Journal of Atomic, Molecular, Condensate & Nano Physics
Vol. 5, No. 2, pp. 97–122, 2018
ISSN 2349-2716 (online); 2349-6088 (print)
Published by RGN Publications

http://www.rgnpublications.com

DOI: 10.26713/jamcnp.v5i2.753

First Spectrum of Tungsten

Research Article

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Abstract. The spectroscopic data of tungsten (W) is important for plasma science, as it is used as a diverter and in ITER. We have recorded the spectrum of tungsten on a 1.5-m Wadsworth spectrograph in the 2100–4900 Å wavelength range. The ground configuration of the neutral tungsten is $5d^46s^2$. First excited configurations in the odd parity system are $5d^36s^2(6p + 7p + 5f + 6f) + 5d^46s6p$. The $5d^46s6p$ configuration has already been studied. We have identified hundreds of lines in this spectrum and confirmed fifty nine levels of the $5d^46s6p$ configuration. Relativistic Hartree-Fock (HFR) and least squares fitted (LSF) parametric calculations were carried out to interpret the observed spectrum. We have found good agreement with the previously published data.

Keywords. Tungsten, Wadsworth spectrograph; Cowan's computer code

PACS. 32.30.-r; 34.80.Dp; 31.10.+z

Received: December 24, 2017 **Accepted:** December 26, 2017

1. Introduction

The spectroscopic data of tungsten (W) are important for ITER and fusion plasma as it is used as diverter. In 1942 Mack [1] have been studied WI spectrum first time, yielding 300 levels, of which 201 were given tentative magnetic g values. Configurations, as well as L and S values, have been assigned to the 65 levels of $5d^46s^2$, $5d^56s$, $5d^46s7s$, $5d^46s6p$, with 18 definite ambiguities due to a mixing of eigenfunctions. Shadmi and Caspi [2] in 1968 reported fifty seven level of the $5d^46s^2$, $5d^56s$ configuration. Laun and Corliss [3] in 1968 observed the first spectrum of tungsten (WI) in the region between 2000-10500 Å. Out of the 6800 spectral line that has been reported 5500 have been classified as transitions between 91 even and 365 odd levels. These energy levels belong to the $5d^46s^2$, $5d^56s$, $5d^46s7s$, $5d^46s6p$ configurations. Corliss [4] in 1969

reported ten new even energy level, of which 161 lines were previously unclassified. Kramida and Shirai in 2006 [5] reported the compilation of wavelengths, energy levels, and transition probabilities for Jean-Francois Wyart [6] in 2010 reported two new levels, one belonging to $J = 0$ and another belonging to $J = 3$, with LS percentage compositions. However the assigned configurations were a mixing of $5d^4 6s6p$, $5d^3 6s^2 6p$, $5d^5 6p$.

2. Experimental Details

The spectrograph was equipped with a grating of 1200 lines/mm surface density and giving a linear inverse dispersion of 5.45 Å/mm for the first order wavelength [7]. Pure tungsten metal wire was used to make two electrodes of appropriate sizes in order to fix them in the gap of electrode chamber. The electrodes are moved across the slit until maximum intensity is observed at the center of the slit. Both the electrode were then connected to capacitors of 2.5 μf charged through high voltage power supply up to 1.5 KV to 2 KV. The tungsten atoms are then excited due to a spark discharge between electrodes. After loading the plate, numbers of exposures were taken with different exposure times so as to obtain optimized line intensities on the spectrum. Recording of the spectrum were performed with 187 shot (numbers of sparks). The tungsten spectrum was recorded on the photographic film as well as paper and Mercury lines were recorded on the same plate keeping the exposure time 35 seconds. These lines of known wavelengths were used as the standard in MOSFIT program for the calibration of tungsten.

3. Results and Discussion

The ab-initio calculation were performed using Cowan's computer code [8] incorporating the configuration $5d^4 6s^2$, $d^5 6s$,and $d^4 6s7s$ for even parity matrix and $5d^4 6s6p$, $5d^3 6s^2 6p$ and $5d^5 6p$ configurations for odd party matrix. The initial energy parameter scaling applied for E_{av} and ζ at 100% of the HFR values and F^k at 85%, G^k and R^k at 75%of the HFR values. The reported values of levels were taken from NIST ASD [9] levels list. The levels were used to run least square fitted (LSF). This allowed adjusting of the energy to the real values and hence a better prediction was achieved. All the previously reported even parity energy levels, three level of $j = 0$, three levels of $j = 1$, eight level of $j = 2$, six levels of $j = 3$, six level of $j = 4$, two levels of $j = 5$ and two levels of $j = 6$ with configuration $5d^4 6s^2$ have been obtained. Most of the energy levels fitted excellently, however some of the levels showed larger deviation. It was observed that it is due to strong mixing of other configurations $5d^5 6s$ and $5d^4 6s7s$ with $5d^4 6s^2$. Of all the odd parity energy levels reported earlier, sixteen levels of $j = 0$, forty four levels of $j = 1$, seventy one levels of $j = 2$, seventy one levels of $j = 3$, sixty eight level of $j = 4$, fifty levels of $j = 5$, thirty levels of $j = 6$ and ten levels of $j = 7$ belonging to configurations $5d^4 6s6p$, $5d^3 6s^2 6p$, $5d^5 6p$ have been obtained. In our recording between the wavelengths 2100-4900 Å many unclassified lines were observed. One hundred and two transition belonging $5d^4 6s^2$ and $5d^4 6s6p$ which have been observed in our spectrum are shown in Table 1. The energy parameters for even parity levels and LSF are given in Table 2 and 3, respectively. The energy parameters for odd parity levels and LSF are given in Table 4 and 5, respectively.

Table 1. Observed wavelengths with energy levels of WI in 2100-4900 Å

Observed wavelength (Å)	Reported wavelength (Å)	Wavenumber (cm^{-1})	Energy level of lower state (cm^{-1})	Energy level of upper state (cm^{-1})	Lower Configuration	Upper Configuration
2277.5926	2277.583	43906	000.00	43892.62	$5d^46s^2(^5D_0)$	$5d^46s(4H)6p(^5H_1)$
2454.9116	2454.978	40735	4830.00	45551.32	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_3)$
2456.3297	2456.534	40711	3325.53	44021	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_3)$
2464.0074	2464.305	40584	2464.31	3325.53	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_1)$
2479.9733	2480.13	40323	1670.29	41978.62	$5d^46s^{25}D_1)$	$5d^46s(4H)6p\ (^5H_2)$
2487.102	2487.495	40207	4830.00	45019.02	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_{2)}$
2495.5547	2495.264	40071	1670.29	41734.13	$5d^46s^2\ (^5D_1)$	$5d^46s(4H)6p\ (^5H_2)$
2504.2658	2504.698	39932	1670.29	41583.2	$5d^46s^2\ (^5D1)$	$5d^46s(4H)6p\ (^5H_2)$
2520.4309	24520.455	39676	15069.93	54733.38	$5d46s2(^3H_5)$	$5d^46s(4H)6p\ ^5H_6)$
2545.1854	2545.34	39290	3325.53	42601.19	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_3)$
2550.403	2550.378	39209	1670.29	40868.4	$5d^46s^2\ (^5D_1)$	$5d^46s(4H)6p\ (^5H_2)$
2551.8503	2551.349	39187	000.00	39183.2	$5d^46s^2\ (^5D_0)$	$5d^46s(4H)6p\ (^5H_1)$
2553.5298	2553.168	39161	4830.00	43985.41	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_4)$
2561.9559	2561.968	39033	4830.00	43850.84	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_3)$
2580.0667	2580.487	38759	1670.29	40411.12	$5d^46s^2\ (^5D_1)$	$5d^46s(4H)6p\ (^5H_1)$
2613.2294	2613.076	38267	3325.53	41583.2	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_2)$
2625.379	2625.22	38090	4830.00	42910.74	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_{4)}$
2646.3447	2646.185	37788	3325.53	41104.52	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_2)$
2657.5756	2657.361	37628	4830.00	42450.24	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_4)$
2663.8558	2663.556	37540	15460.01	52992.69	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_4)$
2668.8833	2668.473	37469	19253.56	56717.13	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_3)$
2675.3168	2675.867	37379	1670.29	39030.25	$5d^46s^2\ (^5D_1)$	$5d^46s(4H)6p\ (^5H_2)$
2677.3236	2677.276	37351	3325.53	40665.85	$5d^46s^2(^5D_2)$	$5d^46s(4H)6p\ (^5H_3)$
2697.3059	2697.514	37074	2951.29	40011.5	$5d^5(6S)6s(^7S_3)$	$5d^46s(4H)6p\ (^5H_2)$
2705.4386	2705.174	36963	13348.56	50303.78	$5d^46s^2(^3G_3)$	$5d^46s(4H)6p\ (^5H_3)$
2706.4042	2706.579	36949	13348.56	50284.64	$5d^46s^2\ (^3G_3)$	$5d^46s(4H)6p\ (^5H_4)$
2708.2754	2708.188	36924	16431.31	53345.52	$5d^46s^2\ (^3G_4)$	$5d^46s(4H)6p\ (^5H_3)$
2715.5565	2715.503	36825	6219.33	43034.1	$5d^46s^2\ (^5D_4)$	$5d^46s(4H)6p\ (^5H_5)$
2718.9544	2718.906	36779	951.29	39719.96	$5d^5(6S)6s(^7S_3)$	$5d^46s(4H)6p\ (^5H_4)$
2773.9276	2773.999	36050	4830.00	40868.4	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_2)$
2780.2076	2780.285	35969	19535.01	55492.22	$5d^5(4G)\ 6s(^5G_5)$	$5d^46s(4H)6p\ (^5H_5)$
2829.7898	2829.821	35338	14976.18	50303.78	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_3)$
2831.0812	2831.379	35322	2951.29	38259.4	$5d^5(6S)6s(^7S_3)$	$5d^46s(4H)6p\ (^5H_4)$
2833.7098	2 833.630	35289	6219.33	4 499.43	$5d^46s^{2(5}D_4)$	$5d^46s(4H)6p\ (^5H_3)$
2866.289	2866.062	34888	3325.53	38206.38	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_3)$
2879.1542	2879.112	34732	2951.29	37674.08	$5d^46s^2\ (^5D_0)$	$5d^46s(4H)6p\ (^5H_1)$
2896.3266	2896.442	34526	2951.29	37466.3	$5d^5(6S)6s(^7S_3)$	$5d^46s(4H)6p\ (^5H_2)$
2918.4765	2918.254	34264	6219.33	40476.42	$5d^46s^2(^5D_4)$	$5d^46s(4H)6p\ (^5H_5)$
2944.4063	2944.398	33963	2951.29	36904.16	$5d^5(6S)6s(^7S_3)$	$5d^46s(4H)6p\ (^5H_2)$

2952.336	2952.262	33871	19256.24	53118.29	$5d^5(4G)\ 6s(^5G_4)$	$5d^46s(4H)6p\ (^5H_4)$
2979.9392	2979.86	33558	3325.53	36874.36	$5d^46s^2(^5D_2)$	$5d^46s(4H)6p\ (^5H_3)$
2990.8507	2 990.714	33435	6219.33	39646.41	$5d^46s^2(^5D_4)$	$5d^46s(4H)6p\ (^5H_3)$
2997.7926	2997.793	33358	4830.00	38206.38	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_3)$
3009.0738	3009.086	33233	4830.00	38053.05	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_3)$
3016.56	3016.466	33150	6219.33	39361.01	$5d^46s^2\ (^5D_4)$	$5d^46s(4H)6p\ (^5H_5)$
3017.4285	3017.436	33141	2951.29	36082.3	$5d^5(6S)6s(^7S_3)$	$5d^46s(4H)6p\ (^5H_4)$
3024.6522	3024.928	33062	1670.29	34719.33	$5d^46s^2(^5D_1)$	$5d^46s(4H)6p\ (^5H_1)$
3039.3237	3 039.312	32902	20064.30	52956.92	$5d^46s(6D)6p\ (^7F_1)$	$5d^46s(4H)6p\ (^5H_1)$
3041.8111	3041.863	32875	3325.53	36190.49	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_1)$
3043.9116	3043.803	32852	4830.00	37674.08	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_3)$
3049.8661	3049.688	32788	2951.29	35731.96	$5d^5(6S)6s(^7S_3)$	$5d^46s(4H)6p\ (^5H_2)$
3073.3421	3073.276	32538	6219.33	38748.44	$5d^46s^2\ (^5D_4)$	$5d^46s(4H)6p\ (^5H_4)$
3093.4268	3093.5	32327	4830.00	37146.36	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_4)$
3127.1449	3127.328	31978	17107.01	49073.88	$5d^46s^2\ (^3F_4)$	$5d^46s(4H)6p\ (^5H_5)$
3176.3371	3176.601	31483	1670.29	33141.38	$5d^46s^2\ (^5D_1)$	$5d^46s(4H)6p\ (^5H_2)$
3184.0015	3184.05	31407	18116.84	49514.34	$5d^5(4G)\ 6s(^5G_2)$	$5d^46s(4H)6p\ (^5H_3)$
3208.7176	3208.566	31165	19648.54	50806.07	$5d^5(4G)\ 6s(^5G_5)$	$5d^46s(4H)6p\ (^5H_5)$
3232.638	3232.654	30934	15460.01	46385.46	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_3)$
3259.3584	3259.66	30681	4830.00	35499.15	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_3)$
3283.6844	3283.554	30454	14976.18	45422.26	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_2)$
3300.7599	3300.822	30296	4830.00	35116.78	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_4)$
3311.1938	3311.388	30201	2951.29	33141.38	$5d^5(6S)6s(^7S_3)$	$5d46s(4H)6p(^5H_2)$
3322.3832	3322.263	30099	15460.01	45551.32	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_3)$
3326.09	3326.196	30065	6219.33	36275.1	$5d^46s^2\ (^5D_4)$	$5d^46s(4H)6p\ (^5H_5)$
3345.8952	3345.858	29887	13348.56	43227.66	$5d^46s^2\ (^3G_3)$	$5d^46s(4H)6p\ (^5H_4)$
3373.6542	3373.752	29641	3325.53	32957.58	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_3)$
3382.5701	3382.598	29563	15460.01	45014.54	$5d^46s^2\ (^5D_3)$	$5d^46s(4H)6p\ (^5H_3)$
3442.6409	3429.592	29047	19535.01	48684.68	$5d^5(4G)\ 6s(^5G_5)$	$5d^46s(4H)6p\ (^5H_6)$
3457.5407	3457.713	28922	3325.53	32238.02	$5d^46s^2\ (^5D_2)$	$5d^46s(4H)6p\ (^5H_3)$
3463.2509	3463.247	28875	2951.29	31817.63	$5d^5(6S)6s(^7S_3)$	$5d^46s(4H)6p\ (^5H_2)$
3495.0905	3495.236	28612	19648.54	48250.7	$5d^5(4G)\ 6s(^5G_6)$	$5d^46s(4H)6p\ (^5H_7)$
3535.5991	3535.539	28284	13307.10	41583.2	$5d^46s^2\ (^3P_2)$	$5d^46s(4H)6p\ (^5H_2)$
3537.5017	3537.446	28269	15460.01	43720.87	$5d^46s^2\ (^3D_2)$	$5d^46s(4H)6p\ (^5H_2)$
3537.5017	3537.446	28269	28268.54	43720.87	$5d^46s^2\ (^3D_3)$	$5d^46s(4H)6p\ (^5H_4)$
3545.2059	3545.22	3545.2	0.00	28198.9	$5d^46s^2\ (^5D_0)$	$5d^46s(6D)(^5P_1)$
3570.6257	3570.648	28006	4830.00	32828.12	$5d^46s^2\ (^5D_3)$	$5d^46s(6D)(^5D_4)$
3575.2693	3575.22	27970	17008.50	44970.82	$5d^46s^2\ (^3H_6)$	$5d^46s(4H)6p(^5H_7)$
3606.12	3606.063	27731	1670.29	29393.4	$5d^46s^2\ (^5D_1)$	$5d^46s(6D)(^5P_2)$
3617.5638	3617.515	27643	2951.29	30586.64	$5d^5(6S)6s(^7S_3)$	$5d^46s(6D)(^5P_3)$
3622.326	3622.337	27607	19256.24	46854.8	$5d^5(4G)\ 6s(^5G_4)$	$5d^46s(4H)6p(^5H_5)$
3689.884	3689.866	27101	18974.51	46068.02	$5d^5(4G)\ 6s(^5G_3)$	$5d^46s(4H)6p\ (^5H_3)$

3703.4348	3703.597	27002	13777.71	40770.78	$5d^4 6s^2 (^3F_2)$	$5d^4 6s(4H)6p (^5H_1)$
3730.3849	3730.419	26807	19826.04	46625.05	$5d^4 6s^2 (^3G_5)$	$5d^4 6s(4H)6p (^5H_5)$
3749.5218	3749.655	26670	22852.80	49514.34	$5d^4 6s^2 (^1G_2)4$	$5d^4 6s(4H)6p (^5H_3)$
3760.2232	3760.126	26594	3325.53	29912.85	$5d^4 6s^2 (^5D_2)$	$5^{d4} 6s(6D)(^5D_3)$
3780.9575	3780.772	26448	2951.29	29393.4	$5d^5(6S)6s(^7S_3)$	$5d^4 6s(6D)(^5P_2)$
3824.3822	3824.388	26148	19648.54	45789.14	$5d^5(4G)\ 6s(^5G_6)$	$5d^4 6s(4H)6p (^5H_5)$
3835.0868	3835.058	26075	3325.53	29393.4	$5d^4 6s^2 (^5D_2)$	$5d^4 6s(6D)(^5P_2)$
3846.3347	3846.218	25999	1670.29	27662.52	$5d^4 6s^2 (^5D_1)$	$5d^4 6s(6D)(^5F_2)$
3855.5355	3855.554	25937	13777.71	39707.02	$5d^4 6s^2 (^3F_2)$	$5d^4 6s(4H)6p(^5H_2)$
3872.8381	3872.84	25821	17701.18	43514.68	$5d^4 6s^2 (^3F_3)$	$5d^4 6s(4H)6p (^5H_3)$
3881.4208	3881.405	25764	4830.00	30586.64	$5d^4 6s^2 (^5D_3)$	$5d^4 6s(6D)(^5P_3)$
3983.1842	3983.292	25106	19826.04	44923.9	$5d^4 6s^2 (^3G_5)$	$5d^4 6s(4H)6p (^5H_6)$
4008.7485	4008.7506	24945	2951.29	27889.68	$5d^5(6S)6s(^7S_3)$	$5d^5(6S)6p\ ^7P_4$
4015.1246	4015.218	24906	19648.54	44546.76	$5d^5(4G)\ 6s(^5G_6)$	$5d^4 6s(4H)6p (^5H_5)$
4102.9486	4102.702	24373	6219.33	30586.64	$5d^4 6s^2 (^5D_4)$	$5d^4 6s(6D)(^5P_3)$
4137.4107	4137.457	24170	3325.53	27488.11	$5d^4 6s^2 (^5D_2)$	$5d^5(6S)6p\ ^7P_3$
4171.1553	4171.174	23974	4830.00	28797.24	$5d^4 6s^2(^5D_3)$	$5d^4 6s(6D)(^7D_4)$
4244.4203	42244.364	23560	6219.33	29773.34	$5d^4 6s^2 (^5D_4)$	$5d^4 6s(6D)(^7D_5)$
4294.6064	4294.606	23285	2951.29	26229.77	$5d^5(6S)6s(^7S_3)$	$5d^5(6S)6p\ ^7P_2$
4302.1018	4302.11	23244	2951.29	26189.2	$5d^5(6S)6s(^7S_3)$	$5d^4 6s(6D)(^7D_5)$

Table 2. HF and LSF Parameters of even configurations of WI in cm^{-1}

configuration	parameter	LSF	accuracy	HF	LSF/HF
5d46s2	E0(5d4 6s2)	19394.9	115.0	23326.0	
	F2(5d, 5d)	33482.8	812.0	50713.0	0.660
	F4(5d, 5d)	25362.2	1334.0	32950.1	0.770
	alfa(5d)	45.8	16.0		
	beta(5d)	0.0	(fixed)		
	T(5d)	-12.0	2.0		
	T1(5d)	0.0	(fixed)	0.0	
	T2(5d)	0.0	(fixed)	0.0	
	zeta(5d)	1899.9	94.0	2307.0	0.824

1 system 1 sigma(5)= 552.00 CONVERGED.

