If the molecule is in the normal state when it absorbs the incident light, then the transition will be strongest to the excited state for which the end-point of the vibrational motion (i.e., all the vibrational energy potential) puts the molecule in the configuration most nearly that of the normal state. The intensities in Fig. 1 and the proposed arrangement in Table V show there is no single band that may be definitely taken to be the most probable transition from (0, 0, 0)″. The probabilities of transition of $(v_1''-v_1')$ and $(v_2''-v_2')$ (to the extent that these may be considered unmixed ν_1 and ν_2 in the two electronic states) in combination cause a number of bands to appear with about the same intensity. If the intensity explanation of the disturbance at peak *O* is accepted, a parabola of maximum intensities can be drawn in Table V. Selecting a central value on this parabola, the excited molecule vibrating with $v_1'=1$, $v_2'=3$, $v_3'=0$ may be taken as having vibrational energy potential sufficient to put the molecule in the configuration of the vibrationless normal state. The energy difference $(1, 3, 0)'-(0, 0, 0)'$ is 2050 cm^{-1} (0.25 volt). Since the S−O distance and the OSO angle both undoubtedly change from their values in the normal electronic state, it is not possible from this data to determine the shape and dimensions of the molecule in the excited state.

Jonescu[22] from a partial rotational analysis reports the OSO angle in the excited state as 96°. With the frequencies 225 cm^{-1} and 1370 cm^{-1} recognized in the spectrum, Eq. (4) of Bailey and Cassie[23] was used to suggest a possible ν_3' frequency. The solutions are in the neighborhood of 1400 and 250 cm^{-1}; the former involving the less change from the unsymmetrical frequency in the normal state appears the more likely. If then the unsymmetrical frequencies in the two states are so nearly equal it is not surprising (see discussion earlier) that these were not identified in the spectrum.

The writer wishes to thank Professor R. S. Mulliken for the suggestion of the problem and for much help and encouragement throughout the investigation.

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[23] C. R. Bailey and A. B. D. Cassie, Proc. Roy. Soc. London **A137**, 630 (1932).

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The Spectra of Lead IV and Bismuth V

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Early investigations in the spectra of Pb IV by Rao and Narayan, Smith and Kishen have been extended to include 34 terms arising from the configurations $5d^{10}ns$, $5d^{10}np$, $5d^{10}nd$, $5d^{10}5f$, $5d^96s^2$, $5d^96s6p$ and $5d^96s6d$. With data by Arvidsson, Smith and the author, the region reported extends from 198 to 5005A and 79 lines have been classified. In the extension to Bi V, values have been assigned to 14 terms involving 18 lines in the region below 1487A. By a Hick's formula the value of the $5d^{10}6s\ {}^2S_{0\frac{1}{2}}$ term has been computed to be 340,885 cm^{-1} for Pb IV and 451,700 cm^{-1} for Bi V, giving ionization potentials of 42.0 and 55.7 volts, respectively.

PREVIOUS investigations of Pb IV by Rao and Narayan,[1] and Smith[2] established terms arising from the configurations $5d^{10}6s$, $5d^{10}6p$, $5d^{10}7s$, $5d^{10}7p$, $5d^{10}6s$, and $5d^{10}7d$ with optional assignments for the last four configurations, these assignments being commented upon by Kishen[3] in a brief note to *Nature*. Arvidsson[4] measured the spectrum below 1440A due to transitions in the various states of ionization of Pb and accordingly classified the lines as to their states of ionization. Using these data and the measurements by Smith[5] for the region 2200 to 5005A and measurements by the author for the inter-

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[3] Kishen, Nature **130**, 739 (1932).
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[5] Smith, Trans. Roy. Soc. Canada **22**, 331 (1928).

