1721.93	A	40	10.17	17.34	2−2	(6)
1628.54	A	25	10.64	18.22	1−1	
1651.87	A	20	10.17	17.64	2−3	
1844.66	A	50	10.64	17.34	1−2	
Air						
2111.60	A	50	10.97	16.82	2−3	5s ¹D −5p ³F°
Vac						(7)
1855.85	A	40	10.97	17.62	2−2	
1851.13	A	40	10.97	17.64	2−3	5s ¹D −5p ³D°†
						(8)
1747.67	A	40	10.97	18.03	2−3	5s ¹D −5p ¹F°
						(9)

Cd III—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 1678.15	A	30	10.97	18.33	2–2	$5s\ ^1D - 5p\ ^1D^\circ$ (10)
1725.66	A	30	16.52	23.67	2–2	$5p\ ^3P^\circ - 5s^2\ ^3P\dagger$
1604.87	A	20	16.52	24.21	2–1	(11)
1739.00	A	25	17.13	24.23	1–0	
1886.49	A	15	17.13	23.67	1–2	
1851.37	A	20	17.54	24.21	0–1	
1547.57	A	25	16.52	24.50	2–2	$5p\ ^3P^\circ - 5s^2\ ^1D\dagger$ (12)
1416.28	A	25	16.52	25.24	2–3	$5p\ ^3P^\circ - 6s\ ^3D\dagger$ (13)
Air 2499.81	A	25	17.16	22.10	4–4	$5p\ ^3F^\circ - 5s^2\ ^3F\dagger$
2087.92	A	75	16.82	22.73	3–3	(14)
2039.83	A	40	17.62	23.67	2–2	$5p\ ^3F^\circ - 5s^2\ ^3P$ (15)
Vac 1545.17	A	50	16.82	24.81	3–4	$5p\ ^3F^\circ - 5s^2\ ^1G\dagger$ (16)
1529.30	A	30	17.16	25.24	4–3	$5p\ ^3F^\circ - 6s\ ^3D\dagger$
1455.74	A	30	16.82	25.30	3–2	(17)

Cd III—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 1447.55	A	25	16.82	25.34	3–4	$5p\ ^3F^\circ - 5d\ ^3G\dagger$ (18)
Air 2766.992	A	20	17.64	22.10	3–4	$5p\ ^3D^\circ - 5s^2\ ^3F\dagger$
2618.807	A	15	18.22	22.94	1–2	(19)
2045.60	A	50	17.64	23.67	3–2	$5p\ ^3D^\circ - 5s^2\ ^3P\dagger$
2061.25	A	10	18.22	24.21	1–1	(20)
Vac 1722.95	A	40	17.64	24.81	3–4	$5p\ ^3D^\circ - 5s^2\ ^1G$ (21)
1909.98	A	25	18.03	24.50	1–2	$5p\ ^1P^\circ - 5s^2\ ^1D$ (22)
1823.41	A	40	18.03	24.81	3–4	$5p\ ^1F^\circ - 5s^2\ ^1G$ (23)
1550.45	A	20	18.03	26.00	3–2	$5p\ ^1F^\circ - 6s\ ^1D$ (24)
Air 2805.588	A	30	18.33	22.73	2–3	$5p\ ^1D^\circ - 5s^2\ ^3F$ (25)
2000.59	A	20	18.33	24.50	2–2	$5p\ ^1D^\circ - 5s^2\ ^1D$ (26)

Cd IV

I P Anal B List C February 1956

REFERENCE

A M. Green, Phys. Rev. **60**, 117 (1941). W L, I, T

Cd IV

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 546.53	A	25	0.00	22.59	2½–3½	$4d^9\ ^2D - 5p\ ^4F^\circ$
554.04	A	18	0.72	23.00	1½–2½	(1)
536.75	A	17	0.00	23.00	2½–2½	
567.03	A	18	0.72	22.49	1½–1½	
548.92	A	10	0.00	22.49	2½–1½	
542.59	A	25	0.00	22.75	2½–2½	$4d^9\ ^2D - 5p\ ^2D^\circ$
551.26	A	11	0.72	23.11	1½–1½	(2)
560.25	A	14	0.72	22.75	1½–2½	
531.50	A	18	0.00	23.23	2½–3½	$4d^9\ ^2D - 5p\ ^2G^\circ$ (3)
534.28	A	17	0.00	23.11	2½–3½	$4d^9\ ^2D - 5p\ ^2F^\circ$
548.00	A	11	0.72	23.25	1½–2½	(4)
531.08	A	18	0.00	23.25	2½–2½	
524.40	A	14	0.00	23.54	2½–2½	$4d^9\ ^2D - 5p'\ ^4P^\circ\dagger$
541.73	A	18	0.72	23.51	1½–1½	(5)
525.18	A	14	0.00	23.51	2½–1½	
514.49	A	17	0.00	23.99	2½–3½	$4d^9\ ^2D - 5p''\ ^2F^\circ\dagger$
537.22	A	14	0.72	23.70	1½–2½	(6)

Cd IV

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 506.31	A	19	0.00	24.38	2½–3½	$4d^9\ ^2D - 5p'\ ^4D^\circ$
519.41	A	14	0.72	24.48	1½–2½	(7)
504.19	A	11	0.00	24.48	2½–2½	
504.49	A	17	0.00	24.47	2½–1½	
493.00	A	17	0.00	25.04	2½–3½	$4d^9\ ^2D - 5p'''\ ^2F^\circ\dagger$
504.09	A	14	0.72	25.21	1½–2½	(8)
1418.89	A	16	13.42	22.12	4½–5½	$5s\ ^4F - 5p\ ^4G^\circ\dagger$
1572.69	A	6	13.79	21.64	3½–4½	(9)
1547.62	A	6	14.17	22.14	2½–3½	
1545.79	A	6	14.34	22.32	1½–2½	
1370.48	A	16	13.42	22.43	4½–4½	$5s\ ^4F - 5p\ ^4F^\circ\dagger$
1403.68	A	12	13.79	22.59	3½–3½	(10)
1397.65	A	10	14.17	23.00	2½–2½	
1513.92	A	6	14.34	22.49	1½–1½	

INDIUM, $Z = 49$

In I

I P 5.761 Anal A List C September 1961

REFERENCES

A F. Paschen, Ann. der Phys. [5] 32, 148 (1938). W L, T, I P
B F. Paschen, Wavelength from center of gravity of hfs components, See reference A. (W L)
C H. S. Uhler and J. W. Tanch, Astroph. J. 55, 291 (1922). W L, (I)
D W. R. S. Garton and K. Codling, Proc. Phys. Soc., 78, 600 (1961). W L
W. F. Meggers, C. H. Corliss, and B. F. Scribner, Nat. Bur. Std. Monograph 32, Part I, 136 (1962). I

In I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2836.905	B	18	0.27	4.62	1½–2½	$5p\ ^2P^\circ - 5p^2\ ^4P$
2775.358	B	4	0.00	4.45	0½–1½	(1)
2956.997	B	2	0.27	4.45	1½–1½	
2858.133	B	3	0.00	4.32	0½–0½	
3051.142	B	—	0.27	4.32	1½–0½	
2932.630	A	110	0.27	4.48	1½–0½	$5p\ ^2P^\circ - 7s\ ^2S$
2753.878	A	70	0.00	4.48	0½–0½	(2)
2710.265	A	160	0.27	4.83	1½–2½	$5p\ ^2P^\circ - 6d\ ^2D$
2560.150	A	110	0.00	4.82	0½–1½	(3)
2713.936	A	30	0.27	4.82	1½–1½	

In I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2601.756	C	20	0.27	5.02	1½–0½	$5p\ ^2P^\circ - 8s\ ^2S$
2460.079	C	6	0.00	5.02	0½–0½	(4)
2521.371	C	10	0.27	5.17	1½–2½	$5p\ ^2P^\circ - 7d\ ^2D$
2389.556	D	2	0.00	5.16	0½–1½	(5)
2522.985	A	—	0.27	5.16	1½–1½	
2468.023	A	30	0.27	5.27	1½–0½	$5p\ ^2P^\circ - 9s\ ^2S$
2340.199	D	(3)	0.00	5.27	0½–0½	(6)
2399.175	D	(3)	0.27	5.42	1½–0½	$5p\ ^2P^\circ - 10s\ ^2S$
2278.196	D	(2)	0.00	5.42	0½–0½	(7)

In II

I P 18.79 Anal A List D August 1953

REFERENCES

A R. J. Lang and R. A. Sawyer, Zeit. Phys. **71,** 456 (1931). W L, I, T

B F. Paschen und J. S. Campbell. Ann. der Phys. [5] **31,** 48 (1938). W L, (I), T, I P (Wavelengths represent the center of gravity of the hfs components for complex lines).

In II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air 2306.049	B	10	0.00	5.35	0−1	$5s^2\ {}^1S - 5p\ {}^3P^\circ$ (1)
Vac 1586.37‡	A	6	0.00	7.78	0−1	$5s^2\ {}^1S - 5p\ {}^1P^\circ$ (2)
Air 2079.26	A	25	5.66	11.59	2−1	$5p\ {}^3P^\circ - 6s\ {}^3S$ (3)
Vac 1977.45	A	20	5.35	11.59	1−1	
1936.25	A	10	5.22	11.59	0−1	
1930.52	A	8	5.66	12.05	2−2	$5p\ {}^3P^\circ - 5p^2\ {}^1D$ (4)
1674.04	A	6	5.66	13.03	2−2	$5p\ {}^3P^\circ - 5p^2\ {}^3P$† (5)
1669.51	A	4	5.35	12.75	1−1	
1741.59	A	5	5.66	12.75	2−1	
1716.74	A	8	5.35	12.54	1−0	

In II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 1770.83	A	6	5.66	12.63	2−3	$5p\ {}^3P^\circ - 5d\ {}^3D$† (6)
1700.01	A	6	5.35	12.61	1−2	
1774.79	A	5	5.66	12.61	2−2	
1702.51	A	6	5.35	12.60	1−1	
1280.49	A	10	5.35	14.99	1−1	$5p\ {}^3P^\circ - 7s\ {}^3S$† (7)
Air 2941.050	B	8	7.78	11.98	1−0	$5p\ {}^1P^\circ - 6s\ {}^1S$ (8)
2890.180	B	20	7.78	12.05	1−2	$5p\ {}^1P^\circ - 5p^2\ {}^1D$ (9)
Vac 1966.88	A	10	7.78	15.64	1−2	$5p\ {}^1P^\circ - 6d\ {}^1D$ (10)
Air 2749.748	B	6	12.05	16.54	2−3	$5p^2\ {}^1D - 5f\ {}^1F^\circ$ (11)

In III

I P 27.92 Anal C List B January 1956

REFERENCE

A R. Nodwell, unpublished material (December 1955). W L, I, T, I P

In III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1625.42	A	100	0.00	7.60	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ ^2S - 5p\ ^2P^\circ$ (1)
1748.83	A	100	0.00	7.06	$0\frac{1}{2}-0\frac{1}{2}$	
685.31	A	7	0.00	18.01	$0\frac{1}{2}-1\frac{1}{2}$	$5s\ ^2S - 6p\ ^2P^\circ$ (2)
691.62	A	5	0.00	17.85	$0\frac{1}{2}-0\frac{1}{2}$	
1850.30	A	40	7.60	14.27	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 5s^2\ ^2D$ (3)
1532.95	A	30	7.06	15.11	$0\frac{1}{2}-1\frac{1}{2}$	
1642.28	A	20	7.60	15.11	$1\frac{1}{2}-1\frac{1}{2}$	
1530.21	A	20	7.60	15.66	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 6s\ ^2S$ (4)
1434.85	A	30	7.06	15.66	$0\frac{1}{2}-0\frac{1}{2}$	
1487.70	A	20	7.60	15.89	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 5d\ ^2D$ (5)
1403.08	A	30	7.06	15.86	$0\frac{1}{2}-1\frac{1}{2}$	
1494.14	A	20	7.60	15.86	$1\frac{1}{2}-1\frac{1}{2}$	
926.83	A	5	7.60	20.92	$1\frac{1}{2}-0\frac{1}{2}$	$5p\ ^2P^\circ - 7s\ ^2S$ (6)
890.84	A	10	7.06	20.92	$0\frac{1}{2}-0\frac{1}{2}$	
915.87	A	10	7.60	21.07	$1\frac{1}{2}-2\frac{1}{2}$	$5p\ ^2P^\circ - 6d\ ^2D$ (7)
882.24	A	10	7.06	21.05	$0\frac{1}{2}-1\frac{1}{2}$	
917.45	A	2	7.60	21.05	$1\frac{1}{2}-1\frac{1}{2}$	

In III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2154.08	A	30	14.27	20.00	$2\frac{1}{2}-3\frac{1}{2}$	$5s^2\ ^2D - 4f\ ^2F^\circ$ (8)
2527.41	A	100	15.11	20.00	$1\frac{1}{2}-2\frac{1}{2}$	
2154.42	A	2	14.27	20.00	$2\frac{1}{2}-2\frac{1}{2}$	
Vac						
1842.41	A	30	15.66	22.36	$0\frac{1}{2}-1\frac{1}{2}$	$6s\ ^2S - 7p\ ^2P^\circ$? (9)
1862.98	A	15	15.66	22.29	$0\frac{1}{2}-0\frac{1}{2}$	
Air						
3008.08	A	100	15.89	20.00	$2\frac{1}{2}-3\frac{1}{2}$	$5d\ ^2D - 4f\ ^2F^\circ$ (10)
2982.80	A	100	15.86	20.00	$1\frac{1}{2}-2\frac{1}{2}$	
3008.82	A	30	15.89	20.00	$2\frac{1}{2}-2\frac{1}{2}$	
2300.90	A	10	18.01	23.38	$1\frac{1}{2}-0\frac{1}{2}$	$6p\ ^2P^\circ - 8s\ ^2S$ (11)
2232.18	A	5	17.85	23.38	$0\frac{1}{2}-0\frac{1}{2}$	
2261.26	A	20	18.01	23.47	$1\frac{1}{2}-2\frac{1}{2}$	$6p\ ^2P^\circ - 7d\ ^2D$ (12)
2199.52	A	10	17.85	23.46	$0\frac{1}{2}-1\frac{1}{2}$	
2266.26	A	5	18.01	23.46	$1\frac{1}{2}-1\frac{1}{2}$	
2726.15	A	80	20.00	24.52	$3\frac{1}{2}-$	$4f\ ^2F^\circ - 6g\ ^2G$ (13)
2725.52	A	50	20.00	24.52	$2\frac{1}{2}-3\frac{1}{2}$	

TIN, $Z = 50$

Sn I

I P 7.303 Anal A List C June 1956

REFERENCES

A W. F. Meggers, J. Research Nat. Bur. Std. **24**, 153, RP1275 (1940). W L, I, T, I P
B A. G. Shenstone, unpublished material (June 1956). W L, (I)

Sn I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2839.99	A	700R	0.42	4.77	2–2	$5p^2\ ^3P - 6s\ ^3P^\circ$ (1)
3009.136	A	700R	0.21	4.31	1–1	
3175.046‡	A	2000R	0.42	4.31	2–1	
3034.120	A	900R	0.21	4.28	1–0	
2706.510	A	1000R	0.21	4.77	1–2	
2863.324	A	600R	0.00	4.31	0–1	
2661.243	A	200R	0.21	4.85	1–1	$5p^2\ ^3P - 6s\ ^1P^\circ$† (2)
2546.549	A	400r	0.00	4.85	0–1	
2268.913	A	400R	0.42	5.86	2–3	$5p^2\ ^3P - 5d\ ^3F^\circ$ (3)
2380.72	A	60	0.21	5.39	1–2	
2483.392	A	300r	0.42	5.39	2–2	
2429.488	A	1000R	0.42	5.50	2–3	$5p^2\ ^3P - 5d\ ^3D^\circ$ (4)
2354.837	A	1000R	0.21	5.45	1–2	
2246.048	A	400R	0.00	5.49	0–1	
2455.235	A	60	0.42	5.45	2–2	
2334.80	A	300R	0.21	5.49	1–1	
2433.467	A	15	0.42	5.49	2–1	
2286.681	A	200R	0.42	5.82	2–2	$5p^2\ ^3P - 5d\ ^1D^\circ$ (5)
2199.337	A	300R	0.21	5.82	1–2	
2040.660	A	50	0.42	6.47	2–2	$5p^2\ ^3P - 7s\ ^3P^\circ$† (6)
2231.725	A	80R	0.42	5.95	2–1	
2148.733	A	40Rs	0.21	5.95	1–0	
Vac						
1971.452	B	(100r)	0.21	6.47	1–2	
Air						
2073.08	A	100r	0.00	5.95	0–1	
2209.650	A	400R	0.42	6.01	2–2	$5p^2\ ^3P - 5d\ ^3P^\circ$† (7)
2113.93	A	100R	0.21	6.05	1–1	
2194.494	A	150R	0.42	6.05	2–1	
Vac						
1952.141	B	(500h)	0.42	6.75	2–2	$5p^2\ ^3P - 6d\ ^3P^\circ$† (8)
1848.768	B	(100R)	0.21	6.89	1–0	
1815.771	B	(100R)	0.00	6.80	0–1	

Sn I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1891.40	A	100rl	0.42	6.85	2–3	$5p^2\ ^3P - 6d\ ^1F^\circ$ (9)
Air						
2571.576	A	500R	1.06	5.86	2–3	$5p^2\ ^1D - 5d\ ^3F^\circ$
2850.62	A	200r	1.06	5.39	2–2	(10)
2779.810	A	150	1.06	5.50	2–3	$5p^2\ ^1D - 5d\ ^3D^\circ$
2813.575	A	80	1.06	5.45	2–2	(11)
2785.030	A	80	1.06	5.49	2–1	
2594.424	A	200r	1.06	5.82	2–2	$5p^2\ ^1D - 5d\ ^1D^\circ$ (12)
2523.915	A	90r	1.06	5.95	2–1	$5p^2\ ^1D - 7s\ ^3P^\circ$† (13)
2495.704	A	200r	1.06	6.01	2–2	$5p^2\ ^1D - 5d\ ^3P^\circ$† (14)
2421.697	A	800R	1.06	6.16	2–3	$5p^2\ ^1D - 5d\ ^1F^\circ$ (15)
2408.15	A	100	1.06	6.19	2–1	$5p^2\ ^1D - 5d\ ^1P^\circ$ (16)
2317.23	A	600R	1.06	6.39	2–3	$5p^2\ ^1D - 6d\ ^3D^\circ$ (17)
2096.39	A	200rl	1.06	6.95	2–3	$5p^2\ ^1D - 6d\ ^1F^\circ$ (18)
2072.89	A	100	1.06	7.02	2–3	$5p^2\ ^1D - 7d\ ^1F^\circ$? (19)
2913.543	A	200h	2.12	6.35	0–1	$5p^2\ ^1S - 6d\ ^3D^\circ$ (20)

Sn II

I P 14.57 Anal B List C January 1961

REFERENCES

A A. G. Shenstone, unpublished material (June 1955). I P, T, C L, W L, I
B See W. W. McCormick and R. A. Sawyer, Phys. Rev. **54**, 71 (1938). W L, (I), T, I P

Sn II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1899.890	A	5000	0.52	7.02	1½–0½	$5p\ ^2P^\circ - 6s\ ^2S$
1757.904	A	5000	0.00	7.02	0½–0½	(1)
1811.200	A	1000	0.52	7.34	1½–2½	$5p\ ^2P^\circ - 5p^2\ ^2D$
1699.419	A	1000	0.00	7.26	0½–1½	(2)
1831.753	A	500	0.52	7.26	1½–1½	
1475.008	A	1000H	0.52	8.89	1½–2½	$5p\ ^2P^\circ - 5d\ ^2D$
1400.454	A	1000H	0.00	8.82	0½–1½	(3)
1489.106	A	200	0.52	8.82	1½–1½	
1290.886	A	1000	0.52	10.09	1½–1½	$5p\ ^2P^\circ - 5p^2\ ^2P$
1242.933	A	200	0.00	9.93	0½–0½	(4)
1312.262	A	200	0.52	9.93	1½–0½	
1223.716	A	200	0.00	10.09	0½–1½	
1219.090	A	500	0.52	10.65	1½–0½	$5p\ ^2P^\circ - 7s\ ^2S$
1159.010	A	200	0.00	10.65	0½–0½	(5)

Sn II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1161.412	A	500	0.52	11.15	1½–2½	$5p\ ^2P^\circ - 6d\ ^2D$
1108.128	A	500H	0.00	11.14	0½–1½	(6)
1162.920	A	200	0.52	11.14	1½–1½	
1040.715	A	200H	0.52	12.39	1½–2½	$5p\ ^2P^\circ - 7d\ ^2D$†
997.167	A	200H	0.00	12.38	0½–1½	(7)
1574.424	A	1000	6.26	14.10	2½–2½	$5p^2\ ^4P - 6s'\ ^4P^\circ$†
1665.329	A	100h	6.26	13.68	2½–1½	(8)
1517.900	A	200	5.97	14.10	1½–2½	
*1554.877	A	500H	5.74	13.68	0½–1½	
1391.100	A	100	5.97	14.85	1½–	$5p^2\ ^4P - 5^\circ$
1393.516	A	200H	6.26	15.12	2½–	(9) 6°
Air						
2486.99	B	(10)	7.34	12.30	2½–3½	$5p^2\ ^2D - 5f\ ^2F^\circ$
2448.98	B	(15)	7.26	12.30	1½–2½	(10)
Vac						
1520.142	A	100H	7.26	15.39	1½–	$5p^2\ ^2D - 9^\circ$ (11)

Sn III

I P 30.37 Anal B List C January 1961

REFERENCE

A A. G. Shenstone, unpublished material (June 1955). I P, T, C L, W L, I

Sn III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1811.712	A	500	0.00	6.81	0–1	$5s^2\ ^1S - 5p\ ^3P^\circ$ (1)
1251.384	A	2000	0.00	9.86	0–1	$5s^2\ ^1S - 5p\ ^1P^\circ$ (2)
624.164	A	20	0.00	19.78	0–1	$5s^2\ ^1S - 6p\ ^3P^\circ$ (3)
614.540	A	30	0.00	20.09	0–1	$5s^2\ ^1S - 6p\ ^1P^\circ$ (4)
1327.345	A	1000	7.31	16.61	2–2	$5p\ ^3P^\circ - 5p^2\ ^3P$
1334.699	A	200	6.81	16.06	1–1	(5)
1410.613	A	500	7.31	16.06	2–1	
1386.737	A	1000	6.81	15.72	1–0	
1259.916	A	1000	6.81	16.61	1–2	
1305.970	A	1000	6.61	16.06	0–1	
1449.773	A	200	7.31	15.83	2–2	$5p\ ^3P^\circ - 5p^2\ ^1D$
1369.712	A	200	6.81	15.83	1–2	(6)
1243.632	A	500	7.31	17.24	2–1	$5p\ ^3P^\circ - 6s\ ^3S$
1184.254	A	1000	6.81	17.24	1–1	(7)
1161.579	A	100	6.61	17.24	0–1	
1210.575	A	2000	7.31	17.51	2–3	$5p\ ^3P^\circ - 5d\ ^3D$
1158.333	A	1000	6.81	17.47	1–2	(8)
1139.293	A	1000	6.61	17.45	0–1	
1215.105	A	100	7.31	17.47	2–2	
1161.092	A	200	6.81	17.45	1–1	
1218.136	A	100	7.31	17.45	2–1	
1053.875	A	30	7.31	19.03	2–2	$5p\ ^3P^\circ - 5d\ ^1D$
1010.918	A	50	6.81	19.03	1–2	(9)
784.684	A	50	7.31	23.05	2–1	$5p\ ^3P^\circ - 7s\ ^3S$†
700.624	A	50	6.81	23.05	1–1	(10)
775.793	A	75	7.31	23.22	2–3	$5p\ ^3P^\circ - 6d\ ^3D$†
753.014	A	100	6.81	23.21	1–2	(11)
Air						
2069.978	A	200	9.86	15.83	1–2	$5p\ ^1P^\circ - 5p^2\ ^1D$ (12)

Sn III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1674.294	A	50	9.86	17.24	1–1	$5p\ ^1P^\circ - 6s\ ^3S$ (13)
1570.365	A	1000	9.86	17.73	1–0	$5p\ ^1P^\circ - 6s\ ^1S$ (14)
1347.652	A	1000	9.86	19.03	1–2	$5p\ ^1P^\circ - 5d\ ^1D$ (15)
910.924	A	200	9.86	23.42	1–2	$5p\ ^1P^\circ - 6d\ ^1D$ (16)
Air						
2214.964	A	100	16.61	22.18	2–3	$5p^2\ ^3P - 4f\ ^1F^\circ$ (17)
Vac						
1230.171	A	100	16.61	26.65	2–	$5p^2\ ^3P - 4^\circ$ (18)
1204.058	A	200	16.61	26.87	2–2	$5p^2\ ^3P - 5d'\ ^3P^\circ$
1159.297	A	20	16.06	26.76	1–1	(19)
Air						
2896.06	A	300H	15.83	20.09	2–1	$5p^2\ ^1D - 6p\ ^1P^\circ$ (20)
Vac						
1955.516	A	50	15.83	22.14	2–3	$5p^2\ ^1D - 4f\ ^3F^\circ$ (21)
1941.857	A	500	15.83	22.18	2–3	$5p^2\ ^1D - 4f\ ^1F^\circ$ (22)
Air						
2658.57	A	250h	17.51	22.15	3–4	$5d\ ^3D - 4f\ ^3F^\circ$†
2643.56	A	200h	17.47	22.14	2–3	(23)
2631.79	A	150h	17.45	22.14	1–2	
2665.53	A	50h	17.51	22.14	3–3	
2646.10	A	50h	17.47	22.14	2–2	
2618.61	A	50	17.47	22.18	2–3	$5d\ ^3D - 4f\ ^1F^\circ$† (24)
Vac						
1346.049	A	200	17.45	26.62	1–1	$5d\ ^3D - 3^\circ$? (25)

Sn IV

I P 40.56 Anal B List B February 1961

REFERENCE

A A. G. Shenstone, unpublished material (June 1955). I P, T, C L, W L, I

Sn IV

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1314.547	A	1000	0.00	9.39	0½–1½	$5s\ ^2S - 5p\ ^2P^\circ$ (1)
1437.519	A	1000	0.00	8.59	0½–0½	
1119.344	A	1000	9.39	20.42	1½–2½	$5p\ ^2P^\circ - 5d\ ^2D$ (2)
1044.487	A	1000	8.59	20.41	0½–1½	
1120.679	A	500	9.39	20.41	1½–1½	
1073.407	A	1000	9.39	20.89	1½–2½	$5p\ ^2P^\circ - 5s^2\ ^2D?$ (3)
923.147	A	20	8.59	21.96	0½–1½	
1019.719	A	500	9.39	21.50	1½–0½	$5p\ ^2P^\circ - 6s\ ^2S$ (4)
956.249	A	500	8.59	21.50	0½–0½	
628.726	A	50	9.39	29.03	1½–2½	$5p\ ^2P^\circ - 6d\ ^2D$† (5)
605.226	A	50	8.59	28.99	0½–1½	
619.039	A	50	9.39	29.33	1½–0½	$5p\ ^2P^\circ - 7s\ ^2S$ (6)
595.061	A	30	8.59	29.33	0½–0½	
Air						
2887.66	A	200H	20.42	24.69	2½–1½	$5d\ ^2D - 6p\ ^2P^\circ$ (7)
3071.69	A	100H	20.41	24.42	1½–0½	
2878.84	A	20h	20.41	24.69	1½–1½	
2229.127	A	300	20.42	25.96	2½–3½	$5d\ ^2D - 4f\ ^2F^\circ$† (8)
2220.879	A	200	20.41	25.96	1½–2½	

Sn IV

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1058.586	A	150	20.42	32.08	2½–3½	$5d\ ^2D - 5p''\ ^2F^\circ?$ (9)
1052.765	A	150	20.42	32.15	2½–2½	$5d\ ^2D - 5p''\ ^2D^\circ?$† (10)
1017.216	A	150	20.42	32.56	2½–1½	$5d\ ^2D - 5p''\ ^2P^\circ?$ (11)
1103.237	A	300	20.89	32.08	2½–3½	$5s^2\ ^2D - 5p''\ ^2F^\circ?$ (12)
1096.916	A	500	20.89	32.15	2½–2½	$5s^2\ ^2D - 5p''\ ^2D^\circ?$ (13)
1058.370	A	400	20.89	32.56	2½–1½	$5s^2\ ^2D - 5p''\ ^2P^\circ?$ (14)
Air						
2848.42	A	100H	24.69	29.03	1½–2½	$6p\ ^2P^\circ - 6d\ ^2D$† (15)
2705.92	A	30H	24.42	28.99	0½–1½	
2081.604	A	100	25.96	31.88	3½–4½	$4f\ ^2F^\circ - 5g\ ^2G$ (16)
2084.212	A	100	25.96	31.88	2½–3½	

Sn V

I P 71.97 Anal C List C February 1961

REFERENCES

A A. G. Shenstone, unpublished material (June 1955). I P, T, C L,W L, I
B R. C. Gibbs and H. E. White, Proc. Nat. Acad. Sci. 14, 345 (1928). T, C L, W L, (I)

Sn V

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
373.14	B	(10)	0.00	33.08	0–1	$4d^{10}\ ^1S - 5p\ ^3P^\circ$ (1)
355.66	B	(12)	0.00	34.71	0–1	$4d^{10}\ ^1S - 5p\ ^3D^\circ$ (2)
361.55	B	(15)	0.00	34.14	0–1	$4d^{10}\ ^1S - 5p\ ^1P^\circ$ (3)

Sn V

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
*1302.199	A	100	22.54	32.02	3–2	$5s\ ^3D - 5p\ ^3P^\circ$ (4)
1205.723	A	100	22.85	33.08	2–1	
*1302.199	A	100	23.60	33.08	1–1	
1100.735	A	200	22.54	33.17	3–4	$5s\ ^3D - 5p\ ^3F^\circ$† (5)
1294.357	A	200	22.85	32.38	2–3	
1132.794	A	100	22.85	33.74	2–2	
1089.347	A	200	22.54	33.87	3–3	$5s\ ^3D - 5p\ ^3D^\circ$† (6)
1189.918	A	100	22.85	33.22	2–2	
1283.808	A	100	23.60	33.22	1–2	

ANTIMONY, $Z = 51$

Sb I

I P 8.604 Anal A List C October 1953

REFERENCE

A W. F. Meggers and C. J. Humphreys, J. Research Nat. Bur. Std. 28, 467, RP1464 (1942). W L, I, T, I P