Table 3. Observed and Least Square Fitted levels of even parity configuration of WI in cm^{-1}

J	E(obs)	E(LSF)	diff.	LS-composition.
0	0.0	226.0	-226.0	77% <4>5D + 11% <2>3P + 10% <4>3P
	9528.1	9513.0	15.1	34% <4>3P + 21% <4>5D + 21% <2>3P + 20% <4>1S
	20174.2	19954.0	220.2	64% <4>1S + 24% <4>3P + 7% <0>1S
	-	31031.0	-	62% <2>3P + 32% <4>3P + 4% <4>1S
	-	52824.0	-	86% <0>1S + 10% <4>1S
1	1672.9	1734.0	-61.1	90% <4>5D + 6% <2>3P + 4% <4>3P
	13337.1	13345.0	-7.9	54% <4>3P + 21% <2>3P + 19% <4>3D + 6% <4>5D
	18082.8	18355.0	-272.2	80% <4>3D + 8% <2>3P + 8% <4>3P
	-	29795.0	-	65% <2>3P + 34% <4>3P
2	3325.5	3247.0	78.5	95% <4>5D
	13777.7	13815.0	-37.3	41% <4>3F + 26% <4>3D + 13% <2>3F + 9% <4>1D
	14976.2	15456.0	-479.8	40% <4>3D + 29% <4>3F + 23% <4>3P
	19253.6	19640.0	-386.4	34% <4>3P + 24% <2>3P + 18% <4>3D + 9% <4>1D
	24789.7	23779.0	1010.7	38% <4>1D + 27% <4>3P + 12% <2>3P + 10% <4>3D
	28899.6	27626.0	1273.6	54% <2>3P + 16% <4>1D + 15% <2>3F + 8% <4>3P
	30374.2	29911.0	463.2	57% <2>3F + 21% <4>3F + 15% <4>1D + 4% <2>3P
	-	39472.0	-	84% <2>1D + 11% <4>1D
3	4830.0	4641.0	189.0	92% <4>5D
	13348.6	13463.0	-114.4	62% <4>3G + 18% <4>3F + 10% <2>3F
	15460.0	16025.0	-565.0	72% <4>3D + 19% <4>3F + 7% <4>1F
	17701.2	17691.0	10.2	49% <4>3F + 30% <4>3G + 11% <4>3D + 5% <2>3F
	24610.9	24536.0	74.9	77% <4>1F + 9% <4>3D + 8% <2>3F + 7% <4>3G
	29430.5	30765.0	-1334.5	75% <2>3F + 12% <4>3F + 11% <4>1F
4	6219.3	5974.0	245.3	85% <4>5D + 10% <4>3F
	12162.0	12319.0	-157.0	43% <4>3H + 22% <4>3G + 11% <4>3F + 8% <2>1G
	17107.0	16359.0	748.0	52% <4>3G + 21% <4>3H + 17% <4>1G + 4% <4>3F
	16431.3	16787.0	-355.7	48% <4>3F + 20% <4>3H + 10% <4>3G + 10% <4>1G
	22852.8	22736.0	116.8	45% <4>1G + 22% <4>3F + 14% <4>3H + 10% <4>3G
	29479.3	30253.0	-773.7	83% <2>3F + 10% <2>1G
	-	34352.0	-	69% <2>1G + 21% <4>1G + 5% <2>3F
5	15069.9	15050.0	19.9	64% <4>3H + 36% <4>3G
	19826.0	19804.0	22.0	64% <4>3G + 36% <4>3H
6	17008.5	16895.0	113.5	84% <4>3H + 16% <4>1I
	23484.8	23311.0	173.8	84% <4>1I + 16% <4>3H

Table 4. HF and LSF Parameters of odd configurations of WI in cm^{-1}

configuration	parameter	LSF	accuracy	HF	LSF/HF
5d3 6s2 6p	E0(5d3 6s2 6p)	51821.4	518.0	49476.4	1.240
	F2(5d, 5d)	41578.5	1107.0	54644.7	0.761
	F4(5d, 5d)	27245.6	725.0	35807.7	0.761
	alfa(5d)	0.0	(fixed)		
	beta(5d)	0.0	(fixed)		
	T(5d)	0.0	(fixed)		
	T1(5d)	0.0	(fixed)	0.0	
	T2(5d)	0.0	(fixed)	0.0	
	zeta(5d)	2587.4	(fixed)	2587.5	1.000
	zeta(6p)	2976.0	(fixed)	2976.1	1.000
	F1(5d, 6p)	0.0	(fixed)	0.0	
	F2(5d, 6p)	15467.7	1586.0	17515.3	0.883
	G1(5d, 6p)	6449.7	221.0	9056.2	0.712
	G2(5d, 6p)	0.0	(fixed)	0.0	
	G3(5d, 6p)	4838.7	166.0	6794.1	0.712
5d4 6s 6p	E0(5d4 6s 6p)	55179.8	237.0	49355.7	1.375
	F2(5d, 5d)	39511.5	1052.0	51928.2	0.761
	F4(5d, 5d)	25743.4	685.0	33833.4	0.761
	alfa(5d)	0.0	(fixed)		
	beta(5d)	0.0	(fixed)		
	T(5d)	0.0	(fixed)		
	T1(5d)	0.0	(fixed)	0.0	
	T2(5d)	0.0	(fixed)	0.0	
	zeta(5d)	2377.1	(fixed)	2377.2	1.000
	zeta(6p)	2213.2	(fixed)	2213.2	1.000
	F1(5d, 6p)	0.0	(fixed)	0.0	
	F2(5d, 6p)	13593.5	1394.0	15392.9	0.883
	G2(5d, 6s)	13618.7	466.0	19122.2	0.712
	G1(5d, 6p)	5956.0	204.0	8362.8	0.712
	G2(5d, 6p)	0.0	(fixed)	0.0	
	G3(5d, 6p)	4319.2	148.0	6064.8	0.712
	G1(6s, 6p)	19745.8	676.0	27725.2	0.712
5d5 6p	E0(5d5 6p)	66007.7	421.0	60867.1	1.242
	F2(5d, 5d)	41670.9	(fixed)	49024.7	0.850
	F4(5d, 5d)	26979.7	(fixed)	31740.9	0.850
	alfa(5d)	0.0	(fixed)		
	beta(5d)	0.0	(fixed)		
	T(5d)	0.0	(fixed)		
	T1(5d)	0.0	(fixed)	0.0	
	T2(5d)	0.0	(fixed)	0.0	
	zeta(5d)	2173.0	(fixed)	2173.1	1.000
	zeta(6p)	1575.2	(fixed)	1575.2	1.000
	F1(5d, 6p)	0.0	(fixed)	0.0	
	F2(5d, 6p)	11313.2	(fixed)	13309.7	0.850
	G1(5d, 6p)	5710.7	(fixed)	7614.3	0.750
	G2(5d, 6p)	0.0	(fixed)	0.0	
	G3(5d, 6p)	3994.7	(fixed)	5326.4	0.750
5d3 6s2 6p -5d4 6s 6p	R2(5d, 6s; 5d, 5d)	-15354.9	-929.0	-24353.7	0.630
	R2(6s, 6p; 5d, 6p)	-10130.2	-613.0	-16067.1	0.630
	R1(6s, 6p; 6p, 5d)	-9894.2	-598.0	-15692.7	0.630
5d3 6s2 6p -5d5 6p	R2(6s, 6s; 5d, 5d)	15180.3	(fixed)	21686.2	0.700
5d4 6s 6p -5d5 6p	R2(5d, 6s; 5d, 5d)	-16878.0	(fixed)	-24111.5	0.700
	R2(6s, 6p; 5d, 6p)	-10261.2	(fixed)	-14658.8	0.700
	R1(6s, 6p; 6p, 5d)	-9980.5	(fixed)	-14257.8	0.700

Table 5. Observed and Least Square Fitted levels of odd parity configuration of WI in cm^{-1}

J	E(obs)	E(LSF)	diff.	LS-composition.
0	19389.4	20088.0	-698.6	78% 5d4 6s 6p ((<4>5D)6D)7F + 8% 5d4 6s 6p ((<2>3P)4P)5D + 7% 5d4 6s 6p ((<4>3P)4P)5D
	26629.5	27941.0	-1311.5	22% 5d3 6s2 6p (<3>4F)5D + 12% 5d4 6s 6p ((<4>5D)6D)7F + 9% 5d4 6s 6p ((<4>5D)6D)5D + 7% 5d4 6s 6p ((<4>3P)4P)3P
	29823.1	30138.0	-314.9	22% 5d3 6s2 6p (<3>4P)5D + 20% 5d3 6s2 6p (<3>4F)5D + 16% 5d4 6s 6p ((<4>3P)4P)5D + 11% 5d4 6s 6p ((<4>5D)6D)5D
	32386.6	33735.0	-1348.4	20% 5d4 6s 6p ((<4>5D)4D)3P + 15% 5d3 6s2 6p (<3>4F)5D + 14% 5d4 6s 6p ((<4>3P)4P)5D + 7% 5d3 6s2 6p (<3>2P)1S
	36588.3	36691.0	-102.7	16% 5d4 6s 6p ((<4>5D)4D)5D + 14% 5d3 6s2 6p (<3>4P)3P + 13% 5d4 6s 6p ((<4>5D)6D)5D + 11% 5d4 6s 6p ((<4>5D)4D)3P
	38576.1	39528.0	-951.9	17% 5d3 6s2 6p (<3>4F)5D + 12% 5d3 6s2 6p (<3>2P)3P + 9% 5d3 6s2 6p (<3>2P)1S + 7% 5d4 6s 6p ((<4>3F)4F)5D
	41127.4	40900.0	227.4	29% 5d4 6s 6p ((<4>5D)4D)3P + 15% 5d3 6s2 6p (<3>2P)1S + 15% 5d3 6s2 6p (<3>2P)3P + 7% 5d4 6s 6p ((<4>5D)6D)5D
	41965.2	41909.0	56.2	18% 5d4 6s 6p ((<4>5D)4D)5D + 13% 5d3 6s2 6p (<3>4P)5D + 9% 5d4 6s 6p ((<4>3D)4D)5D + 8% 5d4 6s 6p ((<4>1S)2S)3P
	43053.9	43481.0	-427.1	17% 5d4 6s 6p ((<4>5D)6D)5D + 12% 5d4 6s 6p ((<4>3D)4D)5D + 11% 5d3 6s2 6p (<3>4P)5D + 9% 5d5 6p (<5>4D)5D
	45306.9	45222.0	84.9	35% 5d4 6s 6p ((<4>3F)4F)5D + 19% 5d4 6s 6p ((<4>5D)4D)5D + 18% 5d4 6s 6p ((<2>3F)4F)5D + 5% 5d4 6s 6p ((<4>1D)2D)3P
	46613.7	47674.0	-1060.3	18% 5d4 6s 6p ((<4>3D)4D)5D + 17% 5d3 6s2 6p (<3>2P)1S + 11% 5d4 6s 6p ((<4>5D)6D)5D + 9% 5d4 6s 6p ((<4>3P)2P)3P
	48264.6	48685.0	-420.4	19% 5d4 6s 6p ((<4>3D)4D)5D + 11% 5d4 6s 6p ((<4>1S)2S)3P + 10% 5d3 6s2 6p (<3>2P)3P + 9% 5d4 6s 6p ((<4>3D)4D)3P
	48603.4	49748.0	-1144.6	17% 5d3 6s2 6p (<3>4P)5D + 16% 5d3 6s2 6p (<3>4P)3P + 11% 5d3 6s2 6p (<3>2P)3P + 9% 5d4 6s 6p ((<2>3P)4P)5D
	49798.5	51349.0	-1550.5	24% 5d4 6s 6p ((<4>3D)4D)5D + 11% 5d4 6s 6p ((<4>3D)4D)3P + 11% 5d4 6s 6p ((<4>3D)2D)3P + 8% 5d3 6s2 6p (<3>2P)1S
	52233.1	53032.0	-798.9	12% 5d3 6s2 6p (<3>2D)3P + 11% 5d4 6s 6p ((<4>1S)2S)3P + 11% 5d4 6s 6p ((<4>1D)2D)3P + 7% 5d4 6s 6p ((<4>3P)2P)3P
	54295.6	53859.0	436.6	32% 5d5 6p (<3>4P)5D + 7% 5d5 6p (<3>4P)3P + 7% 5d4 6s 6p ((<2>3P)2P)3P + 6% 5d3 6s2 6p (<3>4P)5D
	-	55938.0	-	11% 5d5 6p (<3>4P)5D + 9% 5d4 6s 6p ((<2>3P)2P)1S + 8% 5d5 6p (<3>4P)3P + 7% 5d3 6s2 6p (<3>2D)3P
	-	56645.0	-	21% 5d4 6s 6p ((<4>1D)2D)3P + 8% 5d4 6s 6p ((<2>1D)2D)3P + 7% 5d4 6s 6p ((<4>3P)4P)3P + 7% 5d4 6s 6p ((<2>3P)2P)1S
	-	57407.0	-	18% 5d3 6s2 6p (<3>4P)3P + 11% 5d5 6p (<5>4D)3P + 10% 5d4 6s 6p ((<2>3P)4P)3P + 9% 5d5 6p (<3>4P)5D
	-	59811.0	-	27% 5d5 6p (<5>4D)5D + 12% 5d5 6p (<5>4D)3P + 9% 5d5 6p (<3>4P)3P + 8% 5d4 6s 6p ((<4>1D)2D)3P
	-	61734.0	-	21% 5d4 6s 6p ((<2>3F)4F)5D + 15% 5d4 6s 6p ((<2>3P)4P)5D + 15% 5d4 6s 6p ((<4>3P)4P)5D + 11% 5d4 6s 6p ((<4>3F)4F)5D
	-	62584.0	-	25% 5d5 6p (<5>4D)5D + 19% 5d5 6p (<5>4D)3P + 14% 5d4 6s 6p ((<4>3D)4D)3P + 6% 5d5 6p (<5>2D)3P
	-	63068.0	-	10% 5d3 6s2 6p (<3>2P)1S + 9% 5d4 6s 6p ((<2>3P)2P)1S + 9% 5d4 6s 6p ((<4>3P)2P)3P + 8% 5d4 6s 6p ((<4>3D)4D)3P
	-	64508.0	-	19% 5d5 6p (<3>4F)5D + 15% 5d4 6s 6p ((<2>3F)4F)5D + 12% 5d5 6p (<3>4P)3P + 9% 5d5 6p (<5>2D)3P
	-	65949.0	-	14% 5d4 6s 6p ((<2>3P)4P)5D + 12% 5d4 6s 6p ((<2>3P)4P)3P + 12% 5d5 6p (<5>4D)3P + 8% 5d4 6s 6p ((<2>1D)2D)3P
	-	66604.0	-	26% 5d5 6p (<3>4P)3P + 11% 5d4 6s 6p ((<2>3F)4F)5D + 7% 5d4 6s 6p ((<2>3P)2P)3P + 7% 5d4 6s 6p ((<4>3F)4F)5D
	-	68409.0	-	39% 5d5 6p (<3>4F)5D + 10% 5d5 6p (<5>2S)3P + 9% 5d4 6s 6p ((<4>3D)4D)3P + 7% 5d4 6s 6p ((<4>3D)2D)3P
	-	69466.0	-	19% 5d4 6s 6p ((<2>3P)2P)3P + 11% 5d4 6s 6p ((<2>1D)2D)3P + 11% 5d3 6s2 6p (<1>2D)3P + 8% 5d4 6s 6p ((<2>3F)4F)5D
	-	71425.0	-	15% 5d4 6s 6p ((<2>3P)2P)3P + 11% 5d4 6s 6p ((<4>3P)2P)3P + 11% 5d3 6s2 6p (<3>2D)3P + 10% 5d4 6s 6p ((<4>1D)2D)3P
	-	72411.0	-	51% 5d4 6s 6p ((<4>3P)2P)1S + 14% 5d4 6s 6p ((<2>3P)2P)1S + 11% 5d5 6p (<3>2P)1S
	-	73463.0	-	17% 5d5 6p (<5>2S)3P + 13% 5d5 6p (<5>4D)3P + 12% 5d5 6p (<5>2D)3P + 7% 5d5 6p (<3>4F)5D
	-	76623.0	-	38% 5d5 6p (<5>2S)3P + 13% 5d5 6p (<3>2D)3P + 12% 5d4 6s 6p ((<4>3D)4D)3P + 10% 5d4 6s 6p ((<2>1D)2D)3P
	-	77475.0	-	20% 5d4 6s 6p ((<4>3D)2D)3P + 14% 5d4 6s 6p ((<2>3P)4P)3P + 13% 5d5 6p (<5>2D)3P + 12% 5d4 6s 6p ((<4>1D)2D)3P
	-	82242.0	-	23% 5d4 6s 6p ((<2>3P)4P)3P + 18% 5d5 6p (<3>2D)3P + 16% 5d3 6s2 6p (<1>2D)3P + 12% 5d5 6p (<3>2P)3P

		-	84321.0	-		31%	5d5 6p	(<3>2D)3P	+ 24%	5d4 6s 6p	((<2>1D)2D)3P
					+ 14%	5d4 6s 6p	((<0>1S)2S)3P	+ 7%	5d3 6s2 6p	(<1>2D)3P	
		-	89340.0	-		37%	5d5 6p	(<3>2P)3P	+ 24%	5d5 6p	(<1>2D)3P
					+ 9%	5d4 6s 6p	((<0>1S)2S)3P	+ 5%	5d5 6p	(<5>2S)3P	
		-	92458.0	-		50%	5d5 6p	(<3>2P)1S	+ 17%	5d4 6s 6p	((<0>1S)2S)3P
					+ 6%	5d4 6s 6p	((<4>1S)2S)3P	+ 6%	5d4 6s 6p	((<2>3P)2P)1S	
		-	93077.0	-		28%	5d4 6s 6p	((<0>1S)2S)3P	+ 26%	5d5 6p	(<3>2P)1S
					+ 11%	5d5 6p	(<3>2P)3P	+ 7%	5d4 6s 6p	((<2>1D)2D)3P	
		-	103006.0	-		43%	5d5 6p	(<1>2D)3P	+ 22%	5d5 6p	(<3>2P)3P
					+ 14%	5d5 6p	(<5>2D)3P				
1	20064.3	20718.0	-653.7		73%	5d4 6s 6p	((<4>5D)6D)7F	+ 7%	5d4 6s 6p	((<2>3P)4P)5D	
				+ 6%	5d4 6s 6p	((<4>3P)4P)5D					
	21453.9	22760.0	-1306.1		38%	5d4 6s 6p	((<4>5D)6D)7D	+ 22%	5d4 6s 6p	((<4>5D)6D)5P	
				+ 10%	5d4 6s 6p	((<4>5D)6D)7F	+ 9%	5d4 6s 6p	((<4>3P)4P)5P		
	25983.6	26312.0	-328.4		28%	5d3 6s2 6p	(<3>4F)5F	+ 21%	5d3 6s2 6p	(<3>4F)3D	
				+ 9%	5d4 6s 6p	((<4>5D)6D)5F	+ 5%	5d3 6s2 6p	(<3>4F)5D		
	27778.5	28261.0	-482.5		36%	5d4 6s 6p	((<4>5D)6D)7D	+ 11%	5d3 6s2 6p	(<3>4F)5F	
				+ 10%	5d4 6s 6p	((<4>5D)6D)5P	+ 7%	5d4 6s 6p	((<4>5D)6D)5F		
	28198.9	29274.0	-1075.1		13%	5d3 6s2 6p	(<3>4F)3D	+ 12%	5d4 6s 6p	((<4>5D)6D)5P	
				+ 10%	5d4 6s 6p	((<4>5D)6D)7D	+ 8%	5d4 6s 6p	((<4>5D)6D)5F		
	30683.5	30753.0	-69.5		23%	5d3 6s2 6p	(<3>4F)5D	+ 17%	5d4 6s 6p	((<4>5D)6D)5D	
				+ 15%	5d3 6s2 6p	(<3>4P)5D	+ 9%	5d4 6s 6p	((<4>3P)4P)5D		
	31323.5	32220.0	-896.5		15%	5d3 6s2 6p	(<3>4F)3D	+ 14%	5d4 6s 6p	((<4>3P)4P)5D	
				+ 10%	5d4 6s 6p	((<4>5D)6D)5F	+ 8%	5d3 6s2 6p	(<3>4P)5D		
	34342.4	34271.0	71.4		24%	5d3 6s2 6p	(<3>4F)5F	+ 13%	5d4 6s 6p	((<4>5D)6D)5F	
				+ 13%	5d4 6s 6p	((<4>5D)4D)5F	+ 10%	5d3 6s2 6p	(<3>4F)3D		
	34719.3	34789.0	-69.7		16%	5d4 6s 6p	((<4>5D)4D)5P	+ 14%	5d5 6p	(<5>6S)5P	
				+ 12%	5d3 6s2 6p	(<3>4P)3P	+ 9%	5d4 6s 6p	((<4>5D)4D)3P		
	36190.5	36564.0	-373.5		17%	5d4 6s 6p	((<4>5D)4D)3P	+ 16%	5d4 6s 6p	((<4>5D)6D)5P	
				+ 6%	5d4 6s 6p	((<4>5D)4D)5D	+ 6%	5d3 6s2 6p	(<3>2P)3S		
	37774.0	37521.0	253.0		24%	5d5 6p	(<5>6S)5P	+ 13%	5d4 6s 6p	((<4>5D)4D)5P	
				+ 8%	5d3 6s2 6p	(<3>4F)5D	+ 5%	5d4 6s 6p	((<4>3P)4P)3P		
	38355.8	38795.0	-439.2		17%	5d4 6s 6p	((<4>5D)4D)3P	+ 8%	5d3 6s2 6p	(<3>4P)5P	
				+ 8%	5d4 6s 6p	((<4>5D)4D)5F					
	39183.2	39405.0	-221.8		8%	5d4 6s 6p	((<4>5D)4D)5D	+ 6%	5d3 6s2 6p	(<3>2P)3D	
				+ 5%	5d4 6s 6p	((<4>5D)6D)5D	+ 4%	5d4 6s 6p	((<4>5D)6D)5F		
	39636.2	39625.0	11.2		13%	5d3 6s2 6p	(<3>2P)3D	+ 12%	5d4 6s 6p	((<4>5D)4D)5D	
				+ 7%	5d3 6s2 6p	(<3>4F)5D	+ 7%	5d5 6p	(<5>6S)5P		
	40411.2	40573.0	-161.8		8%	5d4 6s 6p	((<4>5D)4D)5F	+ 7%	5d4 6s 6p	((<4>5D)6D)5F	
				+ 6%	5d4 6s 6p	((<4>3P)4P)3D	+ 6%	5d4 6s 6p	((<4>3D)4D)5F		
	40770.8	40955.0	-184.2		16%	5d4 6s 6p	((<4>3P)4P)5P	+ 9%	5d4 6s 6p	((<4>5D)4D)5F	
				+ 6%	5d4 6s 6p	((<4>3D)4D)5D	+ 5%	5d5 6p	(<5>6S)5P		
	42262.3	41932.0	330.3		12%	5d4 6s 6p	((<4>5D)4D)3P	+ 9%	5d3 6s2 6p	(<3>4P)5D	
				+ 8%	5d4 6s 6p	((<4>5D)4D)5D	+ 4%	5d4 6s 6p	((<4>3G)4G)5F		
	42573.5	42653.0	-79.5		13%	5d4 6s 6p	((<4>3G)4G)5F	+ 10%	5d4 6s 6p	((<4>5D)4D)5F	
				+ 6%	5d4 6s 6p	((<4>3F)4F)5F	+ 4%	5d4 6s 6p	((<4>3P)4P)5P		
		-	43395.0	-		11%	5d4 6s 6p	((<4>3F)4F)5D	+ 8%	5d4 6s 6p	((<4>3G)4G)5F
				+ 5%	5d4 6s 6p	((<4>3P)4P)3S	+ 5%	5d4 6s 6p	((<2>3P)4P)3S		
	43892.6	44093.0	-200.4		25%	5d4 6s 6p	((<4>3F)4F)5F	+ 7%	5d3 6s2 6p	(<3>4F)5F	
				+ 5%	5d3 6s2 6p	(<3>2P)3D	+ 4%	5d4 6s 6p	((<4>5D)4D)3D		
	44353.5	44519.0	-165.5		15%	5d3 6s2 6p	(<3>2D)3D	+ 7%	5d3 6s2 6p	(<3>4P)5D	
				+ 6%	5d4 6s 6p	((<4>1D)2D)3D	+ 6%	5d4 6s 6p	((<4>3D)2D)3D		
	43217.3	44799.0	-1581.7		11%	5d4 6s 6p	((<4>3F)4F)5D	+ 7%	5d3 6s2 6p	(<3>4P)5P	
				+ 7%	5d4 6s 6p	((<2>3P)4P)5P	+ 7%	5d4 6s 6p	((<4>3F)4F)5F		
	45374.0	45306.0	68.0		9%	5d4 6s 6p	((<4>3F)4F)5D	+ 7%	5d4 6s 6p	((<4>5D)4D)3D	
				+ 7%	5d4 6s 6p	((<2>3F)4F)5D	+ 6%	5d3 6s2 6p	(<3>2P)1P		
	44737.2	45464.0	-726.8		12%	5d4 6s 6p	((<4>5D)4D)5D	+ 6%	5d4 6s 6p	((<4>3G)4G)5F	
				+ 5%	5d3 6s2 6p	(<3>2P)1P	+ 5%	5d3 6s2 6p	(<3>2D)3P		
	45760.8	45988.0	-227.2		9%	5d4 6s 6p	((<4>5D)4D)3D	+ 8%	5d3 6s2 6p	(<3>4P)5D	
				+ 6%	5d3 6s2 6p	(<3>2P)3D	+ 6%	5d3 6s2 6p	(<3>2D)1P		
	46291.6	46767.0	-475.4		11%	5d4 6s 6p	((<4>5D)6D)5D	+ 9%	5d4 6s 6p	((<4>3P)2P)3P	
				+ 6%	5d3 6s2 6p	(<3>2D)3P	+ 6%	5d3 6s2 6p	(<3>2P)3P		
	47255.6	47151.0	104.6		19%	5d4 6s 6p	((<4>3D)4D)5F	+ 7%	5d4 6s 6p	((<4>5D)4D)3D	
				+ 7%	5d3 6s2 6p	(<3>4P)3D	+ 5%	5d3 6s2 6p	(<3>4F)3D		
	47819.9	48298.0	-478.1		29%	5d4 6s 6p	((<4>3G)4G)5F	+ 21%	5d4 6s 6p	((<4>3D)4D)5F	
				+ 6%	5d4 6s 6p	((<4>5D)4D)5F	+ 5%	5d3 6s2 6p	(<3>2P)3D		
	48390.0	48669.0	-279.0		13%	5d4 6s 6p	((<4>3D)4D)3D	+ 11%	5d4 6s 6p	((<4>5D)4D)3D	
				+ 9%	5d4 6s 6p	((<4>3D)4D)5P	+ 9%	5d4 6s 6p	((<4>3F)4F)5F		
	48788.1	49186.0	-397.9		10%	5d4 6s 6p	((<4>1S)2S)3P	+ 8%	5d4 6s 6p	((<4>3D)4D)5P	
				+ 6%	5d4 6s 6p	((<4>5D)4D)3D	+ 5%	5d3 6s2 6p	(<3>2P)3S		
	49443.7	49757.0	-313.3		7%	5d4 6s 6p	((<4>3D)4D)5D	+ 7%	5d3 6s2 6p	(<3>4P)3P	
				+ 6%	5d4 6s 6p	((<4>3D)2D)1P	+ 6%	5d4 6s 6p	((<4>5D)4D)5P		
	50533.5	50404.0	129.5		16%	5d4 6s 6p	((<4>3D)4D)5D	+ 8%	5d4 6s 6p	((<4>3D)4D)3D	
				+ 7%	5d4 6s 6p	((<4>5D)4D)5P	+ 5%	5d4 6s 6p	((<4>3D)4D)5P		
	46104.6	50667.0	-4562.4		11%	5d3 6s2 6p	(<3>2P)3P	+ 9%	5d4 6s 6p	((<4>5D)4D)5P	