TABLE I. *Term values Pb IV.*

Configuration	Symbol	J	Term value	No. of Comb.
$5d^{10}6s$	^2S	$0\frac12$	340,885	7
$5d^{10}6p$	$^2P^\circ$	$0\frac12$	264,730	6
	$^2P^\circ$	$1\frac12$	243,668	8
$5d^96s^2$	^2D	$2\frac12$	253,135	4
	^2D	$1\frac12$	229,866	3
—	1	$2\frac12$	250,208	7
	2	$2\frac12$	243,533	6
	3	$2\frac12$	239,635	3
	4	$0\frac12$	189,198	2
$5d^96s6p$	1°	$2\frac12$	185,239	3
	2°	$1\frac12$	183,088	3
	3°	$2\frac12$	179,000	4
	4°	$2\frac12$	173,821	3
	5°	$2\frac12$	173,222	2
$5d^{10}7s$	^2S	$0\frac12$	155,784	8
$5d^{10}6d$	^2D	$1\frac12$	156,328	11
	^2D	$2\frac12$	154,070	7
$5d^96s6d$	5	$1\frac12$	155,739	3
	6	$1\frac12$	155,188	3
$5d^96s6p$	6°	$3\frac12$	155,174	3
	7°	$3\frac12$	152,581	4
	8°	$1\frac12$	140,138	4
	9°	$1\frac12$	131,835	11
	10°	$1\frac12$	130,518	6
	11°	$0\frac12$	129,667	3
	12°	$1\frac12$	117,542	5
$5d^{10}7p$	$^2P^\circ$	$0\frac12$	131,097	5
	$^2P^\circ$	$1\frac12$	123,035	12
$5d^{10}5f$	$^2F^\circ$	$3\frac12$	119,169	3
	$^2F^\circ$	$2\frac12$	114,432	4
$5d^96s6d$	7	$3\frac12$	101,545	4
$5d^{10}8s$	^2S	$0\frac12$	91,251	5
$5d^{10}7d$	^2D	$1\frac12$	90,485	9
	^2D	$2\frac12$	89,467	7

TABLE II. *Classified lines of Pb IV.*

Measurements: 459–1438A Arvidsson[4], 1438–1960 Author, 1960–4497A Smith.[5]