Sb I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2068.33‡	A	1000R	0.00	5.97	1½–2½	$5p^3\ ^4S°-6s\ ^4P$ (1)
2175.81	A	1500R	0.00	5.67	1½–1½	
2311.47	A	2500R	0.00	5.34	1½–0½	
2127.39	A	100R	0.00	5.80	1½–0½	$5p^3\ ^4S°-6s\ ^2P$† (2)
Vac						
1871.15	A	300R	0.00	6.60	1½–2½	$5p^3\ ^4S°-6$ (3)
1780.87	A	100r	0.00	6.93	1½–1½	$5p^3\ ^4S°-12$ (4)
1736.19	A	100r	0.00	7.11	1½–0½	$5p^3\ ^4S°-7s\ ^4P$† (5)
1532.74	A	120R	0.00	8.05	1½–1½	$5p^3\ ^4S°-40$ (6)
Air						
2598.09	A	500R	1.22	5.97	2½–2½	$5p^3\ ^2D°-6s\ ^4P$ (7)
2670.64	A	300r	1.05	5.67	1½–1½	
2769.95	A	400R	1.22	5.67	2½–1½	
2877.92	A	1000R	1.05	5.34	1½–0½	
2510.54	A	100	1.05	5.97	1½–2½	
2528.52	A	2000R	1.22	6.10	2½–1½	$5p^3\ ^2D°-6s\ ^2P$ (8)
2598.05	A	1500R	1.05	5.80	1½–0½	
2445.51	A	400r	1.05	6.10	1½–1½	
2293.44	A	150r	1.22	6.60	2½–2½	$5p^3\ ^2D°-6$ (9)
2224.93	A	120r	1.05	6.60	1½–2½	
2288.98	A	120	1.22	6.61	2½–1½	$5p^3\ ^2D°-7$ (10)
2220.73	A	150r	1.05	6.61	1½–1½	
2208.45	A	300r	1.22	6.80	2½–2½	$5p^3\ ^2D°-8$ (11)
2144.86	A	100R	1.05	6.80	1½–2½	
2179.19	A	250r	1.22	6.88	2½–2½	$5p^3\ ^2D°-6s'\ ^2D$† (12)
2139.69	A	100R	1.05	6.82	1½–1½	
2049.57	A	150R	1.05	7.07	1½–	$5p^3\ ^2D°-15$ (13)
Vac						
1927.08	A	100	1.05	7.46	1½–2½	$5p^3\ ^2D°-21$† (14)
1882.56	A	150r	1.05	7.61	1½–2½	$5p^3\ ^2D°-25$† (15)
1788.24	A	100r	1.05	7.95	1½–1½	$5p^3\ ^2D°-35$† (16)
Vac						
1829.50	A	100	1.22	7.96	2½–2½	$5p^3\ ^2D°-36$† (17)
1765.76	A	100h	1.05	8.04	1½–2½	$5p^3\ ^2D°-39$† (18)
1800.18	A	150	1.22	8.07	2½–1½	$5p^3\ ^2D°-42$ (19)
1723.43	A	150r	1.05	8.21	1½–2½	$5p^3\ ^2D°-47$† (20)
Air						
2851.11	A	100	2.28	6.61	1½–1½	$5p^3\ ^2P°-7$ (21)
2692.25	A	120	2.02	6.61	0½–1½	
2682.76	A	200r	2.28	6.88	1½–2½	$5p^3\ ^2P°-6s'\ ^2D$ (22)
2574.66	A	150	2.02	6.82	0½–1½	
2718.90	A	150r	2.28	6.82	1½–1½	
2652.60	A	200r	2.28	6.93	1½–1½	$5p^3\ ^2P°-12$† (23)
2480.44	A	150	2.02	7.00	0½–0½	$5p^3\ ^2P°-13$† (24)
2612.31	A	300r	2.28	7.00	1½–1½	$5p^3\ ^2P°-14$ (25)
2478.32	A	400	2.02	7.00	0½–1½	
2426.35	A	250	2.02	7.11	0½–0½	$5p^3\ ^2P°-7s\ ^4P$† (26)
2554.64	A	80	2.28	7.11	1½–0½	
2395.22	A	100	2.02	7.18	0½–0½	$5p^3\ ^2P°-17$† (27)
2422.13	A	150	2.28	7.37	1½–0½	$5p^3\ ^2P°-20$ (28)
*2306.46	A	300r	2.02	7.37	0½–0½	
2383.64	A	300h	2.28	7.46	1½–2½	$5p^3\ ^2P°-21$ (29)
2373.67	A	400h	2.28	7.48	1½–1½	$5p^3\ ^2P\ -22$ (30)
2262.51	A	300r	2.02	7.48	0½–1½	
2221.98	A	100	2.02	7.58	0½–0½	$5p^3\ ^2P°-7s\ ^2P$† (31)
2315.89	A	150	2.28	7.61	1½–2½	$5p^3\ ^2P°-25$ (32)
*2306.46	A	300r	2.28	7.63	1½–1½	$5p^3\ ^2P°-26$ (33)
2201.32	A	200r	2.02	7.63	0½–1½	

Strongest Unclassified Lines of Sb I

Vac							Vac					
1950.39	A	200r					1623.3	A	100Hw			
1717.45	A	150r					1612.8	A	200Hw			
1662.6	A	100Hw										

Sb II

I P 16.5 Anal D List C December 1953

REFERENCES

A W. F. Meggers, unpublished material (December 1939). W L, I
B R. J. Lang and E. H. Vestine, Phys. Rev. **42**, 233 (1932). W L, (I), T
K. Murakawa and S. Suwa, Reports Inst. Sci. Tech. Tokyo Univ. **1**, 121 (1947) I P, T

Sb II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1606.96‡	A	5e	0.70	8.38	2–3	$5p^2\,{}^3P - 5p^3\,{}^3D^\circ$ (1)
1576.09	A	3e	0.38	8.21	1–2	
1643.57	B	(5)	0.70	8.21	2–2	
1581.35	A	4e	0.38	8.18	1–1	
1649.28	A	1e?	0.70	8.18	2–1	
1436.45	A	15e	0.70	9.29	2–2	$5p^2\,{}^3P - 6s\,{}^3P^\circ$ (2)
1504.18	A	10e	0.38	8.58	1–1	
1565.512	B	(10)	0.70	8.58	2–1	
1513.26	A	10e	0.38	8.53	1–0	
1384.67	A	10e	0.38	9.29	1–2	
1438.11	A	15e	0.00	8.58	0–1	
1498.53	A	8e	0.70	8.94	2–2	$5p^2\,{}^3P - 5d\,{}^3D^\circ$ (3)
1372.80	A	4e	0.38	9.37	1–1	$5p^2\,{}^3P - 6s\,{}^1P^\circ$ (4)
1317.54	A	7e	0.00	9.37	0–1	
1407.79	A	8e	0.70	9.47	2–2	$5p^2\,{}^3P - 5p^3\,{}^3P^\circ$ (5)
1349.82	A	4e	0.38	9.52	1–1	
1398.97	A	1e	0.70	9.52	2–1	
1358.01	A	4e	0.38	9.47	1–2	
1296.36	A	4e	0.00	9.52	0–1	

Sb II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1374.90	A	3e	0.70	9.68	2–2	$5p^2\,{}^3P - 5p^3\,{}^1D^\circ$ (6)
1327.39	A	5e	0.38	9.68	1–2	
1600.40	A	6e	1.58	9.29	2–2	$5p^2\,{}^1D - 6s\,{}^3P^\circ$ (7)
1762.312	B	(6)	1.58	8.58	2–1	
1584.57	A	15e	1.58	9.37	2–1	$5p^2\,{}^1D - 6s\,{}^1P^\circ$ (8)
1554.00	A	7e	1.58	9.52	2–1	$5p^2\,{}^1D - 5p^3\,{}^3P^\circ$ (9)
1524.35	A	4e	1.58	9.68	2–2	$5p^2\,{}^1D - 5p^3\,{}^1D^\circ$ (10)
2190.90	A	(20)	2.95	8.58	0–1	$5p^2\,{}^1S - 6s\,{}^3P^\circ$ (11)
1923.28	A	8e	2.95	9.37	0–1	$5p^2\,{}^1S - 6s\,{}^1P^\circ$ (12)
1878.50	A	4e	2.95	9.52	0–1	$5p^2\,{}^1S - 5p^3\,{}^3P^\circ$ (13)

Sb III

I P 24.7 Anal C List D August 1953

REFERENCES

A R. J. Lang, Phys. Rev. **35**, 445 (1930). W L, I, T, I P
R. J. Lang and E. H. Vestine, Phys. Rev. **42**, 241 (1932). T

Sb III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1404.18	A	20	0.81	9.60	1½–2½	$5p\,{}^2P^\circ - 5p^2\,{}^2D$ (1)
1306.69	A	20	0.00	9.45	0½–1½	
1429.57	A	10	0.81	9.45	1½–1½	
1157.74	A	40	0.81	11.47	1½–0½	$5p\,{}^2P^\circ - 6s\,{}^2S$ (2)
1075.82	A	30	0.00	11.47	0½–0½	
1151.49	A	30	0.81	11.53	1½–0½	$5p\,{}^2P^\circ - 5p^2\,{}^2S$ (3)
1070.43	A	20	0.00	11.53	0½–0½	

Sb III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1065.90	A	40	0.81	12.39	1½–2½	$5p\,{}^2P^\circ - 5d\,{}^2D$ (4)
1011.94	A	40	0.00	12.20	0½–1½	
1084.06	A	20	0.81	12.20	1½–1½	
Air						
2790.27	A	20	12.39	16.82	2½–3½	$5d\,{}^2D - 5f\,{}^2F^\circ$† (5)
2669.39	A	20	12.20	16.82	1½–2½	

TELLURIUM, $Z = 52$

Te I

I P 8.97 Anal C February 1961

Further observations are needed for the preparation of An Ultraviolet Multiplet Table. J. E. Ruedy (Phys. Rev. **41**, 588, 1932) lists no lines in the short-wave region.

The *raie ultime* is at 2142.75A. (See O. Bartelt, Zeit. Phys. 88, 522 1934).

Te II

I P 18.6 Anal C List D March 1961

REFERENCES

A M. Bernarda Handrup, Thesis (1960). I P, T, C L, W L, I

B J. S. Ross, unpublished material from J. E. Mack. W L, (I)

Te II **Te II**

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac							Air						
1274.78	A	7	0.00	9.68	1½–0½	$5p^3\,{}^4S°$ – 78448	2661.10	B	(80)	10.50	15.14	2½–3½	85049 –*122617°*
1208.55	A	9	0.00	10.21	1½–1½	(1) – 82743							(4)
1175.79	A	12	0.00	10.50	1½–2½	– 85049							
1174.30	A	10	0.00	10.51	1½–1½	– 85160							
802.28	A	8	0.00	15.39	1½–2½	–124646							
799.60	A	6	0.00	15.44	1½–1½	–125066	2711.58	B	(20)	10.51	15.06	1½–2½	85160 –*122028°*
							2657.70	B	(40)	10.51	15.16	1½–1½	(5) –*122775°*
							2649.66	B	(100)	10.51	15.17	1½–2½	–*122888°*
1374.84	A	10	1.53	10.51	2½–1½	$5p^2\,{}^2D°$ – 85160							
1324.92	A	10	1.53	10.85	2½–3½	(2) – 87900							
							2942.11	B	(50)	10.96	15.16	0½–1½	88796 –*122775°*
													(6)
Air													
2438.69	B	(50)	10.11	15.17	1½–2½	81895 –*122888°*	2946.68	B	(50)	10.98	15.17	1½–2½	88961 –*122888°*
						(3)							(7)

IODINE, $Z = 53$

I I

I P 10.41 Anal A List B February 1961

REFERENCE

A C. C. Kiess and C. H. Corliss, J. Research Nat. Bur. Std. **63A**, 1 (1959). I P, T, C L, W L, I

* and §§=Blend in I I and also a blend of I I and I II.

I I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1830.380‡	A	75000	0.00	6.74	1½–2½	$5p^5\ ^2P^\circ - 6s\ ^4P$ (1)
1844.451	A	15000	0.94	7.63	0½–1½	
1617.604	A	5000	0.00	7.63	1½–1½	
1876.415	A	2000	0.94	7.52	0½–0½	
1642.137	A	2000	0.00	7.52	1½–0½	
1782.758	A	12000	0.00	6.92	1½–1½	$5p^5\ ^2P^\circ - 6s\ ^2P$ (2)
1799.091	A	5000	0.94	7.80	0½–0½	
1582.610	A	1500	0.00	7.80	1½–0½	
Air						
2061.633	A	2000	0.94	6.92	0½–1½	
Vac						
1514.678	A	5000	0.00	8.15	1½–2½	$5p^5\ ^2P^\circ - 6s'\ ^2D$ (3)
1702.068	A	15000	0.94	8.19	0½–1½	
1507.041	A	5000	0.00	8.19	1½–1½	
1485.918	A	1000	0.00	8.31	1½–1½	$5p^5\ ^2P^\circ - nd$ 1 (4)
1675.174	A	1500	0.94	8.31	0½–1½	
1458.794	A	2500	0.00	8.46	1½–1½	$5p^5\ ^2P^\circ - nd$ 2 (5)
1640.780	A	2500	0.94	8.46	0½–1½	
1457.981	A	10000	0.00	8.47	1½–2½	$5p^5\ ^2P^\circ - nd$ 3 (6)
1457.470	A	5000*	0.00	8.47	1½–1½	$5p^5\ ^2P^\circ - nd$ 4 (7)
1639.106	A	200	0.94	8.47	0½–1½	
1457.389	A	5000*	0.00	8.47	1½–1½	$5p^5\ ^2P^\circ - nd$ 4.1 (8)
1425.490	A	8000	0.00	8.66	1½–2½	$5p^5\ ^2P^\circ - nd$ 5 (9)
1421.364	A	2000	0.00	8.69	1½–1½	$5p^5\ ^2P^\circ - nd$ 5.1 (10)
1593.580	A	5000	0.94	8.69	0½–1½	
1390.750	A	3000	0.00	8.88	1½–2½	$5p^5\ ^2P^\circ - 7s\ ^4P$† (11)
1267.569	A	600*	0.00	9.74	1½–1½	
1412.180	A	200	0.94	9.68	0½–0½	
1275.255	A	1500	0.00	9.68	1½–0½	
1383.225	A	4000	0.00	8.92	1½–1½	$5p^5\ ^2P^\circ - 7s\ ^2P$† (12)
1261.269	A	800	0.00	9.79	1½–0½	
1367.714	A	2500	0.00	9.03	1½–1½	$5p^5\ ^2P^\circ - nd$ 6 (13)
1526.448	A	2500	0.94	9.03	0½–1½	
1360.965	A	5000	0.00	9.07	1½–1½	$5p^5\ ^2P^\circ - nd$ 7 (14)
1518.047	A	15000	0.94	9.07	0½–1½	
1357.971	A	3000	0.00	9.09	1½–1½	$5p^5\ ^2P^\circ - nd$ 8 (15)
1514.323	A	2000	0.94	9.09	0½–1½	
1355.099	A	5000	0.00	9.11	1½–2½	$5p^5\ ^2P^\circ - nd$ 9 (16)

I I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1340.709	A	1500	0.00	9.21	1½–1½	$5p^5\ ^2P^\circ - nd$ 11 (17)
1492.888	A	5000	0.94	9.21	0½–1½	
*1336.478§§	A	1000	0.00	9.24	1½–2½	$5p^5\ ^2P^\circ - nd$ 13 (18)
1330.189	A	2000	0.00	9.28	1½–2½	$5p^5\ ^2P^\circ - nd$ 14 (19)
1465.828	A	2500	0.94	9.36	0½–1½	$5p^5\ ^2P^\circ - nd$ 16† (20)
1317.542	A	3000	0.00	9.37	1½–2½	$5p^5\ ^2P^\circ - nd$ 17 (21)
1313.947	A	3000	0.00	9.40	1½–2½	$5p^5\ ^2P^\circ - nd$ 18 (22)
1313.432	A	1500	0.00	9.40	1½–1½	$5p^5\ ^2P^\circ - nd$ 19 (23)
1459.145	A	4000	0.94	9.40	0½–1½	
1453.179	A	5000	0.94	9.43	0½–0½	$5p^5\ ^2P^\circ - nd$ 19.1 (24)
1302.983	A	3000	0.00	9.47	1½–0½	$5p^5\ ^2P^\circ - nd$ 20 (25)
1446.260	A	5000	0.94	9.47	0½–0½	
1300.335	A	10000	0.00	9.49	1½–2½	$5p^5\ ^2P^\circ - nd$ 21 (26)
1291.143	A	300	0.00	9.56	1½–2½	$5p^5\ ^2P^\circ - 8s\ ^4P$ (27)
1289.395	A	3000	0.00	9.57	1½–1½	$5p^5\ ^2P^\circ - 8s\ ^2P$ (28)
1429.539	A	800	0.94	9.57	0½–1½	
1267.596	A	600*	0.00	9.74	1½–0½	$5p^5\ ^2P^\circ - nd$ 21.2† (29)
1400.014	A	2000	0.94	9.76	0½–1½	$5p^5\ ^2P^\circ - nd$ 22† (30)
1259.510	A	3000	0.00	9.80	1½–1½	$5p^5\ ^2P^\circ - nd$ 24 (31)
1392.898	A	2000	0.94	9.80	0½–1½	
1259.153	A	2500	0.00	9.80	1½–2½	$5p^5\ ^2P^\circ - nd$ 25 (32)
1251.335	A	600	0.00	9.87	1½–2½	$5p^5\ ^2P^\circ - 9s\ ^4P$ (33)
1250.826	A	400	0.00	9.87	1½–1½	$5p^5\ ^2P^\circ - 9s\ ^2P$ (34)
1382.284	A	1200	0.94	9.87	0½–1½	
1368.217	A	2500	0.94	9.96	0½–1½	$5p^5\ ^2P^\circ - nd$ 26† (35)

I I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1237.892	A	300	0.00	9.97	1½−1½	$5p^5\ ^2P^\circ - nd$ 27
1366.506	A	800	0.94	9.97	0½−1½	(36)
1237.231	A	200	0.00	9.98	1½−2½	$5p^5\ ^2P^\circ - nd$ 27.1
						(37)
1236.362	A	400	0.00	9.98	1½−2½	$5p^5\ ^2P^\circ - nd$ 28.1
						(38)
1233.463	A	300	0.00	10.01	1½−1½	$5p^5\ ^2P^\circ - nd$ 28.2
1361.111	A	3000	0.94	10.01	0½−1½	(39)
1230.732	A	400	0.00	10.03	1½−2½	$5p^5\ ^2P^\circ - 10s\ ^4P$
						(40)
1228.888	A	500	0.00	10.05	1½−1½	$5p^5\ ^2P^\circ - nd$ 29
1355.542	A	2000	0.94	10.05	0½−1½	(41)
1224.856	A	400	0.00	10.08	1½−1½	$5p^5\ ^2P^\circ - nd$ 31
						(42)
1224.501	A	300	0.00	10.08	1½−0½	$5p^5\ ^2P^\circ - nd$ 30
1350.206	A	600	0.94	10.08	0½−0½	(43)

I I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1224.077	A	600*	0.00	10.09	1½−1½	$5p^5\ ^2P^\circ - nd$ 31.1†
						(44)
1223.430	A	100	0.00	10.09	1½−1½	$5p^5\ ^2P^\circ - nd$ 32
1348.903	A	800	0.94	10.09	0½−1½	(45)
1343.626	A	1000	0.94	10.13	0½−0½	$5p^5\ ^2P^\circ - nd$ 32.2†
						(46)
1218.411	A	200	0.00	10.13	1½−2½	$5p^5\ ^2P^\circ - 11s\ ^4P$
						(47)
1217.142	A	150	0.00	10.14	1½−0½	$5p^5\ ^2P^\circ - nd$ 34
1341.264	A	100	0.94	10.14	0½−0½	(48)
1339.903	A	800	0.94	10.15	0½−0½	$5p^5\ ^2P^\circ - nd$ 35†
						(49)
*1336.478§§	A	1000	0.94	10.18	0½−0½	$5p^5\ ^2P^\circ - nd$ 36.1†
						(50)
1335.238	A	200	0.94	10.18	0½−0½	$5p^5\ ^2P^\circ - nd$ 38†
						(51)

I II

I P 19.05 Anal A List C February 1961

REFERENCE

A W. C. Martin and C. H. Corliss, J. Research Nat. Bur. Std. 64A, 443, (1960). I P, T, C L, W L, I

I II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1234.063‡	A	20000	0.00	10.00	2−2	$5p^4\ ^3P - 6s\ ^5S^\circ$
						(1)
1220.887	A	20000	0.00	10.11	2−2	$5p^4\ ^3P - 5p^5\ ^3P^\circ$
1296.416	A	3000	0.87	10.40	1−1	(2)
1187.338	A	15000	0.00	10.40	2−1	
1200.223	A	7000	0.87	11.16	1−0	
*1336.517§	A	20000	0.87	10.11	1−2	
1285.782	A	1500	0.80	10.40	0−1	
1178.650	A	10000	0.00	10.47	2−1	$5p^4\ ^3P - 6s\ ^3S^\circ$
1286.084	A	4000	0.87	10.47	1−1	(3)
1275.596	A	1000	0.80	10.47	0−1	
1166.482	A	20000	0.00	10.58	2−3	$5p^4\ ^3P - 5d\ ^5D^\circ$†
1230.222	A	600	0.80	10.83	0−1	(4)
1160.562	A	10000	0.00	10.64	2−2	
1139.805	A	10000	0.00	10.83	2−1	
1277.190	A	2500	0.87	10.54	1−0	
1075.210	A	3000	0.00	11.48	2−3	$5p^4\ ^3P - 5d\ ^3D^\circ$
1198.884	A	5000	0.87	11.17	1−2	(5)
1167.054	A	1500	0.80	11.37	0−1	
1105.000	A	5000	0.00	11.17	2−2	
1175.841	A	5000	0.87	11.37	1−1	
1085.405	A	700	0.00	11.37	2−1	
1034.655	A	10000	0.00	11.93	2−3	$5p^4\ ^3P - 6s'\ ^3D^\circ$
1154.668	A	1500	0.87	11.57	1−2	(6)
1131.504	A	2000	0.80	11.71	0−1	
1067.341	A	2000	0.00	11.57	2−2	
1139.752	A	1200	0.87	11.71	1−1	
1054.582	A	150	0.00	11.71	2−1	
1042.154	A	100	0.00	11.85	2−1	$5p^4\ ^3P - 5p^5\ ^1P^\circ$
1125.251	A	3500	0.87	11.85	1−1	(7)
1117.219	A	1500	0.80	11.85	0−1	

I II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1018.583	A	4000	0.00	12.12	2−3	$5p^4\ ^3P - 5d'\ ^3D^\circ$†
1111.165	A	2500	0.87	11.98	1−2	(8)
1019.400	A	800	0.80	12.91	0−1	
1030.047	A	800	0.00	11.98	2−2	
1026.065	A	350	0.87	12.91	1−1	
1023.544	A	200	0.00	12.06	2−2	$5p^4\ ^3P - 6s'\ ^1D^\circ$
1103.590	A	800	0.87	12.06	1−2	(9)
873.489	A	1500	0.00	14.13	2−2	$5p^4\ ^3P - 5d'\ ^3P^\circ$
901.004	A	200	0.87	14.58	1−1	(10)
1101.239	A	400	0.87	12.09	1−0	
931.139	A	100	0.87	14.13	1−2	
895.844	A	400	0.80	14.58	0−1	
1000.572	A	1200	0.00	12.34	2−3	$5p^4\ ^3P - 5d'\ ^3F^\circ$
995.768	A	700	0.87	13.27	1−2	(11)
930.133	A	100	0.00	13.27	2−2	
929.143	A	800	0.00	13.29	2−3	$5p^4\ ^3P - 5d'\ ^3G^\circ$
						(12)
905.313	A	100	0.00	13.64	2−2	$5p^4\ ^3P - 6s''\ ^3P^\circ$†
1009.936	A	700	0.87	13.10	1−1	(13)
1019.230	A	400	0.87	12.99	1−0	
967.378	A	700	0.87	13.64	1−2	
1003.457	A	500	0.80	13.10	0−1	
921.343	A	400	0.00	13.40	2−2	$5p^4\ ^3P - 5d'\ ^1D^\circ$
						(14)
914.957	A	200	0.00	13.49	2−1	$5p^4\ ^3P - 5d'\ ^3S^\circ$†
978.394	A	300	0.87	13.49	1−1	(15)
893.167	A	1000	0.00	13.82	2−1	$5p^4\ ^3P - 6s''\ ^1P^\circ$†
						(16)
881.881	A	1500	0.00	14.00	2−3	$5p^4\ ^3P - 5d'\ ^1F^\circ$
						(17)

I II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
879.844	A	2000	0.00	14.03	2–3	$5p^4\ ^3P - 5d''\ ^3D°$
890.995	A	1000	0.87	14.73	1–2	(18)
872.391	A	800	0.80	14.95	0–1	
838.070	A	700	0.00	14.73	2–2	
877.276	A	800	0.87	14.95	1–1	
825.934	A	300	0.00	14.95	2–1	
870.343	A	900	0.00	14.18	2–1	$5p^4\ ^3P - 5d'\ ^1P°$† (19)
847.926	A	1000	0.00	14.56	2–2	$5p^4\ ^3P - 5d''\ ^3P°$†
847.796	A	600	0.87	15.44	1–0?	(20)
902.130	A	400	0.87	14.56	1–2	
843.113	A	600	0.00	14.64	2–2	$5p^4\ ^3P - 7s\ ^5S°$
*896.692	A	400	0.87	14.64	1–2	(21)
834.095	A	1200	0.00	14.80	2–1	$5p^4\ ^3P - 7s\ ^3S°$† (22)
825.122	A	500	0.00	14.96	2–3	$5p^4\ ^3P - 5d''\ ^3F°$† (23)
863.590	A	600	0.80	15.09	0–1	$5p^4\ ^3P - 6d\ ^5D°$†
868.380	A	750	0.87	15.09	1–1	(24)
818.047	A	700	0.00	15.09	2–1	
798.158	A	1000	0.00	15.47	2–3	$5p^4\ ^3P - 6d\ ^3D°$†
846.295	A	900	0.87	15.46	1–2	(25)
841.097	A	700	0.80	15.47	0–1	
798.427	A	400	0.00	15.46	2–2	
827.797	A	400	0.87	15.79	1–1	$5p^4\ ^3P - 5d''\ ^1P°$
823.426	A	170	0.80	15.79	0–1	(26)
748.781	A	800	0.00	16.49	2–3	$5p^4\ ^3P - 7s'\ ^3D°$†
*765.594	A	600	0.00	16.12	2–2	(27)
*765.594	A	600	0.00	16.12	2–1	
737.546	A	500	0.00	16.74	2–3	$5p^4\ ^3P - 7d\ ^3D°$
770.771	A	300	0.80	16.81	0–1	(28)
740.950	A	300	0.00	16.66	2–2	
773.055	A	500	0.87	16.84	1–1, 2	$5p^4\ ^3P - 6d'\ 6°$† (29)
772.344	A	400	0.87	16.86	1–1, 2	$5p^4\ ^3P - 6d'\ 7°$† (30)
727.246	A	800	0.00	16.98	2–3	$5p^4\ ^3P - 6d'\ 9°$ (31)
722.980	A	1000	0.00	17.08	2–2	$5p^4\ ^3P - 6d'\ 10°$ (32)
719.546	A	1000	0.00	17.16	2–1	$5p^4\ ^3P - 6d'\ 12°$† (33)
706.055	A	400	0.00	17.48	2–3	$5p^4\ ^3P - 8d\ ^3D°$† (34)
689.817	A	250	0.00	17.90	2–3	$5p^4\ ^3P - 9d\ ^3D°$† (35)
1466.673	A	1000	1.69	10.11	2–2	$5p^4\ ^1D - 5p^5\ ^3P°$† (36)
1380.501	A	500	1.69	10.64	2–2	$5p^4\ ^1D - 5d\ ^5D°$† (37)
1275.424	A	2000	1.69	11.37	2–1	$5p^4\ ^1D - 5d\ ^3D°$† (38)

I II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1205.931	A	2000	1.69	11.93	2–3	$5p^4\ ^1D - 6s'\ ^3D°$
1250.559	A	700	1.69	11.57	2–2	(39)
1233.069	A	100	1.69	11.71	2–1	
1216.125	A	3000	1.69	11.85	2–1	$5p^4\ ^1D - 5p^5\ ^1P°$ (40)
1184.156	A	200	1.69	12.12	2–3	$5p^4\ ^1D - 5d'\ ^3D°$†
1199.677	A	1000	1.69	11.98	2–2	(41)
1190.853	A	10000	1.69	12.06	2–2	$5p^4\ ^1D - 6s'\ ^1D°$ (42)
1159.871	A	1000	1.69	12.34	2–3	$5p^4\ ^1D - 5d'\ ^3F°$
1066.273	A	250	1.69	13.27	2–2	(43)
1033.801	A	400	1.69	13.64	2–2	$5p^4\ ^1D - 6s''\ ^3P°$
1082.540	A	400	1.69	13.10	2–1	(44)
1054.742	A	1500	1.69	13.40	2–2	$5p^4\ ^1D - 5d'\ ^1D°$ (45)
1003.350	A	1000	1.69	14.00	2–3	$5p^4\ ^1D - 5d'\ ^1F°$ (46)
1003.612	A	300	1.69	14.00	2–2	$5p^4\ ^1D - 5d''\ ^1D°$ (47)
930.506	A	150	1.69	14.96	2–3	$5p^4\ ^1D - 5d''\ ^3F°$
917.007	A	300	1.69	15.16	2–2	(48)
910.309	A	400	1.69	15.26	2–3	$5p^4\ ^1D - 5d''\ ^1F°$ (49)
896.376	A	400	1.69	15.47	2–3	$5p^4\ ^1D - 6d\ ^3D°$
*896.692	A	400	1.69	15.46	2–2	(50)
895.957	A	200	1.69	15.47	2–1	
875.941	A	1000	1.69	15.79	2–1	$5p^4\ ^1D - 5d''\ ^1P°$ (51)
855.494	A	400	1.69	16.12	2–2	$5p^4\ ^1D - 7s'\ ^3D°$ (52)
831.168	A	300	1.69	16.55	2–2	$5p^4\ ^1D - 7s'\ ^1D°$ (53)
794.757	A	400	1.69	17.23	2–1, 2	$5p^4\ ^1D - 6d'\ 13°$ (54)
794.237	A	500	1.69	17.24	2–3	$5p^4\ ^1D - 6d'\ 14°$ (55)
791.147	A	350	1.69	17.30	2–1	$5p^4\ ^1D - 9s\ ^3S°$ (56)
788.815	A	700	1.69	17.34	2–1	$5p^4\ ^1D - 6d'\ 15°$ (57)
Air						
2582.794	A	2000	10.62	15.40	4–5	$5d\ ^5D° - 4f\ ^5F$†
2566.242	A	1000	10.58	15.39	3–4	(58)
2593.458	A	300	10.64	15.40	2–3	
3078.754	A	5000	11.48	15.49	3–4	$5d\ ^3D° - 4f\ ^3F$†
2878.632	A	1500	11.17	15.46	2–3	(59)
2993.866	A	1000	11.37	15.50	1–2	
2730.124	A	500	12.73	17.25	4–4	$5d'\ ^1G° - 4f'\ ^1G$ (60)

XENON, $Z = 54$

Xe I

I P 12.078 Anal A List D February 1953

REFERENCES

A J. C. Boyce, Phys. Rev. **49**, 730 (1936). W L, I, I P
C. J. Humphreys and W. F. Meggers, Bur. Std. J. Research **10**, 146, RP521 (1933). T
See C. E. Moore, *Atomic Energy Levels*, Circ. Nat. Bur. Std. **467**, Vol. III, 113 (1958). T

Xe I **Xe I**

I A	Ref	Int	E P		J	Multiplet No.	I A	Ref	Int	E P		J	Multiplet No.
			Low	High						Low	High		
Vac 1469.621‡	A	5	0.00	8.40	0−1	$5p^6\ ^1S - 6s\ [1\frac{1}{2}]^\circ$ (1)	Vac 1250.199	A	2	0.00	9.87	0−1	$5p^6\ ^1S - 5d\ [0\frac{1}{2}]^\circ$ (3)
1295.560	A	8d	0.00	9.53	0−1	$5p^6\ ^1S - 6s'\ [0\frac{1}{2}]^\circ$ (2)	1192.04	A	2	0.00	10.36	0−1	$5p^6\ ^1S - 5d\ [1\frac{1}{2}]^\circ$ (4)

Xe II

I P 21.1 Anal A List C January 1954

REFERENCES

A J. C. Boyce, Phys. Rev. **49**, 730 (1936). W L, (I)
B C. J. Humphreys, J. Research Nat. Bur. Std. **22**, 19, RP1164 (1939). W L, I, T, I P

Xe II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1100.432‡	A	(10)	0.00	11.22	1½–0½	$5p^5\ ^2P^\circ - 5p^6\ ^2S$
1244.756	A	(5)	1.30	11.22	0½–0½	(1)
1074.476	A	(15)	0.00	11.49	1½–2½	$5p^5\ ^2P^\circ - 6s\ ^4P$
1183.053	A	(7)	1.30	11.74	0½–1½	(2)
1051.920	A	(10)	0.00	11.74	1½–1½	
1048.272	A	(8)	0.00	11.78	1½–2½	$5p^5\ ^2P^\circ - 5d\ ^4D$
1169.63	A	(2)	1.30	11.86	0½–1½	(3)
1041.306	A	(9)	0.00	11.86	1½–1½	
1158.474	A	(5)	1.30	11.96	0½–0½	
1032.438	A	(4)	0.00	11.96	1½–0½	
972.769	A	(7)	0.00	12.69	1½–1½	$5p^5\ ^2P^\circ - 6s\ ^2P$
1083.860	A	(5)	1.30	12.69	0½–1½	(4)
1037.680	A	(6)	1.30	13.20	0½–0½	$5p^5\ ^2P^\circ - 5d\ ^4P$
935.405	A	(2)	0.00	13.20	1½–0½	(5)
925.866	A	(5)	0.00	13.33	1½–2½	$5p^5\ ^2P^\circ - 6s'\ ^2D$
976.678	A	(6)	1.30	13.94	0½–1½	(6)
885.54	A	(3)	0.00	13.94	1½–1½	
880.802	A	(5)	1.30	15.32	0½–0½	$5p^5\ ^2P^\circ - 6s''\ ^2S$ (7)

Xe II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
803.066	A	(3)	1.30	16.67	0½–0½	$5p^5\ ^2P^\circ - 7s\ ^4P$
740.406	A	(3)	0.00	16.67	1½–0½	(8)
Air						
2864.73	B	150	13.00	17.31	1½–1½	$5d\ ^2P - 6p''\ ^2P^\circ$ (9)
2979.32	B	300	13.14	17.29	2½–2½	$5d\ ^4P - 15^\circ$ (10)
2895.22	B	150h	14.17	18.43	2½–2½	$5d'\ ^2F - 35^\circ$ (11)

Strongest Unclassified Line of Xe II

Air 2475.89	B	100				

Xe III

I P 32.0 Anal A List D October 1953

REFERENCES

A J. C. Boyce, Phys. Rev. **49**, 730 (1936). W L, I
C. J. Humphreys, J. Research Nat. Bur. Std. **16**, 639, RP898 (1936). W L, T, I P

Xe III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1017.680	A	35	0.00	12.13	2–2	$5p^4\ ^3P - 5p^5\ ^3P^\circ$
1066.391	A	12	1.21	12.79	1–1	(1)
965.540	A	10	0.00	12.79	2–1	
1003.370	A	35	1.21	13.51	1–0	
1130.344	A	30	1.21	12.13	1–2	
1047.801	A	10	1.00	12.79	0–1	
896.003	A	20	0.00	13.78	2–3	$5p^4\ ^3P - 5d\ ^5D^\circ$†
893.989	A	20	0.00	13.81	2–2	(2)
889.276	A	15	0.00	13.88	2–1	
824.881	A	30	0.00	14.97	2–3	$5p^4\ ^3P - 5d\ ^3D^\circ$†
801.980	A	15	0.00	15.39	2–2	(3)
823.210	A	25	0.00	15.00	2–2	$5p^4\ ^3P - 6s\ ^5S^\circ$† (4)

Xe III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
796.070	A	12	0.00	15.51	2–1	$5p^4\ ^3P - 6s\ ^3S^\circ$† (5)
792.896	A	15	0.00	15.57	2–3	$5p^4\ ^3P - 5d'\ ^3F^\circ$
*779.126	A	25	0.00	15.84	2–2?	(6)
721.199	A	10	0.00	17.12	2–3	$5p^4\ ^3P - 6s'\ ^3D^\circ$†
742.566	A	15	0.00	16.62	2–2	(7)
733.314	A	10	0.00	16.83	2–2	$5p^4\ ^3P - 5d'\ 41^\circ$† (8)
698.541	A	20	0.00	17.67	2–3	$5p^4\ ^3P - 5d'\ ^3D^\circ$†
756.031	A	10	1.21	17.54	1–2	(9)
769.143	A	10	1.00	17.05	0–1	
*779.126	A	25	1.21	17.05	1–1	

CESIUM, $Z = 55$

Cs I

I P 3.877 Anal A February 1954

REFERENCES

H. R. Kratz, Phys. Rev. 75, 1844 (1949). W L, T, I P
H. Beutler und K. Guggenheimer, Zeit. Phys. 88, 25 (1934). W L, T
See also *"Atomic Energy Levels"* Circ. Nat. Bur. Std. **467**, Vol. III, 124 (1958).