			+ 8% 5d4 6s 6p ((<4>3D)4D)5P + 8% 5d4 6s 6p ((<4>3D)4D)5D
51763.4	51289.0	474.4	17% 5d4 6s 6p ((<4>5D)4D)5P + 14% 5d5 6p (<5>6S)5P
			+ 11% 5d4 6s 6p ((<4>5D)6D)5P + 8% 5d4 6s 6p ((<4>3D)4D)5P
52477.6	51729.0	748.6	9% 5d3 6s2 6p (<3>2D)1P + 6% 5d3 6s2 6p (<3>2P)3P
			+ 6% 5d3 6s2 6p (<3>2D)3P + 6% 5d4 6s 6p ((<2>3P)4P)3D
53420.1	52733.0	687.1	11% 5d4 6s 6p ((<4>3F)2F)3D + 6% 5d5 6p (<5>2D)3D
			+ 6% 5d3 6s2 6p (<3>2F)3D + 5% 5d5 6p (<5>4D)5F
53227.0	53028.0	199.0	7% 5d4 6s 6p ((<4>3P)2P)3D + 6% 5d4 6s 6p ((<4>3D)4D)5D
			+ 5% 5d4 6s 6p ((<2>3P)2P)3P + 4% 5d5 6p (<3>4P)3P
53875.3	53499.0	376.3	10% 5d5 6p (<5>4D)3D + 9% 5d4 6s 6p ((<4>1S)2S)3P
			+ 9% 5d4 6s 6p ((<4>3P)2P)1P + 7% 5d4 6s 6p ((<4>3D)4D)3D
54374.8	53810.0	564.8	8% 5d4 6s 6p ((<4>3P)2P)1P + 7% 5d3 6s2 6p (<3>2P)1P
			+ 5% 5d5 6p (<3>4P)5D + 4% 5d3 6s2 6p (<3>2P)3P
54419.7	54383.0	36.7	9% 5d4 6s 6p ((<2>3F)4F)5F + 6% 5d4 6s 6p ((<4>3D)2D)3D
			+ 6% 5d4 6s 6p ((<4>1D)2D)3D + 6% 5d3 6s2 6p (<3>4P)3S
54941.0	54621.0	320.0	12% 5d4 6s 6p ((<4>3P)2P)3P + 8% 5d5 6p (<3>4P)3S
			+ 6% 5d4 6s 6p ((<4>3D)2D)1P + 6% 5d3 6s2 6p (<3>2P)1P
55384.4	54762.0	622.4	20% 5d5 6p (<3>4P)5D + 5% 5d5 6p (<3>4P)5P
			+ 5% 5d3 6s2 6p (<3>2P)3D
58290.2	55438.0	2852.2	14% 5d5 6p (<5>4G)5F + 7% 5d3 6s2 6p (<3>4P)3S
			+ 6% 5d4 6s 6p ((<4>1D)2D)3D + 6% 5d3 6s2 6p (<3>2P)1P
55859.3	55646.0	213.3	21% 5d4 6s 6p ((<2>3F)4F)5F + 6% 5d5 6p (<3>4F)5F
			+ 5% 5d5 6p (<3>4P)5D + 5% 5d4 6s 6p ((<4>5D)4D)3D
-	56216.0	-	12% 5d4 6s 6p ((<2>3P)4P)5P + 11% 5d5 6p (<3>4P)5P
			+ 8% 5d4 6s 6p ((<4>1D)2D)3P + 5% 5d3 6s2 6p (<3>2P)3S
-	56428.0	-	16% 5d5 6p (<5>4G)5F + 8% 5d3 6s2 6p (<3>2P)3S
			+ 6% 5d5 6p (<3>2F)3D + 5% 5d3 6s2 6p (<3>4P)3S
-	57011.0	-	7% 5d5 6p (<5>4D)5F + 7% 5d4 6s 6p ((<4>3D)2D)3D
			+ 7% 5d3 6s2 6p (<3>4P)3P + 6% 5d5 6p (<3>4P)5D
-	57547.0	-	11% 5d3 6s2 6p (<3>2P)3S + 8% 5d5 6p (<5>4G)5F
			+ 8% 5d3 6s2 6p (<3>4P)5P + 6% 5d4 6s 6p ((<2>3P)4P)3S
-	57697.0	-	27% 5d5 6p (<5>4D)5F + 6% 5d5 6p (<5>4D)3D
			+ 5% 5d4 6s 6p ((<4>1F)2F)3D + 4% 5d4 6s 6p ((<4>3D)2D)3P
-	58166.0	-	9% 5d5 6p (<3>4P)5P + 8% 5d5 6p (<5>4D)5P
			+ 8% 5d5 6p (<3>4P)3P + 6% 5d5 6p (<5>4D)5F
-	58570.0	-	7% 5d4 6s 6p ((<2>3F)4F)5F + 6% 5d4 6s 6p ((<4>3P)2P)1P
			+ 5% 5d4 6s 6p ((<2>3F)4F)5D + 5% 5d5 6p (<5>4G)5F
-	59049.0	-	6% 5d5 6p (<5>4D)5D + 5% 5d4 6s 6p ((<4>3P)2P)3D
			+ 5% 5d5 6p (<3>4P)5D + 4% 5d4 6s 6p ((<2>3P)4P)3P
-	59598.0	-	10% 5d4 6s 6p ((<2>3F)4F)5F + 9% 5d4 6s 6p ((<4>1F)2F)3D
			+ 6% 5d4 6s 6p ((<2>3F)4F)3D + 4% 5d4 6s 6p ((<4>3P)2P)1P
-	59880.0	-	11% 5d3 6s2 6p (<3>4P)3D + 8% 5d5 6p (<3>4P)3D
			+ 6% 5d5 6p (<5>4D)3D + 4% 5d4 6s 6p ((<2>3P)4P)5P
-	60592.0	-	14% 5d3 6s2 6p (<3>2F)3D + 8% 5d5 6p (<5>4D)3D
			+ 6% 5d4 6s 6p ((<4>1F)2F)3D + 6% 5d4 6s 6p ((<4>3F)2F)3D
-	60782.0	-	9% 5d5 6p (<3>4F)3D + 7% 5d4 6s 6p ((<2>3P)4P)3D
			+ 6% 5d4 6s 6p ((<4>1D)2D)3P + 6% 5d3 6s2 6p (<3>4P)3S
-	61207.0	-	15% 5d5 6p (<5>4D)5D + 5% 5d4 6s 6p ((<4>3D)2D)1P
			+ 5% 5d5 6p (<5>4D)3P + 5% 5d4 6s 6p ((<4>1D)2D)3D
-	61503.0	-	17% 5d5 6p (<5>4D)5P + 15% 5d4 6s 6p ((<2>3P)4P)5P
			+ 11% 5d4 6s 6p ((<2>3F)4F)5D + 8% 5d4 6s 6p ((<4>3D)4D)5P
-	61919.0	-	11% 5d4 6s 6p ((<2>3P)4P)5D + 9% 5d4 6s 6p ((<4>3P)4P)5D
			+ 7% 5d5 6p (<5>4D)3P + 6% 5d4 6s 6p ((<4>3D)4D)3P
-	62397.0	-	12% 5d5 6p (<5>4D)5D + 10% 5d5 6p (<5>4D)5P
			+ 8% 5d5 6p (<5>4D)3P + 6% 5d5 6p (<3>4P)5D
-	62538.0	-	14% 5d4 6s 6p ((<4>3D)4D)3P + 6% 5d4 6s 6p ((<2>3P)4P)3D
			+ 5% 5d4 6s 6p ((<4>1D)2D)3P + 4% 5d5 6p (<5>2D)3P
-	63298.0	-	15% 5d5 6p (<3>4P)5P + 14% 5d5 6p (<5>4D)5P
			+ 9% 5d4 6s 6p ((<4>3P)4P)5P + 6% 5d5 6p (<5>4D)5D
-	64084.0	-	8% 5d3 6s2 6p (<3>4P)3D + 7% 5d3 6s2 6p (<3>2P)1P
			+ 6% 5d4 6s 6p ((<2>3F)2F)3D + 5% 5d5 6p (<3>4P)3P
-	64240.0	-	14% 5d5 6p (<3>4P)3D + 8% 5d5 6p (<3>4F)3D
			+ 7% 5d5 6p (<5>2F)3D + 5% 5d5 6p (<3>2F)3D
-	64605.0	-	8% 5d3 6s2 6p (<3>2P)1P + 7% 5d4 6s 6p ((<4>3P)2P)1P
			+ 7% 5d3 6s2 6p (<1>2D)3D + 6% 5d5 6p (<3>4P)3P
-	65637.0	-	14% 5d5 6p (<3>4F)5F + 7% 5d5 6p (<3>4F)5D
			+ 6% 5d4 6s 6p ((<4>1S)2S)1P + 5% 5d3 6s2 6p (<1>2D)1P
-	65876.0	-	12% 5d5 6p (<3>4P)3P + 5% 5d5 6p (<5>2D)1P
			+ 5% 5d4 6s 6p ((<2>3P)4P)3P + 4% 5d4 6s 6p ((<4>3P)2P)3P
-	66308.0	-	8% 5d3 6s2 6p (<3>2F)3D + 8% 5d4 6s 6p ((<4>1F)2F)3D
			+ 6% 5d5 6p (<3>4F)3D + 4% 5d4 6s 6p ((<4>3P)4P)5D
-	66740.0	-	21% 5d5 6p (<3>4F)5F + 11% 5d5 6p (<3>4F)3D
-	67323.0	-	22% 5d5 6p (<3>4F)5D + 13% 5d4 6s 6p ((<2>3F)4F)5D
			+ 6% 5d5 6p (<3>4F)5F + 5% 5d4 6s 6p ((<4>1F)2F)3D
-	67410.0	-	13% 5d4 6s 6p ((<4>1F)2F)3D + 6% 5d5 6p (<3>4P)3P
			+ 5% 5d4 6s 6p ((<4>1S)2S)1P + 5% 5d5 6p (<3>4P)3S

		-	67602.0	-	9%	5d5 6p	(<5>2D)3D	+	9%	5d4 6s 6p	((<4>3P)4P)3D
					+ 6%	5d3 6s2 6p	(<1>2D)3D	+	5%	5d5 6p	(<3>4F)5D
		-	68605.0	-	19%	5d5 6p	(<3>4F)5D	+	6%	5d4 6s 6p	((<4>3D)4D)3P
					+ 5%	5d5 6p	(<5>2S)3P	+	5%	5d4 6s 6p	((<4>3F)4F)5D
		-	69857.0	-	10%	5d5 6p	(<3>4F)5D	+	8%	5d3 6s2 6p	(<3>2F)3D
					+ 7%	5d5 6p	(<3>2F)3D	+	6%	5d4 6s 6p	((<2>1D)2D)3P
		-	70261.0	-	10%	5d4 6s 6p	((<2>3P)2P)3P	+	7%	5d5 6p	(<3>4P)3S
					+ 7%	5d4 6s 6p	((<4>1D)2D)1P	+	6%	5d4 6s 6p	((<2>3P)2P)1P
		-	70452.0	-	15%	5d4 6s 6p	((<4>3P)4P)3S	+	7%	5d3 6s2 6p	(<3>4P)3S
					+ 6%	5d4 6s 6p	((<2>3P)2P)3S	+	6%	5d4 6s 6p	((<2>3P)2P)3P
		-	71072.0	-	11%	5d4 6s 6p	((<4>3P)4P)3S	+	9%	5d4 6s 6p	((<4>1D)2D)1P
					+ 9%	5d5 6p	(<5>2S)1P	+	6%	5d5 6p	(<5>2D)1P
		-	71268.0	-	15%	5d5 6p	(<3>2F)3D	+	15%	5d4 6s 6p	((<4>3P)2P)3S
					+ 6%	5d5 6p	(<3>4P)3S	+	5%	5d3 6s2 6p	(<3>2D)3P
		-	71939.0	-	13%	5d5 6p	(<5>4D)3D	+	9%	5d5 6p	(<3>4F)3D
					+ 7%	5d4 6s 6p	((<4>3D)4D)3D	+	6%	5d3 6s2 6p	(<1>2D)3D
		-	72716.0	-	9%	5d5 6p	(<3>2D)3D	+	8%	5d4 6s 6p	((<4>3P)2P)3D
					+ 5%	5d3 6s2 6p	(<3>2D)3D	+	5%	5d4 6s 6p	((<4>3D)2D)3D
		-	73480.0	-	15%	5d5 6p	(<5>2F)3D	+	10%	5d5 6p	(<5>2D)3D
					+ 8%	5d5 6p	(<3>2D)3D	+	8%	5d4 6s 6p	((<4>3D)4D)3D
		-	74534.0	-	10%	5d4 6s 6p	((<2>3P)2P)1P	+	7%	5d5 6p	(<5>2S)3P
					+ 6%	5d5 6p	(<5>2F)3D	+	5%	5d4 6s 6p	((<4>3P)2P)1P
		-	74859.0	-	14%	5d4 6s 6p	((<2>3F)2F)3D	+	13%	5d5 6p	(<5>2D)3P
					+ 5%	5d3 6s2 6p	(<1>2D)3D	+	5%	5d4 6s 6p	((<2>3P)4P)3P
		-	75753.0	-	10%	5d4 6s 6p	((<2>3P)2P)1P	+	7%	5d5 6p	(<5>2D)1P
					+ 6%	5d5 6p	(<3>2D)3D	+	5%	5d5 6p	(<3>2P)1P
		-	76502.0	-	10%	5d3 6s2 6p	(<3>2D)3P	+	9%	5d5 6p	(<5>2S)3P
					+ 8%	5d4 6s 6p	((<2>3P)4P)3P	+	7%	5d4 6s 6p	((<4>3P)4P)3P
		-	76589.0	-	14%	5d5 6p	(<5>2S)3P	+	10%	5d5 6p	(<5>2F)3D
					+ 10%	5d5 6p	(<5>2S)1P	+	9%	5d5 6p	(<3>2D)1P
		-	77518.0	-	17%	5d5 6p	(<3>2D)1P	+	13%	5d4 6s 6p	((<2>1D)2D)3D
					+ 7%	5d5 6p	(<5>2S)3P	+	7%	5d5 6p	(<3>2D)3D
		-	77901.0	-	12%	5d5 6p	(<5>2S)3P	+	11%	5d4 6s 6p	((<2>1D)2D)3D
					+ 8%	5d5 6p	(<3>2D)3D	+	7%	5d5 6p	(<5>2S)1P
		-	79135.0	-	13%	5d5 6p	(<3>2F)3D	+	10%	5d3 6s2 6p	(<1>2D)1P
					+ 8%	5d5 6p	(<3>4F)3D	+	5%	5d4 6s 6p	((<4>3F)2F)3D
		-	80435.0	-	12%	5d5 6p	(<3>2D)3P	+	11%	5d3 6s2 6p	(<1>2D)3P
					+ 8%	5d4 6s 6p	((<2>1D)2D)3D	+	8%	5d4 6s 6p	((<2>3P)2P)3S
		-	82263.0	-	16%	5d5 6p	(<3>2D)1P	+	10%	5d3 6s2 6p	(<1>2D)1P
					+ 10%	5d5 6p	(<5>2D)1P	+	7%	5d5 6p	(<5>2S)1P
		-	83501.0	-	9%	5d4 6s 6p	((<2>3P)2P)3S	+	8%	5d4 6s 6p	((<2>1D)2D)3D
					+ 6%	5d4 6s 6p	((<2>3P)4P)3S	+	6%	5d4 6s 6p	((<4>3P)4P)3D
		-	83811.0	-	17%	5d4 6s 6p	((<2>1D)2D)1P	+	8%	5d5 6p	(<3>2P)3P
					+ 7%	5d4 6s 6p	((<2>3F)2F)3D				
		-	84560.0	-	35%	5d5 6p	(<3>2D)3P	+	15%	5d4 6s 6p	((<2>1D)2D)3P
					+ 9%	5d4 6s 6p	((<0>1S)2S)3P	+	4%	5d3 6s2 6p	(<1>2D)3P
		-	85064.0	-	11%	5d4 6s 6p	((<2>3P)4P)3D	+	10%	5d5 6p	(<3>2P)3D
					+ 8%	5d5 6p	(<3>2D)3D	+	6%	5d4 6s 6p	((<4>3P)4P)3D
		-	85689.0	-	22%	5d5 6p	(<3>2D)3D	+	12%	5d4 6s 6p	((<2>1D)2D)3D
					+ 8%	5d4 6s 6p	((<2>3F)2F)3D	+	7%	5d4 6s 6p	((<4>1D)2D)3D
		-	87042.0	-	18%	5d4 6s 6p	((<2>1D)2D)1P	+	7%	5d4 6s 6p	((<4>1D)2D)1P
					+ 6%	5d5 6p	(<3>2P)3D	+	5%	5d3 6s2 6p	(<1>2D)1P
		-	89010.0	-	16%	5d4 6s 6p	((<2>1D)2D)1P	+	12%	5d4 6s 6p	((<0>1S)2S)1P
					+ 11%	5d4 6s 6p	((<4>1D)2D)1P	+	5%	5d5 6p	(<1>2D)3P
		-	89737.0	-	28%	5d5 6p	(<3>2P)3P	+	17%	5d5 6p	(<1>2D)3P
					+ 6%	5d5 6p	(<3>2D)1P	+	5%	5d4 6s 6p	((<4>1D)2D)1P
		-	93037.0	-	47%	5d4 6s 6p	((<0>1S)2S)3P	+	15%	5d4 6s 6p	((<4>1S)2S)3P
					+ 10%	5d4 6s 6p	((<2>1D)2D)3P	+	8%	5d5 6p	(<3>2P)3S
		-	93740.0	-	56%	5d5 6p	(<3>2P)3D	+	13%	5d5 6p	(<1>2D)3D
					+ 7%	5d4 6s 6p	((<2>3P)2P)3D				
		-	95431.0	-	67%	5d5 6p	(<3>2P)3S	+	6%	5d5 6p	(<3>2P)3P
					+ 5%	5d4 6s 6p	((<2>3P)2P)3S	+	4%	5d5 6p	(<1>2D)3D
		-	96769.0	-	32%	5d5 6p	(<3>2P)1P	+	13%	5d5 6p	(<1>2D)1P
					+ 11%	5d5 6p	(<1>2D)3D				
		-	98544.0	-	35%	5d5 6p	(<1>2D)3D	+	10%	5d5 6p	(<5>2D)3D
					+ 10%	5d5 6p	(<1>2D)1P	+	6%	5d5 6p	(<3>2D)1P
		-	101493.0	-	33%	5d5 6p	(<1>2D)3P	+	19%	5d5 6p	(<3>2P)3P
					+ 12%	5d5 6p	(<5>2D)3P	+	6%	5d5 6p	(<3>2P)1P
		-	103850.0	-	29%	5d5 6p	(<3>2P)1P	+	12%	5d5 6p	(<1>2D)1P
					+ 11%	5d4 6s 6p	((<2>1D)2D)1P	+	8%	5d5 6p	(<1>2D)3P
		-	110606.0	-	49%	5d4 6s 6p	((<0>1S)2S)1P	+	23%	5d5 6p	(<1>2D)1P
					+ 12%	5d4 6s 6p	((<4>1S)2S)1P	+	4%	5d3 6s2 6p	(<1>2D)1P
2	21448.8	22151.0	-702.2	85%	5d4 6s 6p	((<4>5D)6D)7F	+	5%	5d4 6s 6p	((<2>3P)4P)5D	
	23964.7	24840.0	-875.3	72%	5d4 6s 6p	((<4>5D)6D)7P	+	10%	5d4 6s 6p	((<4>5D)6D)7D	
	26229.8	25122.0	1107.8	51%	5d4 6s 6p	((<4>5D)6D)7D	+	16%	5d4 6s 6p	((<4>5D)6D)5P	