C	I	λ(vac.)	ν(vac.)	Combination
4	6	459.04	217846	$5d^{10}6s\ {}^2S_{0\frac12} - 5d^{10}7p\ {}^2P^\circ_{1\frac12}$
4	1	473.45	211216	$5d^{10}6s\ {}^2S_{0\frac12} - 5d^96s6p\ 11^\circ_{0\frac12}$
4	7	475.36	210367	$5d^{10}6s\ {}^2S_{0\frac12} - 5d^96s6p\ 10^\circ_{1\frac12}$
4	8	478.355	209050	$5d^{10}6s\ {}^2S_{0\frac12} - 5d^96s6p\ 9^\circ_{1\frac12}$
4	2	498.14	200747	$5d^{10}6s\ {}^2S_{0\frac12} - 5d^96s6p\ 8^\circ_{1\frac12}$
4	2	573.90	174246	$5d^{10}6p\ {}^2P^\circ_{0\frac12} - 5d^{10}7d\ {}^2D_{1\frac12}$
4	2	576.43	173482	$5d^{10}6p\ {}^2P^\circ_{0\frac12} - 5d^{10}8s\ {}^2S_{0\frac12}$
4	2	648.50	154202	$5d^{10}6p\ {}^2P^\circ_{1\frac12} - 5d^{10}7d\ {}^2D_{2\frac12}$
6	3	652.81	153184	$5d^{10}6p\ {}^2P^\circ_{1\frac12} - 5d^{10}7d\ {}^2D_{1\frac12}$
4	2	656.09	152418	$5d^{10}6p\ {}^2P^\circ_{1\frac12} - 5d^{10}8s\ {}^2S_{0\frac12}$
	0	829.89	120498	$2_{2\frac12} - 5d^{10}7p\ {}^2P^\circ_{1\frac12}$
4	7	830.11	120466	$3_{2\frac12} - 5d^{10}5f\ {}^2F^\circ_{3\frac12}$
4	2	844.79	118373	$1_{2\frac12} - 5d^96s6p\ 9^\circ_{1\frac12}$
5	7	857.65	116598	$3_{2\frac12} - 5d^{10}7p\ {}^2P^\circ_{1\frac12}$
	0	866.31	115432	$5d^96s^2\ {}^2D_{1\frac12} - 5d^{10}5f\ {}^2F^\circ_{2\frac12}$
4	6	884.98	112997	$5d^96s^2\ {}^2D_{2\frac12} - 5d^96s6p\ 8^\circ_{1\frac12}$
4	6	908.51	110070	$1_{2\frac12} - 5d^96s6p\ 8^\circ_{1\frac12}$
4	7	917.89	108946	$5d^{10}6p\ {}^2P^\circ_{0\frac12} - 5d^{10}7s\ {}^2S_{0\frac12}$
4	10	922.49	108402	$5d^{10}6p\ {}^2P^\circ_{0\frac12} - 5d^{10}6d\ {}^2D_{1\frac12}$
4	7	927.62	107803	$3_{2\frac12} - 5d^96s6p\ 9^\circ_{1\frac12}$
	0	936.05	106832	$5d^96s^2\ {}^2D_{1\frac12} - 5d^{10}7p\ {}^2P^\circ_{1\frac12}$
4	0	967.15	103397	$2_{2\frac12} - 5d^96s6p\ 8^\circ_{1\frac12}$
	0	994.53	100550	$5d^96s^2\ {}^2D_{2\frac12} - 5d^96s6p\ 7^\circ_{3\frac12}$
4	3	1012.47	98768.4	$5d^96s^2\ {}^2D_{1\frac12} - 5d^{10}7p\ {}^2P^\circ_{0\frac12}$
5	3	1024.33	97624.8	$1_{2\frac12} - 5d^96s6p\ 7^\circ_{3\frac12}$
4	30	1028.61	97218.6	$5d^{10}6s\ {}^2S_{0\frac12} - 5d^{10}6p\ {}^2P^\circ_{1\frac12}$
4	3	1044.14	95772.6	$5d^96s6p\ 1^\circ_{2\frac12} - 5d^{10}7d\ {}^2D_{2\frac12}$
4	4	1052.25	95034.4	$1_{2\frac12} - 5d^96s6p\ 6^\circ_{3\frac12}$
4	2	1079.88	92602.9	$5d^96s6p\ 2^\circ_{1\frac12} - 5d^{10}7d\ {}^2D_{1\frac12}$
4	1	1099.46	90953.7	$2_{2\frac12} - 5d^96s6p\ 7^\circ_{3\frac12}$