Cs I

All members of the $6s\ ^2S$—$np\ ^2P^\circ$ series, which is now observed from $n=6$ to 73, are in the wavelength region longer than 3183 A. All ultraviolet observations are from the ground term to levels above the ionization limit.

Cs II

I P 25.0 Anal B List C January 1954

REFERENCES

A M. Wheatley and R. Sawyer, Phys. Rev. **61**, 591 (1942). W L, I, T
B J. Olthoff and R. A. Sawyer, Phys. Rev. **42**, 766 (1932). W L, (I), (T)
R. A. Boyd and R. A. Sawyer, Phys. Rev. **61**, 601 (1942). I P

Cs II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 926.75‡	B	(20)	0.00	13.32	0−1	$5p^6\ ^1S$ −6s [1½]° (1)
813.85	B	(20)	0.00	15.17	0−1	$5p^6\ ^1S$ −6s′ [0½]° (2)
901.34	B	(20)	0.00	13.70	0−1	$5p^6\ ^1S$ −5d [1½]° (3)
808.77	B	(20)	0.00	15.26	0−1	$5p^6\ ^1S$ −5d′ [1½]° (4)
668.43	B	(12)	0.00	18.47	0−1	$5p^6\ ^1S$ −6d [0½]° (5)
639.42	B	(12)	0.00	19.31	0−1	$5p^6\ ^1S$ −23° (6)
Air 2257.82	A	12	13.86	19.32	4−3	5d [3½]°−13 (7)

Cs II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air 2881.19	A	15	15.11	19.39	0−1	6s′ [0½]°−15 (8)
2931.09	A	20	15.26	19.47	1−0	5d′ [1½]°−16 (9)
2748.23	A	15	15.81	20.30	2−1	6p [2½] −30° (10)
2392.86	A	15	16.14	21.30	2−3	6p [1½] −47° (11)
2776.99	A	15	18.86	23.31	2−2	6d [1½]°−27
2609.44	A	15	18.86	23.59	2−3	(12)25
2816.94	A	20	18.93	23.31	2−2	20°−27
2651.71	A	12	18.93	23.58	2−2	(13)26
2254.58	A	15	18.93	24.40	2−3	22
2568.69	A	15	18.96	23.76	3−2	21°−24
2267.61	A	20	18.96	24.40	3−3	(14)22
2573.03	A	30	18.97	23.77	3−3	22°−23
2273.83	A	20	18.97	24.40	3−3	(15)22

BARIUM, $Z = 56$

Ba I

I P 5.19 Anal A List C May 1961

REFERENCES

A F. Sullivan and K. Burns, Science Studies St. Bonaventure College **9**, No. 3, 7 (1941). W L, T
B K. Schmitz, See H. Kayser und H. Konen, *Handbuch der Spectroscopie* **7**, 79 (1934). W L
H. N. Russell and C. E. Moore, J. Research Nat. Bur. Std. **55**, 299, RP2633 (1955). I P, T, C L
W. R. S. Garton and K. Codling, Proc. Phys. Soc. **75**, 87 (1960). I P, T, C L, W L, I
A. S. King, Contr. Mt. Wilson Obs. No. **150**; Astroph. J. **48**, 13 (1918). I

Ba I **Ba I**

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air 2785.276	A	15	0.00	4.43	0−1	$6s^2\ ^1S - 8p\ ^1P^\circ$ (1)	Air 2702.632	A	8	0.00	4.57	0−1	$6s^2\ ^1S - 7p'\ ^3P^\circ$ (3)
2739.243	B	3	0.00	4.51	0−1	$6s^2\ ^1S - 7p'\ ^3D^\circ$ (2)	2596.637	A	8n	0.00	4.75	0−1	$6s^2\ ^1S - 7p'\ ^1P^\circ$ (4)

Ba II

I P 9.961 Anal A List C February 1954

REFERENCES

A F. Sullivan and K. Burns, Science Studies **9**, 7 (1941). W L
B E. W. H. Selwyn, Proc. Phys. Soc. **41**, 400 (1929). W L, (I)
C See E. Rasmussen, Zeit. Phys. **83**, 407 (1933). W L, I, T, I P
P Predicted wavelength
See H. Kayser and H. Konen, *Handbuch der Spectroscopie* **7**, 93 (1934). I

Ba II **Ba II**

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 1999.54	B	(3)	0.00	6.17	0½−1½	$6s\ ^2S - 7p\ ^2P^\circ$ (1)	Vac 1924.77	B	(5)	0.70	7.11	2½−3½	$5d\ ^2D - 5f\ ^2F^\circ$ (4)
Air 2024.18	B	(4)	0.00	6.10	0½−0½		1904.16	B	(1)	0.60	7.08	1½−2½	
2335.269	A	10R	0.70	5.99	2½−3½	$5d\ ^2D - 4f\ ^2F^\circ$ (2)	Air 2771.348	A	3r	2.71	7.16	1½−0½	$6p\ ^2P^\circ - 8s\ ^2S$ (5)
2304.248	A	8R	0.60	5.96	1½−2½		2647.264	A	4r	2.50	7.16	0½−0½	
2347.592	A	6	0.70	5.96	2½−2½		2634.778	A	7r	2.71	7.39	1½−2½	$6p\ ^2P^\circ - 7d\ ^2D$ (6)
2254.73	C	10	0.70	6.17	2½−1½	$5d\ ^2D - 7p\ ^2P^\circ$ (3)	2528.404	P	–	2.50	7.38	0½−1½	
2245.61	C	8	0.60	6.10	1½−0½		2641.369	A	2r	2.71	7.38	1½−1½	
2214.7	C	5	0.60	6.17	1½−1½								

LANTHANUM, $Z = 57$

La I

I P 5.59 ± 0.03 Anal A List A March 1954

REFERENCE

A W. F. Meggers, See H. N. Russell and W. F. Meggers, Bur. Std. J. Research 9, 625, RP497 (1932).
W L, I, T, I P

La I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2722.31	A	6	0.00	4.53	1½−	$a\ ^2D$ −10° (1)
2725.57	A	15	0.13	4.66	2½−3½?	$a\ ^2D$ −11° (2)
2707.07	A	3	0.33	4.89	1½−	$a\ ^4F$ −12° (3)

La I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2766.46	A	4	0.43	4.89	3½−	$a\ ^4F$ −13° (4)
2729.85	A	5	0.37	4.89	2½−	
2761.56	A	7	0.51	4.98	4½−	$a\ ^4F$ −14° (5)
2714.52	A	8	0.43	4.98	3½−	
2677.77	A	2	0.37	4.98	2½−	$a\ ^4F$ −15° (6)
2653.48	A	2	0.33	4.98	1½−	

La II

I P 11.39 Anal A List C March 1954

REFERENCE

A W. F. Meggers, see H. N. Russell and W. F. Meggers, Bur. Std. J. Research 9, 628, RP497 (1932).
W L, I, T, I P

La II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2187.87	A	40	0.00	5.64	2−1	$a\ ^3F - x\ ^1P°$ (1)
2256.77	A	50	0.17	5.64	2−1	$a\ ^1D - x\ ^1P°$ (2)
2319.44	A	20	0.32	5.64	2−1	$a\ ^3D - x\ ^1P°$ (3)
2533.14	A	15	0.77	5.64	2−1	$a\ ^3P - x\ ^1P°$ (4)
2471.90	A	20	0.65	5.64	0−1	
2610.34	A	150	0.91	5.64	0−1	$a\ ^1S - x\ ^1P°$ (5)
2808.39	A	150	1.25	5.64	2—1	$b\ ^1D - x\ ^1P°$ (6)
2580.82	A	8hl	1.94	6.72	4−5	$z\ ^3F° - f\ ^3G$ (7)
2566.09	A	10hl	1.77	6.58	3−4	
2582.55	A	6	1.75	6.53	2−3	

La II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2596.08	A	20	2.05	6.80	4−4	$z\ ^1G° - e\ ^3H†$ (8)
2399.64	A	20hl	2.05	7.19	4−4	$z\ ^1G° - g\ ^3F$ (9)
2325.75	A	20hl	2.05	7.35	4−4	$z\ ^1G° - g\ ^1G$ (10)
2560.37	A	50	2.37	7.19	4−4	$y\ ^3F° - g\ ^3F$ (11)
2519.22	A	50	2.25	7.15	3−3	
2487.59	A	40	2.12	7.09	2−2	
2582.96	A	8	2.37	7.15	4−3	
2552.60	A	7	2.25	7.09	3−2	
2455.88	A	10	2.12	7.15	2−3	
2479.85	A	10l	2.37	7.35	4−4	$y\ ^3F° - g\ ^1G$ (12)
2695.47	A	35	2.44	7.02	6−6	$z\ ^3H° - e\ ^3H†$ (13)
2672.90	A	30	2.29	6.91	5−5	
2681.49	A	10	2.20	6.80	4−4	
2472.44	A	10	2.20	7.19	4−4	$z\ ^3H° - g\ ^3F$ (14)

La II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2561.84	A	20l	2.33	7.15	2–3	$z\ ^1D^\circ - g\ ^3F$† (15)
2438.02	A	20	2.33	7.39	2–2	$z\ ^1D^\circ - h\ ^1D$ (16)
2317.82	A	20hl	2.33	7.66	2–2	$z\ ^1D^\circ - i\ ^1D$ (17)
3025.88	A	4?	2.75	6.83	5–4	$z\ ^3G^\circ - f\ ^3F$ (18)
2983.44	A	3	2.63	6.77	4–3	
2985.76	A	2	2.52	6.65	3–2	
2862.98	A	15hl	2.52	6.83	3–4	
2893.08	A	60	2.75	7.02	5–6	$z\ ^3G^\circ - e\ ^3H$† (19)
2885.13	A	50	2.63	6.91	4–5	
2880.65	A	40	2.52	6.80	3–4	
2778.76	A	10	2.75	7.19	5–4	$z\ ^3G^\circ - g\ ^3F$† (20)
2732.40	A	10	2.63	7.15	4–3	
2702.13	A	8	2.52	7.09	3–2	
2798.56	A	40hl	2.78	7.19	3–4	$z\ ^3D^\circ - g\ ^3F$† (21)
2791.51	A	25	2.73	7.15	2–3	
2780.23	A	20	2.65	7.09	1–2	
2501.18	A	15hl	2.78	7.72	3–2	$z\ ^3D^\circ - f\ ^3P$† (22)
*2561.84	A	20l	2.73	7.55	2–1	
2586.35	A	10	2.65	7.42	1–0	
2531.60	A	8	2.78	7.66	3–2	$z\ ^3D^\circ - i\ ^1D$ (23)
2546.40	A	20hl	2.87	7.72	2–2	$z\ ^3P^\circ - f\ ^3P$† (24)
2601.79	A	5	2.80	7.55	1–1	

La II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2436.42	A	15	2.87	7.94	2–2	$z\ ^3P^\circ - g\ ^3P$ (25)
2438.42	A	10	2.80	7.86	1–1	
2471.06	A	5	2.87	7.86	2–1	
2452.73	A	8	2.80	7.83	1–0	
2404.65	A	6	2.80	7.94	1–2	
2437.14	A	10	2.80	7.86	0–1	
2855.90	A	50hl	3.03	7.35	3–4	$y\ ^1F^\circ - g\ ^1G$ (26)
2631.94	A	8	3.03	7.72	3–2	$y\ ^1F^\circ - f\ ^3P$ (27)
2923.90	A	20	3.50	7.72	3–2	$y\ ^3D^\circ - f\ ^3P$† (28)
2962.90	A	15	3.38	7.55	2–1	
2929.86	A	7	3.21	7.42	1–0	
2779.78	A	10	3.50	7.94	3–2	$y\ ^3D^\circ - g\ ^3P$† (29)
2752.84	A	10	3.38	7.86	2–1	
2666.54	A	3	3.21	7.83	1–0	
3059.91	A	8	3.39	7.42	1–0	$z\ ^1P^\circ - f\ ^3P$† (30)
2767.40	A	8	3.48	7.94	1–2	$y\ ^3P^\circ - g\ ^3P$ (31)
2840.51	A	25hl	3.64	7.99	2–3	$y\ ^3P^\circ - h\ ^3D$† (32)
2748.31	A	8	3.48	7.97	1–2	
2715.43	A	10hl	3.40	7.95	0–1	
2950.50	A	50	3.52	7.70	5–6	$z\ ^1H^\circ - e\ ^1I$ (33)

Strongest Unclassified Lines of La II

Air							Air					
2445.56	A	10h					2142.81	A	20hl			
2163.66	A	20hl										

La III

I P 19.09 Anal A List A April 1954

REFERENCES

A H. N. Russell and W. F. Meggers, Bur. Std. J. Research 9, 625 RP497 (1932). W L, I, T, I P

B R. J. Lang, Canadian J. Research [A] 13, 4 (1935). W L, (I), T

La III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2297.75	A	200	0.20	5.57	2½–1½	$5d\ ^2D - 6p\ ^2P^\circ$ (1)
2379.38	A	200	0.00	5.19	1½–0½	
2216.08	A	50	0.00	5.57	1½–1½	
Vac						
1099.73	B	(15)	0.20	11.42	2½–3½	$5d\ ^2D - 4f\ ^2F^\circ$ (2)
1081.61	B	(15)	0.00	11.41	1½–2½	
1100.70	B	(7)	0.20	11.41	2½–2½	

La III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2651.60	A	300	5.57	10.22	1½–2½	$6p\ ^2P^\circ - 6d\ ^2D$ (3)
2476.72	A	100	5.19	10.17	0½–1½	
2682.46	A	30	5.57	10.17	1½–1½	
2684.90	A	50	5.57	10.17	1½–0½	$6p\ ^2P^\circ - 7s\ ^2S$ (4)
2478.8	A	20	5.19	10.17	0½–0½	
Vac						
1462.26	B	(5)	5.57	14.01	1½–0½	$6p\ ^2P^\circ - 8s\ ^2S$ (5)
1399.01	B	(2)	5.19	14.01	0½–0½	

HAFNIUM, $Z = 72$

Hf I

I P 6.8 Anal B List C July 1961

REFERENCE

A W. F. Meggers, unpublished material (July 1959). I P, T, W L, C L, I, Z E

Hf I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
3119.980	A	100	0.56	4.52	4–3	$a\ ^3F - x\ ^3D°$
3067.426	A	200	0.29	4.31	3–2	(1)
3016.80	A	200	0.00	4.09	2–1	
2918.591	A	300	0.29	4.52	3–3	
2860.558	A	100	0.00	4.31	2–2	
2730.700	A	50	0.00	4.52	2–3	
3172.949	A	300	0.56	4.45	4–4	$a\ ^3F - x\ ^3F°$
3164.385	A	100	0.29	4.19	3–3	(2)
2980.815	A	500	0.00	4.14	2–2	
3402.512	A	200	0.56	4.19	4–3	
3206.108	A	150	0.29	4.14	3–2	
2964.885	A	400	0.29	4.45	3–4	
2944.71	A	200	0.00	4.19	2–3	
3096.764	A	150	0.56	4.55	4–4	$a\ ^3F - w\ ^3F°$
3020.530	A	300	0.29	4.38	3–3	(3)
2940.762	A	800	0.00	4.20	2–2	
3236.76	A	100	0.56	4.38	4–3	
3159.84	A	300	0.29	4.20	3–2	
2898.256	A	500	0.29	4.55	3–4	
2819.746	A	100	0.00	4.38	2–3	
2954.201	A	500	0.56	4.74	4–3	$a\ ^3F - w\ ^3D°$†
2904.760	A	300	0.29	4.54	3–2	(4)
2889.62	A	300	0.00	4.27	2–1	
3306.110	A	300	0.56	4.30	4–4	$a\ ^3F - z\ ^1G°$
3080.842	A	200	0.29	4.30	3–4	(5)
2866.373	A	500	0.00	4.31	2–3	$a\ ^3F - y\ ^1F°$†
						(6)
2887.132	A	200	0.56	4.84	4–3	$a\ ^3F - v\ ^3D°$†
2779.370	A	150	0.29	4.73	3–2	(7)
2833.285	A	150	0.00	4.36	2–1	
3156.688	A	200	0.56	4.47	4–3	$a\ ^3F - x\ ^1F°$
2950.670	A	600	0.29	4.47	3–3	(8)
2758.771	A	80	0.00	4.47	2–3	
2761.634	A	200	0.56	5.03	4–3	$a\ ^3F - u\ ^3D°$†
2636.997	A	50	0.29	4.97	3–2	(9)
2705.612	A	100	0.00	4.56	2–1	
2916.48	A	800	0.56	4.80	4–5	$a\ ^3F - x\ ^3G°$†
3057.010	A	400	0.56	4.60	4–4	(10)

Hf I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2904.412	A	400	0.56	4.81	4–4	$a\ ^3F - v\ ^3F°$†
						(11)
3291.043	A	150	0.81	4.56	1–1	$a\ ^3P - u\ ^3D°$†
2966.953	A	150	0.81	4.97	1–2	(12)
2973.390	A	100	0.81	4.96	1–2	$a\ ^3P - v\ ^3F°$†
						(13)
2924.613	A	150	0.68	4.90	0–1	$a\ ^3P - 39704°$†
						(14)
2887.542	A	100	0.81	5.09	1–1	$a\ ^3P - 41193°$†
						(15)
2929.395	A	200	1.11	5.32	2–3	$a\ ^3P - 43104°$
						(16)
*2850.967	A	100	1.11	5.44	2–3	$a\ ^3P - 44049°$
						(17)
2817.685	A	100	1.11	5.49	2–3	$a\ ^3P - 44463°$
						(18)
2979.288	A	100	0.70	4.84	2–3	$a\ ^1D - v\ ^3D°$†
						(19)
2845.832	A	200	0.70	5.03	2–3	$a\ ^1D - u\ ^3D°$
						(20)
2958.01	A	300	0.70	4.87	2–2	$a\ ^1D - x\ ^3P°$
3074.789	A	100	0.70	4.71	2–1	(21)
*2850.967	A	100	0.70	5.02	2–1	$a\ ^1D - 40704°$
						(22)
2743.677	A	100	0.70	5.19	2–2	$a\ ^1D - 42075°$
						(23)
2668.290	A	90	0.70	5.32	2–3	$a\ ^1D - 43104°$
						(24)
2982.727	A	150	1.30	5.44	4–3	$a\ ^1G - 44049°$
						(25)

Hf II

I P 14.8 Anal A List C March 1961

REFERENCE

A W. F. Meggers, unpublished material (January 1957). I P, T, C L, W L, I

Hf II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2820.23	A	400	0.38	4.75	2½–3½	$a\,^2D - z\,^4G^\circ$ (1)
2861.01	A	300	0.00	4.31	1½–2½	
3134.72	A	1000	0.38	4.31	2½–2½	
2582.51	A	200	0.38	5.16	2½–2½	$a\,^2D - y\,^2D^\circ$ (2)
2638.71	A	400	0.00	4.68	1½–1½	
2869.83	A	100	0.38	4.68	2½–1½	
2393.83	A	100	0.00	5.16	1½–2½	
2606.37	A	200	0.38	5.11	2½–3½	$a\,^2D - z\,^2F^\circ$ (3)
2591.33	A	100	0.00	4.76	1½–2½	
2813.87	A	200	0.38	4.76	2½–2½	
2417.69	A	150	0.38	5.48	2½–3½	$a\,^2D - y\,^4F^\circ$† (4)
2460.49	A	300	0.38	5.39	2½–2½	
2351.21	A	150	0.00	5.25	1½–1½	
2516.88	A	500	0.38	5.28	2½–1½	$a\,^2D - y\,^2P^\circ$† (5)
2322.48	A	100	0.00	5.31	1½–0½	
2400.80	A	80	0.38	5.52	2½–3½	$a\,^2D - y\,^2F^\circ$ (6)
2277.16	A	200	0.00	5.42	1½–2½	
2447.25	A	300	0.38	5.42	2½–2½	
2641.41‡	A	800	1.03	5.70	4½–5½	$a\,^4F - z\,^4G^\circ$† (7)
2773.36	A	400	0.78	5.23	3½–4½	
2975.89	A	600	0.61	4.75	2½–3½	
3194.20	A	800	0.45	4.31	1½–2½	
2937.78	A	800	1.03	5.23	4½–4½	
3109.12	A	1000	0.78	4.75	3½–3½	
3328.21	A	70	0.61	4.31	2½–2½	
3495.75	A	250	0.78	4.31	3½–2½	
2822.68	A	300	0.78	5.16	3½–2½	$a\,^4F - y\,^2D^\circ$ (8)
3031.16	A	600	0.61	4.68	2½–1½	
2712.42	A	100	0.61	5.16	2½–2½	
2919.59	A	500	0.45	4.68	1½–1½	
2622.74	A	400	0.45	5.16	1½–2½	
2808.00	A	300	0.61	5.00	2½–2½	$a\,^4F - z\,^4P^\circ$† (9)
2712.00	A	30	0.45	5.00	1½–2½	
3025.29	A	200	1.03	5.11	4½–3½	$a\,^4F - z\,^2F^\circ$ (10)
3101.39	A	400	0.78	4.76	3½–2½	
2851.21	A	200	0.78	5.11	3½–3½	
2968.81	A	500	0.61	4.76	2½–2½	
2738.77	A	400	0.61	5.11	2½–3½	
2861.70	A	500	0.45	4.76	1½–2½	
2647.30	A	500	1.03	5.69	4½–4½	$a\,^4F - y\,^4F^\circ$ (11)
2626.95	A	50	0.78	5.48	3½–3½	
2578.15	A	100	0.61	5.39	2½–2½	
2571.68	A	400	0.45	5.25	1½–1½	
2774.01	A	100	1.03	5.48	4½–3½	
2677.56	A	20	0.78	5.39	3½–2½	
2657.85	A	100	0.61	5.25	2½–1½	
2513.02	A	300	0.78	5.69	3½–4½	
2531.19	A	200	0.61	5.48	2½–3½	
2496.99	A	200	0.45	5.39	1½–2½	
2537.33	A	100	0.45	5.31	1½–0½	$a\,^4F - y\,^2P^\circ$† (12)
2751.82	A	200	1.03	5.52	4½–3½	$a\,^4F - y\,^2F^\circ$ (13)
2661.89	A	200	0.78	5.42	3½–2½	
2607.03	A	400	0.78	5.52	3½–3½	
2563.61	A	150	0.61	5.42	2½–2½	
2512.69	A	200	0.61	5.52	2½–3½	
2483.34	A	40	0.45	5.42	1½–2½	
2464.19	A	300	1.03	6.04	4½–3½	$a\,^4F - y\,^4D^\circ$† (14)
2405.42	A	200	0.78	5.91	3½–2½	
2393.36	A	80	0.61	5.76	2½–1½	
2380.30	A	80	0.45	5.63	1½–0½	
2347.44	A	120	0.78	6.04	3½–3½	
2324.89	A	60	0.61	5.91	2½–2½	
2323.26	A	60	0.45	5.76	1½–1½	

Hf II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2410.13	A	100	1.03	6.15	4½–4½	$a\,^4F - z\,^2G^\circ$† (15)
2449.43	A	100	0.78	5.82	3½–3½	
2576.83	A	150	1.03	5.82	4½–3½	
2961.80	A	100	1.60	5.76	1½–1½	$a\,^4P - y\,^4D^\circ$† (16)
2967.23	A	200	1.48	5.63	0½–0½	
2977.59	A	100	1.60	5.74	1½–0½	$a\,^4P - z\,^2S^\circ$† (17)
2968.94	A	100	1.66	5.82	2½–3½	$a\,^4P - z\,^2G^\circ$ (18)
2814.48	A	250	1.66	6.05	2½–2½	$a\,^4P - x\,^2D^\circ$† (19)
2852.01	A	100	1.60	5.92	1½–1½	
2898.71	A	200	1.66	5.92	2½–1½	
2706.73	A	100	1.66	6.22	2½–1½	$a\,^4P - y\,^4P^\circ$† (20)
2665.98	A	100	1.60	6.22	1½–1½	
2425.98	A	100	1.66	6.75	2½–2½	$a\,^4P - x\,^4D^\circ$† (21)
2548.19	A	60	1.66	6.51	2½–1½	
2515.49	A	100	1.66	6.57	2½–3½	$a\,^4P - w\,^2F^\circ$† (22)
2404.56	A	40	1.66	6.80	2½–2½	$a\,^4P - x\,^4P^\circ$† (23)
2463.94	A	60	1.60	6.60	1½–1½	
2473.90	A	100	1.60	6.58	1½–0½	
2469.17	A	100	1.66	6.66	2½–3½	$a\,^4P - y\,^2G^\circ$ (24)
2789.83	A	50	1.49	5.91	2½–2½	$a\,^2F - y\,^4D^\circ$† (25)
3046.03	A	200	1.86	5.91	3½–2½	
2876.33	A	300	1.86	6.15	3½–4½	$a\,^2F - z\,^2G^\circ$ (26)
2849.21	A	300	1.49	5.82	2½–3½	
3116.95	A	100	1.86	5.82	3½–3½	
2947.14	A	100	1.86	6.05	3½–2½	$a\,^2F - x\,^2D^\circ$† (27)
2706.64	A	70	1.49	6.05	2½–2½	
2683.35	A	400	1.86	6.46	3½–3½	$a\,^2F - x\,^2F^\circ$† (28)
2573.91	A	150	1.49	6.28	2½–2½	
2657.49	A	50	1.86	6.51	3½–2½	$a\,^2F - w\,^2D^\circ$ (29)
2559.19	A	100	1.49	6.31	2½–1½	
2500.74	A	100	1.86	6.80	3½–2½	$a\,^2F - x\,^4P^\circ$† (30)
2413.34	A	30	1.49	6.60	2½–1½	
2096.18	A	100	1.86	7.75	3½–2½	$a\,^2F - v\,^2F^\circ$† (31)
2829.33	A	80	2.14	6.51	2½–2½	$b\,^2D - w\,^2D^\circ$† (32)
2718.50	A	100	1.77	6.31	1½–1½	
2433.56	A	100	2.14	7.22	2½–3½	$b\,^2D - x\,^4D^\circ$† (33)
2478.55	A	30	1.77	6.75	1½–2½	
2651.17	A	100	2.14	6.80	2½–1½	$b\,^2D - x\,^2P^\circ$† (34)
2789.50	A	100	2.15	6.57	4½–3½	$a\,^2G - w\,^2F^\circ$ (35)
2814.77	A	100	2.19	6.57	3½–3½	
2551.37	A	200*	2.15	6.98	4½–5½	$a\,^2G - z\,^2H^\circ$† (36)
2789.72	A	200	2.19	6.61	3½–4½	
2613.61	A	200	2.15	6.87	4½–4½	$a\,^2G - y\,^2G^\circ$† (37)
2756.92	A	80	2.19	6.66	3½–3½	
2129.10	A	100	2.19	7.98	3½–2½	$a\,^2G - u\,^2D^\circ$ (38)

TANTALUM, $Z = 73$

Ta I

I P 7.9 Anal B List D April 1961

REFERENCES

A C. C. Kiess and H. K. Kiess, unpublished material (March 1961). I P, T, C L, W L, I
See C. E. Moore, *Atomic Energy Levels,* Circ. Nat. Bur. Std. **467,** Vol. III, 149 (1958). I P, T
* and §=Blend of Ta I and Ta II