			+ 10% 5d4 6s 6p ((<4>5D)6D)7P	+ 4% 5d4 6s 6p	((<4>3P)4P)5P
26367.3	26199.0	168.3	62% 5d3 6s2 6p (<3>4F)5G	+ 8% 5d3 6s2 6p	(<3>2D)3F
			+ 7% 5d3 6s2 6p (<3>4F)3F	+ 4% 5d3 6s2 6p	(<1>2D)3F
27662.5	28428.0	-765.5	28% 5d3 6s2 6p (<3>4F)5F	+ 17% 5d4 6s 6p	((<4>5D)6D)5F
			+ 8% 5d3 6s2 6p (<3>4F)3D	+ 6% 5d4 6s 6p	((<4>3F)4F)5F
29195.8	29863.0	-667.2	24% 5d4 6s 6p ((<4>5D)6D)7D	+ 16% 5d4 6s 6p	((<4>5D)6D)5P
			+ 8% 5d3 6s2 6p (<3>4F)5F	+ 7% 5d4 6s 6p	((<4>5D)6D)5F
29393.4	30421.0	-1027.6	15% 5d3 6s2 6p (<3>4F)3D	+ 10% 5d4 6s 6p	((<4>5D)6D)5P
			+ 9% 5d3 6s2 6p (<3>4F)5D	+ 7% 5d3 6s2 6p	(<3>4F)5G
31817.6	31871.0	-53.4	20% 5d3 6s2 6p (<3>4F)5D	+ 17% 5d4 6s 6p	((<4>5D)6D)5D
			+ 15% 5d3 6s2 6p (<3>4P)5D	+ 9% 5d3 6s2 6p	(<3>4F)5F
33141.4	33477.0	-335.6	44% 5d5 6p (<5>6S)7P	+ 8% 5d4 6s 6p	((<4>5D)4D)5P
			+ 6% 5d5 6p (<5>6S)5P	+ 6% 5d4 6s 6p	((<4>5D)6D)5P
33944.1	34229.0	-284.9	15% 5d3 6s2 6p (<3>4F)5F	+ 13% 5d4 6s 6p	((<4>5D)4D)5F
			+ 11% 5d4 6s 6p ((<4>5D)6D)5F	+ 7% 5d5 6p	(<5>6S)7P
35311.6	34934.0	377.6	20% 5d3 6s2 6p (<3>4F)3D	+ 10% 5d4 6s 6p	((<4>3P)4P)5D
			+ 5% 5d3 6s2 6p (<3>4P)5D	+ 5% 5d3 6s2 6p	(<3>4F)3F
34485.9	35036.0	-550.1	19% 5d5 6p (<5>6S)7P	+ 6% 5d3 6s2 6p	(<3>4P)3P
			+ 5% 5d3 6s2 6p (<3>4F)5D	+ 4% 5d4 6s 6p	((<4>3P)4P)5D
35732.0	35381.0	351.0	12% 5d4 6s 6p ((<4>5D)4D)5P	+ 10% 5d5 6p	(<5>6S)7P
			+ 10% 5d5 6p (<5>6S)5P	+ 8% 5d4 6s 6p	((<4>3P)4P)5S
36673.7	36752.0	-78.3	23% 5d4 6s 6p ((<4>3G)4G)5G	+ 7% 5d4 6s 6p	((<4>3G)4G)3F
			+ 6% 5d4 6s 6p ((<4>1F)2F)3F	+ 5% 5d5 6p	(<5>4G)5G
36904.2	37035.0	-130.8	8% 5d4 6s 6p ((<4>5D)4D)3F	+ 7% 5d3 6s2 6p	(<3>4F)3F
			+ 7% 5d3 6s2 6p (<3>4F)5F	+ 7% 5d4 6s 6p	((<4>5D)6D)5F
37466.3	38596.0	-1129.7	7% 5d4 6s 6p ((<4>5D)4D)3P	+ 6% 5d4 6s 6p	((<4>3F)2F)1D
			+ 5% 5d4 6s 6p ((<4>5D)4D)5D	+ 5% 5d3 6s2 6p	(<3>2F)1D
39030.3	39330.0	-299.8	18% 5d4 6s 6p ((<4>3F)4F)5G	+ 9% 5d4 6s 6p	((<2>3F)4F)5G
			+ 6% 5d4 6s 6p ((<4>3P)4P)5P		
39707.0	39567.0	140.0	36% 5d5 6p (<5>6S)5P	+ 9% 5d4 6s 6p	((<4>3P)4P)5P
			+ 6% 5d4 6s 6p ((<4>3F)4F)5G	+ 4% 5d4 6s 6p	((<4>5D)6D)5P
41104.5	40334.0	770.5	11% 5d4 6s 6p ((<4>3H)4H)5G	+ 7% 5d3 6s2 6p	(<3>2P)3D
			+ 6% 5d3 6s2 6p (<3>2D)3F	+ 5% 5d4 6s 6p	((<4>3F)4F)5G
40011.5	40761.0	-749.5	20% 5d3 6s2 6p (<3>4F)3F	+ 6% 5d4 6s 6p	((<4>5D)4D)5D
			+ 6% 5d3 6s2 6p (<3>4F)5D	+ 5% 5d3 6s2 6p	(<3>2P)3D
40868.4	41144.0	-275.6	11% 5d4 6s 6p ((<4>3G)4G)5G	+ 6% 5d4 6s 6p	((<4>5D)4D)5D
			+ 6% 5d3 6s2 6p (<3>4F)3D	+ 5% 5d4 6s 6p	((<4>3F)4F)5G
41583.2	41491.0	92.2	11% 5d4 6s 6p ((<4>5D)4D)3P	+ 9% 5d4 6s 6p	((<4>5D)4D)3F
			+ 5% 5d4 6s 6p ((<4>3G)4G)3F	+ 5% 5d3 6s2 6p	(<3>2D)3F
41734.1	41622.0	112.1	10% 5d4 6s 6p ((<4>5D)4D)3F	+ 9% 5d3 6s2 6p	(<3>4P)5P
			+ 7% 5d4 6s 6p ((<4>3P)4P)5S	+ 4% 5d3 6s2 6p	(<3>4F)3F
42449.6	41959.0	490.6	7% 5d4 6s 6p ((<4>3H)4H)5G	+ 6% 5d4 6s 6p	((<4>5D)4D)3P
			+ 5% 5d4 6s 6p ((<4>1G)2G)3F	+ 5% 5d3 6s2 6p	(<3>2D)3F
41978.6	42620.0	-641.4	21% 5d4 6s 6p ((<4>5D)4D)5F	+ 10% 5d4 6s 6p	((<4>5D)6D)5F
			+ 9% 5d4 6s 6p ((<4>5D)4D)5D	+ 7% 5d5 6p	(<5>4G)5F
43227.7	43027.0	200.7	15% 5d4 6s 6p ((<4>3H)4H)5G	+ 8% 5d3 6s2 6p	(<3>2G)3F
			+ 7% 5d4 6s 6p ((<4>3G)4G)5G	+ 5% 5d4 6s 6p	((<4>1G)2G)3F
43514.7	43370.0	144.7	9% 5d4 6s 6p ((<4>5D)4D)3P	+ 8% 5d4 6s 6p	((<4>3G)4G)5G
			+ 5% 5d4 6s 6p ((<4>3F)4F)5F	+ 5% 5d4 6s 6p	((<4>3G)4G)3F
43975.2	43878.0	97.2	12% 5d4 6s 6p ((<4>3D)4D)5D	+ 5% 5d4 6s 6p	((<4>3D)4D)5P
			+ 5% 5d5 6p (<5>4D)5D	+ 5% 5d4 6s 6p	((<4>3G)4G)5F
44436.8	44441.0	-4.3	9% 5d4 6s 6p ((<4>3D)4D)5F	+ 6% 5d4 6s 6p	((<4>5D)4D)3F
			+ 5% 5d4 6s 6p ((<4>5D)4D)5D	+ 5% 5d3 6s2 6p	(<3>4P)5P
44596.3	44547.0	49.3	17% 5d4 6s 6p ((<4>3F)4F)5F	+ 6% 5d3 6s2 6p	(<3>4P)5D
			+ 5% 5d4 6s 6p ((<2>3F)4F)5F	+ 5% 5d4 6s 6p	((<4>3D)4D)5P
45422.3	44983.0	439.3	9% 5d4 6s 6p ((<4>5D)4D)3P	+ 6% 5d3 6s2 6p	(<3>4P)5D
			+ 6% 5d3 6s2 6p (<3>2P)3D	+ 4% 5d4 6s 6p	((<4>3H)4H)5G
45019.0	45183.0	-164.0	25% 5d4 6s 6p ((<4>3F)4F)5D	+ 12% 5d4 6s 6p	((<4>3D)4D)5F
			+ 8% 5d4 6s 6p ((<2>3F)4F)5D	+ 5% 5d4 6s 6p	((<4>3H)4H)5G
45902.5	45894.0	8.5	11% 5d3 6s2 6p (<3>2G)3F	+ 8% 5d4 6s 6p	((<4>3D)4D)5P
			+ 6% 5d4 6s 6p ((<4>5D)4D)3D		
46806.4	46051.0	755.4	9% 5d3 6s2 6p (<3>2G)3F	+ 5% 5d5 6p	(<5>4D)5D
			+ 5% 5d4 6s 6p ((<4>5D)6D)5D	+ 5% 5d4 6s 6p	((<2>3P)4P)5P
47079.4	46317.0	762.4	9% 5d3 6s2 6p (<3>2P)3P	+ 6% 5d3 6s2 6p	(<3>2G)3F
			+ 5% 5d4 6s 6p ((<4>3H)4H)5G	+ 5% 5d3 6s2 6p	(<3>4F)5F
46327.8	46522.0	-194.3	17% 5d4 6s 6p ((<4>3F)4F)5F	+ 7% 5d4 6s 6p	((<4>5D)4D)3D
			+ 7% 5d4 6s 6p ((<4>3H)4H)5G	+ 6% 5d3 6s2 6p	(<3>4F)5F
47337.9	47127.0	210.9	7% 5d3 6s2 6p (<3>4P)3P	+ 6% 5d4 6s 6p	((<4>3D)4D)5F
47442.5	47686.0	-243.5	7% 5d4 6s 6p ((<4>3D)4D)5P	+ 6% 5d4 6s 6p	((<4>3D)2D)1D
			+ 5% 5d4 6s 6p ((<2>3P)4P)5D		
48244.3	47840.0	404.3	9% 5d4 6s 6p ((<4>5D)4D)3D	+ 7% 5d4 6s 6p	((<4>3D)4D)5P
			+ 7% 5d3 6s2 6p (<3>4P)5S	+ 6% 5d4 6s 6p	((<4>5D)4D)3P
49270.2	48755.0	515.2	6% 5d4 6s 6p ((<4>1D)2D)3D	+ 5% 5d3 6s2 6p	(<3>2D)3D
			+ 5% 5d4 6s 6p ((<4>3D)4D)5F	+ 5% 5d4 6s 6p	((<4>3F)2F)3D
48318.8	49135.0	-816.2	6% 5d4 6s 6p ((<4>3P)4P)5P	+ 5% 5d4 6s 6p	((<4>5D)4D)5P
			+ 4% 5d4 6s 6p ((<4>5D)4D)3F		