4	7	1116.08	89599.3	$5d^{10}6p\ {}^2P^\circ_{1\frac12} - 5d^{10}6d\ {}^2D_{2\frac12}$
6	4	1131.76	88358.0	$2_{2\frac12} - 5d^96s6p\ 6^\circ_{3\frac12}$
4	7	1137.86	87884.3	$5d^{10}6p\ {}^2P^\circ_{1\frac12} - 5d^{10}7s\ {}^2S_{0\frac12}$
4	6	1144.95	87340.1	$5d^{10}6p\ {}^2P^\circ_{1\frac12} - 5d^{10}6d\ {}^2D_{1\frac12}$
5	1	1260.82	79313.5	$5d^96s^2\ {}^2D_{2\frac12} - 5d^96s6p\ 4^\circ_{2\frac12}$
4	2	1291.08	77454.5	$5d^96s6p\ 3^\circ_{2\frac12} - 5d^96s6d\ 7_{3\frac12}$
4	1	1298.93	76986.4	$1_{2\frac12} - 5d^96s6p\ 5^\circ_{2\frac12}$
4	0	1309.13	76386.6	$1_{2\frac12} - 5d^96s6p\ 4^\circ_{2\frac12}$
4	40	1313.06	76158.0	$5d^{10}6s\ {}^2S_{0\frac12} - 5d^{10}6p\ {}^2P^\circ_{0\frac12}$
4	1	1323.92	75533.3	$5d^{10}6p\ {}^2P^\circ_{0\frac12} - 4_{0\frac12}$
4	6	1348.87	74136.1	$5d^96s^2\ {}^2D_{2\frac12} - 5d^96s6p\ 3^\circ_{2\frac12}$
4	1	1395.14	71677.4	$5d^96s6p\ 5^\circ_{2\frac12} - 5d^96s6d\ 7_{3\frac12}$
4	1	1404.34	71207.8	$1_{2\frac12} - 5d^96s6p\ 3^\circ_{2\frac12}$
4	0	1437.47	69712.2	$2_{2\frac12} - 5d^96s6p\ 4^\circ_{2\frac12}$
	1	1715.39	58295.8	$2_{2\frac12} - 5d^96s6p\ 1^\circ_{2\frac12}$
	4	1835.88	54469.8	$5d^{10}6p\ {}^2P^\circ_{1\frac12} - 4_{0\frac12}$
	6	1864.47	53634.5	$5d^96s6p\ 6^\circ_{3\frac12} - 5d^96s6d\ 7_{3\frac12}$
	6	1959.42	51035.5	$5d^96s6p\ 7^\circ_{3\frac12} - 5d^95s6d\ 7_{3\frac12}$
		λ(air)		
	0	2359.55	42368.0	$5d^96s6p\ 9^\circ_{1\frac12} - 5d^{10}7d\ {}^2D_{2\frac12}$
	0	2385.81	41901.7	$5d^{10}6d\ {}^2D_{1\frac12} - 5d^{10}5f\ {}^2F^\circ_{2\frac12}$
	00	2417.69	41349.2	$5d^96s6p\ 9^\circ_{1\frac12} - 5d^{10}7d\ {}^2D_{1\frac12}$
	4	2461.51	40613.2	$5d^{10}7p\ {}^2P^\circ_{0\frac12} - 5d^{10}7d\ {}^2D_{1\frac12}$
	0	2463.32	40583.3	$5d^96s6p\ 9^\circ_{1\frac12} - 5d^{10}8s\ {}^2S_{0\frac12}$
	0	2497.17	40033.3	$5d^96s6p\ 10^\circ_{1\frac12} - 5d^{10}7d\ {}^2D_{1\frac12}$
	2	2508.90	39846.1	$5d^{10}7p\ {}^2P^\circ_{0\frac12} - 5d^{10}8s\ {}^2S_{0\frac12}$
	1	2577.30	38788.7	$5d^{10}6d\ {}^2D_{1\frac12} - 5d^96s6p\ 12^\circ_{1\frac12}$
	6	2614.21	38241.1	$5d^{10}7s\ {}^2S_{0\frac12} - 5d^96s6p\ 12^\circ_{1\frac12}$
	00	2736.91	36526.8	$5d^{10}6d\ {}^2D_{2\frac12} - 5d^96s6p\ 12^\circ_{1\frac12}$
	7	2864.26	34902.8	$5d^{10}6d\ {}^2D_{2\frac12} - 5d^{10}5f\ {}^2F^\circ_{3\frac12}$
	4	2978.26	33566.9	$5d^{10}7p\ {}^2P^\circ_{1\frac12} - 5d^{10}7d\ {}^2D_{2\frac12}$