Ta I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2965.54	A	25	0.25	4.41	$2\frac{1}{2}-1\frac{1}{2}$	$a\,^4F$ $-35721°$ (1)
2899.03	A	15	0.49	4.75	$3\frac{1}{2}-2\frac{1}{2}$	$a\,^4F$ — $y\,^4F°$†
2891.84	A	30	0.25	4.52	$2\frac{1}{2}-1\frac{1}{2}$	(2)
2714.66‡	A	18	0.00	4.55	$1\frac{1}{2}-2\frac{1}{2}$	$a\,^4F$ — $y\,^4G°$†
2850.97	A	35	0.69	5.02	$4\frac{1}{2}-4\frac{1}{2}$	(3)
2879.73	A	15	0.49	4.77	$3\frac{1}{2}-3\frac{1}{2}$	
2871.40	A	25	0.25	4.55	$2\frac{1}{2}-2\frac{1}{2}$	
2691.31	A	18	0.00	4.59	$1\frac{1}{2}-2\frac{1}{2}$	$a\,^4F$ $-37145°$
2668.62	A	20	0.00	4.62	$1\frac{1}{2}-0\frac{1}{2}$	(4) $-37461°$
2969.47	A	20	0.49	4.65	$3\frac{1}{2}-2\frac{1}{2}$	$a\,^4F$ $-37630°$
2806.59	A	25	0.25	4.65	$2\frac{1}{2}-2\frac{1}{2}$	(5)
2796.33	A	25	0.25	4.66	$2\frac{1}{2}-1\frac{1}{2}$	$a\,^4F$ $-37760°$
2647.47	A	30	0.00	4.66	$1\frac{1}{2}-1\frac{1}{2}$	(6)
2661.88	A	18	0.69	5.33	$4\frac{1}{2}-3\frac{1}{2}$	$a\,^4F$ — $y\,^6F°$† (7)
2736.24	A	20	0.25	4.76	$2\frac{1}{2}-1\frac{1}{2}$	$a\,^4F$ $-38545°$ (8)
*2873.56§	A	20	0.49	4.78	$3\frac{1}{2}-2\frac{1}{2}$	$a\,^4F$ $-38753°$
2720.74	A	12	0.25	4.78	$2\frac{1}{2}-2\frac{1}{2}$	(9)
2579.62	A	12	0.00	4.78	$1\frac{1}{2}-2\frac{1}{2}$	
2573.54	A	18	0.00	4.80	$1\frac{1}{2}-0\frac{1}{2}$	$a\,^4F$ $-38845°$ (10)

Ta I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2848.51	A	22	0.49	4.82	$3\frac{1}{2}-2\frac{1}{2}$	$a\,^4F$ $-39059°$
2698.29	A	20	0.25	4.82	$2\frac{1}{2}-2\frac{1}{2}$	(11)
2559.43	A	25	0.00	4.82	$1\frac{1}{2}-2\frac{1}{2}$	
2684.27	A	18	0.25	4.85	$2\frac{1}{2}-1\frac{1}{2}$	$a\,^4F$ $-39253°$† (12)
2957.59	A	20	0.69	4.87	$4\frac{1}{2}-4\frac{1}{2}$	$a\,^4F$ $-39422°$
2819.37	A	15	0.49	4.87	$3\frac{1}{2}-4\frac{1}{2}$	(13)
2802.06	A	20	0.49	4.89	$3\frac{1}{2}-3\frac{1}{2}$	$a\,^4F$ $-39641°$† (14)
2798.40	A	18	0.49	4.90	$3\frac{1}{2}-2\frac{1}{2}$	$a\,^4F$ $-39688°$
2653.27	A	75	0.25	4.90	$2\frac{1}{2}-2\frac{1}{2}$	(15)
2790.72	A	25	0.49	4.91	$3\frac{1}{2}-2\frac{1}{2}$	$a\,^4F$ $-39786°$†
2646.36	A	20	0.25	4.91	$2\frac{1}{2}-2\frac{1}{2}$	(16)
2779.11	A	35	0.49	4.93	$3\frac{1}{2}-3\frac{1}{2}$	$a\,^4F$ $-39936°$† (17)
2880.00	A	20	0.69	4.98	$4\frac{1}{2}-3\frac{1}{2}$	$a\,^4F$ $-40333°$
2748.77	A	20	0.49	4.98	$3\frac{1}{2}-3\frac{1}{2}$	(18)
2608.63	A	15	0.25	4.98	$2\frac{1}{2}-3\frac{1}{2}$	
2845.34	A	20	0.69	5.03	$4\frac{1}{2}-3\frac{1}{2}$	$a\,^4F$ $-40755°$
2717.18	A	15	0.49	5.03	$3\frac{1}{2}-3\frac{1}{2}$	(19)

Ta I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2710.12	A	20	0.49	5.04	3½–2½	$a\,^4F$ *−40851°*
2573.80	A	15	0.25	5.04	2½–2½	(20)
2427.64	A	18	0.00	5.08	1½–0½	$a\,^4F$ *−41179°* (21)
2636.67	A	25	0.49	5.17	3½–2½	$a\,^4F$ *−41879°*†
2507.45	A	15	0.25	5.17	2½–2½	(22)
2692.39	A	18	0.69	5.28	4½–3½	$a\,^4F$ *−42751°* (23)
2668.06	A	15	0.69	5.32	4½–4½	$a\,^4F$ *−43090°*
2555.07	A	10	0.49	5.32	3½–4½	(24)
2661.33	A	30	0.69	5.33	4½–5½	$a\,^4F$ *−43185°*
2636.90	A	30	0.69	5.37	4½–3½	(25) *−43533°*†
2504.45	A	27	0.49	5.42	3½–2½	$a\,^4F$ *−43880°*† (26)
2595.26	A	15	0.69	5.45	4½–5½	$a\,^4F$ *−44141°*
2593.09	A	15	0.69	5.45	4½–4½	(27) *−44173°*
2989.49	A	20	0.75	4.88	0½–0½	$a\,^4P$ *−39490°*† (28)
*2874.14	A	15	0.75	5.04	1½–2½	$a\,^4P$ *−40851°*†
2814.79	A	20	0.75	5.13	1½–2½	(29) *−41584°*†
2806.29	A	20	0.75	5.15	1½–1½	*−41692°*†
2791.67	A	20	0.75	5.17	1½–2½	*−41879°*
2718.37	A	15	0.75	5.29	1½–2½	*−42844°*†
2947.80	A	10	1.14	5.33	2½–1½	$a\,^4P$ *−43167°*
2694.75	A	12	0.75	5.33	1½–1½	(30)
2693.34	A	15	0.75	5.33	0½–1½	
2696.80	A	15	1.14	5.72	2½–2½	$a\,^4P$ – $y\,^4P°$† (31)
2643.88	A	15	0.75	5.42	1½–2½	$a\,^4P$ *−43880°* (32)
2601.05	A	15	0.75	5.49	0½–1½	$a\,^4P$ *−44483°*† (33)
2787.69	A	50	1.14	5.57	2½–3½	$a\,^4P$ *−45114°* (34)
2741.16	A	12	1.14	5.64	2½–1½	$a\,^4P$ *−45723°*
2519.78	A	12	0.75	5.64	0½–1½	(35)
2650.28	A	18	1.14	5.80	2½–1½	$a\,^4P$ *−46974°*
2575.47	A	15	1.14	5.93	2½–3½	(36) *−48069°*
2844.24	A	25	1.32	5.66	4½–5½	$a\,^2G$ – $y\,^6F°$ (37)
2988.57	A	15	1.32	5.45	4½–5½	$a\,^2G$ *−44141°* (38)

Ta I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2900.35	A	20	1.20	5.45	3½–4½	$a\,^2G$ *−44173°*†
2857.28	A	15	1.20	5.52	3½–3½	(39) *−44693°*†
2781.37	A	25	1.20	5.64	3½–3½	*−45648°*
2817.50	A	15	1.32	5.70	4½–3½	$a\,^2G$ *−46172°*†
2727.77	A	15	1.32	5.84	4½–5½	(40) *−47339°*
2646.21	A	25	1.32	5.98	4½–4½	*−48468°*
2599.41	A	15	1.32	6.07	4½–4½	*−49149°*†
2902.04	A	18	1.65	5.90	4½–4½	$a\,^6D$ – $x\,^6D°$
2925.28	A	10	1.51	5.73	3½–3½	(41)
2939.26	A	15	1.39	5.59	2½–2½	
2834.40	A	15	1.23	5.59	1½–1½	
2876.09	A	10	1.20	5.50	0½–0½	
3024.08	A	10	1.65	5.73	4½–3½	
3027.49	A	12	1.51	5.59	3½–2½	
2940.10	A	18	1.39	5.59	2½–1½	
2894.15	A	12	1.23	5.50	1½–0½	
2810.90	A	20	1.51	5.90	3½–4½	
2842.80	A	20	1.39	5.73	2½–3½	
2833.62	A	15	1.23	5.59	1½–2½	
2796.55	A	15	1.23	5.64	1½–1½	$a\,^6D$ *−45723°*† (42)
2686.29	A	15	1.20	5.80	0½–1½	$a\,^6D$ *−46974°* (43)
2941.36	A	15	1.65	5.84	4½–5½	$a\,^6D$ *−47339°* (44)
2789.77	A	20	1.51	5.93	3½–3½	$a\,^6D$ *−48069°* (45)
2914.12	A	20	1.35	5.59	1½–2½	$a\,^2P$ – $x\,^6D°$†
2781.79	A	15	1.35	5.79	1½–1½	(46) *−46887°*
2775.11	A	15	1.35	5.80	1½–1½	*−46974°*
2864.49	A	15	1.87	6.17	5½–4½	$a\,^2H$ *−50014°* (47)
2889.37	A	15	2.15	6.42	3½–3½	$a\,^2F$ *−51982°* (48)
*2874.14	A	15	2.43	6.72	1½–1½	$z\,^4D°$ – $f\,^4F$ (49)
2821.98	A	15	3.25	7.63	1½–1½	$y\,^4D°$ −61789 (50)

Ta II

I P 16 Anal A List C April 1961

REFERENCE

A C. C. Kiess, J. Research Nat. Bur. Std. **66A3** (1962). T, C L, W L, I

* and §=Blend of Ta I and Ta II

Ta II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2965.93	A	50	0.00	4.16	1–1	*a* ^{5}F −33706°
2965.14	A	250	0.00	4.16	1–2	(1) −33715°
2702.78	A	35	0.00	4.57	1–1	−36987°
*2685.16	A	150	0.00	4.60	1–2	−37230°
2595.58	A	50	0.00	4.75	1–2	−38515°
2844.46	A	200	0.13	4.47	2–2	*a* ^{5}F −36177°
*2797.76	A	200	0.13	4.54	2–3	(2) −36763°
2780.34	A	50	0.13	4.57	2–1	−36987°
2761.65	A	75	0.13	4.60	2–2	−37230°
2665.60	A	50	0.13	4.76	2–1	−38535°
2635.59	A	200	0.13	4.81	2–3	−38962°
2612.62	A	50	0.13	4.85	2–3	−39295°
2545.50	A	75	0.13	4.98	2–1	−40304°
2182.72	A	50	0.13	5.78	2–3	−46831°
2986.81	A	50	0.33	4.46	3–4	*a* ^{5}F −36112°
*2890.26	A	50	0.33	4.60	3–2	(3) −37230°
2752.49	A	100	0.33	4.81	3–3	−38962°
2727.44	A	75	0.33	4.85	3–3	−39295°
2694.52	A	100	0.33	4.91	3–4	−39743°
2659.40	A	40	0.33	4.97	3–2	−40233°
2596.46	A	75	0.33	5.08	3–2	−41144°
*2569.13	A	40	0.33	5.13	3–3	−41554°
2554.63	A	50	0.33	5.16	3–4	−41775°
2532.13	A	100	0.33	5.20	3–4	−42122°
2381.14	A	50	0.33	5.51	3–4	−44626°
2227.85	A	50	0.33	5.87	3–2	−47514°
*2866.14	A	35	0.55	4.85	4–3	*a* ^{5}F −39295°
2829.79	A	30	0.55	4.91	4–4	(4) −39743°
2680.66	A	75	0.55	5.15	4–5	−41709°
2675.90	A	100	0.55	5.16	4–4	−41775°
2651.23	A	125	0.55	5.20	4–4	−42122°
2593.68	A	50	0.55	5.30	4–3	−42959°
2387.09	A	50	0.55	5.72	4–5	−46295°
2196.05	A	50	0.55	6.16	4–4	−49937°
2814.30	A	90	0.76	5.15	5–5	*a* ^{5}F −41709°
2603.49	A	125	0.76	5.50	5–5	(5) −44585°
2470.90	A	50	0.76	5.76	5–4	−46645°
2432.71	A	75	0.76	5.84	5–4	−47280°
2400.62‡	A	100	0.76	5.90	5–6	−47829°
2364.26	A	40	0.76	5.98	5–4	−48470°
2332.00	A	35	0.76	6.06	5–5	−49055°
2142.52	A	40	0.76	6.52	5–6	−52846°
2827.59	A	60	0.39	4.76	2–1	*a* ^{3}F −38535°
2476.69	A	40	0.39	5.38	2–3	(6) −43544°
2879.09	A	35	0.84	5.13	3–3	*a* ^{3}F −41554°
2860.88	A	75	0.84	5.16	3–4	(7) −41775°
2832.70	A	50	0.84	5.20	3–4	−42122°
2689.27	A	50	0.84	5.43	3–4	−44005°
2658.86	A	75	0.84	5.48	3–3	−44430°

Ta II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2957.88	A	50	1.20	5.38	4–3	*a* ^{3}F −43544°
*2866.14	A	35	1.20	5.51	4–4	(8) −44626°
2735.26	A	50	1.20	5.72	4–5	−46295°
*2709.27	A	125	1.20	5.76	4–4	−46645°
2905.24	A	100	0.51	4.76	0–1	*a* ^{3}P −38535°
*2685.16	A	150	0.51	5.11	0–1	(9) −41355°
2881.60	A	50	0.66	4.94	1–0	*a* ^{3}P −40023°
2858.43	A	125	0.66	4.98	1–1	(10) −40304°
2791.37	A	50	0.66	5.08	1–2	−41144°
2885.40	A	40	0.70	4.98	2–1	*a* ^{3}P −40304°
2817.10	A	200	0.70	5.08	2–2	(11) −41144°
2784.96	A	75	0.70	5.13	2–3	−41554°
2739.26	A	75	0.70	5.20	2–2	−42153°
2680.06	A	75	0.70	5.30	2–3	−42959°
2672.50	A	50	0.70	5.32	2–2	−43064°
2526.03	A	50	0.70	5.58	2–1	−45233°
2953.00	A	100	1.20	5.38	2–3	*b* ^{3}F −43544°
2877.67	A	100	1.20	5.48	2–3	(12) −44430°
2557.71	A	50	1.20	6.02	2–1	−48776°
2537.96	A	75	1.20	6.06	2–2	−49080°
2501.99	A	50	1.20	6.13	2–3	−49646°
2949.92	A	70	1.80	5.98	3–4	*b* ^{3}F −48470°
2850.98	A	40	1.80	6.13	3–3	(13) −49646°
*2579.06	A	40	1.80	6.59	3–4	−53343°
2421.85	A	50	1.80	6.90	3–2	−55859°
2811.70	A	125	2.28	6.67	4–5	*b* ^{3}F −54048°
2799.27	A	35	2.28	6.69	4–4	(14) −54206°
*2633.78	A	75	2.28	6.97	4–5	−56450°
2628.84	A	50	2.28	6.98	4–5	−56521°
2819.13	A	70	1.32	5.70	1–1	*a* ^{5}P −46174° (15)
2798.72	A	40	1.47	5.88	2–1	*a* ^{5}P −47595°
2481.87	A	30	1.47	6.44	2–1	(16) −52155°
*2579.06	A	40	1.54	6.32	3–2	*a* ^{5}P −51197°
2463.83	A	50	1.54	6.54	3–2	(17) −53010°

Ta II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2968.29	A	75	1.45	5.61	3–2	*a* ^{3}G −45446°
*2709.27	A	125	1.45	6.01	3–2	(18) −48666°
2639.19	A	40	1.45	6.13	3–3	−49646°
2976.99	A	50	1.57	5.71	4–4	*a* ^{3}G −46286°
2976.22	A	200	1.57	5.72	4–5	(19) −46295°
2900.74	A	75	1.57	5.82	4–3	−47168°
2795.20	A	70	1.57	5.98	4–4	−48470°
2757.26	A	40	1.57	6.04	4–3	−48962°
2658.14	A	50	1.57	6.21	4–3	−50314°
2644.58	A	100	1.57	6.24	4–5	−50507°
2578.25	A	40	1.57	6.36	4–4	−51479°
2901.87	A	50	1.58	5.84	5–4	*a* ^{3}G −47280° (20)
2856.68	A	50	1.56	5.88	0–1	*a* ^{5}D −47595° (21)
*2936.95	A	50	1.66	5.87	1–2	*a* ^{5}D −47514°
2912.41	A	40	1.66	5.90	1–0	(22) −47801°
*2890.26	A	50	1.66	5.93	1–0	−48064°
*2584.49	A	75	1.66	6.44	1–1	−52155°
2999.38	A	125	1.79	5.90	2–3	*a* ^{5}D −47825°
2964.02	A	50	1.79	5.95	2–2	(23) −48223°
2956.84	A	100	1.94	6.12	3–3	*a* ^{5}D −49536°
2951.90	A	75	1.94	6.12	3–2	(24) −49592°
2922.13	A	40	1.94	6.16	3–4	−49937°
2746.83	A	75	1.94	6.43	3–3	−52121°
2918.96	A	200	2.13	6.36	4–4	*a* ^{5}D −51479°
2865.32	A	85	2.13	6.43	4–3	(25) −52121°
2544.37	A	75	2.13	6.98	4–5	−56521°
2974.54	A	50	1.67	5.82	2–3	*a* ^{1}D −47168°
*2917.56	A	50	1.67	5.90	2–3	(26) −47825°
2592.54	A	50	1.67	6.43	2–3	−52121°
*2917.56	A	50	1.75	5.98	4–4	*a* ^{1}G −48470°
*2797.76	A	200	1.75	6.16	4–4	(27) −49937°
*2936.95	A	50	1.81	6.01	1–2	*a* ^{3}D −48666°
2617.22	A	30	1.81	6.52	1–1	(28) −52824°
*2978.20	A	50	2.29	6.43	3–3	*a* ^{3}D −52121°
2945.59	A	60	2.29	6.48	3–4	(29) −52492°
2938.02	A	75	2.29	6.49	3–3	−52580°
*2873.56§	A	40	2.29	6.59	3–4	−53343°

Ta II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2838.23	A	175	1.96	6.31	4–3	*a* ^{3}H −51073°
2606.43	A	100	1.96	6.69	4–4	(30) −54206°
2468.42	A	40	1.96	6.96	4–3	−56351°
*2978.20	A	50	2.25	6.39	5–5	*a* ^{3}H −51753°
2852.34	A	150	2.25	6.57	5–5	(31) −53234°
2843.51	A	110	2.25	6.59	5–4	−53343°
2678.81	A	50	2.25	6.85	5–5	−55505°
*2633.78	A	75	2.25	6.93	5–4	−56142°
2598.19	A	75	2.25	7.00	5–6	−56662°
2475.32	A	50	2.25	7.23	5–5	−58572°
2867.41	A	150	2.22	6.52	6–6	*a* ^{3}H −52846°
2771.82	A	75	2.22	6.67	6–5	(32) −54048°
2664.25	A	75	2.22	6.85	6–5	−55505°
*2584.49	A	75	2.22	7.00	6–6	−56662°
*2944.57	A	50	2.14	6.34	1–1	*b* ^{3}P −51326°
2381.55	A	40	2.14	7.33	1–2	(33) −59351°
2969.04	A	40	2.85	7.01	4–4	*c* ^{3}F −56753°
*2730.74	A	50	2.85	7.37	4–5	(34) −59692°
*2730.74	A	50	3.46	7.98	2–3	*c* ^{3}P −64653° (35)
*2569.13	A	40	2.89	7.69	1–2	*a* ^{1}P −62317° (36)
2710.73	A	40	2.99	7.54	5–4	*a* ^{1}H −61105°
2675.73	A	50	2.99	7.60	5–6	(37) −61588°
*2762.05	A	75	3.14	7.61	5–6	*b* ^{3}H −61608°
2723.85	A	40	3.14	7.67	5–4	(38) −62115°
2955.32	A	50	3.21	7.39	6–5	*b* ^{3}H −59838°
*2762.05	A	75	3.21	7.68	6–5	(39) −62204°
2899.20	A	50	3.07	7.33	3–2	*a* ^{1}F −59351°
2669.57	A	40	3.07	7.69	3–2	(40) −62317°
*2944.57	A	50	3.48	7.67	4–4	*b* ^{3}G −62115°
2914.73	A	50	3.48	7.71	4–4	(41) −62463°
2828.58	A	75	3.86	8.22	5–5	*b* ^{3}G −66610° (42)

TUNGSTEN, $Z = 74$

W I

I P 7.95 Anal B List C March 1956

REFERENCES

A D. D. Laun, unpublished material (June 1955). W L, I, T
O. Laporte and J. E. Mack, Phys. Rev. **63**, 246 (1943). I P

W I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	
Air							
2910.997	A	100	0.00	4.24	0–1	*a* ^{5}D	*−34342°*
2879.396	A	140R	0.00	4.29	0–1	(1)	*−34719°*
2762.339	A	150	0.00	4.47	0–1		*−36190°*
2606.388	A	35R	0.00	4.74	0–1		*−38355°*
2551.349	A	200R	0.00	4.84	0–1		*−39183°*
2451.996	A	50R	0.00	5.03	0–1		*−40770°*
2313.170	A	30R	0.00	5.34	0–1		*−43217°*
2277.583	A	60R	0.00	5.42	0–1		*−43892°*
2253.910	A	25R	0.00	5.48	0–1		*−44353°*
2934.996	A	250R	0.21	4.41	1–2	*a* ^{5}D	*−35731°*
2896.009	A	150R	0.21	4.47	1–1	(2)	*−36190°*
2863.012	A	50	0.21	4.52	1–0		*−36588°*
2856.030	A	150R	0.21	4.53	1–2		*−36673°*
2837.345	A	60	0.21	4.56	1–2		*−36904°*
2768.982	A	100	0.21	4.66	1–1		*−37773°*
*2725.062	A	60	0.21	4.74	1–1		*−38355°*
2675.867	A	60c	0.21	4.82	1–2		*−39030°*
2664.966	A	100c	0.21	4.84	1–1		*−39183°*
2633.129	A	75R	0.21	4.89	1–1		*−39636°*
2607.378	A	35R	0.21	4.94	1–2	*a* ^{5}D	*−40011°*
2580.487	A	125R	0.21	4.99	1–1	(3)	*−40411°*
2556.749	A	40R	0.21	5.03	1–1		*−40770°*
2533.635	A	35R	0.21	5.08	1–0		*−41127°*
2504.698	A	60R	0.21	5.13	1–2		*−41583°*
2495.264	A	50R	0.21	5.15	1–2		*−41734°*
2480.955	A	30R	0.21	5.18	1–0		*−41965°*
2480.130	A	50R	0.21	5.18	1–2		*−41978°*
2462.793	A	50R	0.21	5.22	1–1		*−42262°*
*2451.484§	A	35R	0.21	5.24	1–2		*−42449°*
2444.056	A	60R	0.21	5.26	1–1	*a* ^{5}D	*−42573°*
2415.685	A	35R	0.21	5.31	1–0	(4)	*−43053°*
2405.580	A	30R	0.21	5.34	1–2		*−43227°*
2260.10	A	35R	0.21	5.67	1–2		*−45902°*
2201.504	A	60	0.21	5.81	1–2		*−47079°*
2146.43	A	35R	0.21	5.96	1–2		*−48244°*
2121.60	A	200R?	0.21	6.02	1–1		*−48788°?*
2105.394	A	50	0.21	6.07	1–2		*−49151°*
2964.520	A	150	0.36	4.53	3–2	*a* ^{7}S	*−36673°*
2946.989	A	500R	0.36	4.55	3–3	(5)	*−36874°*
2944.398	A	500R	0.36	4.56	3–2		*−36904°*
2923.539	A	60	0.36	4.59	3–4		*−37146°*
2896.442	A	400R	0.36	4.63	3–2		*−37466°*
2879.112	A	150R	0.36	4.65	3–3		*−37674°*
2848.022	A	180R	0.36	4.70	3–3		*−38053°*
2835.638	A	60	0.36	4.72	3–3		*−38206°*
2831.379	A	150R	0.36	4.72	3–4		*−38259°*
2792.696	A	60R	0.36	4.78	3–4		*−38748°*

W I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	
Air							
2770.880	A	200R	0.36	4.82	3–2	*a* ^{7}S	*−39030°*
2724.352	A	300R	0.36	4.89	3–3	(6)	*−39646°*
*2719.858	A	50	0.36	4.90	3–2		*−39707°*
2718.906	A	250R	0.36	4.90	3–4		*−39719°*
2697.514	A	60	0.36	4.94	3–2		*−40011°*
2681.422	A	400R	0.36	4.97	3–4		*−40233°*
2678.878	A	150	0.36	4.97	3–3		*−40269°*
*2656.540	A	300R	0.36	5.01	3–4		*−40583°*
2632.695	A	40R	0.36	5.05	3–3		*−40923°*
2613.818	A	50R	0.36	5.09	3–4		*−41198°*
2580.337	A	30R	0.36	5.15	3–3		*−41694°*
2997.793	A	75	0.41	4.53	2–2	*a* ^{5}D	*−36673°*
2979.860	A	70R	0.41	4.55	2–3	(7)	*−36874°*
2928.194	A	50	0.41	4.63	2–2		*−37466°*
2910.483	A	100	0.41	4.65	2–3		*−37674°*
2878.721	A	50	0.41	4.70	2–3		*−38053°*
2866.062	A	200R	0.41	4.72	2–3		*−38206°*
2799.928	A	50	0.41	4.82	2–2		*−39030°*
2787.984	A	50	0.41	4.84	2–1		*−39183°*
*2725.033	A	60	0.41	4.94	2–2		*−40011°*
2706.017	A	50Fe?	0.41	4.97	2–3		*−40269°*
2695.670	A	150R	0.41	4.99	2–1	*a* ^{5}D	*−40411°*
2677.276	A	100R	0.41	5.02	2–3	(8)	*−40665°*
2662.835	A	200R	0.41	5.05	2–2		*−40868°*
2646.185	A	70	0.41	5.07	2–2		*−41104°*
2613.076	A	80R	0.41	5.13	2–2		*−41583°*
2547.136	A	100R	0.41	5.26	2–1		*−42573°*
2545.340	A	50R	0.41	5.26	2–3		*−42601°*
2489.720	A	35R	0.41	5.37	2–3		*−43478°*
2466.848	A	50R	0.41	5.41	2–3		*−43850°*
2464.305	A	30R	0.41	5.42	2–1		*−43892°*
2459.300	A	70R	0.41	5.43	2–2		*−43975°*
2456.534	A	75R	0.41	5.43	2–3	*a* ^{5}D	*−44021°*
2414.039	A	20R	0.41	5.52	2–1	(9)	*−44737°*
2326.698	A	15R	0.41	5.71	2–1		*−46291°*
2321.629	A	40R	0.41	5.73	2–3		*−46385°*
2263.880	A	35R	0.41	5.86	2–3		*−47483°*
2229.196	A	50	0.41	5.95	2–3		*−48170°*
2225.544	A	100	0.41	5.96	2–2		*−48244°*
2198.915	A	200R	0.41	6.02	2–1		*−48788°*
2175.842	A	80R	0.41	6.08	2–2		*−49270°*
2164.340	A	25R	0.41	6.11	2–3		*−49514°*
2109.31	A	60	0.41	6.26	2–2		*−50718°*
2995.258	A	60	0.60	4.72	3–3	*a* ^{5}D	*−38206°*
2947.388	A	150R?	0.60	4.78	3–4	(10)	*−38748°*
2923.103	A	150	0.60	4.82	3–2		*−39030°*
2841.570	A	80R	0.60	4.94	3–2		*−40011°*
2773.999	A	200R	0.60	5.05	3–2		*−40868°*
2769.741	A	80	0.60	5.05	3–3		*−40923°*
2748.844	A	80c	0.60	5.09	3–4		*−41198°*
2708.927	A	80	0.60	5.15	3–2		*−41734°*
2698.844	A	80	0.60	5.17	3–4		*−41871°*

W I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2691.094	A	100	0.60	5.18	3–2	*a* ^{5}D —41978°
2671.472	A	200R	0.60	5.22	3–3	(11) —42251°
2657.361	A	60	0.60	5.24	3–4	—42450°
2625.220	A	60R	0.60	5.30	3–4	—42910°
2603.544	A	40R	0.60	5.34	3–2	—43227°
2601.963	A	40R	0.60	5.34	3–4	—43251°
2561.968	A	50R	0.60	5.41	3–3	—43850°
2553.824	A	100R	0.60	5.43	3–2	—43975°
2553.168	A	70c	0.60	5.43	3–4	—43985°
2528.486	A	50R	0.60	5.48	3–2	*a* ^{5}D —44367°
2523.410	A	30R	0.60	5.49	3–3	(12) —44447°
2487.495	A	25R	0.60	5.56	3–2	—45019°
2472.506	A	35R	0.60	5.59	3–4	—45262°
2454.978	A	40R	0.60	5.62	3–3	—45551°
2435.957	A	40R	0.60	5.66	3–4	—45869°
2433.982	A	25R	0.60	5.67	3–2	—45902°
2424.206	A	40R	0.60	5.69	3–3	—46068°
2405.689	A	20R	0.60	5.73	3–3	—46385°
2374.468	A	30R	0.60	5.79	3–4	*a* ^{5}D —46931°
2306.593	A	35R	0.60	5.95	3–3	(13) —48170°
2227.98	A	80R	0.60	6.14	3–2	—49699°
2223.574	A	80R	0.60	6.15	3–4	—49788°
2214.830	A	40	0.60	6.17	3–3	—49966°
2199.300	A	50	0.60	6.21	3–4	—50284°
2178.474	A	80R	0.60	6.26	3–2	—50718°
2174.620	A	60	0.60	6.27	3–3	—50800°
2169.474	A	100R	0.60	6.28	3–4	—50909°
2993.614	A	125R	0.77	4.89	4–5	*a* ^{5}D —39614°
2990.714	A	50	0.77	4.89	4–3	(14) —39646°
2939.047	A	30R	0.77	4.97	4–4	—40233°
2918.254	A	100	0.77	5.00	4–5	—40476°
*2881.606	A	80	0.77	5.05	4–5	—40911°
2858.042	A	60	0.77	5.09	4–4	—41198°
2833.630	A	120R	0.77	5.12	4–3	—41499°
2818.060	A	250R	0.77	5.15	4–3	—41694°
2774.476	A	300R	0.77	5.22	4–3	—42251°
2715.503	A	75	0.77	5.31	4–5	—43034°
2699.594	A	150R	0.77	5.34	4–4	*a* ^{5}D —43251°
*2664.321§	A	80c	0.77	5.40	4–5	(15) —43741°
*2656.540	A	300R	0.77	5.41	4–3	—43850°
2615.124	A	40R	0.77	5.49	4–3	—44447°
2608.320	A	50R	0.77	5.50	4–5	—44546°
2521.323	A	50R	0.77	5.66	4–4	—45869°
2481.440	A	80R	0.77	5.74	4–5	—46506°
2474.149	A	70R	0.77	5.76	4–4	—46625°
2460.160	A	25R	0.77	5.78	4–5	—46854°
2455.506	A	40R	0.77	5.79	4–4	—46931°
2384.824	A	20R	0.77	5.94	4–5	—48138°
2382.990	A	20R	0.77	5.95	4–3	*a* ^{5}D —48170°
2326.564	A	25R	0.77	6.07	4–5	(16) —49187°
2314.174	A	20R	0.77	6.10	4–3	—49417°
2309.018	A	25R	0.77	6.11	4–3	—49514°
2294.494	A	80R	0.77	6.15	4–4	—49788°
2285.17	A	100R	0.77	6.17	4–3	—49966°
2202.856	A	50	0.77	6.37	4–3	—51600°
2182.90	A	150R	0.77	6.42	4–3	—52015°
2179.764	A	100R	0.77	6.43	4–5	—52081°
2164.928	A	25R	0.77	6.47	4–5	—52395°
2128.122	A	50	0.77	6.57	4–5	—53194°
2909.120	A	50	1.18	5.42	0–1	*a* ^{3}P —43892°
2839.340	A	50	1.18	5.52	0–1	(17) —44737°
2733.178	A	50	1.18	5.69	0–1	—46104°