49151.9	49339.0	-187.1	19% 5d4 6s 6p ((<4>3G)4G)5F + 7% 5d4 6s 6p ((<4>3D)4D)5F
49517.3	49751.0	-233.7	15% 5d4 6s 6p ((<4>5D)4D)3D + 9% 5d5 6p (<5>4D)3D
			+ 5% 5d4 6s 6p ((<4>5D)4D)5F + 5% 5d4 6s 6p ((<4>3D)4D)5F
50494.5	49902.0	592.5	8% 5d4 6s 6p ((<4>3D)4D)5D + 8% 5d3 6s2 6p (<3>2P)3D
			+ 6% 5d4 6s 6p ((<4>3D)4D)3D + 5% 5d4 6s 6p ((<4>5D)4D)5P
50718.9	50414.0	304.9	6% 5d4 6s 6p ((<4>3D)4D)3D + 5% 5d5 6p (<5>4G)5G
			+ 5% 5d3 6s2 6p (<3>4P)5D + 5% 5d3 6s2 6p (<3>2G)3F
51182.4	51194.0	-11.6	6% 5d4 6s 6p ((<4>5D)4D)3D + 5% 5d4 6s 6p ((<2>3P)4P)5S
			+ 4% 5d4 6s 6p ((<4>3G)4G)3F + 4% 5d4 6s 6p ((<4>5D)4D)5P
51606.8	51325.0	281.8	29% 5d5 6p (<5>4G)5G + 8% 5d5 6p (<5>4G)3F
			+ 6% 5d4 6s 6p ((<4>1F)2F)3F + 4% 5d4 6s 6p ((<4>3G)4G)5G
52064.1	51823.0	241.1	6% 5d3 6s2 6p (<3>4P)3P + 5% 5d3 6s2 6p (<3>4P)3D
			+ 5% 5d4 6s 6p ((<4>3D)4D)5D + 5% 5d4 6s 6p ((<4>3D)2D)3F
51693.8	51957.0	-263.2	13% 5d4 6s 6p ((<4>3F)4F)3F + 7% 5d4 6s 6p ((<4>3D)4D)5D
			+ 5% 5d4 6s 6p ((<2>3P)4P)5S + 4% 5d4 6s 6p ((<4>5D)4D)3D
52056.4	52378.0	-321.6	8% 5d4 6s 6p ((<2>3P)4P)5S + 7% 5d5 6p (<5>4G)3F
			+ 6% 5d3 6s2 6p (<3>2P)1D + 6% 5d5 6p (<5>4D)5F
52152.6	52580.0	-427.4	8% 5d4 6s 6p ((<4>3P)2P)1D + 5% 5d3 6s2 6p (<3>2D)3F
			+ 5% 5d4 6s 6p ((<4>3D)2D)3F + 4% 5d4 6s 6p ((<2>3P)2P)1D
52503.4	52818.0	-314.6	6% 5d4 6s 6p ((<4>1D)2D)3F + 4% 5d3 6s2 6p (<3>4P)3D
52653.6	53151.0	-497.4	13% 5d3 6s2 6p (<3>4P)5P + 7% 5d4 6s 6p ((<4>3F)2F)3D
			+ 5% 5d4 6s 6p ((<4>5D)4D)5P + 5% 5d4 6s 6p ((<2>3P)4P)3D
53003.7	53400.0	-396.3	7% 5d3 6s2 6p (<1>2D)3P + 6% 5d4 6s 6p ((<4>1G)2G)3F
			+ 6% 5d3 6s2 6p (<3>2P)1D + 5% 5d4 6s 6p ((<4>1D)2D)3F
52885.5	53730.0	-844.5	8% 5d4 6s 6p ((<4>1S)2S)3P + 6% 5d3 6s2 6p (<3>2P)3P
			+ 6% 5d4 6s 6p ((<2>3P)4P)5S + 4% 5d5 6p (<5>4G)5G
53284.9	54172.0	-887.1	13% 5d4 6s 6p ((<4>5D)4D)5P + 9% 5d3 6s2 6p (<3>2P)3P
			+ 8% 5d5 6p (<5>4G)3F + 5% 5d4 6s 6p ((<4>3D)2D)1D
53669.4	54686.0	-1016.6	6% 5d5 6p (<5>4G)5G + 5% 5d4 6s 6p ((<2>3P)4P)5S
			+ 4% 5d4 6s 6p ((<4>1F)2F)3D
53912.6	54878.0	-965.4	10% 5d5 6p (<5>4D)5F + 8% 5d5 6p (<3>4P)5D
			+ 5% 5d5 6p (<5>4G)3F
53959.3	55371.0	-1411.7	8% 5d4 6s 6p ((<4>1F)2F)3D + 7% 5d4 6s 6p ((<2>3F)4F)5F
			+ 6% 5d5 6p (<5>4G)5F + 6% 5d4 6s 6p ((<4>1D)2D)3D
54859.2	55565.0	-705.8	8% 5d4 6s 6p ((<4>3P)2P)3P + 5% 5d5 6p (<3>4P)5D
55032.7	55967.0	-934.3	13% 5d5 6p (<5>4G)5F + 11% 5d4 6s 6p ((<2>3F)4F)5F
			+ 5% 5d5 6p (<3>4P)5P + 4% 5d5 6p (<3>4P)5D
55084.0	56257.0	-1173.0	7% 5d5 6p (<5>4G)5F + 6% 5d4 6s 6p ((<4>1F)2F)3F
			+ 6% 5d4 6s 6p ((<4>3P)4P)3D + 4% 5d4 6s 6p ((<4>3F)2F)3F
55619.7	56399.0	-779.3	9% 5d3 6s2 6p (<3>2F)3F + 6% 5d5 6p (<5>4D)3F
			+ 5% 5d4 6s 6p ((<4>3D)2D)3F + 5% 5d5 6p (<3>4P)5D
55390.2	56609.0	-1218.8	9% 5d4 6s 6p ((<2>3P)4P)5P + 8% 5d5 6p (<3>4P)5P
			+ 5% 5d5 6p (<5>4G)5F + 4% 5d5 6p (<3>4P)5S
55835.1	57067.0	-1231.9	7% 5d5 6p (<3>4P)5P + 7% 5d5 6p (<5>4D)3F
			+ 6% 5d4 6s 6p ((<4>3F)2F)3F + 4% 5d5 6p (<3>4P)5S
56037.3	57479.0	-1441.7	7% 5d5 6p (<5>4D)5F + 6% 5d4 6s 6p ((<2>3F)4F)5G
			+ 6% 5d5 6p (<3>4P)5D + 6% 5d3 6s2 6p (<3>2F)3F
56999.3	57840.0	-840.7	9% 5d5 6p (<3>4P)5S + 7% 5d5 6p (<3>4P)5P
			+ 5% 5d5 6p (<3>4P)5D
58595.4	58211.0	384.4	7% 5d5 6p (<5>4D)3P + 6% 5d5 6p (<5>4G)5F
			+ 5% 5d5 6p (<3>4P)5S
58655.7	58484.0	171.7	19% 5d5 6p (<5>4D)5F + 7% 5d4 6s 6p ((<4>1F)2F)3D
			+ 5% 5d5 6p (<3>4P)5S
59211.5	58528.0	683.5	8% 5d4 6s 6p ((<4>1F)2F)3F + 6% 5d4 6s 6p ((<4>3D)2D)3D
			+ 6% 5d5 6p (<5>2D)3F + 6% 5d4 6s 6p ((<2>3F)4F)5G
59422.0	58765.0	657.0	14% 5d5 6p (<5>4G)5F + 11% 5d4 6s 6p ((<4>3P)2P)3D
			+ 5% 5d4 6s 6p ((<2>3P)4P)3D + 5% 5d4 6s 6p ((<2>3F)4F)5F
–	59037.0	–	12% 5d4 6s 6p ((<2>3F)4F)5F + 9% 5d4 6s 6p ((<4>3P)2P)3D
			+ 7% 5d3 6s2 6p (<3>2F)3D + 7% 5d3 6s2 6p (<3>4P)3D
59999.1	59282.0	717.1	8% 5d4 6s 6p ((<2>3F)4F)3F + 6% 5d4 6s 6p ((<4>3F)4F)3F
			+ 4% 5d4 6s 6p ((<4>3F)2F)3F
–	59452.0	–	5% 5d3 6s2 6p (<3>2D)1D + 5% 5d4 6s 6p ((<2>3F)4F)5F
			+ 5% 5d5 6p (<5>4D)5F + 4% 5d4 6s 6p ((<2>3F)4F)5G
–	59901.0	–	8% 5d4 6s 6p ((<4>3P)4P)5P + 6% 5d5 6p (<5>4D)5P
			+ 5% 5d4 6s 6p ((<2>3F)4F)5F + 5% 5d3 6s2 6p (<3>2D)3P
–	60550.0	–	7% 5d3 6s2 6p (<3>2F)3D + 5% 5d4 6s 6p ((<4>1S)2S)3P
			+ 4% 5d5 6p (<3>4P)3D + 4% 5d5 6p (<3>4P)3P
–	60711.0	–	8% 5d4 6s 6p ((<2>3F)4F)3D + 5% 5d4 6s 6p ((<4>3D)2D)3D
			+ 4% 5d4 6s 6p ((<2>3P)4P)5D
–	60763.0	–	10% 5d5 6p (<5>4D)5P + 7% 5d4 6s 6p ((<4>3D)4D)3P
			+ 6% 5d5 6p (<5>2D)3P + 4% 5d3 6s2 6p (<1>2D)3D
–	61130.0	–	11% 5d5 6p (<5>4D)5D + 5% 5d5 6p (<3>4F)5D
			+ 5% 5d5 6p (<3>4F)3F + 5% 5d4 6s 6p ((<4>3G)2G)3F
–	61312.0	–	7% 5d4 6s 6p ((<2>3F)4F)5G + 5% 5d4 6s 6p ((<2>3F)4F)5D
			+ 5% 5d4 6s 6p ((<4>3G)2G)3F + 4% 5d5 6p (<3>4P)3P
–	61597.0	–	7% 5d5 6p (<3>4P)5P + 7% 5d5 6p (<5>2F)3D

```
                          +  6% 5d4 6s 6p   ((<2>3P)4P)5P +  5% 5d4 6s 6p   ((<4>3F)2F)3D
-    62165.0       -        6% 5d4 6s 6p   ((<2>3F)4F)5D +  5% 5d5 6p       (<3>4P)5P
                          +  4% 5d5 6p      (<3>4P)5S
-    62381.0       -        8% 5d4 6s 6p   ((<2>3F)4F)5D +  6% 5d4 6s 6p   ((<4>3P)2P)1D
                          +  4% 5d3 6s2 6p  (<1>2D)3F
-    62920.0       -        9% 5d5 6p      (<5>4D)5D      +  8% 5d4 6s 6p   ((<4>3D)4D)3P
                          +  8% 5d5 6p      (<5>4D)3P      +  7% 5d5 6p      (<3>4F)5G
-    63279.0       -        7% 5d4 6s 6p   ((<2>3P)2P)3D +  6% 5d4 6s 6p   ((<4>3P)4P)3D
                          +  4% 5d3 6s2 6p  (<3>4P)3D      +  4% 5d4 6s 6p   ((<2>3F)4F)5F
-    63452.0       -       10% 5d4 6s 6p   ((<4>3P)2P)1D +  6% 5d4 6s 6p   ((<4>1D)2D)3P
                          +  6% 5d3 6s2 6p  (<1>2D)1D      +  4% 5d5 6p      (<5>4D)5P
-    63774.0       -        7% 5d5 6p      (<3>4P)3D      +  5% 5d3 6s2 6p  (<1>2D)3D
                          +  5% 5d4 6s 6p   ((<4>1D)2D)3D +  5% 5d3 6s2 6p  (<1>2D)3P
-    63886.0       -       27% 5d5 6p      (<3>4F)5G      +  6% 5d5 6p      (<3>2F)3F
                          +  5% 5d4 6s 6p   ((<4>1F)2F)3F
-    64219.0       -        8% 5d4 6s 6p   ((<2>3P)2P)1D +  6% 5d3 6s2 6p  (<3>2F)1D
                          +  5% 5d5 6p      (<3>4F)3D      +  5% 5d3 6s2 6p  (<1>2D)1D
-    64485.0       -        6% 5d5 6p      (<3>4F)5F      +  4% 5d5 6p      (<3>4P)3P
-    64626.0       -        7% 5d5 6p      (<3>2F)1D      +  5% 5d5 6p      (<5>4D)3F
                          +  5% 5d4 6s 6p   ((<2>3F)4F)3F +  4% 5d4 6s 6p   ((<4>3F)2F)3F
-    64952.0       -        6% 5d5 6p      (<5>2F)3D      +  4% 5d3 6s2 6p  (<3>2D)3D
-    65354.0       -       11% 5d5 6p      (<3>4F)5G      +  9% 5d5 6p      (<3>4F)5F
                          +  7% 5d5 6p      (<3>4F)3D      +  7% 5d5 6p      (<3>4F)3F
-    65793.0       -        9% 5d4 6s 6p   ((<4>1D)2D)3P +  5% 5d3 6s2 6p  (<3>2F)3D
                          +  5% 5d4 6s 6p   ((<2>3P)4P)5S
-    66290.0       -        8% 5d4 6s 6p   ((<4>1F)2F)3D +  7% 5d5 6p      (<3>4F)5F
                          +  6% 5d4 6s 6p   ((<4>3P)2P)3P +  5% 5d4 6s 6p   ((<2>3P)4P)3P
-    66554.0       -       11% 5d5 6p      (<3>4F)5F      +  7% 5d5 6p      (<3>4P)3D
                          +  5% 5d5 6p      (<3>4F)3D
-    66873.0       -        9% 5d5 6p      (<5>4D)3F      +  9% 5d5 6p      (<5>2D)3F
                          +  7% 5d4 6s 6p   ((<4>3P)4P)5S +  4% 5d4 6s 6p   ((<4>3P)2P)3P
-    67108.0       -        9% 5d4 6s 6p   ((<2>3F)4F)5D +  5% 5d4 6s 6p   ((<2>3F)2F)3D
                          +  5% 5d5 6p      (<3>2F)3F      +  4% 5d5 6p      (<3>4F)3F
-    67814.0       -        7% 5d4 6s 6p   ((<2>3F)4F)5D +  6% 5d4 6s 6p   ((<2>3F)2F)3F
                          +  6% 5d4 6s 6p   ((<4>3D)2D)3P
-    67907.0       -       11% 5d4 6s 6p   ((<4>3P)4P)5S +  8% 5d4 6s 6p   ((<2>3P)4P)5P
                          +  7% 5d4 6s 6p   ((<2>3P)4P)5S +  6% 5d4 6s 6p   ((<2>3F)4F)5D
-    68505.0       -        9% 5d4 6s 6p   ((<4>1F)2F)3D +  6% 5d5 6p      (<3>4F)5D
                          +  5% 5d5 6p      (<3>2F)1D
-    68560.0       -       23% 5d5 6p      (<3>4F)5D      +  7% 5d5 6p      (<3>4F)5F
                          +  6% 5d5 6p      (<3>2F)3F
-    68773.0       -       11% 5d4 6s 6p   ((<4>3D)4D)3F +  5% 5d5 6p      (<3>2D)3F
                          +  5% 5d5 6p      (<5>2D)1D      +  4% 5d5 6p      (<3>2F)3D
-    69224.0       -        4% 5d4 6s 6p   ((<4>1D)2D)3P +  4% 5d4 6s 6p   ((<4>3P)4P)3D
                          +  4% 5d5 6p      (<3>2F)1D
-    69607.0       -       10% 5d4 6s 6p   ((<2>3P)2P)3P +  8% 5d5 6p      (<3>4F)5D
                          +  5% 5d3 6s2 6p  (<3>2F)1D
-    70163.0       -       13% 5d5 6p      (<5>2F)1D      +  4% 5d4 6s 6p   ((<2>1D)2D)3P
-    70187.0       -       10% 5d4 6s 6p   ((<2>3P)2P)3P +  6% 5d5 6p      (<3>2D)3D
                          +  5% 5d4 6s 6p   ((<2>1D)2D)3P +  5% 5d4 6s 6p   ((<2>1D)2D)3D
-    70377.0       -        5% 5d5 6p      (<5>2D)3F      +  5% 5d4 6s 6p   ((<4>3D)2D)3F
                          +  5% 5d5 6p      (<3>2F)3D      +  5% 5d5 6p      (<3>4F)5D
-    71336.0       -       12% 5d5 6p      (<3>2F)3D      +  7% 5d3 6s2 6p  (<3>2D)3P
                          +  5% 5d4 6s 6p   ((<2>1G)2G)3F +  5% 5d4 6s 6p   ((<2>3P)4P)3P
-    71708.0       -       12% 5d5 6p      (<3>4F)3D      + 10% 5d5 6p      (<5>4D)3D
                          +  8% 5d4 6s 6p   ((<4>3P)2P)3D +  7% 5d4 6s 6p   ((<4>3D)4D)3D
-    71726.0       -       15% 5d5 6p      (<5>2F)3F      +  6% 5d5 6p      (<3>2D)1D
                          +  6% 5d5 6p      (<5>2D)1D      +  5% 5d4 6s 6p   ((<2>3F)2F)3F
-    72776.0       -       18% 5d5 6p      (<5>2G)3F      +  8% 5d4 6s 6p   ((<2>3F)2F)3D
                          +  5% 5d4 6s 6p   ((<4>1G)2G)3F +  5% 5d5 6p      (<5>2D)1D
-    73040.0       -        9% 5d5 6p      (<5>2F)3F      +  7% 5d3 6s2 6p  (<3>2F)3F
                          +  6% 5d4 6s 6p   ((<2>1G)2G)3F +  6% 5d5 6p      (<3>2F)3D
-    73746.0       -       10% 5d4 6s 6p   ((<2>1G)2G)3F +  6% 5d5 6p      (<3>2D)3D
                          +  5% 5d5 6p      (<3>4F)3F      +  5% 5d5 6p      (<5>2F)3D
-    73890.0       -       12% 5d5 6p      (<5>2G)3F      +  8% 5d5 6p      (<3>2D)3D
                          +  7% 5d3 6s2 6p  (<3>2D)3D      +  6% 5d5 6p      (<3>2F)1D
-    74416.0       -        9% 5d5 6p      (<5>2F)3F      +  5% 5d5 6p      (<5>2D)3F
                          +  5% 5d5 6p      (<5>2F)1D      +  5% 5d3 6s2 6p  (<1>2D)3F
-    75594.0       -       12% 5d5 6p      (<5>2S)3P      +  9% 5d4 6s 6p   ((<2>3P)4P)3P
                          +  8% 5d5 6p      (<5>2G)3F      +  6% 5d5 6p      (<5>2F)3D
-    75963.0       -        8% 5d5 6p      (<3>2F)3F      +  6% 5d5 6p      (<5>2G)3F
                          +  6% 5d5 6p      (<5>2D)1D      +  6% 5d5 6p      (<5>2F)3F
-    76601.0       -        8% 5d4 6s 6p   ((<4>1D)2D)1D +  6% 5d5 6p      (<3>4F)3F
                          +  5% 5d5 6p      (<3>2D)3D      +  5% 5d4 6s 6p   ((<4>3F)2F)1D
-    76825.0       -       12% 5d4 6s 6p   ((<2>3F)2F)3D +  7% 5d3 6s2 6p  (<1>2D)3D
                          +  7% 5d4 6s 6p   ((<4>3P)4P)3P +  6% 5d4 6s 6p   ((<2>1D)2D)3D
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		-	77248.0	-		9%	5d5 6p	(<3>2D)3F	+	8%	5d5 6p	(<3>2D)1D
					+	8%	5d5 6p	(<5>2S)3P	+	7%	5d3 6s2 6p	(<1>2D)3F
		-	77946.0	-		36%	5d5 6p	(<5>2S)3P	+	7%	5d5 6p	(<5>2F)3D
					+	5%	5d4 6s 6p	((<2>1D)2D)3P				
		-	78227.0	-		8%	5d4 6s 6p	((<2>1D)2D)3D	+	6%	5d5 6p	(<3>2D)3D
					+	4%	5d5 6p	(<5>2S)3P	+	4%	5d5 6p	(<3>2G)3F
		-	78772.0	-		16%	5d4 6s 6p	((<2>3F)2F)3F	+	8%	5d5 6p	(<3>4F)3F
					+	6%	5d5 6p	(<3>2D)1D	+	6%	5d4 6s 6p	((<4>3D)2D)3F
		-	79730.0	-		12%	5d5 6p	(<3>2D)1D	+	10%	5d4 6s 6p	((<2>1D)2D)3D
					+	6%	5d5 6p	(<5>2F)3D	+	4%	5d4 6s 6p	((<2>1D)2D)3P
		-	80588.0	-		14%	5d5 6p	(<3>2D)1D	+	9%	5d4 6s 6p	((<2>1D)2D)3D
					+	6%	5d3 6s2 6p	(<1>2D)3D	+	4%	5d4 6s 6p	((<4>3D)2D)3P
		-	80963.0	-		11%	5d4 6s 6p	((<2>3F)2F)1D	+	6%	5d4 6s 6p	((<2>1D)2D)3F