	2	3002.78	33292.8	$5d^{10}6d\ {}^2D_{1\frac12} - 5d^{10}7p\ {}^2P^\circ_{1\frac12}$
	7	3052.66	32748.8	$5d^{10}7s\ {}^2S_{0\frac12} - 5d^{10}7p\ {}^2P^\circ_{1\frac12}$
	00	3056.82	32704.3	$5d^96s6d\ 5_{1\frac12} - 5d^{10}7p\ {}^2P^\circ_{1\frac12}$
	1	3071.41	32548.9	$5d^{10}7p\ {}^2P^\circ_{1\frac12} - 5d^{10}7d\ {}^2D_{1\frac12}$
	1	3109.23	32153.0	$5d^96s6d\ 6_{1\frac12} - 5d^{10}7p\ {}^2P^\circ_{1\frac12}$
	2	3145.60	31781.3	$5d^{10}7p\ {}^2P^\circ_{1\frac12} - 5d^{10}8s\ {}^2S_{0\frac12}$
	00	3207.47	31168.2	$5d^96s6p\ 1^\circ_{2\frac12} - 5d^{10}6d\ {}^2D_{2\frac12}$
	6	3221.30	31034.4	$5d^{10}6d\ {}^2D_{2\frac12} - 5d^{10}7p\ {}^2P^\circ_{1\frac12}$
	2	3365.74	29702.6	$5d^{10}5f\ {}^2F^\circ_{3\frac12} - 5d^{10}7d\ {}^2D_{2\frac12}$
	3	3560.88	28075.0	$5d^96s6p\ 12^\circ_{1\frac12} - 5d^{10}7d\ {}^2D_{2\frac12}$
	8	3655.61	27347.5	$5d^96s6p\ 2^\circ_{1\frac12} - 5d^96s6d\ 5_{1\frac12}$
	00	3694.25	27061.4	$5d^96s6p\ 12^\circ_{1\frac12} - 5d^{10}7d\ {}^2D_{1\frac12}$
	5	3736.00	26759.0	$5d^96s6p\ 2^\circ_{1\frac12} - 5d^{10}6d\ {}^2D_{1\frac12}$
	0	3749.15	26665.2	$5d^{10}6d\ {}^2D_{1\frac12} - 5d^96s6p\ 11^\circ_{0\frac12}$
	5	3827.53	26119.1	$5d^{10}7s\ {}^2S_{0\frac12} - 5d^96s6p\ 11^\circ_{0\frac12}$
	0	3873.36	25810.1	$5d^{10}6d\ {}^2D_{1\frac12} - 5d^96s6p\ 10^\circ_{1\frac12}$
	0	3957.26	25262.9	$5d^{10}7s\ {}^2S_{0\frac12} - 5d^96s6p\ 10^\circ_{1\frac12}$
	6	3962.45	25229.8	$5d^{10}6d\ {}^2D_{1\frac12} - 5d^{10}7p\ {}^2P^\circ_{0\frac12}$
	2	4004.16	24967.0	$5d^{10}5f\ {}^2F^\circ_{2\frac12} - 5d^{10}7d\ {}^2D_{2\frac12}$
	4	4049.79	24685.7	$5d^{10}7s\ {}^2S_{0\frac12} - 5d^{10}7p\ {}^2P^\circ_{0\frac12}$
	0	4052.52	24669.1	$5d^96s6d\ 6_{1\frac12} - 5d^96s6p\ 10^\circ_{1\frac12}$
	0	4081.84	24492.9	$5d^{10}6d\ {}^2D_{1\frac12} - 5d^96s6p\ 9^\circ_{1\frac12}$
	2	4174.46	23948.5	{ $5d^{10}7s\ {}^2S_{0\frac12} - 5d^96s6p\ 9^\circ_{1\frac12}$ $5d^{10}5f\ {}^2F^\circ_{2\frac12} - 5d^{10}7d\ {}^2D_{1\frac12}$
	5	4182.40	23903.0	$5d^96s6d\ 5_{1\frac12} - 5d^96s6p\ 9^\circ_{1\frac12}$
	10	4245.08	23550.1	$5d^{10}6d\ {}^2D_{2\frac12} - 5d^96s6p\ 10^\circ_{1\frac12}$
	00	4281.25	23351.1	$5d^96s6d\ 6_{1\frac12} - 5d^96s6p\ 9^\circ_{1\frac12}$
	00	4410.18	22668.5	$5d^96s6p\ 3^\circ_{2\frac12} - 5d^{10}6d\ {}^2D_{1\frac12}$
	2	4496.21	22234.7	$5d^{10}6d\ {}^2D_{2\frac12} - 5d^96s6p\ 9^\circ_{1\frac12}$