W I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2972.922	A	50	1.50	5.65	4–5	*a* ^{3}H —45789°
*2881.606	A	80	1.50	5.78	4–5	(18) —46854°
2791.961	A	80	1.50	5.92	4–4	—47968°
2700.012	A	100R?	1.50	6.07	4–5	—49187°
2683.347	A	100	1.50	6.10	4–3	—49417°
2632.485	A	30R	1.50	6.19	4–5	—50137°
2484.741	A	40R	1.50	6.47	4–5	—52395°
2482.212	A	16R	1.50	6.47	4–4	—52436°
2448.390	A	25R	1.50	6.54	4–4	—52992°
2331.292	A	30R	1.50	6.80	4–4	—55043°
2960.146	A	60	1.64	5.81	1–2	*a* ^{3}P —47079°
2747.005	A	50	1.64	6.14	1–2	(19) —49699°
2829.821	A	50	1.65	6.01	3–4	*a* ^{3}G —48676°
2771.628	A	50	1.65	6.10	3–3	(20) —49417°
2743.426	A	50	1.65	6.15	3–4	—49788°
2706.579	A	100Fe?	1.65	6.21	3–4	—50284°
2691.289	A	70	1.65	6.23	3–2	—50494°
2969.618	A	60	1.70	5.86	2–2	*a* ^{3}F —47442°
*2719.858	A	50	1.70	6.24	2–1	(21) —50533°
2857.145	A	50	1.85	6.17	2–3	*a* ^{3}P —49966° (22)
2708.592	A	100Fe?	1.86	6.42	5–6	*a* ^{3}H —51978°
2560.124	A	40R	1.86	6.68	5–4	(23) —54118°
2520.455	A	50	1.86	6.76	5–6	—54733°
2241.282	A	50	1.86	7.37	5–5	—59673°
2853.502	A	50	1.91	6.23	3–2	*a* ^{3}F —50494°
2663.556	A	50c	1.91	6.54	3–4	(24) —52992°
2654.659	A	60c	1.91	6.56	3–4	—53118°
2719.331	A	50	2.03	6.57	4–5	*a* ^{3}G —53194°
2708.188	A	50c	2.03	6.59	4–3	(25) —53345°
2652.592	A	50c	2.03	6.68	4–4	—54118°
2680.046	A	60	2.10	6.70	6–5	*a* ^{3}H —54310°
2584.386	A	70R	2.10	6.88	6–7	(26) —55690°
2214.340	A	50	2.10	7.67	6–5	—62154°
*2719.858	A	50	2.11	6.65	4–5	*a* ^{3}F —53862° (27)
2765.642	A	50c	2.19	6.65	3–4	*a* ^{1}F —53848° (28)
2687.369	A	80	2.34	6.93	3–4	*a* ^{5}G —56174° (29)
2668.473	A	50c	2.38	7.00	2–3	*a* ^{3}D —56717° (30)
2735.975	A	50	2.38	6.89	4–5	*a* ^{5}G —55795°
2721.650	A	50	2.38	6.91	4–5	(31) —55987°
2707.877	A	80	2.38	6.93	4–4	—56174°
2780.285	A	60	2.41	6.85	5–5	*a* ^{5}G —55492°
2722.456	A	50	2.41	6.94	5–4	(32) —56255°
2702.524	A	50	2.41	6.98	5–6	—56526°
2977.106	A	60	2.43	6.57	6–6	*a* ^{5}G —53228°
2773.702	A	80	2.43	6.88	6–7	(33) —55690°
2937.142	A	60	2.45	6.65	5–5	*a* ^{3}G —53862° (34)
2767.144	A	50	2.45	6.91	3–4	*a* ^{3}D —55955° (35)
2936.009	A	50	2.59	6.79	2–2	20983 —55032° (36)

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Strongest Unclassified Lines of W I						
Air						
2915.587	A	50				
2869.117	A	50				
2844.922	A	50				
2705.174	A	60				
2674.692	A	50c				
2585.235	A	50				
2527.763	A	40R				
2519.874	A	50				
2395.476	A	30R				
2374.154	A	25R				
2246.77	A	45R				
Air						
2230.734	A	50				
2212.170	A	75				
2198.367	A	150				
2197.080	A	80				
2192.36	A	60				
2110.33	A	60				
2101.538	A	100				
2099.85	A	50				
2090.477	A	60				
2087.10	A	80				

W II

I P 18? Anal B List B July 1956

REFERENCES

A D. D. Laun, J. Research Nat. Bur. Std. **21**, 207, RP1125 (1938) and unpublished material (March 1956). W L, I, T

W. Finkelnburg und W. Humbach, Naturwiss. **42**, 35 (1935). I P

* and §=Blend of W II and W I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2764.263	A	400	0.00	4.46	0½–0½	$a\,^6D$ *−36165°*
2554.864	A	60	0.00	4.83	0½–1½	(1) *−39129°*
*2248.750§	A	100	0.00	5.49	0½–0½	*−44455°*
2225.882	A	150	0.00	5.54	0½–1½	*−44911°*
2194.515	A	50	0.00	5.62	0½–1½	*−45553°*?
Vac						
1951.06	A	40	0.00	6.33	0½–1½	*−51254°*
1901.325	A	30	0.00	6.49	0½–0½	*−52593°*
Air						
2697.714	A	160	0.19	4.76	1½–0½	$a\,^6D$ *−38576°*
2658.036	A	100	0.19	4.83	1½–1½	(2) *−39192°*
*2466.522	A	80	0.19	5.19	1½–2½	*−42049°*
*2451.468§	A	50d?	0.19	5.22	1½–1½	*−42298°*
2333.770	A	35	0.19	5.48	1½–2½	*−44354°*
2328.314	A	35	0.19	5.49	1½–0½	*−44455°*
2303.819	A	75	0.19	5.54	1½–1½	*−44911°*
*2270.232	A	125	0.19	5.62	1½–1½	*−45553°*
2229.620	A	100	0.19	5.72	1½–2½	*−46355°*
2189.364	A	40	0.19	5.82	1½–1½	*−47179°*
*2169.936	A	40	0.19	5.87	1½–1½	*−47588°*
2571.459	A	150	0.39	5.19	2½–2½	$a\,^6D$ *−42049°*
2555.106	A	100	0.39	5.22	2½–1½	(3) *−42298°*
2427.493	A	40	0.39	5.48	2½–2½	*−44354°*
2397.097	A	200	0.39	5.54	2½–3½	*−44877°*
2315.022	A	50	0.39	5.72	2½–2½	*−46355°*
2250.730	A	50	0.39	5.87	2½–1½	*−47588°*
2216.023	A	40	0.39	5.96	2½–2½	*−48284°*
2189.494	A	60	0.39	6.03	2½–3½	*−48830°*
2182.225	A	40	0.39	6.05	2½–1½	*−48982°*
*2169.936	A	40	0.39	6.08	2½–2½	*−49242°*
*2079.108	A	80	0.39	6.33	2½–1½	*−51254°*
2071.193	A	40	0.39	6.35	2½–2½	*−51438°*
2035.87	A	40	0.39	6.45	2½–3½	*−52275°*
2001.70	A	30	0.39	6.56	2½–2½	*−53113°*
Vac						
1962.14	A	40	0.39	6.68	2½–1½	*−54137°*
1948.35	A	30	0.39	6.73	2½–3½	*−54498°*
Air						
2677.796	A	60	0.58	5.19	3½–2½	$a\,^6D$ *−42049°*
2653.568	A	35	0.58	5.23	3½–3½	(4) *−42390°*
2522.039	A	80	0.58	5.48	3½–2½	*−44354°*
*2496.648§	A	120	0.58	5.53	3½–4½	*−44758°*
2489.231	A	200	0.58	5.54	3½–3½	*−44877°*
2392.932	A	60	0.58	5.74	3½–4½	*−46493°*
2341.368	A	35	0.58	5.85	3½–2½	*−47413°*
2294.55	A	35	0.58	5.96	3½–2½	*−48284°*
2266.12	A	80	0.58	6.03	3½–3½	*−48830°*
*2251.14§	A	40	0.58	6.06	3½–3½	*−49124°*
2248.270	A	40	0.58	6.07	3½–4½	*−49181°*
2245.19	A	40	0.58	6.08	3½–2½	*−49242°*
*2193.440	A	40	0.58	6.21	3½–2½	*−50292°*
2166.316	A	80	0.58	6.28	3½–4½	*−50863°*
2065.57	A	30	0.58	6.56	3½–2½	*−53113°*
2053.670	A	50	0.58	6.59	3½–4½	*−53369°*
2026.07	A	30	0.58	6.67	3½–4½	*−54056°*
2008.08	A	40	0.58	6.73	3½–3½	*−54498°*
2589.171	A	90	0.76	5.53	4½–4½	$a\,^6D$ *−44758°*
2581.206	A	30	0.76	5.54	4½–3½	(5) *−44877°*
2497.480	A	75	0.76	5.70	4½–3½	*−46175°*
2477.796	A	200	0.76	5.74	4½–4½	*−46493°*
2326.091	A	60	0.76	6.06	4½–3½	*−49124°*
2235.64	A	30	0.76	6.28	4½–4½	*−50863°*
2226.56	A	60	0.76	6.30	4½–3½	*−51045°*
2204.482‡	A	300	0.76	6.36	4½–5½	*−51495°*
2186.738	A	40	0.76	6.40	4½–3½	*−51863°*
2138.133	A	30	0.76	6.53	4½–3½	*−52901*?°
*2079.108	A	80	0.76	6.69	4½–5½	*−54229°*
2067.52	A	30	0.76	6.73	4½–3½	*−54498°*
2048.03	A	30	0.76	6.78	4½–5½	*−54958°*
2029.99	A	50	0.76	6.84	4½–4½	*−55392°*
*2886.923	A	35	0.92	5.19	2½–2½	$a\,^6S$ *−42049°*
2666.493	A	60	0.92	5.54	2½–1½	(6) *−44911°*
2579.542	A	100d	0.92	5.70	2½–3½	*−46175°*
2567.620	A	30	0.92	5.72	2½–2½	*−46355°*
2499.692	A	100	0.92	5.85	2½–2½	*−47413°*
2488.780	A	120	0.92	5.87	2½–1½	*−47588°*
2446.394	A	120	0.92	5.96	2½–2½	*−48284°*
2390.371	A	75	0.92	6.08	2½–2½	*−49242°*
*2177.546	A	30	0.92	6.58	2½–1½	*−53329°*

W II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2998.693	A	50	1.08	5.19	1½–2½	a ⁴F −42049°
2976.476	A	50	1.08	5.22	1½–1½	(7) −42298°
2761.587	A	100	1.08	5.54	1½–1½	−44911°
2720.594	A	40	1.08	5.61	1½–0½	−45457°
2598.748	A	35	1.08	5.82	1½–1½	−47179°
*2466.522	A	80	1.08	6.08	1½–2½	−49242°
2278.108	A	30	1.08	6.49	1½–0½	−52593°
*2189.19§	A	30	1.08	6.71	1½–2½	−54375°
2173.550	A	50	1.08	6.75	1½–2½	−54704°
2075.588	A	30	1.08	7.02	1½–2½	−56874°
2974.377	A	35	1.40	5.54	2½–1½	a ⁴F −44911°
2918.633	A	100	1.40	5.62	2½–1½	(8) −45553°
2768.326	A	50	1.40	5.85	2½–2½	−47413°
2563.914	A	30	1.40	6.21	2½–2½	−50292°
*2515.324	A	30	1.40	6.30	2½–3½	−51045°
2464.616	A	40	1.40	6.40	2½–3½	−51863°
2390.890	A	30	1.40	6.56	2½–2½	−53113°
2198.676	A	80	1.40	7.01	2½–3½	−56768°
*2193.542	A	40	1.40	7.02	2½–2½	−56874°
2940.204	A	60	1.66	5.85	3½–2½	a ⁴F −47413°
2822.542	A	125	1.66	6.03	3½–3½	(9) −48830°
2669.371	A	30	1.66	6.28	3½–4½	−50863°
2628.996	A	35	1.66	6.35	3½–2½	−51438°
2572.366	A	30	1.66	6.45	3½–3½	−52275°
2420.990	A	35	1.66	6.75	3½–2½	−54704°
2206.922	A	30	1.66	7.25	3½–3½	−58709°
2776.509	A	100	1.83	6.28	4½–4½	a ⁴F −50863°
2701.485	A	60	1.83	6.40	4½–3½	(10) −51863°
2492.928	A	75	1.83	6.78	4½–5½	−54958°
*2270.232	A	125	1.83	7.27	4½–5½	−58891°
2220.938	A	60	1.83	7.39	4½–3½	−59869°
2163.880	A	30	1.83	7.54	4½–4½	−61055°
2987.294	A	60	1.09	5.22	0½–1½	a ⁴P −42298°
2729.620	A	75	1.09	5.61	0½–0½	(11) −45457°
2241.080	A	50	1.09	6.60	0½–0½	−53440°
2206.588	A	80	1.09	6.68	0½–1½	−54137°
*2193.440	A	40	1.09	6.72	0½–0½	−54408°
2078.325	A	40	1.09	7.03	0½–1½	−56932°
2961.020	A	50	1.31	5.48	1½–2½	a ⁴P −44354°
*2952.262	A	100d	1.31	5.49	1½–0½	(12) −44455°
2859.484	A	30	1.31	5.62	1½–1½	−45553°
2518.144	A	50	1.31	6.21	1½–2½	−50292°
2458.564	A	30	1.31	6.33	1½–1½	−51254°
2339.160	A	30	1.31	6.58	1½–1½	−53329°
2301.642	A	30	1.31	6.67	1½–2½	−54026°
2266.25	A	80	1.31	6.75	1½–2½	−54704°
2812.210	A	50	1.66	6.05	2½–1½	a ⁴P −48982°
2801.058	A	30	1.66	6.06	2½–3½	(13) −49124°
2643.296	A	30	1.66	6.33	2½–1½	−51254°
2601.430	A	30	1.66	6.40	2½–3½	−51863°
2519.444	A	30	1.66	6.56	2½–2½	−53113°
2306.918	A	40	1.66	7.01	2½–3½	−56768°
2256.85	A	30	1.66	7.13	2½–3½	−57729°
2939.757	A	35	1.63	5.82	0½–1½	a ⁴D −47179°
2683.226	A	80	1.63	6.23	0½–1½	(14) −50430°
2536.000	A	40	1.63	6.49	0½–0½	−52593°
*2193.542	A	40	1.63	7.25	0½–1½	−58747°

W II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2729.936	A	30b	1.81	6.33	1½–1½	a ⁴D −51254°
2716.322	A	80	1.81	6.35	1½–2½	(15) −51438°
2576.168	A	30	1.81	6.60	1½–0½	−53440°
2513.435	A	30	1.81	6.72	1½–0½	−54408°
3000.624	A	50	1.85	5.96	2½–2½	a ⁴D −48284°
*2952.262	A	100d	1.85	6.03	2½–3½	(16) −48830°
2830.064	A	80	1.85	6.21	2½–2½	−50292°
2709.582	A	80	1.85	6.40	2½–3½	−51863°
2679.638	A	70b	1.85	6.45	2½–3½	−52275°
2635.379	A	30	1.85	6.53	2½–3½	−52901°
2620.757	A	30	1.85	6.56	2½–2½	−53113°
2559.500	A	40	1.85	6.67	2½–2½	−54026°
2799.042	A	100	1.87	6.28	3½–4½	a ⁴D −50863°
2722.805	A	70	1.87	6.40	3½–3½	(17) −51863°
2615.446	A	80	1.87	6.59	3½–4½	−53369°
2569.298	A	80	1.87	6.67	3½–4½	−54056°
2265.338	A	35	1.87	7.32	3½–3½	−59276°
*2177.546	A	30	1.87	7.54	3½–4½	−61055°
2805.936	A	120	2.00	6.40	2½–3½	a ⁴G −51863°
2710.792	A	40	2.00	6.56	2½–2½	(18) −53113°
2694.994	A	30	2.00	6.58	2½–1½	−53329°
2694.382	A	60	2.00	6.58	2½–3½	−53338°
2688.230	A	35	2.00	6.60	2½–1½	−53422°
2459.876	A	30	2.00	7.02	2½–2½	−56874°
2374.454	A	35	2.00	7.20	2½–2½	−58336°
2868.736	A	80	2.05	6.35	3½–2½	a ⁴G −51438°
2834.208	A	50b	2.05	6.40	3½–3½	(19) −51863°
2778.694	A	80	2.05	6.49	3½–4½	−52567°
2720.404	A	30	2.05	6.58	3½–3½	−53338°
2718.044	A	120	2.05	6.59	3½–4½	−53369°
2670.395	A	50	2.05	6.67	3½–2½	−54026°
2576.372	A	40	2.05	6.84	3½–4½	−55392°
2488.120	A	30	2.05	7.01	3½–3½	−56768°
2481.546	A	30	2.05	7.02	3½–2½	−56874°
2185.42	A	50	2.05	7.70	3½–2½	−62333°
2913.748	A	30	2.04	6.28	4½–4½	a ⁴G −50863°
2831.236	A	35	2.04	6.40	4½–3½	(20) −51863°
2715.346	A	80	2.04	6.59	4½–4½	−53369°
2653.424	A	35	2.04	6.69	4½–5½	−54229°
2634.578	A	35b	2.04	6.73	4½–3½	−54498°
2603.018	A	120	2.04	6.78	4½–5½	−54958°
2237.06	A	100	2.04	7.56	4½–5½	−61240°
2231.080	A	30	2.04	7.57	4½–4½	−61360°
2782.142	A	80	2.15	6.59	5½–4½	a ⁴G −53369°
2717.180	A	40	2.15	6.69	5½–5½	(21) −54229°
*2664.346§	A	200	2.15	6.78	5½–5½	−54958°
2563.166	A	200	2.15	6.97	5½–6½	−56439°
2282.202	A	75	2.15	7.56	5½–5½	−61240°
2264.178	A	35	2.15	7.60	5½–5½	−61589°
2263.53	A	80	2.15	7.60	5½–6½	−61602°
2702.115	A	300	2.40	6.97	6½–6½	19442 −56439° (22)
2686.946	A	100	2.89	7.49	2½–2½	23450 −60656° (23)
2740.801	A	200	2.94	7.44	3½–4½	23803 −60278° (24)

Strongest Unclassified Lines of W II

Air			Air		
2994.700	A	60	2249.890	A	150
2936.61	A	125	2235.37	A	60
2925.834	A	125	2231.230	A	100
2852.083	A	70	2228.88	A	80d?
2737.387	A	60b	2226.77	A	70
2703.467	A	120	2218.110	A	60
2673.608	A	60	2203.986	A	70
2647.726	A	70	2189.850	A	100
2602.516	A	75	2160.885	A	80
2506.048	A	80			

RHENIUM, $Z = 75$

Re I

I P 7.84 Anal A List B July 1956

REFERENCES

A P. F. A. Klinkenberg, W. F. Meggers, R. Velasco, and M. A. Catalán, J. Research Nat. Bur. Std. **59,** 319, RP2804 (1957). W L, I, T, I P
See, also, W. F. Meggers, J. Research Nat. Bur. Std.. **49,** 187, RP2355 (1952). W L, I

Re I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2896.012	A	60R	0.00	4.26	2½–3½	$a\,^6S - z\,^6D°$
2992.363	A	150R	0.00	4.12	2½–2½	(1)
3067.398	A	200r	0.00	4.02	2½–1½	
2647.128	A	30R	0.00	4.66	2½–3½	$a\,^6S - z\,^6F°$
2559.076	A	20R	0.00	4.82	2½–2½	(2)
2834.608	A	15	0.00	4.35	2½–2½	$a\,^6S - z\,^4P°$
2636.637	A	100R	0.00	4.68	2½–1½	(3)
2595.234	A	60R	0.00	4.76	2½–3½	$a\,^6S - z\,^6G°$†
2674.339	A	200R	0.00	4.61	2½–2½	(4)
2651.903	A	100R	0.00	4.65	2½–2½	$a\,^6S$ *−37697°*
2520.009	A	50r	0.00	4.90	2½–2½	(5) *−39670°*
2449.710	A	60r	0.00	5.04	2½–1½	*−40808°*
2508.991	A	200R	0.00	4.92	2½–3½	$a\,^6S - y\,^6P°$
2294.486	A	400R	0.00	5.38	2½–2½	(6)
2287.506	A	400R	0.00	5.40	2½–1½	
2441.47	A	100R	0.00	5.05	2½–3½	$a\,^6S - y\,^6D°$
2419.807	A	100r	0.00	5.10	2½–2½	(7)
2405.602	A	200r	0.00	5.13	2½–1½	
2428.576	A	300R	0.00	5.08	2½–3½	$a\,^6S$ *−41163°*
2389.110	A	20r	0.00	5.17	2½–3½	(8) *−41843°*
2365.90	A	150R	0.00	5.22	2½–1½	*−42254°*
2306.540	A	60r	0.00	5.35	2½–1½	*−43341°*
*2302.992	A	150R	0.00	5.36	2½–1½?	*−43409°*
2281.620	A	200R	0.00	5.41	2½–3½	*−43815°*
*2302.992	A	150R	0.00	5.36	2½–3½	$a\,^6S - z\,^4D°$
2322.490	A	50R	0.00	5.31	2½–2½	(9)
2274.618	A	300R	0.00	5.43	2½–2½	$a\,^6S$ *−43949°*
2264.393	A	200R	0.00	5.45	2½–1½	(10) *−44148°*
2256.193	A	150R	0.00	5.47	2½–2½	*−44308°*
2235.440	A	50r	0.00	5.52	2½–1½	*−44720°*
2226.418	A	300R	0.00	5.54	2½–3½	*−44901°*

Re I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2085.594	A	200R	0.00	5.92	2½–3½	$a\,^6S - y\,^6F°$ (11)
2198.914	A	200R	0.00	5.61	2½–3½	$a\,^6S$ *−45462°*
2176.206	A	200R	0.00	5.67	2½–3½	(12) *−45937°*
2167.938	A	200R	0.00	5.69	2½–2½	*−46112°*
2156.673	A	100R	0.00	5.72	2½–3½	*−46352°*
2142.97	A	20r	0.00	5.76	2½–2½	*−46649°*
2097.122	A	100R	0.00	5.88	2½–3½	*−47669°*
2092.24	A	50r	0.00	5.90	2½–1½	*−47779°*
2083.925	A	40r	0.00	5.92	2½–2½	$a\,^6S$ *−47970°*
2074.70	A	20r	0.00	5.95	2½–3½	(13) *−48184°*
2049.079	A	400R	0.00	6.02	2½–3½	*−48786°*
2039.204	A	50r	0.00	6.05	2½–2½	*−49022°*
2038.99	A	30r	0.00	6.05	2½–3½	*−49027°*
2017.866	A	200R	0.00	6.12	2½–2½?	*−49540°*
2016.56	A	20r	0.00	6.12	2½–2½	*−49573°*
2003.532	A	50R	0.00	6.16	2½–1½	*−49895°*
Vac						
1995.61	A	(20R)	0.00	6.19	2½–2½	$a\,^6S$ *−50110°*
1963.38	A	(15R)	0.00	6.29	2½–2½	(14) *−50934°*
1927.72	A	(15r)	0.00	6.40	2½–1½	*−51874°*
1909.36	A	(50R)	0.00	6.47	2½–3½	*−52373°*
1905.74	A	(50R)	0.00	6.48	2½–2½	*−52472°*
1900.83	A	(50R)	0.00	6.49	2½–3½	*−52610°*
Air						
2962.266	A	30r	1.43	5.60	2½–2½	$a\,^4P$ *−45332°*
2850.975	A	60r	1.43	5.76	2½–2½	(15) *−46649°*
2814.676	A	40R	1.43	5.81	2½–2½	*−47101°*
2770.417	A	70R	1.43	5.88	2½–3½	*−47669°*
2747.438	A	20r	1.43	5.92	2½–2½	*−47970°*
2654.120	A	40R	1.43	6.08	2½–1½	*−49250°*
2611.603	A	40R	1.43	6.16	2½–3½	*−49863°*
2594.854	A	30R	1.43	6.19	2½–2½	*−50110°*
2591.582	A	30r	1.43	6.19	2½–2½	*−50158°*
2564.186	A	50R	1.43	6.24	2½–1½	*−50571°*
2544.739	A	100r	1.43	6.28	2½–3½	*−50869°*

Re I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	
Air							
2540.513	A	40r	1.43	6.29	2½–2½	*a* ⁴P	−50934°
2444.943	A	70r	1.43	6.48	2½–2½	(16)	−52472°
2410.37	A	30r	1.43	6.55	2½–2½		−53058°
2396.791	A	40r	1.43	6.58	2½–1½		−53293°
2394.37	A	30r	1.43	6.58	2½–3½		−53335°
2391.278	A	30r	1.43	6.59	2½–2½		−53389°
2371.500	A	30r	1.43	6.63	2½–3½		−53738°
2365.666	A	20r	1.43	6.65	2½–1½		−53842°
2352.069	A	100R	1.43	6.68	2½–3½		−54086°
2334.33	A	20r	1.43	6.72	2½–2½		−54409°
2328.664	A	30r	1.43	6.73	2½–3½		−54513°
*2255.729	A	100r	1.43	6.90	2½–3½	*a* ⁴P	−55901°
*2255.729	A	100r	1.43	6.90	2½–1½	(17)	−55902°
2067.89	A	20r	1.43	7.40	2½–3½		−59926°
2033.78	A	20r	1.43	7.50	2½–2½		−60737°
2840.348	A	50r	1.71	6.05	1½–2½	*a* ⁴P	−49022°
2599.856	A	50R	1.71	6.45	1½–1½	(18)	−52278°
2533.310	A	15r	1.71	6.58	1½–0½		−53288°
2345.282	A	20r	1.71	6.97	1½–0½		−56451°
2397.31	A	50	1.87	7.02	0½–1½		−56866°
2999.599	A	200R	1.45	5.57	4½–5½	*a* ⁶D	— *y* ⁶F°
2887.676	A	300R	1.45	5.72	4½–4½	(19)	
2763.295	A	40	1.45	5.92	4½–3½		
*2976.294	A	40	1.45	5.60	4½–4½	*a* ⁶D	−45343°
2965.756	A	150R	1.45	5.61	4½–3½	(20)	−45462°
2927.42	A	40	1.45	5.67	4½–5½		−45904°
2819.951	A	50	1.45	5.83	4½–4½		−47205°
2783.570	A	60	1.45	5.88	4½–3½		−47669°
2715.474	A	300R	1.45	6.00	4½–5½		−48569°
2671.842	A	40	1.45	6.07	4½–4½		−49170°
2663.633	A	50	1.45	6.08	4½–5½		−49286°
2642.752	A	60R	1.45	6.12	4½–4½		−49582°
2586.788	A	50R	1.45	6.22	4½–4½		−50401°
2545.485	A	30r	1.45	6.30	4½–4½		−51027°
2516.120	A	150r	1.45	6.36	4½–4½	*a* ⁶D	−51486°
2487.331	A	200R	1.45	6.41	4½–5½	(21)	−51945°
2483.920	A	200R	1.45	6.42	4½–4½		−52001°
2461.196	A	200R	1.45	6.47	4½–3½		−52373°
2432.18	A	80	1.45	6.53	4½–3½		−52857°
2405.056	A	300R	1.45	6.58	4½–4½		−53320°
2381.136	A	40	1.45	6.63	4½–3½		−53738°
*2369.27	A	50r	1.45	6.66	4½–5½		−53948°
2356.496	A	30r	1.45	6.69	4½–3½		−54177°
2337.953	A	40R	1.45	6.73	4½–3½		−54513°
2335.730	A	20r	1.45	6.73	4½–5½		−54554°
2238.603	A	40r	1.45	6.96	4½–4½		−56411°
3108.808	A	100R	1.76	5.72	3½–4½	*a* ⁶D	— *y* ⁶F°
2965.112	A	80R	1.76	5.92	3½–3½	(22)	
2943.145	A	50r	1.76	5.95	3½–3½	*a* ⁶D	−48184°
2785.206	A	50r	1.76	6.19	3½–2½	(23)	−50110°
2781.434	A	30r	1.76	6.19	3½–2½		−50158°
2722.702	A	80	1.76	6.29	3½–2½		−50934°
2715.770	A	30r	1.76	6.30	3½–4½		−51027°
2649.050	A	50R	1.76	6.41	3½–3½		−51955°
2620.026	A	40R	1.76	6.47	3½–3½		−52373°
2556.512	A	80R	1.76	6.58	3½–4½		−53320°
2552.021	A	40r	1.76	6.59	3½–2½		−53389°
2501.721	A	50r	1.76	6.69	3½–3½		−54177°
2375.073	A	100r	1.76	6.95	3½–4½		−56307°
*2369.27	A	50r	1.76	6.96	3½–4½		−56411°

Re I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	
Air							
2843.000	A	60r	1.95	6.29	2½–2½	*a* ⁶D	−50934°
2688.528	A	100	1.95	6.54	2½–1½	(24)	−52954°
*2442.510	A	40r	1.95	7.00	2½–3½		−56699°
2419.404	A	60r	1.95	7.05	2½–3½		−57090°
2414.587	A	30r	1.95	7.06	2½–3½		−57172°
2296.926	A	40r	1.95	7.32	2½–1½		−59293°
2271.300	A	40r	1.95	7.38	2½–3½		−59784°
3001.137	A	20r	1.81	5.92	2½–3½	*a* ⁴G (25)	— *y* ⁶F°
2834.077	A	40	1.81	6.16	2½–1½	*a* ⁴G	−49895°
2757.996	A	40r	1.81	6.28	2½–3½	(26)	−50869°
2683.558	A	40	1.81	6.40	2½–1½		−51874°
2614.558	A	50R	1.81	6.53	2½–3½		−52857°
*2421.730	A	40r	1.81	6.90	2½–3½		−55901°
*2421.730	A	40r	1.81	6.90	2½–1½		−55902°
2375.815	A	15r	1.81	7.00	2½–3½		−56699°
2353.95	A	30r	1.81	7.05	2½–3½		−57090°
2349.391	A	30r	1.81	7.06	2½–3½		−57172°
2786.558	A	20r	1.86	6.29	3½–2½	*a* ⁴G	−50934°
2763.792	A	40	1.86	6.32	3½–3½	(27)	−51229°
2732.206	A	50R	1.86	6.38	3½–3½		−51647°
2393.645	A	50r	1.86	7.01	3½–2½		−56822°
2367.683	A	50r	1.86	7.07	3½–4½		−57280°
2354.08	A	30r	1.86	7.10	3½–2½		−57524°
2183.72	A	100R	1.86	7.51	3½–2½		−60837°
2113.87	A	30r	1.86	7.70	3½–3½		−62350°
2107.452	A	60r	1.86	7.71	3½–3½		−62493°
2315.956	A	30r	2.05	7.38	4½–3½	*a* ⁴G (28)	−59784°
2909.820	A	60r	2.01	6.25	5½–5½	*a* ⁴G	−50663°
2791.290	A	50r	2.01	6.43	5½–6½	(29)	−52122°
2320.162	A	50r	2.01	7.33	5½–4½		−59394°
2319.19	A	30r	2.01	7.33	5½–5½		−59412°
*2442.510	A	40r	2.14	7.19	3½–3½	*a* ⁴D (30)	−58260°
2620.344	A	30R	2.69	7.40	3½–3½	*a* ²F (31)	−59926°
2902.48	A	100	2.77	7.02	1½–1½	*a* ²D (32)	−56866°

Re II

I P 16.5 Anal B List C October 1958

REFERENCES

A W. F. Meggers, M. A. Catalán, and M. Sales, J. Research Nat. Bur. Std. **61,** 441, RP 2914 (1958). W L, I, T
W. Finkelnburg und W. Humbach, Naturwiss. **42,** 35 (1955). I P