					+	6%	5d5 6p	(<5>2D)1D	+	6%	5d5 6p	(<3>2D)3F
		-	81609.0	-		21%	5d4 6s 6p	((<4>1F)2F)1D	+	13%	5d4 6s 6p	((<4>1D)2D)1D
					+	7%	5d5 6p	(<3>2D)1D	+	7%	5d4 6s 6p	((<2>3F)2F)1D
		-	82946.0	-		8%	5d5 6p	(<3>2D)3F	+	8%	5d4 6s 6p	((<2>1D)2D)3F
					+	5%	5d5 6p	(<5>2F)3D	+	5%	5d3 6s2 6p	(<1>2D)3P
		-	83258.0	-		15%	5d5 6p	(<3>2D)3F	+	14%	5d4 6s 6p	((<2>1D)2D)3F
					+	8%	5d4 6s 6p	((<2>3P)4P)3D	+	8%	5d4 6s 6p	((<4>3P)4P)3D
		-	83440.0	-		8%	5d5 6p	(<3>2D)3P	+	7%	5d4 6s 6p	((<4>1F)2F)1D
					+	7%	5d5 6p	(<3>2G)3F	+	5%	5d4 6s 6p	((<2>3P)4P)3D
		-	84736.0	-		29%	5d5 6p	(<3>2D)3P	+	7%	5d4 6s 6p	((<2>1D)2D)3P
					+	4%	5d5 6p	(<5>2F)3D	+	4%	5d3 6s2 6p	(<1>2D)3P
		-	85401.0	-		20%	5d5 6p	(<3>2G)3F	+	9%	5d4 6s 6p	((<2>1D)2D)3D
					+	7%	5d4 6s 6p	((<2>3F)4F)3D	+	7%	5d5 6p	(<3>2D)3D
		-	86311.0	-		22%	5d5 6p	(<3>2D)3D	+	15%	5d4 6s 6p	((<2>1D)2D)3D
					+	9%	5d4 6s 6p	((<4>1D)2D)3D	+	8%	5d4 6s 6p	((<2>3F)2F)3D
		-	88078.0	-		29%	5d5 6p	(<3>2G)3F	+	11%	5d4 6s 6p	((<4>1F)2F)1D
					+	8%	5d5 6p	(<5>2F)1D	+	7%	5d5 6p	(<3>2P)1D
		-	90536.0	-		31%	5d5 6p	(<3>2P)3P	+	16%	5d5 6p	(<1>2D)3P
					+	7%	5d5 6p	(<3>2P)1D	+	6%	5d5 6p	(<1>2D)1D
		-	91626.0	-		12%	5d5 6p	(<1>2D)3P	+	11%	5d5 6p	(<3>2P)1D
					+	11%	5d5 6p	(<3>2P)3P	+	10%	5d5 6p	(<3>2P)3D
		-	94451.0	-		29%	5d5 6p	(<3>2P)3D	+	19%	5d4 6s 6p	((<0>1S)2S)3P
					+	8%	5d4 6s 6p	((<4>1S)2S)3P	+	8%	5d5 6p	(<1>2D)1D
		-	94867.0	-		37%	5d4 6s 6p	((<0>1S)2S)3P	+	14%	5d5 6p	(<3>2P)3D
					+	10%	5d4 6s 6p	((<4>1S)2S)3P	+	4%	5d5 6p	(<1>2D)1D
		-	96367.0	-		43%	5d5 6p	(<1>2D)3F	+	13%	5d5 6p	(<5>2D)3F
					+	10%	5d5 6p	(<1>2D)3D	+	5%	5d5 6p	(<3>2G)3F
		-	98323.0	-		25%	5d5 6p	(<3>2P)1D	+	13%	5d5 6p	(<1>2D)1D
					+	13%	5d5 6p	(<1>2D)3D	+	12%	5d5 6p	(<1>2D)3P
		-	99711.0	-		31%	5d5 6p	(<1>2D)3D	+	17%	5d5 6p	(<3>2P)1D
					+	12%	5d5 6p	(<1>2D)3F	+	9%	5d5 6p	(<5>2D)3D
		-	100241.0	-		26%	5d5 6p	(<1>2D)3P	+	24%	5d5 6p	(<3>2P)3P
					+	11%	5d5 6p	(<5>2D)3P	+	6%	5d4 6s 6p	((<2>1D)2D)1D
		-	102703.0	-		39%	5d4 6s 6p	((<2>1D)2D)1D	+	26%	5d5 6p	(<1>2D)1D
					+	9%	5d4 6s 6p	((<4>1D)2D)1D	+	8%	5d5 6p	(<3>2D)1D
3	23047.3	23803.0	-755.7		92%	5d4 6s 6p	((<4>5D)6D)7F					
	26618.9	26398.0	220.9		82%	5d4 6s 6p	((<4>5D)6D)7P	+	5%	5d5 6p	(<5>6S)7P	
	27488.1	27116.0	372.1		75%	5d4 6s 6p	((<4>5D)6D)7D	+	5%	5d4 6s 6p	((<4>5D)6D)5P	
	30586.6	29297.0	1289.6		70%	5d3 6s2 6p	(<3>4F)5G	+	5%	5d4 6s 6p	((<4>3F)4F)5G	
				+	4%	5d3 6s2 6p	(<3>2D)3F					
	29139.1	30607.0	-1467.9		23%	5d3 6s2 6p	(<3>4F)5F	+	18%	5d4 6s 6p	((<4>5D)6D)5F	
				+	10%	5d4 6s 6p	((<4>5D)6D)5P	+	6%	5d4 6s 6p	((<4>3F)4F)5F	
	29912.8	31326.0	-1413.2		18%	5d4 6s 6p	((<4>5D)6D)5P	+	16%	5d4 6s 6p	((<4>5D)6D)7D	
				+	8%	5d3 6s2 6p	(<3>4P)5P	+	6%	5d3 6s2 6p	(<3>4F)5F	
	32238.0	32611.0	-373.0		40%	5d3 6s2 6p	(<3>4F)5D	+	20%	5d4 6s 6p	((<4>5D)6D)5D	
				+	8%	5d3 6s2 6p	(<3>4F)3D					
	32957.6	33133.0	-175.4		10%	5d4 6s 6p	((<4>3P)4P)5D	+	10%	5d3 6s2 6p	(<3>4P)5D	
				+	6%	5d3 6s2 6p	(<3>4F)3G	+	6%	5d5 6p	(<5>6S)7P	
	34228.6	34274.0	-45.4		24%	5d3 6s2 6p	(<3>4F)3G	+	12%	5d4 6s 6p	((<4>3H)4H)5H	
				+	6%	5d4 6s 6p	((<4>3G)4G)5H					
	34354.1	34796.0	-441.9		26%	5d5 6p	(<5>6S)7P	+	17%	5d4 6s 6p	((<4>3H)4H)5H	
				+	11%	5d4 6s 6p	((<4>3G)4G)5H	+	4%	5d4 6s 6p	((<4>5D)6D)5P	
	35499.2	35118.0	381.2		27%	5d5 6p	(<5>6S)7P	+	11%	5d3 6s2 6p	(<3>4F)3G	
				+	10%	5d3 6s2 6p	(<3>4F)5F	+	7%	5d4 6s 6p	((<4>3G)4G)5H	
	35943.2	36138.0	-194.8		13%	5d3 6s2 6p	(<3>4F)5F	+	7%	5d4 6s 6p	((<4>5D)4D)5F	
				+	6%	5d4 6s 6p	((<4>3H)4H)5H	+	6%	5d4 6s 6p	((<4>3G)4G)5F	
	36874.4	36570.0	304.4		10%	5d4 6s 6p	((<4>3P)4P)5D	+	8%	5d4 6s 6p	((<4>5D)4D)5P	
				+	7%	5d5 6p	(<5>6S)5P	+	6%	5d3 6s2 6p	(<3>4P)5D	
	37674.1	37802.0	-127.9		10%	5d5 6p	(<5>6S)7P	+	7%	5d4 6s 6p	((<4>3G)4G)5G	
				+	5%	5d4 6s 6p	((<4>3P)4P)5D	+	5%	5d3 6s2 6p	(<3>4F)3F	
	38206.4	38111.0	95.4		10%	5d3 6s2 6p	(<3>4F)3D	+	10%	5d4 6s 6p	((<4>3G)4G)5G	
				+	7%	5d5 6p	(<5>6S)7P	+	5%	5d5 6p	(<5>6S)5P	

38053.0	38768.0	-715.0	10%	5d5	6p	(<5>6S)5P	+ 8%	5d4	6s	6p	((<4>5D)4D)3F
			+ 7%	5d4	6s	6p ((<4>3H)4H)5H	+ 6%	5d4	6s	6p	((<4>5D)6D)5F
39646.4	39133.0	513.4	15%	5d4	6s	6p ((<4>3G)4G)5H	+ 14%	5d4	6s	6p	((<4>3H)4H)3G
			+ 5%	5d4	6s	6p ((<4>3G)4G)3F	+ 4%	5d3	6s2	6p	(<3>2F)3G
40269.4	40097.0	172.4	16%	5d4	6s	6p ((<4>3G)4G)5H	+ 15%	5d4	6s	6p	((<4>3H)4H)5H
			+ 9%	5d3	6s2	6p (<3>2G)3G	+ 8%	5d4	6s	6p	((<4>3G)4G)5G
40665.8	40409.0	256.8	28%	5d5	6p	(<5>6S)5P	+ 11%	5d4	6s	6p	((<4>3P)4P)5P
			+ 8%	5d3	6s2	6p (<3>4P)5P	+ 5%	5d4	6s	6p	((<4>5D)6D)5P
40923.8	40828.0	95.8	20%	5d4	6s	6p ((<4>3F)4F)5G	+ 7%	5d4	6s	6p	((<4>3H)4H)5G
			+ 6%	5d4	6s	6p ((<2>3F)4F)5G					
41499.4	41210.0	289.4	10%	5d3	6s2	6p (<3>2G)1F	+ 7%	5d4	6s	6p	((<4>5D)6D)5D
			+ 5%	5d3	6s2	6p (<3>2G)3F					
41694.3	41889.0	-194.7	12%	5d4	6s	6p ((<4>5D)4D)3F	+ 9%	5d3	6s2	6p	(<3>2G)3F
			+ 6%	5d4	6s	6p ((<4>3G)4G)5H	+ 4%	5d3	6s2	6p	(<3>2P)3D
42251.5	42190.0	61.5	6%	5d4	6s	6p ((<4>3F)4F)5D	+ 5%	5d4	6s	6p	((<4>3G)4G)5H
			+ 5%	5d3	6s2	6p (<3>4F)3F	+ 4%	5d4	6s	6p	((<4>3G)4G)5F
43478.6	42443.0	1035.6	10%	5d3	6s2	6p (<3>2G)3G	+ 7%	5d3	6s2	6p	(<3>4F)3D
			+ 5%	5d4	6s	6p ((<4>5D)4D)3F	+ 5%	5d4	6s	6p	((<4>3D)4D)5F
43850.8	42890.0	960.8	13%	5d3	6s2	6p (<3>4F)3F	+ 6%	5d4	6s	6p	((<4>5D)4D)5D
			+ 4%	5d4	6s	6p ((<4>3F)2F)3G					
42601.2	43485.0	-883.8	12%	5d4	6s	6p ((<4>5D)4D)5F	+ 12%	5d4	6s	6p	((<4>3G)4G)5F
			+ 9%	5d4	6s	6p ((<4>5D)4D)5D	+ 8%	5d4	6s	6p	((<4>3D)4D)5P
47483.7	43616.0	3867.7	8%	5d4	6s	6p ((<4>3F)4F)5G	+ 8%	5d4	6s	6p	((<4>5D)4D)3F
			+ 8%	5d4	6s	6p ((<4>3G)4G)5H	+ 5%	5d4	6s	6p	((<4>3H)4H)5H
44021.0	44103.0	-82.0	7%	5d4	6s	6p ((<4>3D)4D)5F	+ 6%	5d4	6s	6p	((<4>3D)4D)5D
			+ 5%	5d4	6s	6p ((<4>3F)4F)5G	+ 4%	5d4	6s	6p	((<4>3G)4G)3G
44447.0	44497.0	-50.0	9%	5d4	6s	6p ((<4>3D)4D)5P	+ 8%	5d4	6s	6p	((<4>3G)4G)5G
			+ 7%	5d4	6s	6p ((<4>3D)4D)5F	+ 6%	5d4	6s	6p	((<4>3D)4D)5D
45014.5	44781.0	233.5	12%	5d4	6s	6p ((<4>3H)4H)5G	+ 6%	5d4	6s	6p	((<4>5D)4D)5F
			+ 5%	5d5	6p	(<5>4G)5F	+ 5%	5d4	6s	6p	((<4>5D)4D)3F
45555.1	45332.0	223.1	9%	5d4	6s	6p ((<4>5D)4D)5F	+ 8%	5d4	6s	6p	((<4>3F)4F)5F
			+ 6%	5d4	6s	6p ((<4>5D)4D)5D	+ 5%	5d3	6s2	6p	(<3>4F)3F
45677.7	45621.0	56.7	13%	5d4	6s	6p ((<4>3F)4F)5D	+ 6%	5d4	6s	6p	((<4>3H)4H)5G
			+ 6%	5d4	6s	6p ((<4>3F)4F)5F	+ 4%	5d4	6s	6p	((<2>3F)4F)5D
46068.0	46094.0	-26.0	10%	5d4	6s	6p ((<4>3F)4F)5F	+ 9%	5d4	6s	6p	((<4>3D)4D)5F
			+ 5%	5d4	6s	6p ((<4>3D)4D)3D	+ 5%	5d4	6s	6p	((<4>5D)4D)5F
46385.5	46550.0	-164.5	21%	5d4	6s	6p ((<4>3H)4H)5G	+ 5%	5d3	6s2	6p	(<3>2G)3F
			+ 5%	5d3	6s2	6p (<3>2H)3G	+ 4%	5d4	6s	6p	((<4>3D)4D)5F
47361.7	46845.0	516.7	7%	5d3	6s2	6p (<3>4F)3F	+ 7%	5d4	6s	6p	((<4>3D)4D)5P
			+ 6%	5d3	6s2	6p (<3>2G)3F	+ 5%	5d3	6s2	6p	(<3>4F)5D
42514.1	47213.0	-4698.9	11%	5d4	6s	6p ((<4>5D)4D)3F	+ 5%	5d4	6s	6p	((<4>3F)4F)5D
47593.4	47672.0	-78.6	5%	5d3	6s2	6p (<3>2P)3D	+ 5%	5d4	6s	6p	((<4>3G)4G)5F
			+ 5%	5d3	6s2	6p (<3>4P)5D	+ 4%	5d3	6s2	6p	(<3>4F)5F
48170.5	48129.0	41.5	4%	5d4	6s	6p ((<2>3P)4P)5D	+ 4%	5d3	6s2	6p	(<3>4P)5D
48326.4	48316.0	10.4	8%	5d4	6s	6p ((<4>3F)4F)5F	+ 6%	5d4	6s	6p	((<4>3D)4D)3D
			+ 4%	5d4	6s	6p ((<2>3P)4P)5P					
49072.1	48603.0	469.1	8%	5d4	6s	6p ((<4>5D)6D)5D	+ 6%	5d4	6s	6p	((<4>3H)2H)3G
			+ 6%	5d3	6s2	6p (<3>2G)3F	+ 5%	5d3	6s2	6p	(<3>2D)3F
49417.9	48886.0	531.9	12%	5d3	6s2	6p (<3>2G)1F	+ 8%	5d4	6s	6p	((<4>5D)4D)3D
			+ 6%	5d4	6s	6p ((<4>3G)4G)3F	+ 5%	5d5	6p		(<5>4G)5H
49514.3	49410.0	104.3	11%	5d4	6s	6p ((<4>3G)2G)1F	+ 5%	5d3	6s2	6p	(<3>2D)1F
			+ 4%	5d3	6s2	6p (<3>4P)5D	+ 4%	5d4	6s	6p	((<4>1G)2G)3F
50303.8	49890.0	413.8	9%	5d3	6s2	6p (<3>4P)5D	+ 6%	5d4	6s	6p	((<2>3P)4P)5D
			+ 6%	5d3	6s2	6p (<3>4F)3D	+ 5%	5d3	6s2	6p	(<3>4P)5P
50185.7	50130.0	55.7	5%	5d4	6s	6p ((<4>5D)4D)5P	+ 4%	5d4	6s	6p	((<4>3F)4F)3F
49966.0	50374.0	-408.0	17%	5d4	6s	6p ((<4>3G)4G)5F	+ 12%	5d4	6s	6p	((<4>3D)4D)5F
			+ 5%	5d3	6s2	6p (<3>2H)3G	+ 5%	5d4	6s	6p	((<4>5D)4D)5F
50800.4	50668.0	132.4	22%	5d5	6p	(<5>4G)5H	+ 8%	5d4	6s	6p	((<4>3F)2F)1F
			+ 7%	5d4	6s	6p ((<4>3F)2F)3G	+ 5%	5d5	6p		(<5>4G)3G
50894.1	51186.0	-291.9	14%	5d4	6s	6p ((<4>3D)4D)5D	+ 9%	5d5	6p		(<5>4G)5H
			+ 5%	5d4	6s	6p ((<4>5D)6D)5D	+ 5%	5d3	6s2	6p	(<3>4F)5D
52255.8	51795.0	460.8	10%	5d5	6p	(<5>4G)3F	+ 9%	5d5	6p		(<5>4G)5G
			+ 6%	5d4	6s	6p ((<4>1G)2G)3G	+ 5%	5d5	6p		(<3>4P)5D
-	51939.0	-	9%	5d4	6s	6p ((<4>1F)2F)3F	+ 8%	5d5	6p		(<5>4G)3F
			+ 6%	5d5	6p	(<5>4G)5G					
52015.3	52170.0	-154.7	12%	5d5	6p	(<5>4G)5H	+ 7%	5d5	6p		(<5>4G)5G
			+ 5%	5d4	6s	6p ((<4>1F)2F)3G					
51072.2	52555.0	-1482.8	17%	5d5	6p	(<5>4G)5G	+ 9%	5d4	6s	6p	((<4>5D)4D)3D
			+ 6%	5d4	6s	6p ((<4>3G)4G)5G	+ 5%	5d4	6s	6p	((<4>3G)4G)3F
52806.6	52858.0	-51.4	9%	5d4	6s	6p ((<4>3F)4F)3F	+ 8%	5d4	6s	6p	((<4>1G)2G)3F
			+ 6%	5d5	6p	(<5>4G)3G	+ 4%	5d5	6p		(<5>4D)3D
53345.5	53207.0	138.5	12%	5d5	6p	(<5>4G)3G	+ 9%	5d3	6s2	6p	(<3>2G)3G
			+ 7%	5d4	6s	6p ((<4>3G)2G)3G	+ 7%	5d5	6p		(<5>4G)5H
-	53734.0	-	5%	5d4	6s	6p ((<4>3D)4D)3F	+ 5%	5d4	6s	6p	((<4>3F)2F)1F
			+ 4%	5d3	6s2	6p (<3>4P)3D	+ 4%	5d5	6p		(<5>4D)3F
52943.5	53985.0	-1041.5	6%	5d4	6s	6p ((<4>3G)2G)1F	+ 4%	5d5	6p		(<5>4D)5F

54117.4	54260.0	-142.6	6%	5d4	6s	6p	((<4>3G)2G)1F	+	5%	5d4	6s 6p ((<4>1F)2F)3G
			+ 5%	5d4	6s	6p	((<4>3H)2H)3G				
54269.8	54379.0	-109.2	8%	5d4	6s	6p	((<4>1D)2D)3F	+	5%	5d5	6p (<3>4P)5D
54556.4	54707.0	-150.6	10%	5d4	6s	6p	((<4>1F)2F)3D	+	6%	5d4	6s 6p ((<4>5D)4D)5P
			+ 4%	5d4	6s	6p	((<4>3F)2F)1F	+	4%	5d5	6p (<5>4G)3G
54900.9	54819.0	81.9	9%	5d3	6s2	6p	(<3>4P)5P	+	7%	5d4	6s 6p ((<4>3G)2G)3G
			+ 5%	5d4	6s	6p	((<4>3D)2D)1F	+	5%	5d3	6s2 6p (<3>2F)3G
55389.3	55318.0	71.3	6%	5d4	6s	6p	((<2>3P)4P)3D	+	5%	5d5	6p (<5>4D)3D
			+ 5%	5d4	6s	6p	((<4>3D)2D)1F	+	5%	5d3	6s2 6p (<3>2F)3F
55546.1	55541.0	5.1	9%	5d5	6p		(<5>4G)5G	+	8%	5d5	6p (<5>4G)3F
			+ 5%	5d5	6p		(<5>4D)5F	+	5%	5d4	6s 6p ((<4>3G)4G)3F
56332.0	55954.0	378.0	7%	5d4	6s	6p	((<4>3H)2H)3G	+	5%	5d5	6p (<5>4G)3F
			+ 5%	5d4	6s	6p	((<4>3G)2G)3G	+	4%	5d4	6s 6p ((<4>3G)4G)3G
58091.6	56282.0	1809.6	10%	5d5	6p		(<3>4P)5P	+	9%	5d4	6s 6p ((<4>3F)2F)1F
			+ 7%	5d3	6s2	6p	(<3>2G)1F	+	5%	5d4	6s 6p ((<4>3F)4F)3G
56484.3	56348.0	136.3	17%	5d5	6p		(<3>4P)5P	+	6%	5d5	6p (<5>4G)5F
			+ 5%	5d3	6s2	6p	(<3>2F)3D	+	4%	5d4	6s 6p ((<4>3F)4F)3G
57131.8	56735.0	396.8	11%	5d5	6p		(<5>4G)5F	+	7%	5d4	6s 6p ((<4>3G)4G)3G
			+ 6%	5d4	6s	6p	((<4>5D)4D)5P	+	5%	5d4	6s 6p ((<2>3P)4P)5P
56717.1	57111.0	-393.9	7%	5d5	6p		(<5>4G)5F	+	5%	5d4	6s 6p ((<4>3G)4G)3G
			+ 5%	5d5	6p		(<5>4D)5F	+	4%	5d5	6p (<5>4D)5P
57732.5	57360.0	372.5	12%	5d5	6p		(<5>4G)5F	+	8%	5d4	6s 6p ((<4>1F)2F)3F
			+ 7%	5d4	6s	6p	((<4>1F)2F)3D	+	6%	5d4	6s 6p ((<2>3F)2F)3F
51600.5	57833.0	-6232.5	8%	5d3	6s2	6p	(<3>4P)3D	+	6%	5d4	6s 6p ((<2>3P)4P)3D
			+ 5%	5d4	6s	6p	((<4>3F)2F)3D	+	5%	5d4	6s 6p ((<2>3P)2P)3D
58206.0	58074.0	132.0	11%	5d4	6s	6p	((<2>3P)4P)5P	+	7%	5d4	6s 6p ((<4>3P)4P)5P
			+ 5%	5d3	6s2	6p	(<3>4P)3D	+	4%	5d5	6p (<5>4D)5F
53390.4	58320.0	-4929.6	6%	5d4	6s	6p	((<4>3G)4G)3G	+	5%	5d3	6s2 6p (<1>2D)3F
			+ 5%	5d5	6p		(<3>4P)3D	+	4%	5d4	6s 6p ((<4>3G)2G)1F
58487.5	58400.0	87.5	9%	5d3	6s2	6p	(<3>2F)3F	+	5%	5d3	6s2 6p (<3>4P)3D
			+ 4%	5d4	6s	6p	((<4>1F)2F)3D				
-	58787.0	-	7%	5d3	6s2	6p	(<3>2H)3G	+	7%	5d5	6p (<5>4G)5F
			+ 5%	5d4	6s	6p	((<4>3G)4G)3G	+	5%	5d5	6p (<5>4D)3D
-	58840.0	-	8%	5d4	6s	6p	((<2>3F)4F)5G	+	5%	5d4	6s 6p ((<4>1F)2F)3F
			+ 5%	5d5	6p		(<5>4D)5P	+	5%	5d3	6s2 6p (<3>2F)3F
59399.7	59075.0	324.7	7%	5d5	6p		(<3>4P)5D	+	7%	5d4	6s 6p ((<2>3P)4P)3D
			+ 7%	5d4	6s	6p	((<2>3F)4F)5F	+	4%	5d4	6s 6p ((<4>1G)2G)1F
-	59211.0	-	23%	5d4	6s	6p	((<2>3F)4F)5F	+	8%	5d5	6p (<5>4G)5F
			+ 5%	5d5	6p		(<5>4D)5P	+	4%	5d4	6s 6p ((<2>3P)4P)5P
-	60112.0	-	6%	5d4	6s	6p	((<4>3F)4F)3G	+	4%	5d4	6s 6p ((<4>3D)4D)3F
-	60232.0	-	11%	5d5	6p		(<5>4D)3F	+	9%	5d4	6s 6p ((<4>3G)2G)3F
			+ 4%	5d4	6s	6p	((<4>3F)4F)3G				
-	60445.0	-	10%	5d5	6p		(<5>4D)5P	+	8%	5d5	6p (<5>4D)5D
-	60879.0	-	14%	5d4	6s	6p	((<2>3F)4F)5D	+	6%	5d4	6s 6p ((<2>3F)4F)5G
			+ 5%	5d3	6s2	6p	(<3>2D)3D	+	5%	5d4	6s 6p ((<2>3P)4P)5D
-	61135.0	-	9%	5d3	6s2	6p	(<3>2F)1F	+	5%	5d4	6s 6p ((<2>3F)4F)5G
			+ 4%	5d4	6s	6p	((<2>1G)2G)3G				
58644.1	61186.0	-2541.9	9%	5d5	6p		(<5>4D)5D	+	8%	5d4	6s 6p ((<2>3F)4F)5G