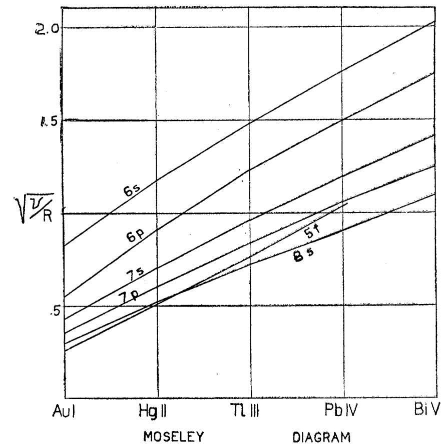

FIG. 1. Moseley diagram.

mediate region, an analysis of the spectrum of Pb IV is reported here from 198 to 5005A and values have been assigned to 34 terms which arise from the configurations $5d^{10}ns$, $5d^{10}np$, $5d^{10}nd$, $5d^{10}5f$, $5d^{9}6s^{2}$, $5d^{9}6s6p$ and $5d^{9}6s6d$. These term values, referred to $5d^{10}\,{}^{1}S_{0}$ of Pb V, are given in Table I. The 79 classified lines for Pb IV appear in Table II, where in the column C is given the classification as to the state of ionization as made by Arvidsson.

Arvidsson[4] classified three pairs of doublets in Bi V, and this report extends the classification to 18 lines, establishing 14 terms due to $5d^{10}ns$, $5d^{10}np$, $5d^{10}nd$, and $5d^{9}6s^{2}$ configurations. These term values, referred to $5d^{10}\,{}^{1}S_{0}$ of Bi VI, are given in Table III. In the present investigation the region was limited to the measurements by Arvidsson from 176 to 1487A. In Table IV are the classified lines, the column C giving Arvidsson's classification as to the state of ionization.

In the Moseley diagram, Fig. 1, curves are given for the principal terms. The absolute values have been determined by applying a Hick's formula to the $5d^{10}6s$, $5d^{10}7s$, and $5d^{10}8s$ terms in each spectrum, obtaining 340,885 cm^{-1} for the $5d^{10}6s\ {}^{2}S_{0\frac{1}{2}}$ term of Pb IV and 451,700 cm^{-1} for the corresponding term of Bi V, giving ionization potentials of 42.0 and 55.7 volts, respectively. The characteristically large hyperfine structure of Bi is noted as 13 cm^{-1} for the ${}^{2}S_{0\frac{1}{2}}$ term.

TABLE III. *Term values Bi V.*

Configuration	Symbol	J	Term value	No. of Comb.
$5d^{10}6s$	${}^{2}S$	$0\frac{1}{2}$	451,700 *h*	4
$5d^{10}6p$	${}^{2}P^{\circ}$	$0\frac{1}{2}$	363,940	6
	${}^{2}P^{\circ}$	$1\frac{1}{2}$	336,019	7
$5d^{9}6s^{2}$	${}^{2}D$	$2\frac{1}{2}$	348,044	1
	${}^{2}D$	$1\frac{1}{2}$	317,928	2
—	1	$1\frac{1}{2}$	228,470	2
$5d^{10}6d$	${}^{2}D$	$1\frac{1}{2}$	222,405	2
	${}^{2}D$	$2\frac{1}{2}$	219,153	1
$5d^{10}7s$	${}^{2}S$	$0\frac{1}{2}$	218,353	2
$5d^{10}7p$	${}^{2}P^{\circ}$	$0\frac{1}{2}$	181,075	2
	${}^{2}P^{\circ}$	$1\frac{1}{2}$	170,619	3
$5d^{10}7d$	${}^{2}D$	$1\frac{1}{2}$	134,387	1
	${}^{2}D$	$2\frac{1}{2}$	133,064	1
$5d^{10}8s$	${}^{2}S$	$0\frac{1}{2}$	131,264	2

h hyperfine separation $\Delta\nu = 13\text{cm}^{-1}$.