Re II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1973.13‡	A	150	0.00	6.26	3–4	$a\ ^7S - z\ ^7P^\circ$ (1)
Air						
2214.26	A	1000cw	0.00	5.57	3–3	
2275.25	A	500c	0.00	5.42	3–2	
Vac						
1858.65	A	200	0.00	6.64	3–3	$a\ ^7S - z\ ^5P^\circ$
1898.36	A	100	0.00	6.50	3–2	(2)
1750.14	A	200d?	0.00	6.50	3–2	$a\ ^7S - z\ ^5D^\circ$† (3)
Air						
2568.64	A	300	1.84	6.64	4–3	$a\ ^5D - z\ ^5P^\circ$†
2571.81	A	300cw	1.84	6.64	3–3	(4)
2608.50	A	400	1.77	6.50	2–2	
2455.83	A	100c	1.77	6.80	2–2	$a\ ^5D - y\ ^5P^\circ$† (5)
2023.64	A	200	1.84	7.94	4–5	$a\ ^5D - z\ ^5F^\circ$†
2235.80	A	100c	1.84	7.36	4–4	(6)
2370.76	A	100	1.84	7.04	4–3	
2467.57	A	100c	1.83	6.84	3–2	
Vac						
1725.20	A	100	1.84	7.04	4–3	$a\ ^5D - 72846^\circ$ (7)
Air						
2733.04	A	300cl	2.13	6.64	2–3	$a\ ^5S - z\ ^5P^\circ$†
2819.78	A	60cwl	2.13	6.50	2–2	(8)
2553.59	A	100cw	2.13	6.96	2–1	$a\ ^5S - z\ ^5D^\circ$† (9)

Re II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2635.83	A	200cwl	2.13	6.81	2–1	$a\ ^5S - y\ ^5P^\circ$† (10)
2181.77	A	100cw	2.13	7.78	2–3	$a\ ^5S - 63043^\circ$ (11)
2386.90	A	100cw	2.59	7.76	5–4	$a\ ^5G - z\ ^5D^\circ$†
2469.36	A	100cwl	2.33	7.32	2–3	(12)
2588.58	A	60cd	2.59	7.36	5–4	$a\ ^5G - z\ ^5F^\circ$†
2753.64	A	100cws	2.36	6.84	3–2	(13)
2554.63	A	200	2.53	7.36	4–4	
2637.01	A	150c	2.36	7.04	3–3	
2731.56	A	150cwl	2.33	6.84	2–2	
2616.72	A	150cwl	2.33	7.04	2–3	
2502.35	A	200cw	2.59	7.52	5–5	$a\ ^5G - z\ ^5G^\circ$?† (14)
2550.09	A	100cw	2.53	7.37	4–3	$a\ ^5G - 59665^\circ$
2449.03	A	100c	2.33	7.37	2–3	(15)
2114.25	A	100	2.59	8.43	5–5	$a\ ^5G - 68259^\circ$† (16)
2009.92	A	100	2.36	8.50	3–	$a\ ^5G - 68876^\circ$† (17)
2628.26	A	100h	2.67	7.37	3–3	$a\ ^5P - 59665^\circ$ (18)
2177.85	A	100	2.89	8.55	5–4	23381 – 69283° (19)

OSMIUM, $Z = 76$

Os I

I P 8.5 Anal B List C April 1961

REFERENCES

A Th. A. M. van Kleef, Proc. Koninkl. Nederl. Akad. Wetensch. (Amsterdam) [B] **63**, 501 (1960). T, C L, W L, I

Th. A. M. van Kleef and P. F. A. Klinkenberg, Physica **27**, 83 (1961). I P, T

* and §=Blend of Os I and Os II

Os I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2929.507	A	30	0.00	4.21	4–3	$a\,^5D$ *−34125°*
2909.061‡	A	500R	0.00	4.24	4–5	(1) *−34365°*
2872.405	A	50	0.00	4.30	4–4	*−34803°*
2806.906	A	100w	0.00	4.40	4–3	*−35615°*
2714.642	A	50r	0.00	4.55	4–4	*−36826°*
2644.114	A	75	0.00	4.67	4–3	*−37808°*
2637.133	A	150	0.00	4.68	4–4	*−37908°*
2621.818	A	25	0.00	4.71	4–4	*−38130°*
2476.836	A	25	0.00	4.98	4–4	*−40361°*
2424.970	A	50	0.00	5.09	4–5	*−41225°*
2387.292	A	40	0.00	5.17	4–3	$a\,^5D$ *−41875°*
2362.771	A	50	0.00	5.22	4–4	(2) *−42310°*
*2362.411	A	25	0.00	5.22	4–3	*−42316°*
2338.650	A	30l	0.00	5.28	4–4	*−42746°*
2324.24	A	30	0.00	5.31	4–3	*−43011°*
2278.44	A	25	0.00	5.42	4–5	*−43876°*
*2227.98§	A	30	0.00	5.54	4–3	*−44869°*
2226.83	A	25	0.00	5.54	4–4	*−44892°*
2225.44	A	25	0.00	5.55	4–5	*−44921°*
2202.49	A	25	0.00	5.60	4–4	*−45388°*
*2184.68	A	25	0.00	5.65	4–5	$a\,^5D$ *−45758°*
2157.84	A	30	0.00	5.72	4–3	(3) *−46327°*
2124.39	A	25	0.00	5.81	4–3	*−47057°*
2117.96	A	80	0.00	5.83	4–5	*−47200°*
2079.97	A	40	0.00	5.93	4–5	*−48062°*
2076.95	A	25	0.00	5.94	4–4	*−48131°*
2069.61	A	25	0.00	5.96	4–3	*−48302°*
2034.44	A	30	0.00	6.07	4–3	*−49138°*
2970.972	A	40	0.51	4.67	3–3	$a\,^5D$ *−37808°*
2962.148	A	30	0.51	4.68	3–4	(4) *−37908°*
*2961.012	A	40	0.51	4.68	3–2	*−37921°*
2942.848	A	30	0.51	4.71	3–4	*−38130°*
2931.280	A	40	0.51	4.72	3–3	*−38264°*
*2925.568	A	40	0.51	4.73	3–2	*−38330°*
*2912.334	A	50	0.51	4.75	3–3	*−38486°*
2838.173	A	30	0.51	4.86	3–3	*−39382°*

Os I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2829.269	A	40	0.51	4.88	3–2	$a\,^5D$ *−39493°*
2782.552	A	40	0.51	4.95	3–4	(5) *−40087°*
*2761.418	A	50	0.51	4.98	3–4	*−40361°*
2721.862	A	75	0.51	5.05	3–2	*−40888°*
2619.944	A	30	0.51	5.22	3–3	*−42316°*
2590.755	A	75	0.51	5.28	3–4	*−42746°*
2374.337	A	25	0.51	5.71	3–4	*−46263°*
*2370.699	A	25	0.51	5.72	3–3	*−46327°*
2345.770	A	25	0.51	5.77	3–3	$a\,^5D$ *−46776°*
2283.67	A	50	0.51	5.92	3–2	(6) *−47934°*
2241.62	A	25	0.51	6.02	3–4	*−48756°*
2223.85	A	30	0.51	6.06	3–2	*−49112°*
2165.19	A	40	0.51	6.21	3–3	*−50329°*
2157.08	A	25	0.51	6.23	3–4	*−50503°*
2123.84	A	40	0.51	6.32	3–3	*−51228°*
2063.55	A	25	0.51	6.49	3–3	*−52604°*
2949.532	A	30	0.34	4.52	2–2	$a\,^5D$ *−36634°*
2934.642	A	30	0.34	4.54	2–3	(7) *−36806°*
2919.794	A	100	0.34	4.57	2–1	*−36979°*
2850.762	A	75	0.34	4.67	2–3	*−37808°*
2815.780	A	40	0.34	4.72	2–1	*−38244°*
*2814.200	A	50	0.34	4.72	2–3	*−38264°*
2808.935	A	40	0.34	4.73	2–2	*−38330°*
*2796.727	A	100	0.34	4.75	2–3	*−38486°*
2786.798	A	40	0.34	4.77	2–1	*−38613°*
*2776.910	A	25	0.34	4.78	2–2	*−38741°*
2720.044	A	75	0.34	4.88	2–2	$a\,^5D$ *−39493°*
2706.702	A	50	0.34	4.90	2–2	(8) *−39674°*
2647.730	A	25	0.34	5.00	2–1	*−40497°*
*2527.075	A	30r	0.34	5.22	2–1	*−42299°*
2456.462	A	125	0.34	5.36	2–2	*−43437°*
2451.726	A	125	0.34	5.37	2–3	*−43515°*
2414.517	A	25	0.34	5.45	2–3	*−44144°*
2384.632	A	30	0.34	5.51	2–2	*−44662°*
2380.823	A	30	0.34	5.52	2–1	*−44729°*
2372.921	A	25	0.34	5.54	2–3	*−44869°*

Os I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2301.88	A	25	0.34	5.70	2–2	a ^{5}D −46169°
2270.17	A	60	0.34	5.77	2–3	(9) −46776°
2268.28	A	40	0.34	5.78	2–2	−46812°
2234.61	A	35	0.34	5.86	2–1	−47477°
2211.96	A	40	0.34	5.92	2–2	−47934°
2188.97	A	50	0.34	5.98	2–1	−48409°
2158.53	A	50	0.34	6.06	2–1	−49053°
2154.59	A	25	0.34	6.07	2–3	−49138°
2117.66	A	40	0.34	6.17	2–3	−49947°
2048.28	A	25	0.34	6.36	2–2	−51545°
2964.062	A	25	0.71	4.88	1–2	a ^{5}D −39493°
2878.400	A	40	0.71	5.00	1–1	(10) −40497°
2846.391	A	40	0.71	5.05	1–2	−40888°
*2540.741	A	40	0.71	5.57	1–0	−45113°
2378.151	A	30	0.71	5.90	1–0	−47802°
*2370.699	A	25	0.71	5.92	1–2	−47934°
2201.93	A	25	0.71	6.32	1–0	−51166°
*2097.60	A	25	0.71	6.60	1–2	−53424°
2905.730	A	40	0.75	5.00	0–1	a ^{5}D −40497°
*2362.411	A	25	0.75	5.98	0–1	(11) −48409°
2276.43	A	30	0.75	6.17	0–1	−50007°
2159.98	A	60	0.75	6.47	0–1	−52374°
2860.956	A	100	0.64	4.95	5–4	a ^{5}F −40087°
2844.396	A	50	0.64	4.97	5–6	(12) −40290°
2838.626	A	100R	0.64	4.98	5–4	−40361°
2786.306	A	25	0.64	5.06	5–6	−41023°
2732.805	A	75	0.64	5.15	5–4	−41725°
2689.816	A	50	0.64	5.22	5–4	−42310°
2658.600	A	50	0.64	5.28	5–4	−42746°
2613.058	A	50	0.64	5.36	5–5	−43401°
2581.958	A	80s	0.64	5.41	5–4	a ^{5}F −43862°
2581.052	A	25	0.64	5.42	5–5	(13) −43876°
2515.044	A	40s	0.64	5.54	5–4	−44892°
2513.246	A	50	0.64	5.55	5–5	−44921°
2488.548	A	50w	0.64	5.59	5–6	−45315°
2461.417	A	50	0.64	5.65	5–5	−45758°
*2431.193	A	40	0.64	5.71	5–4	−46263°
2379.393	A	40	0.64	5.82	5–4	−47158°
2377.03	A	50	0.64	5.83	5–5	a ^{5}F −47200°
2304.38	A	40	0.64	5.99	5–4	(14) −48525°
2214.16	A	25	0.64	6.21	5–4	−50293°
2203.91	A	25	0.64	6.23	5–4	−50503°
*2184.68	A	25	0.64	6.28	5–5	−50902°
2164.49	A	25	0.64	6.34	5–4	−51329°
*2097.60	A	25	0.64	6.52	5–6	−52801°
2977.637	A	30	1.08	5.22	4–3	a ^{5}F −42316°
2917.258	A	40	1.08	5.31	4–3	(15) −43011°
2874.955	A	50	1.08	5.37	4–3	−43515°
2855.337	A	25	1.08	5.40	4–4	−43754°
2763.273	A	25	1.08	5.55	4–5	−44921°
*2699.589	A	50	1.08	5.65	4–3	−45774°
2659.833	A	30	1.08	5.72	4–3	−46327°
2571.782	A	25	1.08	5.88	4–3	−47614°
2542.512	A	50	1.08	5.93	4–5	−48062°
*2527.075	A	30r	1.08	5.96	4–3	−48302°
2512.873	A	40	1.08	5.99	4–4	a ^{5}F −48525°
2450.738	A	25	1.08	6.12	4–5	(16) −49534°
2403.853	A	25	1.08	6.21	4–3	−50329°
2401.127	A	25	1.08	6.22	4–5	−50377°
2393.866	A	30	1.08	6.23	4–4	−50503°
2371.188	A	50	1.08	6.28	4–5	−50902°
2369.255	A	50	1.08	6.29	4–4	−50937°
2357.267	A	25	1.08	6.31	4–5	−51151°
2353.006	A	30l	1.08	6.32	4–3	−51228°

Os I—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
*2982.902	A	40	1.40	5.54	3–4	a ^{5}F −44892°
*2929.507	A	30	1.40	5.62	3–2	(17) −45503°
2649.335	A	25	1.40	6.06	3–2	−49112°
*2527.075	A	30r	1.40	6.29	3–4	−50937°
*2431.607	A	40	1.40	6.48	3–4	−52490°
2394.292	A	45	1.40	6.56	3–4	−53131°
2382.479	A	30	1.40	6.58	3–3	−53338°
2377.618	A	50	1.40	6.60	3–2	−53424°
2351.732	A	25	1.40	6.65	3–3	−53887°
2341.949	A	30l	1.40	6.67	3–2	−54064°
2509.936	A	25	1.58	6.49	2–3	a ^{5}F −52604°
*2431.607	A	40	1.58	6.65	2–3	(18) −53887°
2396.784	A	100	1.58	6.73	2–1	−54484°
2378.746	A	25	1.58	6.77	2–1	−54800°
2896.063	A	40	1.61	5.87	1–2	a ^{5}F −47539° (19)
2997.647	A	40	1.25	5.37	2–3	a ^{3}P −43515°
2913.844	A	30	1.25	5.49	2–1	(20) −44474°
2674.885	A	25	1.25	5.87	2–2	−47539°
2351.579	A	25	1.25	6.50	2–3	−52677°
2309.40	A	40	1.25	6.60	2–1	−53454°
2286.517	A	30	1.25	6.65	2–3	−53887°
2242.10	A	30	1.25	6.76	2–2	−54753°
*2776.910	A	25	2.26	6.70	0–1	a ^{3}P −54302° (21)
2895.064	A	25	1.36	5.62	4–3	a ^{3}F −45561°
2877.351	A	30	1.36	5.65	4–3	(22) −45774°
2837.422	A	25	1.36	5.71	4–4	−46263°
*2796.727	A	100	1.36	5.77	4–3	−46776°
*2699.589	A	50	1.36	5.93	4–5	−48062°
2568.834	A	25l	1.36	6.17	4–3	−49947°
*2540.741	A	40	1.36	6.22	4–5	−50377°
2398.200	A	25	1.36	6.51	4–4	−52715°
2374.527	A	25	1.36	6.56	4–4	−53131°
*2961.012	A	40	1.74	5.91	3–4	a ^{3}F −47853°
*2814.200	A	50	1.74	6.12	3–2	(23) −49614°
*2761.418	A	50	1.74	6.21	3–4	−50293°
2757.808	A	25	1.65	6.12	2–2	a ^{3}F −49614°
*2431.193	A	40	1.65	6.73	2–1	(24) −54484°
*2982.902	A	40	1.77	5.91	5–4	a ^{3}G −47853° (25)
*2848.247	A	30	1.83	6.17	4–3	a ^{3}G −49947° (26)
2804.067	A	80	1.90	6.30	3–3	a ^{5}P −51042° (27)
2860.063	A	25	2.00	6.32	1–0	a ^{5}P −51166°
*2848.247	A	30	2.00	6.33	1–2	(28) −51311°
*2925.568	A	40	2.33	6.55	3–2	a ^{3}D −53073° (29)
*2912.334	A	50	3.12	7.36	2–2	z ^{7}D° −59602 (30)

Os II

I P Anal C List C April 1961

REFERENCES

A Th. A. M. van Kleef, Proc. Konin. Nederl. Akad. Wetensch. [B] **63**, 593 (1961). T, C L, W L, I
Th. A. M. van Kleef and P. F. A. Klinkenberg, Physica **27**, 83 (1961). T
* and §=Blend of Os II and Os I

Os II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	
Air							
2537.997	A	15	0.00	4.86	4½–3½	$a\,^6D$	*−39389°*
2282.26	A	125	0.00	5.41	4½–3½	(1)	*−43802°*
2255.847	A	125	0.00	5.47	4½–4½		*−44315°*
2486.244	A	15h	0.44	5.41	3½–3½	$a\,^6D$	*−43802°*
2336.803	A	80	0.44	5.72	3½–2½	(2)	*−46373°*
2194.39	A	100	0.44	6.07	3½–3½		*−49149°*
2067.21	A	40	0.44	6.41	3½–4½		*−51951°*
2367.354	A	80	0.49	5.70	2½–1½	$a\,^6D$	*−46157°*
2355.284	A	25	0.49	5.72	2½–2½	(3)	*−46373°*
*2227.98§	A	30	0.49	6.02	2½–2½		*−48798°*
2350.242	A	50	0.69	5.94	1½–0½	$a\,^6D$	*−48128°*
2313.75	A	30	0.69	6.02	1½–2½	(4)	*−48798°*
2164.85	A	50	0.69	6.39	1½–2½		*−51770°*
2046.28	A	10	0.69	6.72	1½–2½		*−54445°*
2423.071	A	80	0.97	6.07	2½–3½	$a\,^6S$ (5)	*−49149°*

Os II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	
Air							
2468.898	A	30	1.41	6.41	3½–4½	$a\,^4D$	*−51951°*
2325.65	A	15	1.41	6.72	3½–2½	(6)	*−54445°*
2225.27	A	20	1.41	6.96	3½–4½		*−56384°*
2214.76	A	30	1.44	7.01	2½–3½	$a\,^4D$ (7)	*−56791°*
2580.026	A	100w	1.63	6.41	3½–4½	$a\,^4F$	*−51951°*
2563.164	A	25	1.63	6.44	3½–3½	(8)	*−52206°*
2427.900	A	40	1.63	6.71	3½–3½		*−54379°*
2424.024	A	10	1.63	6.72	3½–2½		*−54445°*
2315.16	A	25	1.63	6.96	3½–4½		*−56384°*
2293.54	A	25	1.63	7.01	3½–3½		*−56791°*
2578.321	A	10	1.93	6.71	4½–3½	$a\,^2G$	*−54379°*
2391.770	A	20	1.93	7.09	4½–3½	(9)	*−57402°*
2527.756	A	10h	2.13	7.01	3½–3½	$a\,^2G$	*−56791°*
2489.280	A	10h	2.13	7.09	3½–3½	(10)	*−57402°*
2548.832	A	15	2.17	7.01	2½–3½	$a\,^4P$	*−56791°*
2509.708	A	20	2.17	7.09	2½–3½	(11)	*−57402°*

IRIDIUM, $Z = 77$

Ir I

I P 9 Anal C List C July 1961

REFERENCES

A See Th. A. M. van Kleef, Physica **23**, 843 (1957). I P, T, C L, I, Z E
W. Albertson, Phys. Rev. **54**, 183 and unpublished material (1938). (I)

Ir I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	
Air							
2924.792	A	(100r)	0.00	4.22	4½–5½	*a* ^{4}F	*−34180°*
2849.725	A	(80r)	0.00	4.33	4½–4½	(1)	*−35080°*
2664.786	A	(50r)	0.00	4.63	4½–3½		*−37515°*
2639.712	A	(60r)	0.00	4.68	4½–4½		*−37871°*
2619.883	A	35	0.00	4.71	4½–3½		*−38158°*
2614.984	A	25	0.00	4.72	4½–4½		*−38229°*
*2592.056	A	100	0.00	4.76	4½–3½		*−38568°*
2502.983	A	100w	0.00	4.93	4½–5½		*−39940°*
2481.183	A	50	0.00	4.97	4½–3½		*−40291°*
2475.122	A	100	0.00	4.99	4½–4½		*−40389°*
2455.609	A	35	0.00	5.03	4½–3½		*−40710°*
2431.241	A	25	0.00	5.08	4½–4½		*−41118°*
2372.774	A	100	0.00	5.20	4½–5½		*−42131°*
2315.378	A	30	0.00	5.33	4½–3½		*−43176°*
2238.818	A	30	0.00	5.51	4½–4½		*−44652°*
2216.031	A	25	0.00	5.57	4½–3½		*−45111°*
2178.171	A	25	0.00	5.67	4½–3½		*−45895°*
2175.245	A	30	0.00	5.67	4½–5½		*−45957°*
2162.88	A	25	0.00	5.71	4½–4½		*−46220°*
2155.81	A	25	0.00	5.72	4½–4½		*−46371°*
2088.82	A	50	0.00	5.91	4½–5½		*−47858°*
2985.800	A	25	0.78	4.91	3½–2½	*a* ^{4}F	*−39805°*
2943.151	A	30	0.78	4.97	3½–3½	(2)	*−40291°*
*2907.235	A	25	0.78	5.03	3½–3½		*−40710°*
2712.740	A	40	0.78	5.33	3½–3½		*−43176°*
2608.246	A	50	0.78	5.51	3½–4½		*−44652°*
2547.205	A	25	0.78	5.63	3½–2½		*−45570°*
2386.892	A	50	0.78	5.95	3½–2½		*−48206°*
2381.622	A	30	0.78	5.96	3½–4½		*−48299°*
2363.042	A	50	0.78	6.00	3½–3½		*−48629°*
2334.505	A	25	0.78	6.07	3½–2½		*−49146°*
2333.839	A	40	0.78	6.07	3½–4½		*−49158°*
2300.499	A	30	0.78	6.15	3½–2½		*−49779°*
2266.331	A	25	0.78	6.23	3½–4½		*−50434°*
2258.856	A	30	0.78	6.24	3½–3½		*−50580°*
2232.248	A	30	0.78	6.31	3½–3½		*−51107°*
2195.744	A	25	0.78	6.40	3½–3½		*−51852°*
2797.351	A	(40)	0.71	5.13	2½–2½	*a* ^{4}F	*−41522°*
2673.607	A	40	0.71	5.33	2½–3½	(3)	*−43176°*
2671.838	A	50	0.71	5.33	2½–1½		*−43200°*
2644.186	A	35	0.71	5.38	2½–3½		*−43592°*
2572.701	A	25	0.71	5.51	2½–3½		*−44642°*
*2542.016	A	35	0.71	5.57	2½–3½		*−45111°*
2537.225	A	35	0.71	5.58	2½–2½		*−45185°*
2394.326	A	30	0.71	5.87	2½–2½		*−47537°*
2356.552	A	40	0.71	5.95	2½–2½		*−48206°*
2343.176	A	40	0.71	5.98	2½–3½		*−48448°*
2333.298	A	25	0.71	6.00	2½–3½		*−48629°*
2305.466	A	30	0.71	6.07	2½–2½		*−49146°*
2295.084	A	40	0.71	6.09	2½–1½		*−49342°*
2255.810	A	25	0.71	6.18	2½–1½		*−50100°*
2232.471	A	25	0.71	6.24	2½–1½		*−50564°*
2231.657	A	25	0.71	6.24	2½–3½		*−50580°*
2205.68	A	25	0.71	6.31	2½–3½		*−51107°*
2083.22	A	25	0.71	6.64	2½–3½		*−53771°*
2996.078	A	50	0.50	4.62	1½–2½	*a* ^{4}F	*−37446°*
2916.365	A	(60)	0.50	4.74	1½–2½	(4)	*−38358°*
2836.404	A	(60)	0.50	4.85	1½–2½		*−39324°*
2669.913	A	60	0.50	5.13	1½–2½		*−41522°*
2617.781	A	25	0.50	5.22	1½–2½		*−42267°*
2555.347	A	25	0.50	5.33	1½–1½		*−43200°*
2467.302	A	40	0.50	5.51	1½–2½		*−44596°*
2431.938	A	50	0.50	5.58	1½–2½		*−45185°*
2427.613	A	25	0.50	5.59	1½–1½		*−45259°*
2413.310	A	25	0.50	5.62	1½–0½		*−45503°*

Ir I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	
Air							
2379.379	A	25	0.50	5.69	1½–2½	*a* ^{4}F	*−46093°*
2358.165	A	25	0.50	5.74	1½–1½	(4)	*−46471°*
2235.289	A	25	0.50	6.02	1½–1½	cont.	*−48801°*
2172.21	A	30	0.50	6.18	1½–1½		*−50100°*
*2882.635	A	(60)	0.35	4.63	4½–3½	*b* ^{4}F	*−37515°*
2824.448	A	(60r)	0.35	4.72	4½–4½	(5)	*−38229°*
2694.233	A	150h	0.35	4.93	4½–5½		*−39940°*
2668.993	A	50	0.35	4.97	4½–3½		*−40291°*
2661.983	A	150h	0.35	4.99	4½–4½		*−40389°*
2611.295	A	80	0.35	5.08	4½–4½		*−41118°*
2543.971‡	A	200h	0.35	5.20	4½–5½		*−42131°*
2534.457	A	100	0.35	5.22	4½–4½		*−42279°*
2452.807	A	35	0.35	5.38	4½–3½		*−43592°*
2391.178	A	50	0.35	5.51	4½–3½		*−44642°*
2390.617	A	40	0.35	5.51	4½–4½		*−44652°*
2304.215	A	100	0.35	5.71	4½–4½		*−46220°*
2296.209	A	25	0.35	5.72	4½–4½		*−46371°*
2264.607	A	30	0.35	5.80	4½–3½		*−46979°*
2255.101	A	25	0.35	5.82	4½–3½		*−47165°*
2235.750	A	25	0.35	5.87	4½–3½		*−47548°*
2220.373	A	50	0.35	5.91	4½–5½		*−47858°*
2198.854	A	50	0.35	5.96	4½–4½		*−48299°*
2191.64	A	30	0.35	5.98	4½–3½		*−48448°*
2158.05	A	50	0.35	6.07	4½–4½		*−49158°*
2039.43	A	25	0.35	6.40	4½–3½		*−51852°*
2939.265	A	(30)	0.88	5.08	3½–4½	*b* ^{4}F	*−41118°*
2904.799	A	25	0.88	5.13	3½–2½	(6)	*−41522°*
2662.626	A	40	0.88	5.51	3½–4½		*−44652°*
2599.040	A	25	0.88	5.63	3½–2½		*−45570°*
2577.265	A	60	0.88	5.67	3½–3½		*−45895°*
2564.177	A	40	0.88	5.69	3½–2½		*−46093°*
2546.034	A	100h	0.88	5.72	3½–4½		*−46371°*
2418.106	A	30	0.88	5.98	3½–3½		*−48448°*
*2377.983	A	30	0.88	6.07	3½–2½		*−49146°*
2377.275	A	25	0.88	6.07	3½–4½		*−49158°*
2299.526	A	25	0.88	6.24	3½–3½		*−50580°*
2148.22	A	25	0.88	6.62	3½–4½		*−53642°*
2125.44	A	25	0.88	6.68	3½–3½		*−54140°*
2085.74	A	30	0.88	6.79	3½–4½		*−55035°*
2965.202	A	25h	1.22	5.38	2½–3½	*b* ^{4}F	*−43592°*
2875.605	A	25	1.22	5.51	2½–3½	(7)	*−44642°*
2533.131	A	100	1.22	6.09	2½–1½		*−49342°*
2360.730	A	40	1.22	6.45	2½–3½		*−52224°*
2281.907	A	25	1.22	6.63	2½–3½		*−53687°*
2997.192	A	25	1.46	5.58	1½–2½	*b* ^{4}F	*−45185°*
2990.617	A	35	1.46	5.59	1½–1½	(8)	*−45259°*
2962.994	A	25	1.46	5.63	1½–2½		*−45570°*
*2882.635	A	40	1.31	5.59	1½–1½	*a* ^{2}P	*−45259°*
2785.224	A	25	1.31	5.74	1½–1½	(9)	*−46471°*
*2592.056	A	100	1.31	6.07	1½–2½		*−49146°*
2529.474	A	25	1.31	6.18	1½–1½		*−50100°*
2949.762	A	25	1.62	5.80	3½–3½	*a* ^{2}F	*−46979°*
2901.951	A	25	1.62	5.87	3½–2½	(10)	*−47537°*
2839.158	A	25	1.62	5.96	3½–4½		*−48299°*
2676.828	A	35	1.62	6.23	3½–4½		*−50434°*
2997.408	A	25	1.51	5.63	2½–2½	*a* ^{2}D	*−45570°*
2875.983	A	25	1.51	5.80	2½–3½	(11)	*−46979°*

PLATINUM, $Z = 78$

Pt I

I P 8.9 Anal B List C September 1954

REFERENCES

A See A. C. Haussmann, Astroph. J. **66**, 333 (1927). W L, (I), T

B J. J. Livingood, Phys. Rev. **34**, 185 (1929). W L, I, T, I P

Pt I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
3064.69	A	(6R)	0.00	4.03	3−2	6*s* ^{3}D− 1°
2929.79	A	(8R)	0.00	4.21	3−3	(1) − 3°
2830.29	A	(8R)	0.00	4.36	3−3	− 4°
2677.13	A	(5R)	0.00	4.61	3−2	− 6°
2659.44‡	A	(10R)	0.00	4.64	3−4	− 7°
2646.87	A	(6R)	0.00	4.66	3−3	− 8°
2467.42	A	(6R)	0.00	5.00	3−2	−12°
2440.08	A	(4R)	0.00	5.06	3−3	6*s* ^{3}D−15°
2234.91	B	8	0.00	5.52	3−3	(2) −22°
2165.14	B	9	0.00	5.70	3−2	−24°
2153.54	B	8	0.00	5.73	3−2	−25°
2144.22	B	10	0.00	5.76	3−3	−27°
2067.53	B	5	0.00	5.97	3−4	−30°
2049.38	B	6	0.00	6.02	3−3	−32°
3139.34	A	(7)	0.10	4.03	2−2	6*s* ^{3}D− 1°
2997.97	A	(7R)	0.10	4.21	2−3	(3) − 3°
2893.87	A	(6)	0.10	4.36	2−3	− 4°
2771.65	A	(4R)	0.10	4.55	2−1	− 5°
2733.96	A	(8R)	0.10	4.61	2−2	− 6°
2702.38	A	(6R)	0.10	4.66	2−3	6*s* ^{3}D− 8°
2628.02	A	(7R)	0.10	4.79	2−2	(4) −10°
*2487.15	A	(4R)	0.10	5.06	2−3	−15°
2436.69	A	(4R)	0.10	5.16	2−1	−16°
2357.09	A	(4R)	0.10	5.33	2−1	−18°
2202.20	B	8	0.10	5.70	2−2	6*s* ^{3}D−24°
2190.16	B	6	0.10	5.73	2−2	(5) −25°
2180.49	B	8	0.10	5.76	2−3	−27°
2128.62	B	8	0.10	5.89	2−1	−29°
2082.55	B	5	0.10	6.02	2−3	−32°

Pt I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
3002.26	A	(4)	0.10	4.21	4−3	823− 3°
2897.89	A	(5)	0.10	4.36	4−3	(6) − 4°
2719.02	A	(6R)	0.10	4.64	4−4	− 7°
2705.88	A	(5R)	0.10	4.66	4−3	− 8°
2650.84	A	(4R)	0.10	4.76	4−5	− 9°
2182.76	B	6	0.10	5.76	4−3	823−27°
*2166.62	B	6	0.10	5.80	4−4	(7) −28°
2103.33	B	6	0.10	5.97	4−4	−30°
2084.62	B	7	0.10	6.02	4−3	−32°
2062.81	B	5	0.10	6.08	4−3	−33°
2803.22	A	(6)	0.76	5.16	0−1	5d^{10} ^{1}S −16°
2698.40	A	(6)	0.76	5.33	0−1	(8) −18°
2403.10	A	(4R)	0.76	5.89	0−1	−29°
2639.33	A	(5)	0.81	5.49	2−2	6567−21°
2368.28	A	(4R)	0.81	6.02	2−3	(9) −32°
2244.93	B	8	0.81	6.31	2−3	−50°
2222.60	B	8	0.81	6.36	2−2	−38°
2152.07	B	6	0.81	6.55	2−1	−42°
2109.65	B	7	0.81	6.66	2−2	−43°
2070.96	B	6	0.81	6.77	2−3	−44°
2912.30	A	(8)	1.25	5.49	3−2	10116−21°
2738.45	A	(4)	1.25	5.76	3−3	(10) −27°
2713.09	A	(4)	1.25	5.80	3−4	−28°
3251.97	A	(5)	1.25	5.05	1−0	6*s* ^{3}D−14°
2773.99	A	(4)	1.25	5.70	1−2	(11) −24°
2754.90	A	(5)	1.25	5.73	1−2	−25°
2753.85	A	(4)	1.25	5.73	1−0	−26°
2658.16	A	(4)	1.25	5.89	1−1	−29°
2217.33	B	7	1.25	6.82	1−2	−45°
2893.26	A	(4)	1.91	6.18	2−1	15501−36°
2733.67	A	(5R)	1.91	6.43	2−1	(12) −40°