			+ 7%	5d4	6s	6p	((<4>5D)4D)5D	+	5%	5d4	6s 6p ((<2>3P)4P)5P
-	61321.0	-	8%	5d4	6s	6p	((<2>3P)4P)3D	+	7%	5d4	6s 6p ((<4>3P)2P)3D
			+ 6%	5d3	6s2	6p	(<3>2F)3G	+	5%	5d5	6p (<3>2F)3D
-	62060.0	-	8%	5d5	6p		(<5>4D)5D	+	6%	5d4	6s 6p ((<2>3F)4F)5F
			+ 6%	5d5	6p		(<3>4F)5D	+	5%	5d5	6p (<3>4P)5D
-	62294.0	-	6%	5d5	6p		(<5>4D)5F	+	6%	5d4	6s 6p ((<2>3F)4F)5D
			+ 5%	5d4	6s	6p	((<4>1F)2F)3G	+	5%	5d4	6s 6p ((<4>1G)2G)3G
-	62342.0	-	9%	5d5	6p		(<3>4F)5G	+	7%	5d4	6s 6p ((<2>3F)4F)5G
			+ 5%	5d4	6s	6p	((<2>3F)4F)3F	+	5%	5d4	6s 6p ((<4>1F)2F)3G
-	62642.0	-	5%	5d4	6s	6p	((<4>1D)2D)3F	+	5%	5d4	6s 6p ((<4>3G)2G)3F
			+ 5%	5d5	6p		(<3>4F)5G	+	4%	5d5	6p (<5>2G)3F
-	62976.0	-	10%	5d5	6p		(<3>4P)5P	+	7%	5d4	6s 6p ((<4>3F)2F)3G
			+ 5%	5d5	6p		(<5>4G)3G	+	5%	5d4	6s 6p ((<2>3F)4F)3D
-	63581.0	-	8%	5d5	6p		(<5>4D)5P	+	8%	5d5	6p (<3>4F)3D
			+ 8%	5d4	6s	6p	((<2>3F)2F)3D	+	4%	5d3	6s2 6p (<3>2D)3D
-	63742.0	-	12%	5d5	6p		(<3>4P)3D	+	7%	5d3	6s2 6p (<3>2F)1F
			+ 5%	5d3	6s2	6p	(<3>4P)3D	+	5%	5d5	6p (<5>4D)3D
-	63849.0	-	7%	5d5	6p		(<3>2F)1F	+	5%	5d5	6p (<3>4F)5G
			+ 5%	5d4	6s	6p	((<4>3D)2D)1F	+	5%	5d5	6p (<3>4F)3G
-	64214.0	-	12%	5d5	6p		(<3>4F)5G	+	6%	5d4	6s 6p ((<4>3F)2F)3F
			+ 5%	5d4	6s	6p	((<4>3D)4D)3F	+	5%	5d5	6p (<3>2F)3F
-	64517.0	-	10%	5d5	6p		(<3>4F)5F	+	9%	5d5	6p (<3>2F)3G
			+ 6%	5d5	6p		(<3>2F)1F				
-	64785.0	-	6%	5d5	6p		(<3>4F)5G	+	5%	5d5	6p (<3>4P)3D
			+ 5%	5d3	6s2	6p	(<3>2F)1F	+	4%	5d4	6s 6p ((<2>3F)4F)5D
-	65326.0	-	8%	5d4	6s	6p	((<2>3P)2P)3D				
-	65780.0	-	8%	5d5	6p		(<3>4F)5G	+	8%	5d5	6p (<3>4F)3F
			+ 5%	5d4	6s	6p	((<4>3P)4P)3D	+	4%	5d3	6s2 6p (<3>2F)1F

	-	65981.0	-		8%	5d5 6p	(<5>4D)3F	+	7%	5d5 6p	(<5>2G)1F
				+	5%	5d4 6s 6p	((<4>1F)2F)1F	+	4%	5d5 6p	(<3>4P)3D
	-	66119.0	-		8%	5d5 6p	(<3>4F)5F	+	8%	5d5 6p	(<3>4F)3G
				+	7%	5d5 6p	(<3>4F)5G	+	7%	5d5 6p	(<3>4F)5D
	-	66405.0	-		11%	5d4 6s 6p	((<2>1G)2G)3G	+	7%	5d4 6s 6p	((<2>3F)2F)3G
	-	66723.0	-		7%	5d4 6s 6p	((<4>3P)4P)3D	+	6%	5d4 6s 6p	((<4>1F)2F)3D
				+	6%	5d5 6p	(<3>2F)3F	+	5%	5d5 6p	(<3>2F)3G
	-	66917.0	-		15%	5d5 6p	(<3>4F)5F				
	-	67075.0	-		5%	5d4 6s 6p	((<4>3P)4P)5D	+	4%	5d5 6p	(<5>2G)1F
				+	4%	5d4 6s 6p	((<2>3P)2P)3D				
	-	67438.0	-		7%	5d5 6p	(<5>2G)1F	+	6%	5d5 6p	(<3>4F)3F
	-	67739.0	-		10%	5d4 6s 6p	((<4>1F)2F)3D	+	5%	5d4 6s 6p	((<2>3F)4F)5D
	-	68335.0	-		12%	5d4 6s 6p	((<2>1G)2G)3G	+	8%	5d4 6s 6p	((<4>1G)2G)3G
				+	6%	5d4 6s 6p	((<4>1F)2F)3G	+	4%	5d4 6s 6p	((<4>1F)2F)1F
57613.6		68675.0-11061.4			8%	5d5 6p	(<3>2F)3F	+	7%	5d5 6p	(<5>2D)3D
				+	5%	5d5 6p	(<3>2F)3D	+	5%	5d5 6p	(<3>2H)3G
	-	69170.0	-		13%	5d5 6p	(<3>4F)5D	+	8%	5d4 6s 6p	((<2>1G)2G)3F
				+	6%	5d5 6p	(<5>4D)3F				
	-	69756.0	-		14%	5d5 6p	(<3>4F)5D	+	7%	5d5 6p	(<5>2G)1F
				+	6%	5d5 6p	(<3>2F)3D	+	4%	5d5 6p	(<3>4F)3G
	-	69987.0	-		8%	5d5 6p	(<3>4F)5D	+	7%	5d3 6s2 6p	(<3>2F)3D
				+	6%	5d5 6p	(<3>2F)3F	+	6%	5d5 6p	(<3>4F)5F
	-	70225.0	-		6%	5d5 6p	(<5>2D)3F	+	5%	5d4 6s 6p	((<4>1F)2F)1F
				+	5%	5d5 6p	(<3>2D)3F	+	4%	5d3 6s2 6p	(<1>2D)3F
	-	70577.0	-		17%	5d4 6s 6p	((<2>3F)2F)3G	+	6%	5d5 6p	(<3>4F)3F
				+	6%	5d5 6p	(<3>2F)3G	+	4%	5d4 6s 6p	((<4>3F)4F)3G
	-	71104.0	-		11%	5d5 6p	(<3>4F)3G	+	8%	5d5 6p	(<3>2H)3G
				+	7%	5d5 6p	(<5>4G)3G	+	6%	5d4 6s 6p	((<4>3H)2H)3G
	-	71683.0	-		10%	5d4 6s 6p	((<2>3F)2F)3F	+	7%	5d4 6s 6p	((<4>3P)2P)3D
				+	6%	5d4 6s 6p	((<4>1F)2F)1F	+	4%	5d4 6s 6p	((<4>1G)2G)1F
	-	72096.0	-		10%	5d4 6s 6p	((<2>3F)2F)3D	+	8%	5d5 6p	(<5>2G)3G
				+	5%	5d4 6s 6p	((<2>3P)4P)3D	+	5%	5d4 6s 6p	((<2>1G)2G)3F
	-	72518.0	-		12%	5d5 6p	(<5>2G)3F	+	8%	5d5 6p	(<5>2F)3F
				+	5%	5d5 6p	(<5>2F)3G				
	-	72825.0	-		7%	5d4 6s 6p	((<4>1G)2G)1F	+	7%	5d3 6s2 6p	(<3>2F)1F
				+	6%	5d5 6p	(<3>4F)3F	+	6%	5d5 6p	(<3>4F)3G
	-	73358.0	-		13%	5d5 6p	(<5>2F)3F	+	12%	5d5 6p	(<5>2G)3G
				+	8%	5d5 6p	(<5>2F)3G	+	5%	5d4 6s 6p	((<4>3P)2P)3D
	-	73484.0	-		8%	5d4 6s 6p	((<4>1D)2D)1F	+	7%	5d5 6p	(<3>4F)3D
				+	6%	5d5 6p	(<5>4D)3D	+	5%	5d5 6p	(<5>2G)3F
	-	74238.0	-		10%	5d5 6p	(<5>2F)3F	+	8%	5d5 6p	(<3>2H)3G
				+	8%	5d5 6p	(<5>2G)3G	+	6%	5d4 6s 6p	((<2>1D)2D)3F
	-	74406.0	-		7%	5d4 6s 6p	((<2>1G)2G)3F	+	6%	5d4 6s 6p	((<4>3D)2D)3D
				+	5%	5d5 6p	(<3>2D)3F	+	5%	5d5 6p	(<5>2G)3G
	-	75195.0	-		9%	5d5 6p	(<5>2G)3F	+	8%	5d5 6p	(<3>2D)3D
				+	6%	5d5 6p	(<5>2F)1F	+	5%	5d5 6p	(<3>4F)3F
	-	75305.0	-		10%	5d5 6p	(<3>2H)3G	+	7%	5d5 6p	(<5>2D)3F
				+	5%	5d3 6s2 6p	(<1>2D)3F	+	5%	5d5 6p	(<5>2F)3G
	-	75890.0	-		11%	5d5 6p	(<3>2D)3D	+	8%	5d5 6p	(<5>2F)3F
				+	5%	5d4 6s 6p	((<2>3P)2P)3D	+	4%	5d5 6p	(<5>2G)3G
	-	76578.0	-		8%	5d5 6p	(<3>2D)1F	+	7%	5d5 6p	(<5>2D)3D
				+	6%	5d5 6p	(<5>2D)1F	+	4%	5d3 6s2 6p	(<3>2D)1F
	-	76613.0	-		10%	5d5 6p	(<3>2D)1F	+	5%	5d5 6p	(<3>2G)3F
	-	77512.0	-		15%	5d5 6p	(<3>2G)1F	+	10%	5d5 6p	(<3>2D)1F
				+	7%	5d4 6s 6p	((<2>1D)2D)1F	+	6%	5d5 6p	(<5>2F)3G
	-	77932.0	-		15%	5d5 6p	(<3>2F)1F	+	10%	5d4 6s 6p	((<2>3F)2F)1F
				+	7%	5d5 6p	(<3>4F)3D	+	6%	5d5 6p	(<3>2D)3F
	-	78697.0	-		10%	5d5 6p	(<5>2D)1F	+	7%	5d5 6p	(<5>2G)1F
				+	5%	5d4 6s 6p	((<4>3D)2D)1F	+	5%	5d5 6p	(<3>2F)3G
	-	79008.0	-		9%	5d5 6p	(<3>2D)3F	+	8%	5d4 6s 6p	((<2>1D)2D)3D
				+	7%	5d5 6p	(<5>2F)3D	+	7%	5d5 6p	(<3>2G)3F
	-	79647.0	-		10%	5d4 6s 6p	((<2>1D)2D)3D	+	9%	5d4 6s 6p	((<2>3P)4P)3D
				+	6%	5d5 6p	(<3>4F)3D	+	4%	5d4 6s 6p	((<2>3P)2P)3D
	-	80362.0	-		10%	5d5 6p	(<3>2G)3G	+	10%	5d5 6p	(<5>2F)1F
				+	9%	5d5 6p	(<5>2F)3D	+	5%	5d4 6s 6p	((<4>3P)4P)3D
	-	81231.0	-		15%	5d5 6p	(<3>2G)3G	+	8%	5d4 6s 6p	((<2>3F)2F)3G
				+	8%	5d4 6s 6p	((<2>3F)4F)3G	+	6%	5d5 6p	(<3>2D)1F
	-	81569.0	-		9%	5d5 6p	(<3>2F)3D	+	8%	5d5 6p	(<5>2F)3D
				+	7%	5d4 6s 6p	((<2>3F)2F)3F	+	7%	5d4 6s 6p	((<2>3F)2F)3D
	-	82185.0	-		16%	5d3 6s2 6p	(<1>2D)1F	+	7%	5d3 6s2 6p	(<3>2D)1F
				+	7%	5d5 6p	(<3>2G)1F	+	5%	5d5 6p	(<5>2F)1F
	-	82913.0	-		12%	5d4 6s 6p	((<2>1G)2G)1F	+	10%	5d4 6s 6p	((<2>1D)2D)3D
				+	8%	5d5 6p	(<3>2F)1F	+	7%	5d5 6p	(<3>2G)3F
	-	84190.0	-		28%	5d5 6p	(<3>2D)3F	+	27%	5d4 6s 6p	((<2>1D)2D)3F
				+	6%	5d4 6s 6p	((<4>1D)2D)3F	+	5%	5d3 6s2 6p	(<1>2D)3F
	-	84569.0	-		22%	5d5 6p	(<3>2G)3G	+	10%	5d4 6s 6p	((<2>3F)4F)3D

								+	9%	5d4	6s	6p	((<2>3F)2F)3D	+	7%	5d4	6s	6p	((<2>3F)4F)3G
		-	85519.0	-					24%	5d5	6p		(<3>2G)3G	+	6%	5d4	6s	6p	((<2>3F)4F)3D
								+	6%	5d4	6s	6p	((<2>3F)2F)3D	+	5%	5d5	6p		(<5>2F)1F
		-	86832.0	-					27%	5d5	6p		(<3>2D)3D	+	18%	5d4	6s	6p	((<2>1D)2D)3D
								+	12%	5d4	6s	6p	((<4>1D)2D)3D	+	7%	5d5	6p		(<5>2D)3D
		-	86947.0	-					42%	5d5	6p		(<3>2G)3F	+	7%	5d4	6s	6p	((<2>3F)4F)3F
								+	6%	5d5	6p		(<1>2D)3F	+	4%	5d5	6p		(<3>4F)3F
		-	91240.0	-					29%	5d5	6p		(<3>2G)1F	+	19%	5d4	6s	6p	((<2>1G)2G)1F
								+	11%	5d5	6p		(<1>2D)1F	+	8%	5d5	6p		(<3>2D)1F
		-	93264.0	-					61%	5d5	6p		(<3>2P)3D	+	9%	5d5	6p		(<1>2D)3D
								+	7%	5d4	6s	6p	((<2>3P)2P)3D						
		-	95529.0	-					49%	5d4	6s	6p	((<2>1D)2D)1F	+	15%	5d4	6s	6p	((<4>1D)2D)1F
								+	6%	5d4	6s	6p	((<4>1G)2G)1F	+	5%	5d5	6p		(<3>2D)1F
		-	96681.0	-					46%	5d5	6p		(<1>2D)3F	+	13%	5d5	6p		(<5>2D)3F
								+	11%	5d5	6p		(<1>2D)3D	+	5%	5d5	6p		(<3>2G)3F
		-	100063.0	-					48%	5d5	6p		(<1>2D)3D	+	12%	5d5	6p		(<5>2D)3D
								+	9%	5d5	6p		(<3>2P)3D	+	7%	5d5	6p		(<1>2D)1F
		-	101882.0	-					47%	5d5	6p		(<1>2D)1F	+	13%	5d5	6p		(<5>2D)1F
								+	7%	5d5	6p		(<3>2G)1F	+	7%	5d5	6p		(<3>2P)3D
4	24763.4		25481.0	-717.6					90%	5d4	6s	6p	((<4>5D)6D)7F						
	27889.7		27699.0	190.7					81%	5d4	6s	6p	((<4>5D)6D)7P	+	5%	5d5	6p		(<5>6S)7P
								+	5%	5d4	6s	6p	((<4>3F)4F)5D						
	28797.2		28791.0	6.2					74%	5d4	6s	6p	((<4>5D)6D)7D	+	6%	5d4	6s	6p	((<4>5D)6D)5F
								+	6%	5d4	6s	6p	((<4>3F)4F)5F						
	31432.9		32001.0	-568.1					41%	5d3	6s2	6p	(<3>4F)5G	+	9%	5d4	6s	6p	((<4>5D)6D)7D
								+	8%	5d4	6s	6p	((<4>5D)6D)5F	+	7%	5d3	6s2	6p	(<3>4F)5F
	32828.1		33070.0	-241.9					32%	5d3	6s2	6p	(<3>4F)5G	+	13%	5d4	6s	6p	((<4>5D)6D)5F
								+	10%	5d4	6s	6p	((<4>5D)6D)7D	+	4%	5d4	6s	6p	((<4>3F)4F)5F
	34121.7		34383.0	-261.3					35%	5d3	6s2	6p	(<3>4F)5D	+	24%	5d4	6s	6p	((<4>5D)6D)5D
								+	7%	5d3	6s2	6p	(<3>2G)3F	+	4%	5d3	6s2	6p	(<3>4P)5D
	34632.6		34928.0	-295.4					24%	5d4	6s	6p	((<4>3H)4H)5I	+	15%	5d4	6s	6p	((<4>3G)4G)5H
								+	12%	5d4	6s	6p	((<4>3H)4H)5H	+	7%	5d3	6s2	6p	(<3>4F)5F
	35116.8		35488.0	-371.2					34%	5d5	6p		(<5>6S)7P	+	8%	5d3	6s2	6p	(<3>4F)5D
								+	7%	5d4	6s	6p	((<4>5D)6D)7P	+	7%	5d5	6p		(<3>4P)5D
	36082.3		35919.0	163.3					36%	5d5	6p		(<5>6S)7P	+	9%	5d4	6s	6p	((<4>5D)6D)5F
								+	9%	5d4	6s	6p	((<4>3H)4H)5H	+	5%	5d4	6s	6p	((<4>3G)4G)5F
	37146.4		36901.0	245.4					15%	5d4	6s	6p	((<4>3H)4H)5H	+	14%	5d4	6s	6p	((<4>3H)4H)5I
								+	5%	5d3	6s2	6p	(<3>4F)3G	+	4%	5d4	6s	6p	((<4>3G)4G)5H
	38001.1		37471.0	530.1					11%	5d3	6s2	6p	(<3>4F)3G	+	7%	5d3	6s2	6p	(<3>2G)3H
								+	5%	5d3	6s2	6p	(<3>2H)3H	+	5%	5d4	6s	6p	((<4>3F)4F)5D
	38748.4		38426.0	322.4					18%	5d3	6s2	6p	(<3>4F)5F	+	12%	5d3	6s2	6p	(<3>4F)3G
								+	6%	5d3	6s2	6p	(<3>4F)3F	+	5%	5d3	6s2	6p	(<3>2G)3H
	38259.4		38755.0	-495.6					18%	5d4	6s	6p	((<4>3H)4H)5I	+	9%	5d3	6s2	6p	(<3>2H)3H
								+	7%	5d4	6s	6p	((<4>3G)4G)5G	+	7%	5d3	6s2	6p	(<3>2G)1G
	39720.0		39813.0	-93.0					11%	5d3	6s2	6p	(<3>4P)5D	+	10%	5d4	6s	6p	((<4>3P)4P)5D
								+	9%	5d3	6s2	6p	(<3>4F)3G	+	5%	5d4	6s	6p	((<4>3H)4H)5H
	41198.1		40065.0	1133.1					12%	5d4	6s	6p	((<4>3G)4G)5G	+	9%	5d3	6s2	6p	(<3>2H)3H
								+	9%	5d4	6s	6p	((<4>3H)4H)5G	+	5%	5d3	6s2	6p	(<3>4F)3G
	40234.0		40567.0	-333.0					13%	5d4	6s	6p	((<4>3G)4G)5G	+	12%	5d4	6s	6p	((<4>3G)4G)5H
								+	5%	5d4	6s	6p	((<4>3H)4H)3G	+	5%	5d4	6s	6p	((<4>3G)4G)3F
	40583.1		41215.0	-631.9					19%	5d4	6s	6p	((<4>3H)4H)5H	+	13%	5d4	6s	6p	((<4>3F)4F)5G
								+	13%	5d4	6s	6p	((<4>3G)4G)5H	+	7%	5d4	6s	6p	((<2>3F)4F)5G
	41871.9		41947.0	-75.1					13%	5d3	6s2	6p	(<3>2G)3H	+	6%	5d4	6s	6p	((<4>3H)4H)5I
								+	6%	5d3	6s2	6p	(<3>2G)1G	+	6%	5d4	6s	6p	((<4>3F)4F)5F
	42450.2		42460.0	-9.8					8%	5d4	6s	6p	((<4>3G)4G)5H	+	8%	5d3	6s2	6p	(<3>4F)3F
								+	7%	5d3	6s2	6p	(<3>2G)3F	+	6%	5d3	6s2	6p	(<3>2G)3H
	42532.6		42845.0	-312.4					13%	5d4	6s	6p	((<4>5D)4D)3F	+	10%	5d4	6s	6p	((<4>3F)4F)5G
								+	5%	5d4	6s	6p	((<2>3F)4F)5G	+	5%	5d4	6s	6p	((<4>3H)2H)1G
	42910.7		43182.0	-271.3					8%	5d3	6s2	6p	(<3>2G)3F	+	6%	5d4	6s	6p	((<4>3F)4F)5D
								+	6%	5d4	6s	6p	((<4>3G)4G)5F	+	5%	5d4	6s	6p	((<4>3H)4H)3G
	43325.1		43491.0	-165.9					11%	5d4	6s	6p	((<4>3G)4G)5H	+	9%	5d3	6s2	6p	(<3>2G)1G
								+	7%	5d4	6s	6p	((<4>1G)2G)3H	+	6%	5d3	6s2	6p	(<3>2G)3G
	43985.4		43889.0	96.4					15%	5d4	6s	6p	((<4>3D)4D)5F	+	10%	5d4	6s	6p	((<4>3D)4D)5D
								+	5%	5d4	6s	6p	((<4>5D)6D)5F						
	43720.9		44239.0	-518.1					10%	5d4	6s	6p	((<4>3G)4G)5F	+	9%	5d4	6s	6p	((<4>3F)4F)5G
								+	5%	5d4	6s	6p	((<4>5D)4D)5F	+	5%	5d4	6s	6p	((<4>3D)2D)3F
	44940.6		44690.0	250.6					8%	5d4	6s	6p	((<4>3F)4F)5D	+	8%	5d3	6s2	6p	(<3>2G)3H
								+	5%	5d4	6s	6p	((<4>3D)4D)5D	+	5%	5d4	6s	6p	((<4>3G)4G)5F
	45116.8		44834.0	282.8					7%	5d4	6s	6p	((<4>3D)4D)5F	+	5%	5d4	6s	6p	((<4>3H)4H)5G
								+	5%	5d4	6s	6p	((<4>3G)2G)3H	+	5%	5d4	6s	6p	((<4>3H)2H)3H
	45262.5		45199.0	63.5					9%	5d3	6s2	6p	(<3>2G)3G	+	7%	5d4	6s	6p	((<4>5D)4D)5F
								+	5%	5d4	6s	6p	((<4>3G)4G)5G	+	5%	5d4	6s	6p	((<4>3G)4G)3F
	45869.1		45799.0	70.1					14%	5d4	6s	6p	((<4>3D)4D)5F	+	6%	5d4	6s	6p	((<4>3H)4H)3G
								+	6%	5d4	6s	6p	((<4>3D)4D)5D						
	46625.1		46337.0	288.1					14%	5d4	6s	6p	((<4>3H)4H)5G	+	9%	5d3	6s2	6p	(<3>2G)1G

			+	9%	5d4 6s 6p	((<4>5D)4D)3F	+	6%	5d4 6s 6p	((<4>3H)2H)3H
46931.8	46761.0	170.8		14%	5d4 6s 6p	((<4>5D)4D)5F	+	8%	5d4 6s 6p	((<4>3F)4F)5G
			+	7%	5d4 6s 6p	((<4>3D)4D)3F	+	4%	5d3 6s2 6p	(<3>2D)3F
47968.6	47091.0	877.6		9%	5d4 6s 6p	((<4>3F)4F)5D	+	8%	5d3 6s2 6p	(<3>4F)5D
			+	5%	5d4 6s 6p	((<4>5D)4D)5F	+	4%	5d4 6s 6p	((<4>5D)4D)3F
47689.3	47204.0	485.3		15%	5d4 6s 6p	((<4>3F)4F)5F	+	11%	5d4 6s 6p	((<4>3D)4D)5D
			+	8%	5d4 6s 6p	((<4>5D)4D)5D	+	8%	5d5 6p	(<5>4D)5D
47360.2	47470.0	-109.8		15%	5d4 6s 6p	((<4>3H)4H)5G	+	9%	5d4 6s 6p	((<4>3F)4F)5F
			+	7%	5d4 6s 6p	((<4>5D)4D)5D	+	6%	5d3 6s2 6p	(<3>4F)5D
48676.1	48478.0	198.1		7%	5d4 6s 6p	((<4>3D)4D)5F	+	6%	5d4 6s 6p	((<4>3G)4G)3H