TABLE IV. *Classified lines of Bi V.*

Measurements: Arvidsson.[4]

C	I	λ(vac.)	ν(vac.)	Combination
5	1	355.769	281081	$5d^{10}6s\ {}^{2}S_{0\frac{1}{2}} - 5d^{10}7p\ {}^{2}P^{\circ}_{1\frac{1}{2}}$
5	1	369.515	270625	$5d^{10}6s\ {}^{2}S_{0\frac{1}{2}} - 5d^{10}7p\ {}^{2}P^{\circ}_{0\frac{1}{2}}$
4	1	429.78	232677	$5d^{10}6p\ {}^{2}P^{\circ}_{0\frac{1}{2}} - 5d^{10}8s\ {}^{2}S_{0\frac{1}{2}}$
5	1	435.63	229553	$5d^{10}6p\ {}^{2}P^{\circ}_{0\frac{1}{2}} - 5d^{10}7d\ {}^{2}D_{1\frac{1}{2}}$
5	2	488.39	204754	$5d^{10}6p\ {}^{2}P^{\circ}_{1\frac{1}{2}} - 5d^{10}8s\ {}^{2}S_{0\frac{1}{2}}$
5	1	492.72	202955	$5d^{10}6p\ {}^{2}P^{\circ}_{1\frac{1}{2}} - 5d^{10}7d\ {}^{2}D_{2\frac{1}{2}}$
6	3	563.62	177425	$5d^{9}6s^{2}\ {}^{2}D_{2\frac{1}{2}} - 5d^{10}7p\ {}^{2}P^{\circ}_{1\frac{1}{2}}$
5	2	678.87	147304	$5d^{9}6s^{2}\ {}^{2}D_{1\frac{1}{2}} - 5d^{10}7p\ {}^{2}P^{\circ}_{1\frac{1}{2}}$
5	6	686.88	145586	$5d^{10}6p\ {}^{2}P^{\circ}_{0\frac{1}{2}} - 5d^{10}7s\ {}^{2}S_{0\frac{1}{2}}$
6	1	706.54	141535	$5d^{10}6p\ {}^{2}P^{\circ}_{0\frac{1}{2}} - 5d^{10}6d\ {}^{2}D_{1\frac{1}{2}}$
5	5	730.71	136853	$5d^{9}6s^{2}\ {}^{2}D_{1\frac{1}{2}} - 5d^{10}7p\ {}^{2}P^{\circ}_{0\frac{1}{2}}$
5	10	738.17	135470	$5d^{10}6p\ {}^{2}P^{\circ}_{0\frac{1}{2}} - 1_{1\frac{1}{2}}$
5	6	849.86	117666	$5d^{10}6p\ {}^{2}P^{\circ}_{1\frac{1}{2}} - 5d^{10}7s\ {}^{2}S_{0\frac{1}{2}}$
5	5	855.68	116866	$5d^{10}6p\ {}^{2}P^{\circ}_{1\frac{1}{2}} - 5d^{10}6d\ {}^{2}D_{2\frac{1}{2}}$
5	15	864.403	115686.8	$5d^{10}6s\ {}^{2}S_{0\frac{1}{2}} - 5d^{10}6p\ {}^{2}P^{\circ}_{1\frac{1}{2}}$
		0.499	115673.9	
5	6	880.17	113614	$5d^{10}6p\ {}^{2}P^{\circ}_{1\frac{1}{2}} - 5d^{10}6d\ {}^{2}D_{1\frac{1}{2}}$
5	6	929.81	107549	$5d^{10}6p\ {}^{2}P^{\circ}_{1\frac{1}{2}} - 1_{1\frac{1}{2}}$
5	15	1139.370	87767.8	$5d^{10}6s\ {}^{2}S_{0\frac{1}{2}} - 5d^{10}6p\ {}^{2}P^{\circ}_{0\frac{1}{2}}$
		0.548	87754.1	