Pt II

I P 18.48 Anal A List C August 1954

REFERENCE

A A. G. Shenstone, Phil. Trans. Roy. Soc. London [A] **237**, No. 782, 453 (1938). W **L, I, T, I P**

Pt II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1621.658	A	50	0.00	7.61	2½−3½	5d^9 ^{2}D −6*p* ^{4}F° (1)
1530.190	A	50	0.00	8.07	2½−2½	5d^9 ^{2}D −31°† (2)
1735.858	A	30	1.04	8.15	1½−1½	5d^9 ^{2}D −33°† (3)
1505.240	A	50	0.00	8.20	2½−3½	5d^9 ^{2}D −34° (4)
1429.524	A	50	0.00	8.64	2½−2½	5d^9 ^{2}D −37° (5)

Pt II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1402.236	A	50	0.00	8.80	2½−2½	5d^9 ^{2}D −40° (6)
1389.875	A	30	0.00	8.88	2½−2½	5d^9 ^{2}D −41° (7)
1369.362	A	30	0.00	9.02	2½−1½	5d^9 ^{2}D −43° (8)
1305.305	A	30	0.00	9.46	2½−1½	5d^9 ^{2}D −93° (9)
1436.309	A	50	1.04	9.63	1½−2½	5d^9 ^{2}D −53°† (10)
1380.475	A	30	1.04	9.98	1½−2½	5d^9 ^{2}D −91° (11)

Pt II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2144.244	A	100	0.59	6.35	4½–3½	6s ⁴F –6p ⁴D°† (12)
Vac						
1929.250	A	30	1.16	7.55	3½–2½	
Air						
2310.957	A	50	1.65	6.99	2½–1½	
2377.276	A	50	1.16	6.35	3½–3½	
2625.338	A	30	1.65	6.35	2½–3½	
Vac						
1777.086‡	A	50R	0.59	7.54	4½–5½	6s ⁴F –6p ⁴G°† (13)
Air						
2245.518	A	100	1.16	6.65	3½–4½	
2424.871	A	50	1.95	7.04	1½–2½	
2036.461	A	100	0.59	6.65	4½–4½	
2288.197	A	30	1.65	7.04	2½–2½	
Vac						
1781.858	A	50	0.59	7.52	4½–4½	6s ⁴F –6p ⁴F°† (14)
1911.702	A	50	1.16	7.61	3½–3½	
1939.800	A	40	1.16	7.52	3½–4½	
1723.128	A	50	0.59	7.76	4½–4½	6s ⁴F –27° (15)
1870.404	A	30	1.16	7.76	3½–4½	
1983.737	A	30	1.65	7.87	2½–3½	6s ⁴F –28°† (16)
Air						
2041.568	A	40	1.95	7.99	1½–2½	6s ⁴F –30°† (17)
Vac						
1883.051	A	40	1.65	8.20	2½–3½	6s ⁴F –34°† (18)
1374.878	A	50	0.59	9.57	4½–4½	6s ⁴F –52°† (19)
1349.161	A	30	0.59	9.74	4½–4½	6s ⁴F –54°† (20)
1235.878	A	30	0.59	10.58	4½–3½	6s ⁴F –61°† (21)
1077.078	A	30	0.59	12.05	4½–3½	6s ⁴F –68°† (22)
1186.216	A	30	1.65	12.05	2½–3½	
1169.741	A	40	1.65	12.20	2½–3½	6s ⁴F –70°† (23)
1080.366	A	30	1.16	12.58	3½–2½	6s ⁴F –83°† (24)
Air						
2130.689	A	30	2.08	7.87	2½–3½	6s′ ⁴P –28° (25)
2014.925	A	40	2.08	8.20	2½–3½	6s′ ⁴P –34° (26)
Vac						
1867.122	A	30	2.08	8.69	2½–2½	6s′ ⁴P –39°† (27)
1929.677	A	30	2.61	9.01	1½–2½	6s′ ⁴P –42° (28)
1168.282	A	40	2.08	12.64	2½–2½	6s′ ⁴P –85° (29)
Air						
2794.213	A	100	2.23	6.65	3½–4½	6s ²F –6p ⁴G°† (30)

Pt II—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2616.759	A	30	2.90	7.61	2½–3½	6s ²F –6p ⁴F°† (31)
2190.315	A	30	2.23	7.87	3½–3½	6s ²F –28°† (32)
2115.569	A	30	2.23	8.07	3½–2½	6s ²F –31°† (33)
Vac						
1879.094	A	30	2.23	8.80	3½–2½	6s ²F –40° (34)
1949.901	A	30	2.90	9.23	2½–3½	6s ²F –48° (35)
1751.703	A	30	2.23	9.28	3½–3½	6s ²F –49°† (36)
1248.600	A	40	2.23	12.12	3½–2½	6s ²F –69° (37)
1704.765	A	30	2.95	10.19	1½–0½	6s″ ²D –57° (38)
Air						
2774.772	A	50	3.07	7.52	4½–4½	6s² ⁴F –6p ⁴F°† (39)
Vac						
1509.288	A	50	4.28	12.46	3½–3½	6s² ⁴F –76°† (40)
1499.380	A	30	4.28	12.51	3½–2½	6s² ⁴F –77°† (41)
1494.724	A	30	4.28	12.54	3½–3½	6s² ⁴F –80° (42)
1482.823	A	100	4.28	12.60	3½–4½	6s² ⁴F –84° (43)
1524.725	A	30	4.68	12.77	1½–2½	6s² ⁴F –86°† (44)
Air						
2251.523	A	30	3.58	9.07	3½–4½	6s‴ ²G –44°† (45)
2251.918	A	30u	6.35	11.83	3½–4½	6p ⁴D° –7s ⁴F†
2822.270	A	30u	7.55	11.93	2½–3½	(46)
2240.993	A	30u	6.99	12.49	1½–2½	6p ⁴D° –8 (47)
2877.520	A	100u	7.54	11.83	5½–4½	6p ⁴G° –7s ⁴F† (48)
2287.499	A	50u	7.54	12.93	5½–6½	6p ⁴G° –6d ⁴H† (49)
2271.718	A	30u	7.54	12.97	5½–5½	6p ⁴G° –6d ⁴G† (50)
2865.051	A	40u	7.52	11.83	4½–4½	6p ⁴F° –7s ⁴F†
2860.678	A	80u	7.61	11.93	3½–3½	(51)
2799.981	A	40u	7.52	11.93	4½–3½	
2202.577	A	50u	7.52	13.12	4½–4½	6p ⁴F° –6d ⁴F†
2233.110	A	50u	7.61	13.14	3½–3½	(52)
2875.849	A	40u	8.20	12.49	3½–2½	34° –8 (53)

Strongest Unclassified Lines of Pt II

Vac							Vac					
1889.516	A	50					1764.595	A	50			
1777.270	A	30					1506.279	A	30			

GOLD, $Z = 79$

Au I

I P 9.19 Anal A List C September 1954

REFERENCE

A J. R. Platt and R. A. Sawyer, Phys. Rev. **60**, 866 (1941). W L, I, T, I P

Au I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2427.95‡	A	(125)	0.00	5.08	0½–1½	$6s\ ^2S - 6p\ ^2P^\circ$
2675.95	A	50	0.00	4.61	0½–0½	(1)
2126.63	A	15	0.00	5.80	0½–1½	$6s\ ^2S$ − 5°
Vac						(2)
1951.93	A	25	0.00	6.32	0½–1½	− 8°
1942.31	A	45	0.00	6.36	0½–1½	− 9°
1587.24	A	20	0.00	7.78	0½–1½	−20°
1646.59	A	20	0.00	7.50	0½–1½	$6s\ ^2S - 7p\ ^2P^\circ$
1665.78	A	12	0.00	7.41	0½–0½	(3)
Air						
2748.24	A	50	1.13	5.62	2½–3½	$6s^2\ ^2D$ − 2°
2700.90	A	30	1.13	5.70	2½–2½	(4) − 3°†
2641.49	A	30	1.13	5.80	2½–1½	− 5°†
2387.75	A	40	1.13	6.30	2½–3½	− 7°
2376.28	A	20	1.13	6.32	2½–1½	− 8°†
2352.58	A	50	1.13	6.38	2½–2½	$6s^2\ ^2D$ −10°†
2012.05	A	15	1.13	7.26	2½–1½	(5) −16°
Vac						
1978.19	A	30	1.13	7.37	2½–2½	−17°
1919.64	A	20	1.13	7.56	2½–2½	−18°†
Air						
2914.84	A	30	2.65	6.88	1½–0½	$6s^2\ ^2D$ −13°
2883.45	A	25	2.65	6.93	1½–1½	(6) −14°†
2688.72	A	20	2.65	7.24	1½–2½	−15°†

Au I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2590.04	A	15	2.65	7.41	1½–0½	$6s^2\ ^2D - 7p\ ^2P^\circ$†
						(7)
Vac						
1714.57	A	10	1.13	8.33	2½–3½	$6s^2\ ^2D - 5f\ ^2F^\circ$
Air						(8)
2170.75	A	20	2.65	8.33	1½–2½	
2940.68	A	25	4.61	8.81	0½–1½	$6p\ ^2P^\circ - 9d\ ^2D$†
						(9)
2872.38	A	20	4.61	8.91	0½–1½	$6p\ ^2P^\circ - 10d\ ^2D$†
						(10)
2780.82	A	25	4.61	9.05	0½–1½	$6p\ ^2P^\circ - 13d\ ^2D$†
						(11)
2905.91	A	20	5.21	9.45	2½–2½	1° − 6
2873.42	A	20	5.21	9.50	2½–2½	(12) −11
2589.25	A	20	5.21	9.97	2½–2½	−15?
2815.34	A	15	5.70	10.08	2½–1½	3° −17
						(13)

Au II

I P 20.4 Anal B List C September 1954

REFERENCE

A J. R. Platt and R. A. Sawyer, Phys. Rev. 60, 866 (1941). W L, I, T, I P

Au II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1224.57	A	20	0.00	10.08	0–1	$5d^{10}\ {}^1S$– 8° (1)
Air						
2082.09	A	150	1.86	7.78	3–2	2 – 1°
2000.81	A	25	1.86	8.02	3–3	(2) – 2°
Vac						
1740.47‡	A	45	1.86	8.95	3–4	– 3°
1673.61	A	25	1.86	9.23	3–3	– 6°
Air						
*2201.32	A	25	2.18	7.78	2–2	3 – 1°
2110.68	A	60	2.18	8.02	2–3	(3) – 2°
Vac						
1800.58	A	35	2.18	9.03	2–2	– 4°
1793.31	A	35	2.18	9.06	2–1	– 5°
*1468.97	A	30	2.18	10.58	2–3	–10°
*1468.97	A	30	2.18	10.58	2–1	–11°
Air						
*2201.32	A	25	3.43	9.03	1–2	4 – 4°
2044.54	A	50	3.43	9.46	1–2	(4) – 7°
Vac						
1823.24	A	25	3.43	10.20	1–0	– 9°
1725.89	A	25	3.43	10.58	1–1	–11°
1700.69	A	30	3.43	10.69	1–2	–12°
1073.09	A	40	3.43	14.93	1–2	–15°
Air						
2283.300	A	25	3.66	9.06	2–1	5 – 5°
2125.29	A	30	3.66	9.46	2–2	(5) – 7°
Vac						
*1783.22	A	60	3.66	10.58	2–3	–10°
*1783.22	A	60	3.66	10.58	2–1	–11°
1756.10	A	35	3.66	10.69	2–2	–12°
Air						
2913.536	A	25	5.00	9.23	4–3	6 – 6° (6)
*2907.056	A	30	6.44	10.69	3–2	8 –12° (7)
Vac						
1486.49	A	25	6.44	14.75	3–2	–13°
*1468.97	A	30	6.44	14.85	3–3	–14°
1405.17	A	30	6.44	15.23	3–3	–19°
Air						
2215.626	A	35	7.78	13.35	2–3	1°–15 (8)

Au II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2291.400	A	25	8.02	13.41	3–2	2°–16 (9)
2802.064	A	40	8.95	13.35	4–3	3°–15
2188.81	A	35	8.95	14.59	4–4	(10) –24
2819.800	A	30	9.03	13.41	2–2	4°–16
2231.18	A	30	9.03	14.56	2–3	(11) –22
2228.880	A	45	9.03	14.57	2–2	–23
2837.870	A	25	9.06	13.41	1–2	5°–16
2277.518	A	25	9.06	14.48	1–1	(12) –20
2240.164	A	25	9.06	14.57	1–2	–23
2095.13	A	35	9.06	14.95	1–2	–26
2994.820	A	35	9.23	13.35	3–3	6°–15
2954.224	A	30	9.23	13.41	3–2	(13) –16
2340.063	A	25	9.23	14.51	3–3	–21
2314.551	A	25	9.23	14.56	3–3	–22
2304.689	A	45	9.23	14.59	3–4	–24
2263.620	A	80	9.46	14.92	2–1	7°–25
2248.560	A	70	9.46	14.95	2–2	(14) –26
*2907.056	A	30	10.08	14.33	1–1	8°–17
2805.214	A	25	10.08	14.48	1–1	(15) –20
2552.666	A	45	10.08	14.92	1–1	–25
2533.519	A	60	10.08	14.95	1–2	–26
2616.401	A	50	10.20	14.92	0–1	9°–25 (16)
2822.550	A	250	10.58	14.95	3–2	10°–26 (17)
2846.962	A	80	10.58	14.92	1–1	11°–25
2823.170	A	25	10.58	14.95	1–2	(18) –26
2918.250	A	60	10.69	14.92	2–1	12°–25
2893.299	A	80	10.69	14.95	2–2	(19) –26

Au III

I P Anal C List C March 1961

REFERENCE

A L. Iglesias, J. Research Nat. Bur. Std. **64A**, 481 (1960). T, C L, W L, I

Au III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 1040.650	A	100	0.00	11.86	2½–2½	$a\,^2D - z\,^4G°$† (1)
945.099	A	200	0.00	13.06	2½–3½	$a\,^2D - z\,^4F°$† (2)
845.138	A	100	0.00	14.61	2½–3½	$a\,^2D$ –25° (3)
843.454	A	100	0.00	14.64	2½–1½	$a\,^2D$ –26°† (4)
1693.917	A	1000	3.67	10.96	4½–3½	$a\,^4F - z\,^4D°$ (5)
1500.334	A	250	4.33	12.56	3½–2½	
1756.917	A	500	4.79	11.82	2½–1½	
1717.820	A	300	4.98	12.17	1½–0½	
1861.799	A	500	4.33	10.96	3½–3½	
1589.680	A	80	4.79	12.56	2½–2½	
1805.235	A	400	4.98	11.82	1½–1½	
*1629.116	A	300d	4.98	12.56	1½–2½	
1365.372	A	500	3.67	12.71	4½–5½	$a\,^4F - z\,^4G°$† (6)
1775.166	A	800	4.33	11.28	3½–4½	
1574.855	A	200	4.79	12.63	2½–3½	
1793.762	A	500	4.98	11.86	1½–2½	
1621.913	A	500	3.67	11.28	4½–4½	
1487.133	A	300	4.33	12.63	3½–3½	
1746.037	A	500	4.79	11.86	2½–2½	
1638.876	A	250	4.33	11.86	3½–2½	
1336.700	A	200	3.67	12.91	4½–4½	$a\,^4F - z\,^4F°$† (7)
1413.779	A	250	4.33	13.06	3½–3½	
1350.302	A	150	4.79	13.93	2½–2½	
1448.393	A	250	4.98	13.50	1½–1½	
1314.825	A	100	3.67	13.06	4½–3½	
1285.302	A	50	4.33	13.93	3½–2½	
1417.111	A	100	4.79	13.50	2½–1½	
1439.100	A	300	4.33	12.91	3½–4½	
1378.655	A	150	4.98	13.93	1½–2½	
1454.927	A	250	4.79	13.28	2½–2½	$a\,^4F$ –13° (8)
1487.906	A	250	4.98	13.28	1½–2½	
1367.149	A	200	4.33	13.36	3½–2½	$a\,^4F$ –14° (9)
1473.279	A	80	4.98	13.36	1½–2½	
1385.763	A	300	4.79	13.70	2½–3½	$a\,^4F$ –16°† (10)
1239.961	A	100w	4.33	14.29	3½–4½	$a\,^4F$ –22° (11)
1278.514	A	100	4.98	14.64	1½–1½	$a\,^4F$ –26° (12)
1932.038	A	100	6.17	12.56	1½–2½	$a\,^4P - z\,^4D°$† (13)
Air 2159.085	A	100	6.10	11.82	0½–1½	
2184.108	A	100	6.17	11.82	1½–1½	
Vac 1948.792	A	200	5.48	11.82	2½–1½	

Au III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac 1727.281	A	500	5.48	12.63	2½–3½	$a\,^4P - z\,^4G°$†
1935.416	A	100	5.48	11.86	2½–2½	(14)
1821.169	A	400	6.10	12.88	0½–0½	$a\,^4P$ – 9° (15)
*1629.116	A	300d	5.48	13.06	2½–3½	$a\,^4P - z\,^4F°$
1589.559	A	200	6.17	13.93	1½–2½	(16)
1668.098	A	100	6.10	13.50	0½–1½	
1617.137	A	250	5.48	13.12	2½–1½	$a\,^4P$ –12°†
1776.396	A	200	6.17	13.12	1½–1½	(17)
1584.074	A	150	5.48	13.28	2½–2½	$a\,^4P$ –13°† (18)
*1567.512	A	200	5.48	13.36	2½–2½	$a\,^4P$ –14°
1716.697	A	100	6.17	13.36	1½–2½	(19)
1502.441	A	200	5.48	13.70	2½–3½	$a\,^4P$ –16° (20)
*1567.512	A	200	6.17	14.04	1½–0½	$a\,^4P$ –19°
1554.580	A	80	6.10	14.04	0½–0½	(21)
1409.472	A	225	5.48	14.24	2½–2½	$a\,^4P$ –21°† (22)
1391.441	A	180	5.48	14.36	2½–3½	$a\,^4P$ –23° (23)
1379.951	A	150	5.48	14.43	2½–1½	$a\,^4P$ –24°† (24)
1348.873	A	100	5.48	14.64	2½–1½	$a\,^4P$ –26°
1446.701	A	80	6.10	14.64	0½–1½	(25)
1427.393	A	150	6.17	14.82	1½–2½	$a\,^4P$ –27°† (26)
1389.388	A	100	6.17	15.05	1½–1½	$a\,^4P$ –29°† (27)
1380.498	A	125	6.17	15.11	1½–0½	$a\,^4P$ –30° (28)
1356.109	A	150	6.10	15.21	0½–1½	$a\,^4P$ –32°† (29)
Air 2322.267	A	300	5.65	10.96	3½–3½	$a\,^2F - z\,^4D°$† (30)
Vac 1786.106	A	300	5.65	12.56	3½–2½	
Air 2188.966	A	500	5.65	11.28	3½–4½	$a\,^2F - z\,^4G°$† (31)
Vac 1989.631	A	400	6.43	12.63	2½–3½	
1767.415	A	300	5.65	12.63	3½–3½	

Au III—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1699.990	A	200	5.65	12.91	3½–4½	$a\,^2F - z\,^4F°$† (32)
1664.778	A	250	5.65	13.06	3½–3½	
1644.189	A	100	6.43	13.93	2½–2½	
1489.446	A	200	5.65	13.93	3½–2½	
1744.346	A	150	6.43	13.50	2½–1½	
1844.889	A	400	6.43	13.12	2½–1½	$a\,^2F$ −12° (33)
1617.761	A	100	5.65	13.28	3½–2½	$a\,^2F$ −13° (34)
1801.982	A	200	6.43	13.28	2½–2½	
1600.496	A	200	5.65	13.36	3½–2½	$a\,^2F$ −14° (35)
1780.571	A	100	6.43	13.36	2½–2½	
1697.081	A	150	6.43	13.70	2½–3½	$a\,^2F$ −16° (36)
1436.088	A	80	5.65	14.24	3½–2½	$a\,^2F$ −21° (37)
1579.413	A	200	6.43	14.24	2½–2½	
1428.907	A	300	5.65	14.29	3½–4½	$a\,^2F$ −22° (38)
1417.368	A	125	5.65	14.36	3½–3½	$a\,^2F$ −23°† (39)
1377.708	A	180	5.65	14.61	3½–3½	$a\,^2F$ −25° (40)
1503.716	A	200	6.43	14.64	2½–1½	$a\,^2F$ −26° (41)
1471.281	A	150	6.43	14.82	2½–2½	$a\,^2F$ −27°† (42)
1433.344	A	275	6.43	15.04	2½–3½	$a\,^2F$ −28° (43)
Air						
2402.706	A	150	6.68	11.82	1½–1½	$b\,^2D - z\,^4D°$† (44)
2382.403	A	100	6.68	11.86	1½–2½	$b\,^2D - z\,^4G°$† (45)
2405.118	A	150	7.93	13.06	2½–3½	$b\,^2D - z\,^4F°$† (46)
Vac						
1702.235	A	200	6.68	13.93	1½–2½	
1809.811	A	100	6.68	13.50	1½–1½	
1918.278	A	150	6.68	13.12	1½–1½	$b\,^2D$ −12°† (47)
1871.922	A	150	6.68	13.28	1½–2½	$b\,^2D$ −13°† (48)
1848.833	A	150	6.68	13.36	1½–2½	$b\,^2D$ −14° (49)
1593.394	A	150	6.68	14.43	1½–1½	$b\,^2D$ −24°† (50)
1792.653	A	150	7.93	14.82	2½–2½	$b\,^2D$ −27° (51)
1733.140	A	100d	7.93	15.05	2½–1½	$b\,^2D$ −29° (52)
1474.707	A	100	6.68	15.05	1½–1½	
1464.692	A	100	6.68	15.11	1½–0½	$b\,^2D$ −30° (53)
1715.670	A	200	7.93	15.13	2½–2½	$b\,^2D$ −31°† (54)

Au III—Continued

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1395.971	A	180	6.68	15.53	1½–1½	$b\,^2D$ −34°† (55)
1414.247	A	100	7.93	16.66	2½–2½	$b\,^2D$ −43° (56)
Air						
3227.991	A	100	7.14	10.96	4½–3½	$a\,^2G - z\,^4D°$ (57)
3309.856	A	100	7.23	10.96	3½–3½	
2083.092	A	300	7.14	13.06	4½–3½	$a\,^2G - z\,^4F°$† (58)
Vac						
1738.484	A	300	7.14	14.24	4½–3½	$a\,^2G$ −20° (59)
1761.947	A	500	7.23	14.24	3½–3½	
1710.125	A	250	7.14	14.36	4½–3½	$a\,^2G$ −23° (60)
1652.733	A	250	7.14	14.61	4½–3½	$a\,^2G$ −25° (61)
1673.919	A	125	7.23	14.61	3½–3½	
1435.784	A	250	7.14	15.74	4½–5½?	$a\,^2G$ −36° (62)
1430.037	A	250	7.23	15.86	3½–2½	$a\,^2G$ −39° (63)
1381.338	A	200	7.23	16.17	3½–3½	$a\,^2G$ −40°† (64)
1341.660	A	180	7.14	16.34	4½–4½	$a\,^2G$ −41° (65)
1355.598	A	150	7.23	16.34	3½–4½	
Air						
2172.200	A	200	7.20	12.88	0½–0½	$a\,^2P$ − 9° (66)
Vac						
1958.472	A	100	7.20	13.50	0½–1½	$a\,^2P - z\,^4F°$† (67)
1996.853	A	150	7.86	14.04	1½–0½	$a\,^2P$ −18° (68)
1707.508	A	100	7.20	14.43	0½–1½	$a\,^2P$ −24° (69)
1774.419	A	100	7.86	14.82	1½–2½	$a\,^2P$ −27° (70)
1698.970	A	200	7.86	15.13	1½–2½	$a\,^2P$ −31° (71)
1541.978	A	100	7.20	15.21	0½–1½	$a\,^2P$ −32° (72)
1481.066	A	150	7.20	15.54	0½–0½	$a\,^2P$ −35°† (73)
1446.334	A	150	7.20	15.74	0½–1½	$a\,^2P$ −37° (74)
1548.473	A	100	7.86	15.83	1½–1½	$a\,^2P$ −38° (75)
1441.173	A	200	7.86	16.43	1½–2½	$a\,^2P$ −42° (76)
1402.878	A	100	7.86	16.66	1½–2½	$a\,^2P$ −43° (77)

MERCURY, $Z = 80$

Hg I

I P 10.39 Anal A List C January 1959

REFERENCES

A K. Burns, K. B. Adams, and J. Longwell, J. Opt. Soc. Am. **40**, 343 (1950). W L, T

B H. Beutler, Zeit. Phys. **84**, 289 (1933). W L, T

C R. A. Sawyer, J. Opt. Soc. Am. and Rev. Sci. Instr. **13**, 440 (1926). W L, (I), T

P See Trans. Intern. Astron. Union **10**, 218 (1958). Calc. W L
H. Kayser und H. Konen, Handbuch der Spectroscopie **7**, 674 (1934). I
E. W. H. Selwyn, Proc. Phys. Soc. **41**, No. 229, 400 (1929). (I)
For additional references to analysis, see C. E. Moore, Circ. Nat. Bur. Std. **467**, Vol. III, 191 (1958).

Hg I **Hg I**

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2536.517	A	10R	0.00	4.87	0−1	$6s^2\ {}^1S - 6p\ {}^3P^\circ$ (1)
Vac						
1849.492‡	P	(20R)	0.00	6.67	0−1	$6s^2\ {}^1S - 6p\ {}^1P^\circ$ (2)
1402.619	P	4	0.00	8.80	0−1	$6s^2\ {}^1S - 7p\ {}^1P^\circ$ (3)
*1301.010	P	—	0.00	9.49	0−1	$6s^2\ {}^1S - 8p\ {}^1P^\circ$ (4)
*1301.010	P	—	0.00	9.49	0−1	$6s^2\ {}^1S - 6p'\ {}^1P^\circ$ (5)
Air						
2856.935	A	3	4.87	9.19	1−0	$6p\ {}^3P^\circ - 8s\ {}^1S$ (6)
3027.487	A	3	5.44	9.51	2−2	$6p\ {}^3P^\circ - 7d\ {}^1D$ (7)
2655.127	A	4	4.87	9.51	1−2	

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
3021.498	A	5	5.44	9.52	2−3	$6p\ {}^3P^\circ - 7d\ {}^3D$ (8)
2652.039	A	5	4.87	9.52	1−2	
2534.764	A	4	4.65	9.52	0−1	
3023.475	A	4	5.44	9.52	2−2	
2653.679	A	4	4.87	9.52	1−1	
3025.606	A	2	5.44	9.52	2−1	
2925.410	A	4	5.44	9.66	2−1	$6p\ {}^3P^\circ - 9s\ {}^3S$ (9)
2576.285	A	4	4.87	9.66	1−1	
2464.057	A	3	4.65	9.66	0−1	
2563.855	A	1	4.87	9.68	1−0	$6p\ {}^3P^\circ - 9s\ {}^1S$ (10)
2806.759	A	1	5.44	9.83	2−2	$6p\ {}^3P^\circ - 8d\ {}^1D$ (11)
2483.815	A	3	4.87	9.83	1−2	
2803.465	A	4	5.44	9.84	2−3	$6p\ {}^3P^\circ - 8d\ {}^3D$ (12)
2481.996	A	4	4.87	9.84	1−2	
2378.316	A	4	4.65	9.84	0−1	
2804.434	A	2	5.44	9.84	2−2	
2482.710	A	3	4.87	9.84	1−1	
2805.344	A	1	5.44	9.84	2−1	

Hg II

I P 18.676 Anal B List C October 1954

REFERENCES

A F. Paschen, Sitz. Akad. Wiss. Berlin (Phys. Math. Kl.) Parts 31–33, p. 536 (1928). W L, I, T, I P
J. C. McLennan, A. B. McLay, and M. F. Crawford. Proc. Roy. Soc. London [A] **134**, 41 (1931). W L, I, T
S. M. Naudé, Ann. der Phys. [5] **3**, 1 (1929). W L, I, T

Hg II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
[2814.93]	A	10	0.00	4.38	0½–2½	$6s\ ^2S - 6s^2\ ^2D$ (1)
Vac						
1649.959‡	A	30	0.00	7.48	0½–1½	$6s\ ^2S - 6p\ ^2P°$
1942.317	A	50	0.00	6.36	0½–0½	(2)
893.107	A	10	0.00	13.82	0½–1½	$6s\ ^2S - 7p\ ^2P°$
923.393	A	4	0.00	13.37	0½–0½	(3)
Air						
2262.233	A	9	4.38	9.84	2½–2½	$6s^2\ ^2D$ — *79704°*
2052.929	A	9	4.38	10.40	2½–3½	(4) — *84209°*
2026.971	A	9	4.38	10.47	2½–2½	— *84834°*
Vac						
1414.427	A	9	4.38	13.11	2½–3½	—*106213°*
1361.307	A	9	4.38	13.45	2½–3½	$6s^2\ ^2D$ —*108974°*
1331.759	A	10	4.38	13.65	2½–1½	(5) —*110603°*
1321.733	A	10	4.38	13.72	2½–3½	—*111172°*
1307.950	A	9	4.38	13.82	2½–1½	—*111970°*

Hg II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2916.27	A	10	6.24	10.47	1½–2½	$6s^2\ ^2D$ — *84834°*
2148.003	A	7	6.24	11.99	1½–2½	(6) — *97094°*
Vac						
1731.889	A	10	6.24	13.37	1½–0½	—*108298°*
Air						
2847.67	A	50	7.48	11.82	1½–0½	$6p\ ^2P°–7s\ ^2S$
2260.260	A	10	6.36	11.82	0½–0½	(7)
2224.710	A	20	7.48	13.03	1½–2½	$6p\ ^2P°–6d\ ^2D$ (8)
Vac						
1869.242	A	10	6.36	12.96	0½–1½	
Air						
2252.780	A	7	7.48	12.96	1½–1½	

Hg III

I P 34 Anal C List C July 1961

REFERENCES

A M. W. Johns, Canadian J. Research [A] **15,** 193 (1937). I P, T, C L, W L, I

B E. W. Foster, Proc. Roy. Soc. London [A] **200,** 429 (1950). T, C L, W L, (I)

Hg III

I A	Ref	Int	E P Low	E P High	*J*	Multiplet No.
Vac						
*843.11	A	30	0.00	14.64	0−1	$5d^{10}$ ^{1}S −*118607°*
790.17	A	6	0.00	15.62	0−1	(1) −*126556°*
740.75	A	8	0.00	16.67	0−1	−*134998°*
1647.47	A	60	5.29	12.78	3−2	6*s* ^{3}D −*103549°*
1592.93	A	30	5.29	13.04	3−3	(2) −*105627°*
1330.77	A	40	5.29	14.57	3−4	−*117994°*
1321.04	A	30	5.29	14.63	3−2	−*118548°*
*1280.80	A	30d	5.29	14.93	3−2	−*120927°*
1269.78	A	25	5.29	15.01	3−3	−*121602°*
*843.11	A	30	5.29	19.93	3−3	−*161461°*
*1738.50	A	75	5.68	12.78	2−2	6*s* ^{3}D −*103549°*
1677.90	A	50	5.68	13.04	2−3	(3) −*105627°*
1378.96	A	40	5.68	14.63	2−2	−*118548°*
1377.83	A	40	5.68	14.64	2−1	−*118607°*
1335.08	A	40	5.68	14.93	2−2	−*120927°*
1323.22	A	30	5.68	15.01	2−3	−*121602°*
1241.81	A	15	5.68	15.62	2−1	−*126556°*
855.11	A	15	5.68	20.12	2−2	−*162972°*
822.69	A	15	5.68	20.69	2−3	−*167580°*
808.82	A	15	5.68	20.95	2−3	−*169666°*

Hg III

I A	Ref	Int	E P Low	E P High	*J*	Multiplet No.
Air						
2214.46	A	20	7.21	12.78	1−2	6*s* ^{3}D −*103549°*
Vac						(4)
1662.72	A	40	7.21	14.63	1−2	−*118548°*
1599.44	A	50	7.21	14.93	1−2	−*120927°*
1467.33	A	25	7.21	15.62	1−1	−*126556°*
1383.19	A	25	7.21	16.14	1−0	−*130702°*
1305.60	A	30	7.21	16.67	1−1	−*134998°*
*1280.80	A	30d	7.21	16.85	1−2	−*136479°*
Air						
2354.238	A	75	7.54	12.78	2−2	6*s* ^{1}D −*103549°*
2244.375	A	75	7.54	13.04	2−3	(5) −*105627°*
Vac						
1740.27	A	40	7.54	14.63	2−2	−*118548°*
*1738.50	A	75	7.54	14.64	2−1	−*118607°*
1671.06	A	40	7.54	14.93	2−2	−*120927°*
1652.45	A	20	7.54	15.01	2−3	−*121602°*
1527.40	A	40	7.54	15.62	2−1	−*126556°*
1360.46	A	40	7.54	16.61	2−3	−*134588°*
1352.93	A	20	7.54	16.67	2−1	−*134998°*
1326.36	A	25	7.54	16.85	2−2	−*136479°*
Air						
2724.43	B	(70)	12.08	16.61	4−3	6*s*^{2} ^{3}F −*134588°*
Vac						(6)
1727.04	A	15	12.08	19.23	4−3	−*155796°*

THALLIUM, $Z = 81$

Tl I

I P 6.082 Anal A List C January 1955

REFERENCES

A See A. Fowler, *Report on Series in Line Spectra* p. 161 (Fleetway Press, London, 1922). W L, I, T, I P

B H. Beutler und W. Demeter, Zeit. Phys. **91,** 143, 218 (1934). W L, T

H. E. Clearman, J. Opt. Soc. Am. **42, 375** (1952). W L, (I), T

Tl I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
3519.24	A	10R	0.96	4.47	1½–2½	$6p\ ^2P^\circ - 6d\ ^2D$ (1)
2767.92	B	10R	0.00	4.46	0½–1½	
3529.43	A	8R	0.96	4.46	1½–1½	
3229.75	A	10R	0.96	4.78	1½–0½	$6p\ ^2P^\circ - 8s\ ^2S$ (2)
2580.14	B	8R	0.00	4.78	0½–0½	
2918.32	A	10R	0.96	5.19	1½–2½	$6p\ ^2P^\circ - 7d\ ^2D$ (3)
2379.58	A	8R	0.00	5.19	0½–1½	
2921.52	A	6R	0.96	5.19	1½–1½	
2826.16	A	8R	0.96	5.33	1½–1½	$6p\ ^2P^\circ - 9s\ ^2S$ (4)
2315.90	B	6R	0.00	5.33	0½–0½	
2709.23	A	8R	0.96	5.52	1½–2½	$6p\ ^2P^\circ - 8d\ ^2D$ (5)
2237.82	B	6R	0.00	5.51	0½–1½	
2710.67	A	4R	0.96	5.51	1½–1½	

Tl I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2006.58	B	(100R)	0.00	6.15	0½–1½	$6p\ ^2P^\circ - 6p^2\ ^4P$† (6)
2210.71	B	(100R)	0.00	5.58	0½–0½	
2665.57	A	2n	0.96	5.59	1½–0½	$6p\ ^2P^\circ - 10s\ ^2S$ (7)
2206.97	B	4R	0.00	5.59	0½–0½	
2608.99	A	6R	0.96	5.69	1½–2½	$6p\ ^2P^\circ - 9d\ ^2D$ (8)
2168.59	B	4R	0.00	5.69	0½–1½	
2609.77	A	4R	0.96	5.69	1½–1½	
2585.59	A	4R	0.96	5.74	1½–0½	$6p\ ^2P^\circ - 11s\ ^2S$ (9)
2151.92	B	1R	0.00	5.74	0½–0½	
2552.53	A	6R	0.96	5.80	1½–2½	$6p\ ^2P^\circ - 10d\ ^2D$ (10)
2129.28	B	1R	0.00	5.80	0½–1½	
2552.98	A	2R	0.96	5.80	1½–1½	

Tl II

I P 20.34 Anal A List B December 1954

REFERENCE

A C. B. Ellis and R. A. Sawyer, Phys. Rev. **49,** 145 (1936). W L, I, T, I P

Tl II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1908.64‡	A	25R	0.00	6.47	0–1	$6s^2\ ^1S - 6p\ ^3P^\circ$ (1)
1321.71	A	25R	0.00	9.34	0–1	$6s^2\ ^1S - 6p\ ^1P^\circ$ (2)
836.34	A	5R	0.00	14.76	0–1	$6s^2\ ^1S - 7p\ ^3P^\circ$ (3)
817.18	A	10R	0.00	15.11	0–1	$6s^2\ ^1S - 7p\ ^1P^\circ$ (4)
709.23	A	5R	0.00	17.41	0–1	$6s^2\ ^1S - 8p\ ^1P^\circ$ (5)
696.30	A	15R	0.00	17.73	0–1	$6s^2\ ^1S - 11^\circ$ (6)
670.87	A	5R	0.00	18.40	0–1	$6s^2\ ^1S - 9p\ ^1P^\circ$ (7)
Air						
2298.04	A	30	7.62	12.99	2–1	$6p\ ^3P^\circ - 7s\ ^3S$ (8)
Vac						
1892.72	A	8	6.47	12.99	1–1	
1792.76	A	10R	6.10	12.99	0–1	
1871.39	A	4	7.62	14.22	2–2	$6p\ ^3P^\circ - 6d\ ^1D$ (9)
1593.26	A	7R	6.47	14.22	1–2	
1814.85	A	12R	7.62	14.42	2–3	$6p\ ^3P^\circ - 6d\ ^3D$† (10)
1561.58	A	15R	6.47	14.37	1–2	
1499.30	A	10R	6.10	14.34	0–1	
1827.86	A	5	7.62	14.37	2–2	
1568.57	A	10R	6.47	14.34	1–1	

Tl II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1490.50	A	5r	7.62	15.90	2–2	$6p\ ^3P^\circ - 6p^2\ ^3P$† (11)
1308.50	A	4R	6.47	15.90	1–2	
1391.88	A	4R	7.62	16.49	2–1	$6p\ ^3P^\circ - 8s\ ^3S$ (12)
1231.81	A	8	6.47	16.49	1–1	
1188.83	A	3r	6.10	16.49	0–1	
1330.40	A	8R	7.62	16.90	2–2	$6p\ ^3P^\circ - 7d\ ^1D$ (13)
1183.41	A	10R	6.47	16.90	1–2	
1307.50	A	15R	7.62	17.06	2–3	$6p\ ^3P^\circ - 7d\ ^3D$† (14)
1167.43	A	10R	6.47	17.04	1–2	
1130.17	A	10R	6.10	17.03	0–1	
1310.20	A	8R	7.62	17.04	2–2	
1169.17	A	5R	6.47	17.03	1–1	
1246.00	A	5R	7.62	17.53	2–2	$6p\ ^3P^\circ - 6p^2\ ^1D$ (15)
1194.84	A	12R	7.62	17.95	2–1	$6p\ ^3P^\circ - 9s\ ^3S$† (16)
1074.97	A	5R	6.47	17.95	1–1	
1162.55	A	15R	7.62	18.24	2–3	$6p\ ^3P^\circ - 8d\ ^3D$† (17)
1049.73	A	10R	6.47	18.23	1–2	
1018.85	A	8R	6.10	18.22	0–1	
1163.80	A	4R	7.62	18.23	2–2	
1050.30	A	8R	6.47	18.22	1–1	
Air						
2530.86	A	20	9.34	14.22	1–2	$6p\ ^1P^\circ - 6d\ ^1D$ (18)
2451.83	A	8	9.34	14.37	1–2	$6p\ ^1P^\circ - 6d\ ^3D$ (19)
2469.03	A	6	9.34	14.34	1–1	
Vac						
1507.82	A	10R	9.34	17.53	1–2	$6p\ ^1P^\circ - 6p^2\ ^1D$ (20)
1373.52	A	10R	9.34	18.33	1–1	$6p\ ^1P^\circ - 8d\ ^1D$ (21)

LEAD, $Z = 82$

Pb I

I P 7.385 Anal A List C June 1955

REFERENCES

A W. F. Meggers, unpublished material (June 1955). W L, I, T, I P
C. E. Moore, *Atomic Energy Levels*, Circ. Nat. Bur. Std. **467**, Vol. III, 208 (1958). T, I P

Pb I **Pb I**

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air							Air						
2833.060	A	50000R	0.00	4.36	0−1	$6p^2\ ^3P - 7s\ ^3P^\circ$ (1)	2399.597	A	200h	1.31	6.46	2−2	$6p^2\ ^3P - 7d\ ^3D^\circ$ (8)
							2237.443	A	1000r	0.97	6.48	1−1	
							2388.802	A	200	1.31	6.48	2−1	
2801.991	A	50000R	1.31	5.72	2−3	$6p^2\ ^3P - 6d\ ^3F^\circ$ (2)	*2246.884	A	3000R	0.97	6.46	1−2	
2657.094	A	100	0.97	5.61	1−2		Vac						
2873.318	A	20000R	1.31	5.61	2−2		1904.76	A	200R	0.00	6.48	0−1	
2088.41	A	500h	1.31	7.22	2−3	$6p^2\ ^3P - 6d\ ^3D^\circ$ (3)	Air						
2823.196	A	5000R	1.31	5.69	2−2		2332.445	A	1000h	1.31	6.61	2−1	$6p^2\ ^3P - 9s\ ^3P^\circ$† (9)
2613.652	A	1000r	0.97	5.69	1−1		2189.62	A	500rs?	0.97	6.60	1−0	
2614.176	A	10000R	0.97	5.69	1−2								
2169.994	A	2000R	0.00	5.69	0−1		*2246.884	A	3000R	1.31	6.81	2−3	$6p^2\ ^3P - 8d\ ^3F^\circ$† (10)
							2253.947	A	200H	1.31	6.79	2−2	
2663.160	A	5000R	1.31	5.95	2−2	$6p^2\ ^3P - 7s\ ^3P^\circ$ (4)	2111.77	A	200h	0.97	6.81	1−1	$6p^2\ ^3P - 8d\ ^3D^\circ$† (11)
2476.379	A	1500r	0.97	5.95	1−2		2115.04	A	1000r	0.97	6.80	1−2	
2577.269	A	2000r	1.31	6.10	2−1	$6p^2\ ^3P - 7s\ ^1P^\circ$† (5)	Vac						
2401.949	A	500r	0.97	6.10	1−1		1812.93	A	200Rs	0.00	6.81	0−1	
2628.28	A	300	1.31	6.01	2−1	$6p^2\ ^3P - 8s\ ^3P^\circ$ (6)	Air						
2443.840	A	600r	0.97	6.02	1−0		2175.60	A	1000rs	1.31	6.99	2−3	$6p^2\ ^3P - 9d\ ^3F^\circ$† (12)
2446.188	A	1000r	0.97	6.01	1−1								
2053.27	A	100R	0.00	6.01	0−1								
2393.792	A	5000R	1.31	6.47	2−3	$6p^2\ ^3P - 7d\ ^3F^\circ$ (7)	2697.514	A	500hs?	2.65	7.22	2−3	$6p^2\ ^1D - 6d\ ^3D^\circ$ (13)
2411.733	A	500h	1.31	6.43	2−2								

Pb II

I P 14.967 Anal A List C January 1955

REFERENCE

A L. T. Earls and R. A. Sawyer, Phys. Rev. **47**, 115 (1935). W L, I, T, I P

Pb II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1671.53	A	10	1.74	9.12	1½–2½	$6p\ ^2P^\circ - 6p^2\ ^4P$ (1)
1512.42	A	10	0.00	8.16	0½–1½	
1921.66	A	7	1.74	8.16	1½–1½	
1726.75‡	A	20	0.00	7.15	0½–0½	
Air						
2203.5	A	2	1.74	7.34	1½–0½	$6p\ ^2P^\circ - 7s\ ^2S$ (2)
Vac						
1682.15	A	10	0.00	7.34	0½–0½	
1822.03	A	10	1.74	8.51	1½–2½	$6p\ ^2P^\circ - 6d\ ^2D$ (3)
1433.96	A	10	0.00	8.61	0½–1½	
1796.68	A	10	1.74	8.61	1½–1½	
1335.20	A	10	1.74	10.98	1½–2½	$6p\ ^2P^\circ - 6p^2\ ^2D$† (4)
1203.63	A	10	0.00	10.26	0½–1½	
1103.94	A	10	1.74	12.92	1½–1½	$6p\ ^2P^\circ - 6p^2\ ^2P$ (5)
1133.14	A	10	0.00	10.89	0½–0½	
1348.37	A	10	1.74	10.89	1½–0½	
1331.65	A	10Hg?	1.74	11.01	1½–0½	$6p\ ^2P^\circ - 8s\ ^2S$ (6)
1121.36	A	10	0.00	11.01	0½–0½	
1231.20	A	10	1.74	11.77	1½–2½	$6p\ ^2P^\circ - 7d\ ^2D$ (7)
1060.66	A	10	0.00	11.64	0½–1½	
1145.91	A	4	1.74	12.51	1½–0½	$6p\ ^2P^\circ - 9s\ ^2S$ (8)
986.71	A	10	0.00	12.51	0½–0½	

Pb II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1109.84	A	10	1.74	12.86	1½–2½	$6p\ ^2P^\circ - 8d\ ^2D$ (9)
967.23	A	10	0.00	12.76	0½–1½	
1119.57	A	10	1.74	12.76	1½–1½	
1108.43	A	10	1.74	12.88	1½–0½	$6p\ ^2P^\circ - 6p^2\ ^2S$ (10)
958.76	A	2	0.00	12.88	0½–0½	
1065.58	A	9	1.74	13.32	1½–0½	$6p\ ^2P^\circ - 10s\ ^2S$ (11)
926.44	A	5	0.00	13.32	0½–0½	
1049.82	A	10	1.74	13.50	1½–2½	$6p\ ^2P^\circ - 9d\ ^2D$ (12)
1050.77	A	10	1.74	13.49	1½–1½	
1016.61	A	10	1.74	13.88	1½–	$6p\ ^2P^\circ - 10d\ ^2D$ (13)
889.68	A	8	0.00	13.88	0½–1½	
995.89	A	10	1.74	14.14	1½–	$6p\ ^2P^\circ - 11d\ ^2D$ (14)
873.71	A	6	0.00	14.13	0½–1½	
Air						
2948.5	A	10	8.51	12.70	2½–3½	$6d\ ^2D - 6f\ ^2F^\circ$† (15)
3016.4	A	10	8.61	12.70	1½–2½	
2526.7	A	8	8.51	13.40	2½–3½	$6d\ ^2D - 7f\ ^2F^\circ$ (16)
2576.6	A	8	8.61	13.40	1½–2½	

Pb III

I P 31.80 Anal B List C November 1954

REFERENCES

A G. Arvidsson, Ann. der Phys. [5] **12**, 793 (1932). W L, (I)

B J. A. Carroll, Phil. Trans. Roy. Soc. London [A] 225, 419 (1925). W L, I

R. J. Lang, see Stanley Smith, Proc. Nat. Acad. Sci. **14**, 878 (1928). W L, I

A. S. Rao and A. L. Narayan, Zeit. Phys. **59**, 687 (1930). W L, **I, T**

J. N. P. Hume and M. F. Crawford, Phys. Rev. 84, 486 (1951) and unpublished material (1951). I P, T

Pb III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1553.1	B	20	0.00	7.95	0–1	$6s^2\ ^1S - 6p\ ^3P^\circ$ (1)
1048.89	A	(30)	0.00	7.95	0–1	$6s^2\ ^1S - 6p\ ^1P^\circ$ (2)
1165.03	A	15	9.75	20.35	2–2	$6p\ ^3P^\circ - 6p^2\ ^3P$ (3)
1098.41	A	10	7.95	19.19	1–1	
1308.10	A	15	9.75	19.19	2–1	
1279.41	A	15	7.95	17.60	1–0	
995.74	A	10	7.95	20.35	1–2	
1052.25	A	7	7.46	19.19	0–1	

Pb III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1406.48	A	12	9.75	18.53	2–1	$6p\ ^3P^\circ - 7s\ ^3S$ (4)
1166.96	A	15	7.95	18.53	1–1	
1114.99	A	9	7.46	18.53	0–1	
1250.45	A	20	9.75	19.62	2–3	$6p\ ^3P^\circ - 6d\ ^3D$ (5)
1069.12	A	20	7.95	19.50	1–2	
1030.44	A	15	7.46	19.44	0–1	
1266.78	A	15	9.75	19.50	2–2	
1074.66	A	15	7.95	19.44	1–1	
1274.53	A	10	9.75	19.44	2–1	

BISMUTH, $Z = 83$

Bi I

I P 7.258 Anal B List D July 1955

REFERENCES

A R. V. Zumstein, Phys. Rev. **27**, 562 (1926). W L, (I)
B H. E. Clearman, J. Opt. Soc. Am. **42**, 376 (1952). W L, I, T, I P

Bi I **Bi I**

I A	Ref	Int	E P Low	E P High	J	Multiplet No.	I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air							Air						
2061.73	A	(9)	0.00	5.99	$1\frac{1}{2}-2\frac{1}{2}$	$6p^3\ {}^4S^\circ - 7s\ {}^4P$ (1)	3024.62	B	20R	1.91	5.99	$2\frac{1}{2}-2\frac{1}{2}$	$6p^3\ {}^2D^\circ - 7s\ {}^4P\dagger$ (5)
2228.240	A	(9)	0.00	5.54	$1\frac{1}{2}-1\frac{1}{2}$		2989.03	B	40R	1.14	5.54	$1\frac{1}{2}-1\frac{1}{2}$	
3067.732‡	A	(10)	0.00	4.02	$1\frac{1}{2}-0\frac{1}{2}$		2696.75	B	2	1.14	5.99	$1\frac{1}{2}-2\frac{1}{2}$	
2230.626	A	(10)	0.00	5.53	$1\frac{1}{2}-2\frac{1}{2}$	$6p^3\ {}^4S^\circ - 6d\ {}^2D$ (2)	2993.33	B	30R	1.14	5.53	$1\frac{1}{2}-2\frac{1}{2}$	$6p^3\ {}^2D^\circ - 6d\ {}^2D\dagger$ (6)
2276.578	A	(5)	0.00	5.42	$1\frac{1}{2}-1\frac{1}{2}$								
2020.99	A	(2)	0.00	6.11	$1\frac{1}{2}-1\frac{1}{2}$	$6p^3\ {}^4S^\circ - 7s\ {}^2P?$ (3)	2938.24	B	50R	1.91	6.11	$2\frac{1}{2}-1\frac{1}{2}$	$6p^3\ {}^2D^\circ - 7s\ {}^2P?$ (7)
2177.33	A	(2)	0.00	5.67	$1\frac{1}{2}-0\frac{1}{2}$		2897.98	B	50R	1.14	5.67	$1\frac{1}{2}-0\frac{1}{2}$	
							2627.91	B	30R	1.14	6.11	$1\frac{1}{2}-1\frac{1}{2}$	
2110.263	A	(6)	0.00	5.85	$1\frac{1}{2}-0\frac{1}{2}$	$6p^3\ {}^4S^\circ - 8s\ {}^4P\dagger$ (4)							

Bi II

I P 16.62 Anal C List C February 1955

REFERENCES

A G. Arvidsson, Ann. der Phys. [5] **12**, 787 (1932). W L, (I)
B M. F. Crawford, Proc. Roy. Soc. [A] **143**, 548 (1934). W L, I, T, I P
C R. V. Zumstein, Phys. Rev. **38**, 2214 (1931). W L
* and §=Blend of Bi II and Bi III

Bi II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1436.83	A	(20)	0.00	8.59	0−1	1 − 2°
1241.05	A	(10)	0.00	9.95	0−1	(1) − 6°
1791.82	C	70	1.64	8.53	1−0	2 − 1°
1777.01	C	80	1.64	8.59	1−1	(2) − 2°
1591.79	B	60B	1.64	9.40	1−2	− 4°
1520.57	B	40	1.64	9.76	1−2	− 5°
1486.93	A	35	1.64	9.95	1−1	− 6°
1455.11	A	50	1.64	10.13	1−2	− 7°
1325.46	A	20	1.64	10.96	1−2	− 9°
1902.33‡	C	100b	2.10	8.59	2−1	3 − 2°
*1691.5 §	B	20b	2.10	9.40	2−2	(3) − 4°
1611.38	B	40	2.10	9.76	2−2	− 5°
1573.70	B	40	2.10	9.95	2−1	− 6°
1538.06	B	35	2.10	10.13	2−2	− 7°
1533.17	B	40	2.10	10.15	2−3	− 8°
1393.92	A	20	2.10	10.96	2−2	− 9°
1372.61	A	25	2.10	11.10	2−1	−10°
1085.47	A	20	2.10	13.48	2−2	−24°

Bi II

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air						
2803.4	B	15	4.19	8.59	2−1	4 − 2°
2368.1	B	16	4.19	9.40	2−2	(4) − 4°
2214.0	B	40b	4.19	9.76	2−2	− 5°
*2068.9§	B	45b	4.19	10.15	2−3	− 8°
Vac						
1823.71	C	70	4.19	10.96	2−2	− 9°
1787.39	C	60	4.19	11.10	2−1	−10°
1652.81	B	20	4.19	11.66	2−1	−11°
1609.70	B	40	4.19	11.86	2−3	−13°
1536.77	B	30	4.19	12.22	2−2	−14°
1502.50	B	20	4.19	12.41	2−1	−15°
1462.14	A	25	4.19	12.63	2−2	−18°
1447.94	A	25	4.19	12.72	2−3	−19°
1350.07	B	20	4.19	13.33	2−3	−22°
1329.47	A	20	4.19	13.48	2−2	−24°
Air						
2186.9	B	60	5.45	11.10	0−1	5 −10° (5)
Vac						
1989.35	B	25	5.45	11.66	0−1	−11°
1749.29	B	20	5.45	12.51	0−1	−16°
1601.58	B	25	5.45	13.16	0−1	−21°
1563.67	B	20	5.45	13.35	0−1	−23°
Air						
2544.5	B	20B	8.59	13.44	1−2	2°−22 (6)
2713.3	B	20	9.76	14.31	2−3	5°−23 (7)
2950.4	B	20	10.13	14.31	2−3	7°−23 (8)

Bi III

I P 25.45 Anal C List C January 1955

REFERENCES

A M. F. Crawford and A. B. McLay, Proc. Roy. Soc. [A] 143, 540 (1934). W L, I, T, I P

B G. Arvidsson, Ann. der Phys. [5] 12, 802 (1932). W L, (I)

Bi III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1461.00	B	60b	2.57	11.02	1½−2½	$6p\ ^2P^\circ - 6p^2\ ^4P$†
1606.40	A	60b	2.57	10.25	1½−1½	(1)
1423.516	B	35	0.00	8.67	0½−0½	
1423.333	B	35				
Air						
2021.15	A	20	2.57	8.67	1½−0½	
2020.75	A	20				
Vac						
1346.12	B	60	2.57	11.74	1½−0½	$6p\ ^2P^\circ - 7s\ ^2S$
1051.810	B	30	0.00	11.74	0½−0½	(2)
1224.64	B	50	2.57	12.65	1½−2½	$6p\ ^2P^\circ - 6d\ ^2D$
1039.99	B	25	0.00	11.87	0½−1½	(3)
1326.84	B	40	2.57	11.87	1½−1½	

Bi III

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Vac						
1045.76	B	50b	2.57	14.37	1½−2½	$6p\ ^2P^\circ - 6p^2\ ^2D$
920.93	B	(7)	0.00	13.40	0½−1½	(4)
1139.015	B	20	2.57	13.40	1½−1½	
Air						
2855.6	A	80B	12.65	16.97	2½−3½	$6d\ ^2D - 5f\ ^2F^\circ$
2414.6	A	75b	11.87	16.98	1½−2½	(5)
2847.4	A	30B	12.65	16.98	2½−2½	
2213.55	A	30	15.08	20.65	1½−0½	$7p\ ^2P^\circ - 9s\ ^2S$
Vac						(6)
1988.26	A	10	14.44	20.65	0½−0½	

POLONIUM, $Z = 84$

Po I

I P 8.39 Anal C List C September 1956

REFERENCES

A G. W. Charles, D. J. Hunt, G. Pish, and D. L. Timma, J. Opt. Soc. Am. **45**, 869 (1955). W L, I, T, I P
S. Mrozowski, J. Opt. Soc. Am. **46**, 663 (1956). T

Po I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air 2558.01	A	1500w	0.00	4.82	2−2	$6p^4\ ^3P - 7s\ ^5S°$† (1)
2450.11‡	A	1500w	0.00	5.04	2−1	$6p^4\ ^3P - 7s\ ^3S°$†
3003.21	A	2500w	0.93	5.04	0−1	(2)
2800.24	A	400	2.08	6.49	1−1	$6p^4\ ^3P$ − 3°
2761.91	A	600	2.08	6.55	1−2	(3) − 4°
2587.63	A	400	2.08	6.85	1−2	− 6°
2483.97	A	700	2.08	7.05	1−1	− 9°
2557.33	A	300	2.08	6.90	1−2	$6p^4\ ^3P - 8s\ ^5S°$? (4)

Po I

I A	Ref	Int	E P Low	E P High	J	Multiplet No.
Air 2534.95	A	300	2.08	7.19	1−1	$6p^4\ ^3P - 8s\ ^3S°$?
2050.48	A	100	0.93	7.19	0−1	(5)
2958.90	A	600	2.68	6.85	2−2	$6p^4\ ^1D$ − 6°
2490.56	A	700	2.68	7.63	2−	(6) −13°
2919.31	A	400	2.68	6.90	2−2	$6p^4\ ^1D - 8s\ ^5S°$? (7)

Strongest Unclassified Lines of Po I

Air 2663.33	A	700h				
2562.31	A	400				

RADON, $Z = 86$

Rn I

I P 10.702 Anal A List A February 1955

REFERENCES

A E. Rasmussen, Zeit. Phys. **62**, 507 (1930); **80**, 726 (1933). W L, T, I P
B. Edlén, Ark. Mat. Astr. Fys. (Stockholm) **29A**, No. 21 (1943). T

Rn I

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Vac 1786.07‡	A	–	0.00	6.91	0–1	$6p^6\ {}^1S - 7s\ [1\frac{1}{2}]^\circ$
1451.56	A	–	0.00	8.50	0–1	(1) $-6d\ [0\frac{1}{2}]^\circ$

RADIUM, $Z = 88$

Ra I

I P 5.256 Anal A List A March 1955

REFERENCES

A E. Rasmussen, See H. N. Russell, Phys. Rev. **46**, 989 (1934). W L, I, T, I P
E. Rasmussen, Zeit. Phys. **87**, 607 (1934). T, I P

Ra I

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Air 2955.65	A	–	0.00	4.18	0–1	$7s^2\ {}^1S - 7p'\ {}^3P^\circ$ (1)

Ra II

I P 10.103 Anal A List B March 1955

REFERENCE

A E. Rasmussen, Zeit. Phys. **86**, 24 (1933). W L, I, T, I P

Ra II

I A	Ref	Int	E P		J	Multiplet No.
			Low	High		
Vac 1908.7	A	8	0.00	6.47	0½–1½	$7s\ {}^2S - 8p\ {}^2P^\circ$ (1)
1976.0	A	2	0.00	6.25	0½–0½	
Air 2813.76	A	30	1.70	6.08	2½–3½	$6d\ {}^2D - 5f\ {}^2F^\circ$ (2)
2708.96	A	20	1.49	6.05	1½–2½	
2836.46	A	6	1.70	6.05	2½–2½	
2586.61	A	8	1.70	6.47	2½–1½	$6d\ {}^2D - 8p\ {}^2P^\circ$ (3)
2595.15	A	2	1.49	6.25	1½–0½	
2480.11	A	4	1.49	6.47	1½–1½	
2169.9	A	10	1.70	7.38	2½–3½	$6d\ {}^2D - 6f\ {}^2F^\circ$ (4)
2107.6	A	4	1.49	7.35	1½–2½	
Vac 1888.7	A	5	1.70	8.23	2½–3½	$6d\ {}^2D - 7f\ {}^2F^\circ$ (5)
Air 3033.44	A	10	3.24	7.30	1½–0½	$7p\ {}^2P^\circ - 9s\ {}^2S$ (6)
2643.73	A	10	2.64	7.30	0½–0½	
2795.21	A	10	3.24	7.65	1½–2½	$7p\ {}^2P^\circ - 8d\ {}^2D$ (7)
2475.50	A	10	2.64	7.62	0½–1½	
2460.55	A	8	3.24	8.25	1½–0½	$7p\ {}^2P^\circ - 10s\ {}^2S$ (8)
2197.8	A	2	2.64	8.25	0½–0½	
2369.73	A	8	3.24	8.44	1½–2½	$7p\ {}^2P^\circ - 9d\ {}^2D\dagger$ (9)
2131.0	A	5	2.64	8.43	0½–1½	
2177.3	A	4	3.24	8.90	1½–2½	$7p\ {}^2P^\circ - 10d\ {}^2D\dagger$ (10)
Vac 1972.6	A	4	2.64	8.89	0½–1½	

☆ U. S. GOVERNMENT PRINTING OFFICE: 1962—618914

Selected Publications of the National Bureau of Standards

Atomic Energy Levels, C. E. Moore:

Circular 467, Volume I. H to V (Z=1 to 23) 206 spectra. 309 p. (1949)	$5. 50
Circular 467, Volume II. Cr to Nb (Z=24 to 41) 152 spectra. 227 p. (1952)	$4. 00
Circular 467, Volume III. {Mo to La (Z=42 to 57) / Hf to Ac (Z=72 to 89)} 124 spectra. 245 p. (1958)	$2. 50

An Ultraviolet Multiplet Table, C. E. Moore:

Circular 488, Section 1. H to V (Z=1 to 23); Selected Multiplets of 79 Spectra. 78 p. (1950).	$0. 55
Circular 488, Section 2. Cr to Nb (Z=24 to 41); Selected Multiplets of 46 Spectra. 115 p. (1952).	$0. 70
Circular 488, Section 3. {Mo to La (Z=42 to 57) / Hf to Ra (Z=72 to 88)} Selected Multiplets of 78 Spectra. 94 p. (1961).	$0. 60
Circular 488, Section 4. H to Nb (Z=1 to 41); Finding List for Sections 1 and 2 of the Table. 65 p. (1961).	$0. 45
Circular 488, Section 5. {Mo to La (Z=42 to 57) / Hf to Ra (Z=72 to 88)} Finding List for Section 3 of the Table. 30 p. (1961).	$0. 30

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

Monograph 3, Volume I. 2000 A to 7000 A. 508 p. (1960)	$6. 00
Monograph 3, Volume II. 7000 A to 1000 μ. 542 p. (1960)	$6. 00

New Description of Thorium Spectra, Romuald Zalubas:

Monograph 17, 106 p. (1960)	$0. 65

Tables of Spectral-Line Intensities, W. F. Meggers, C. H. Corliss, and B. F. Scribner:

Monograph 32, Part I. Arranged by Elements. 474 p. (1961)	$4. 00
Monograph 32, Part II. Arranged by Wavelengths. 272 p. (1961)	$3. 00

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

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

Technical Note 36 (PB151395), Part I Table of Multiplets, and Part II Finding List, λλ2951Å–13164Å. 242 p. (1959).	$4. 00

The above Technical Note may he purchased by tbe PB number from the Department of Commerce, Office of Technical Services, Wasbington 25, D.C.