			+	5%	5d3 6s2 6p	(<3>2G)1G	+	4%	5d4 6s 6p	((<4>3F)2F)3F
49148.0	48967.0	181.0		7%	5d4 6s 6p	((<4>3F)2F)3G	+	6%	5d3 6s2 6p	(<3>2H)3G
			+	4%	5d5 6p	(<3>2F)3G	+	4%	5d4 6s 6p	((<4>5D)4D)3F
49636.5	49389.0	247.5		7%	5d4 6s 6p	((<4>3F)4F)5D	+	6%	5d5 6p	(<5>4G)5H
			+	6%	5d4 6s 6p	((<4>3F)2F)1G	+	4%	5d5 6p	(<3>2F)3G
49788.6	49746.0	42.6		26%	5d4 6s 6p	((<4>3H)2H)3H	+	12%	5d4 6s 6p	((<4>3H)4H)3H
50284.6	50238.0	46.6		10%	5d4 6s 6p	((<4>3G)4G)5F	+	9%	5d4 6s 6p	((<4>3D)4D)5F
			+	9%	5d4 6s 6p	((<4>1G)2G)3F	+	6%	5d4 6s 6p	((<4>5D)4D)5F
50909.5	50829.0	80.5		12%	5d5 6p	(<5>4G)3H	+	8%	5d4 6s 6p	((<4>3H)2H)1G
			+	8%	5d3 6s2 6p	(<3>4F)3F	+	4%	5d4 6s 6p	((<4>3G)2G)3H
51747.3	51158.0	589.3		8%	5d4 6s 6p	((<4>3H)2H)3G	+	8%	5d4 6s 6p	((<4>3D)4D)5D
			+	5%	5d3 6s2 6p	(<3>2G)3F	+	4%	5d4 6s 6p	((<4>3F)2F)1G
51856.1	51560.0	296.1		8%	5d5 6p	(<5>4G)5H	+	7%	5d3 6s2 6p	(<3>2H)1G
			+	6%	5d4 6s 6p	((<4>3F)2F)1G	+	6%	5d5 6p	(<5>4D)5D
52059.8	51845.0	214.8		10%	5d4 6s 6p	((<4>3F)4F)3F	+	6%	5d5 6p	(<5>4G)5H
			+	5%	5d5 6p	(<5>4G)5G	+	4%	5d5 6p	(<5>4G)3H
52436.4	51996.0	440.4		15%	5d5 6p	(<5>4G)5G	+	15%	5d5 6p	(<5>4G)3F
			+	12%	5d5 6p	(<5>4G)5H	+	5%	5d4 6s 6p	((<4>1F)2F)3F
52992.7	52341.0	651.7		13%	5d3 6s2 6p	(<3>4P)5D	+	13%	5d4 6s 6p	((<2>3P)4P)5D
			+	8%	5d4 6s 6p	((<4>3G)4G)3F	+	5%	5d4 6s 6p	((<4>5D)6D)5D
53118.3	52491.0	627.3		18%	5d5 6p	(<5>4G)5H	+	8%	5d5 6p	(<5>4G)5G
			+	7%	5d4 6s 6p	((<4>3H)2H)3H	+	7%	5d4 6s 6p	((<4>1F)2F)3G
53238.4	53184.0	54.4		5%	5d4 6s 6p	((<2>3P)4P)5D	+	4%	5d3 6s2 6p	(<3>2H)3H
			+	4%	5d4 6s 6p	((<4>3G)2G)3H				
53848.6	53589.0	259.6		9%	5d4 6s 6p	((<4>3G)2G)3G	+	9%	5d5 6p	(<5>4G)3G
			+	6%	5d4 6s 6p	((<4>1G)2G)3G	+	5%	5d4 6s 6p	((<4>3G)4G)5F
54118.8	54004.0	114.8		15%	5d4 6s 6p	((<4>3H)2H)1G	+	10%	5d4 6s 6p	((<4>1I)2I)3H
			+	9%	5d5 6p	(<5>4G)5G	+	6%	5d5 6p	(<5>4G)3H
54911.6	54224.0	687.6		10%	5d5 6p	(<5>4D)5F	+	9%	5d5 6p	(<3>4P)5D
			+	5%	5d3 6s2 6p	(<3>2D)3F				
55043.3	54501.0	542.3		14%	5d4 6s 6p	((<4>1I)2I)3H	+	11%	5d3 6s2 6p	(<3>2H)3G
			+	8%	5d4 6s 6p	((<4>3H)4H)3H	+	4%	5d4 6s 6p	((<4>3H)2H)3G
-	54780.0	-		12%	5d5 6p	(<5>4G)3G	+	12%	5d5 6p	(<5>4G)5G
			+	7%	5d3 6s2 6p	(<3>2H)3H	+	5%	5d4 6s 6p	((<4>3H)2H)1G
55596.9	55025.0	571.9		7%	5d3 6s2 6p	(<3>2H)3G	+	6%	5d5 6p	(<5>4G)5H
			+	5%	5d4 6s 6p	((<4>1F)2F)3G	+	5%	5d5 6p	(<5>4G)3F
55346.2	55358.0	-11.8		10%	5d4 6s 6p	((<4>3G)2G)1G	+	8%	5d5 6p	(<5>4G)3F
			+	4%	5d3 6s2 6p	(<3>2H)1G				
55955.4	55962.0	-6.6		6%	5d4 6s 6p	((<2>3F)4F)5F	+	5%	5d4 6s 6p	((<2>3F)4F)5D
			+	4%	5d5 6p	(<5>4D)3F	+	4%	5d5 6p	(<5>4G)3G
56174.6	56280.0	-105.4		12%	5d4 6s 6p	((<4>3G)2G)3H	+	8%	5d5 6p	(<5>4G)3H
			+	8%	5d4 6s 6p	((<4>1G)2G)3H	+	7%	5d4 6s 6p	((<4>3F)4F)3G
56502.1	56511.0	-8.9		9%	5d4 6s 6p	((<4>3D)4D)3F	+	5%	5d4 6s 6p	((<4>3F)2F)3F
			+	4%	5d3 6s2 6p	(<3>2D)3F	+	4%	5d4 6s 6p	((<2>3P)4P)5D
56255.7	56600.0	-344.3		9%	5d4 6s 6p	((<4>1I)2I)3H	+	7%	5d5 6p	(<5>4G)5F
			+	7%	5d4 6s 6p	((<4>3G)2G)3G	+	6%	5d4 6s 6p	((<4>3F)4F)3G
56831.7	57024.0	-192.3		7%	5d4 6s 6p	((<4>3G)4G)3G	+	7%	5d5 6p	(<3>4P)5D
			+	6%	5d4 6s 6p	((<2>3F)4F)5D	+	5%	5d4 6s 6p	((<4>3P)4P)5D
57315.3	57447.0	-131.8		39%	5d5 6p	(<5>4G)5F	+	6%	5d4 6s 6p	((<4>1F)2F)3F
			+	5%	5d5 6p	(<5>4D)5F	+	4%	5d4 6s 6p	((<4>5D)6D)5F
57471.8	57547.0	-75.2		14%	5d4 6s 6p	((<4>1I)2I)3H	+	9%	5d5 6p	(<5>4D)5F
			+	7%	5d4 6s 6p	((<4>3H)2H)3G	+	6%	5d4 6s 6p	((<4>3H)4H)3G
57803.7	58154.0	-350.3		8%	5d4 6s 6p	((<2>3F)4F)5F	+	7%	5d4 6s 6p	((<4>3G)2G)1G
			+	5%	5d3 6s2 6p	(<3>2H)1G	+	5%	5d3 6s2 6p	(<3>2H)3G
58316.5	59101.0	-784.5		20%	5d4 6s 6p	((<2>3F)4F)5G	+	9%	5d5 6p	(<5>4D)5F
			+	6%	5d4 6s 6p	((<4>3F)4F)5G	+	4%	5d3 6s2 6p	(<3>2F)3G
58330.1	59375.0	-1044.9		13%	5d5 6p	(<5>4D)3F	+	7%	5d5 6p	(<3>4F)3G
			+	5%	5d4 6s 6p	((<4>5D)4D)3F	+	5%	5d4 6s 6p	((<2>1G)2G)3F
58777.8	59665.0	-887.2		29%	5d4 6s 6p	((<2>3F)4F)5F	+	6%	5d5 6p	(<3>4P)5D
			+	4%	5d4 6s 6p	((<4>1F)2F)3F				
58848.9	59985.0	-1136.1		8%	5d3 6s2 6p	(<3>2H)3G	+	6%	5d4 6s 6p	((<2>3F)4F)5F
			+	6%	5d4 6s 6p	((<2>1G)2G)3G	+	5%	5d4 6s 6p	((<2>3F)4F)3G
59171.7	60078.0	-906.3		7%	5d4 6s 6p	((<2>1G)2G)3F	+	5%	5d3 6s2 6p	(<3>2G)3F
			+	5%	5d4 6s 6p	((<4>3H)2H)3G	+	5%	5d4 6s 6p	((<4>3H)2H)1G
60158.3	60890.0	-731.7		12%	5d4 6s 6p	((<4>3G)4G)3G	+	6%	5d5 6p	(<5>4D)5D
			+	5%	5d4 6s 6p	((<4>1F)2F)3F	+	5%	5d3 6s2 6p	(<3>2F)3F

61535.5	60957.0	578.5		9%	5d4	6s	6p	((<4>3D)2D)3F	+	7%	5d5	6p	(<5>4D)3F
			+	5%	5d4	6s	6p	((<4>3G)2G)3F	+	5%	5d3	6s2 6p	(<3>2F)3F
60385.1	61340.0	-954.9		14%	5d4	6s	6p	((<2>3F)4F)5G	+	6%	5d5	6p	(<5>4D)5D
			+	6%	5d5	6p		(<3>4F)5D	+	5%	5d4	6s 6p	((<4>5D)4D)5D
	-	61615.0	-	9%	5d5	6p		(<3>4P)5D	+	6%	5d5	6p	(<3>2F)3F
			+	6%	5d4	6s	6p	((<4>3F)2F)3F	+	5%	5d5	6p	(<5>4D)5F
	-	61987.0	-	9%	5d4	6s	6p	((<2>3F)4F)5G	+	8%	5d5	6p	(<3>4F)5D
			+	7%	5d5	6p		(<5>4D)5D	+	5%	5d5	6p	(<5>2G)1G
	-	62647.0	-	6%	5d4	6s	6p	((<2>3F)4F)3F	+	6%	5d4	6s 6p	((<2>3F)4F)5D
			+	6%	5d4	6s	6p	((<4>3G)2G)3F	+	5%	5d4	6s 6p	((<2>1G)2G)3F
	-	62939.0	-	10%	5d5	6p		(<3>2F)1G	+	8%	5d5	6p	(<3>4P)5D
			+	6%	5d4	6s	6p	((<4>3D)4D)3F	+	6%	5d4	6s 6p	((<2>3F)2F)1G
	-	63215.0	-	14%	5d4	6s	6p	((<4>1D)2D)3F	+	8%	5d4	6s 6p	((<2>3P)4P)5D
			+	7%	5d3	6s2	6p	(<3>2D)3F	+	6%	5d4	6s 6p	((<4>1G)2G)3F
	-	63693.0	-	10%	5d5	6p		(<3>4F)3F	+	7%	5d5	6p	(<3>2F)1G
			+	6%	5d4	6s	6p	((<2>3F)2F)1G	+	5%	5d5	6p	(<5>2G)1G
	-	64067.0	-	12%	5d3	6s2	6p	(<3>2F)3G	+	6%	5d5	6p	(<5>2F)3G
			+	6%	5d4	6s	6p	((<2>3F)4F)5D	+	6%	5d5	6p	(<3>4F)5F
	-	64194.0	-	14%	5d4	6s	6p	((<4>3G)4G)3H	+	8%	5d5	6p	(<3>2H)3H
			+	8%	5d5	6p		(<5>4G)3H	+	4%	5d5	6p	(<3>2F)3F
	-	64489.0	-	14%	5d5	6p		(<5>2I)3H	+	10%	5d5	6p	(<3>2H)1G
			+	9%	5d5	6p		(<3>4F)5G	+	8%	5d4	6s 6p	((<4>3G)4G)3H
	-	64963.0	-	18%	5d4	6s	6p	((<2>3F)4F)5D	+	14%	5d5	6p	(<3>4F)5G
			+	10%	5d4	6s	6p	((<4>3P)4P)5D	+	5%	5d3	6s2 6p	(<3>4P)5D
	-	65171.0	-	9%	5d4	6s	6p	((<2>1G)2G)3H	+	7%	5d5	6p	(<3>4F)5F
			+	5%	5d4	6s	6p	((<4>3G)2G)1G	+	5%	5d4	6s 6p	((<2>1G)2G)1G
	-	65319.0	-	10%	5d5	6p		(<3>4F)5F	+	9%	5d5	6p	(<5>2G)3H
			+	7%	5d3	6s2	6p	(<3>2F)1G	+	6%	5d5	6p	(<5>2F)1G
	-	65874.0	-	10%	5d5	6p		(<3>2F)3G	+	7%	5d4	6s 6p	((<2>3F)2F)3G
			+	6%	5d4	6s	6p	((<2>3F)4F)3G	+	5%	5d3	6s2 6p	(<3>2H)1G
	-	66022.0	-	18%	5d5	6p		(<3>4F)5G	+	7%	5d5	6p	(<5>2G)3H
			+	6%	5d5	6p		(<3>2H)3G	+	6%	5d4	6s 6p	((<2>1G)2G)3H
	-	66213.0	-	8%	5d5	6p		(<5>2F)1G	+	6%	5d4	6s 6p	((<2>3F)4F)3F
			+	5%	5d4	6s	6p	((<4>3G)2G)3F	+	5%	5d5	6p	(<5>4D)3F
	-	66610.0	-	8%	5d5	6p		(<3>2H)1G	+	8%	5d5	6p	(<5>2I)3H
			+	6%	5d3	6s2	6p	(<3>2F)1G	+	6%	5d5	6p	(<3>4F)3G
	-	67061.0	-	11%	5d5	6p		(<5>2G)3H	+	8%	5d4	6s 6p	((<4>1G)2G)3H
			+	6%	5d5	6p		(<5>4G)3G	+	5%	5d4	6s 6p	((<4>3H)4H)3G
	-	67648.0	-	7%	5d4	6s	6p	((<2>1G)2G)1G	+	6%	5d5	6p	(<5>2G)3H
			+	5%	5d3	6s2	6p	(<3>2F)1G	+	5%	5d4	6s 6p	((<4>3D)2D)3F
	-	67963.0	-	7%	5d4	6s	6p	((<4>3D)4D)3F	+	6%	5d3	6s2 6p	(<3>2F)3F
			+	5%	5d5	6p		(<5>2D)3F	+	4%	5d4	6s 6p	((<4>3F)2F)3F
	-	68152.0	-	12%	5d4	6s	6p	((<2>1G)2G)3H	+	10%	5d5	6p	(<5>2I)3H
			+	9%	5d4	6s	6p	((<2>1G)2G)3G	+	8%	5d5	6p	(<3>2F)3G
	-	68634.0	-	9%	5d5	6p		(<5>2G)1G	+	8%	5d4	6s 6p	((<2>3F)2F)1G
			+	6%	5d4	6s	6p	((<2>1G)2G)3F	+	6%	5d5	6p	(<3>4F)5F
	-	69647.0	-	11%	5d5	6p		(<3>2F)1G	+	7%	5d5	6p	(<3>2H)3H
			+	6%	5d3	6s2	6p	(<3>2F)1G	+	4%	5d4	6s 6p	((<4>3H)4H)3G
	-	69899.0	-	8%	5d5	6p		(<3>2H)3G	+	8%	5d4	6s 6p	((<2>1G)2G)3F
			+	7%	5d5	6p		(<3>4F)3F	+	7%	5d5	6p	(<3>4F)5D
	-	70177.0	-	13%	5d5	6p		(<3>4F)5F	+	7%	5d5	6p	(<5>4D)5D
			+	7%	5d5	6p		(<3>4F)5D	+	6%	5d5	6p	(<3>2F)3F
	-	70280.0	-	7%	5d5	6p		(<3>2H)1G	+	7%	5d4	6s 6p	((<4>1G)2G)3G
			+	5%	5d4	6s	6p	((<4>3D)2D)3F	+	5%	5d5	6p	(<5>2G)1G
	-	70809.0	-	10%	5d5	6p		(<5>2G)3H	+	6%	5d3	6s2 6p	(<1>2D)3F
			+	6%	5d4	6s	6p	((<2>3F)2F)3G	+	5%	5d5	6p	(<3>2H)3H
	-	71160.0	-	9%	5d5	6p		(<5>2F)3G	+	8%	5d5	6p	(<3>4F)3G
			+	8%	5d5	6p		(<5>2F)1G	+	7%	5d5	6p	(<3>2H)1G
	-	71883.0	-	21%	5d5	6p		(<3>4F)3G	+	11%	5d5	6p	(<3>2H)3H
			+	8%	5d4	6s	6p	((<4>3G)4G)3F	+	6%	5d4	6s 6p	((<2>1G)2G)3F
	-	72553.0	-	10%	5d5	6p		(<3>2F)3G	+	8%	5d4	6s 6p	((<2>3F)4F)3F
			+	8%	5d5	6p		(<3>2F)3F	+	8%	5d5	6p	(<5>2F)3F
	-	73122.0	-	12%	5d5	6p		(<5>2F)3F	+	6%	5d5	6p	(<3>4F)3G
			+	4%	5d5	6p		(<3>4F)5D	+	4%	5d5	6p	(<5>2D)3F
	-	73826.0	-	11%	5d5	6p		(<3>2D)3F	+	8%	5d4	6s 6p	((<4>1D)2D)3F
			+	8%	5d5	6p		(<5>2G)3F	+	8%	5d4	6s 6p	((<2>1D)2D)3F
	-	74666.0	-	15%	5d4	6s	6p	((<2>3F)2F)1G	+	14%	5d5	6p	(<5>2G)3G
			+	9%	5d5	6p		(<3>2F)3F	+	9%	5d5	6p	(<5>2F)3G
	-	75383.0	-	12%	5d5	6p		(<5>2F)3F	+	9%	5d4	6s 6p	((<4>1F)2F)3F
			+	9%	5d5	6p		(<5>2G)3F	+	8%	5d5	6p	(<3>2D)3F
	-	76129.0	-	12%	5d4	6s	6p	((<2>3F)2F)1G	+	9%	5d4	6s 6p	((<4>1F)2F)1G
			+	7%	5d5	6p		(<5>2G)3F	+	7%	5d5	6p	(<3>2H)3G
	-	76360.0	-	14%	5d5	6p		(<5>2G)3G	+	12%	5d5	6p	(<3>2H)3G
			+	7%	5d5	6p		(<5>2F)3F	+	5%	5d5	6p	(<5>2G)3F
	-	77047.0	-	8%	5d4	6s	6p	((<4>3G)4G)3F	+	7%	5d5	6p	(<3>4F)3F
			+	7%	5d5	6p		(<3>4F)3G	+	6%	5d5	6p	(<5>2F)3F

	–	77091.0	–	24% 5d4 6s 6p ((<2>3F)2F)3F + 10% 5d5 6p (<3>2G)3F
				+ 8% 5d5 6p (<5>2G)1G + 8% 5d4 6s 6p ((<4>1G)2G)1G
	–	78940.0	–	13% 5d3 6s2 6p (<1>2D)3F + 11% 5d5 6p (<3>2G)3H
				+ 8% 5d5 6p (<3>2D)3F + 6% 5d5 6p (<5>2D)3F
	–	79404.0	–	14% 5d5 6p (<3>2G)3G + 12% 5d5 6p (<3>2G)1G
				+ 11% 5d4 6s 6p ((<4>1G)2G)1G + 8% 5d5 6p (<3>2G)3F
	–	80695.0	–	22% 5d5 6p (<3>2G)3H + 12% 5d5 6p (<3>2G)1G
				+ 8% 5d4 6s 6p ((<2>1G)2G)1G + 7% 5d5 6p (<5>2F)3G
	–	82149.0	–	25% 5d5 6p (<3>2G)3H + 10% 5d4 6s 6p ((<2>3F)2F)3G
				+ 8% 5d4 6s 6p ((<2>3F)4F)3G + 6% 5d5 6p (<3>2G)1G
	–	82729.0	–	25% 5d4 6s 6p ((<2>1G)2G)1G + 9% 5d5 6p (<3>2H)1G
				+ 7% 5d5 6p (<3>2G)3H + 7% 5d5 6p (<3>2F)1G
	–	83043.0	–	28% 5d5 6p (<3>2G)3G + 15% 5d5 6p (<5>2F)1G
				+ 14% 5d4 6s 6p ((<4>1F)2F)1G + 11% 5d5 6p (<3>2G)3H
	–	85584.0	–	18% 5d5 6p (<3>2D)3F + 12% 5d5 6p (<3>2G)3G
				+ 10% 5d4 6s 6p ((<2>1D)2D)3F + 7% 5d5 6p (<3>2G)3F
	–	85754.0	–	34% 5d5 6p (<3>2G)3F + 14% 5d5 6p (<3>2G)3G
				+ 7% 5d4 6s 6p ((<2>3F)4F)3F + 5% 5d5 6p (<3>2G)1G
	–	85915.0	–	19% 5d5 6p (<3>2D)3F + 17% 5d4 6s 6p ((<2>1D)2D)3F
				+ 11% 5d5 6p (<3>2G)3G + 5% 5d4 6s 6p ((<2>3F)2F)3G
	–	89276.0	–	41% 5d5 6p (<3>2G)1G + 27% 5d4 6s 6p ((<4>1G)2G)1G
				+ 14% 5d4 6s 6p ((<2>1G)2G)1G + 5% 5d5 6p (<5>2G)1G
	–	97710.0	–	67% 5d5 6p (<1>2D)3F + 18% 5d5 6p (<5>2D)3F
				+ 5% 5d5 6p (<3>2G)3F + 4% 5d3 6s2 6p (<1>2D)3F
5	26676.5	27210.0	-533.5	84% 5d4 6s 6p ((<4>5D)6D)7F
	29773.3	29945.0	-171.7	61% 5d4 6s 6p ((<4>5D)6D)7D + 10% 5d4 6s 6p ((<4>3F)4F)5F
				+ 8% 5d4 6s 6p ((<4>5D)6D)5F + 8% 5d4 6s 6p ((<4>5D)6D)7F
	33370.0	33920.0	-550.0	22% 5d4 6s 6p ((<4>5D)6D)7D + 14% 5d3 6s2 6p (<3>4F)5G
				+ 9% 5d3 6s2 6p (<3>4F)5F + 8% 5d4 6s 6p ((<4>5D)6D)5F
	35507.1	35755.0	-247.9	43% 5d3 6s2 6p (<3>4F)5G + 8% 5d4 6s 6p ((<4>3H)4H)5H
				+ 7% 5d4 6s 6p ((<4>3H)4H)5I + 6% 5d3 6s2 6p (<3>2G)3H
	36275.1	36340.0	-64.9	18% 5d4 6s 6p ((<4>3H)4H)5I + 18% 5d4 6s 6p ((<4>3G)4G)5H
				+ 14% 5d4 6s 6p ((<4>3H)4H)5H + 11% 5d3 6s2 6p (<3>4F)5G
	37309.2	37390.0	-80.8	18% 5d4 6s 6p ((<4>5D)6D)5F + 8% 5d4 6s 6p ((<4>3G)4G)5F
				+ 8% 5d4 6s 6p ((<4>5D)4D)5F + 6% 5d3 6s2 6p (<3>2G)3G
	39361.0	39228.0	133.0	36% 5d4 6s 6p ((<4>3H)4H)5I + 21% 5d4 6s 6p ((<4>3H)4H)5H
				+ 7% 5d4 6s 6p ((<4>3G)4G)5G + 4% 5d4 6s 6p ((<4>5D)6D)5F
	40476.4	39918.0	558.4	13% 5d3 6s2 6p (<3>2H)3I + 13% 5d3 6s2 6p (<3>4F)5F
				+ 10% 5d4 6s 6p ((<4>3F)4F)5F + 8% 5d4 6s 6p ((<4>3G)4G)5F
	39610.5	40492.0	-881.5	24% 5d4 6s 6p ((<4>3H)4H)5G + 18% 5d4 6s 6p ((<4>3G)4G)5G
				+ 7% 5d4 6s 6p ((<4>5D)6D)5F + 7% 5d5 6p (<5>4G)5G
	40912.0	41279.0	-367.0	19% 5d3 6s2 6p (<3>4F)3G + 11% 5d4 6s 6p ((<4>3H)4H)5I
				+ 7% 5d3 6s2 6p (<3>4F)5F + 6% 5d3 6s2 6p (<3>2H)3H
	42866.0	42621.0	245.0	21% 5d4 6s 6p ((<4>3G)4G)5H + 17% 5d4 6s 6p ((<4>3H)4H)5H
				+ 6% 5d3 6s2 6p (<3>2H)3H + 5% 5d4 6s 6p ((<2>3F)4F)5G
	46854.8	42946.0	3908.8	10% 5d4 6s 6p ((<4>3H)4H)3G + 7% 5d4 6s 6p ((<4>3H)4H)5I
				+ 6% 5d4 6s 6p ((<4>3H)4H)5G + 6% 5d3 6s2 6p (<3>2H)3G
	43924.3	43458.0	466.3	18% 5d3 6s2 6p (<3>2H)3H + 11% 5d4 6s 6p ((<4>3G)4G)5H
				+ 10% 5d4 6s 6p ((<4>3H)4H)5H + 8% 5d4 6s 6p ((<4>3H)4H)3H
	43741.4	44032.0	-290.6	15% 5d3 6s2 6p (<3>2H)3I + 15% 5d4 6s 6p ((<4>3F)4F)5G
				+ 7% 5d4 6s 6p ((<4>3G)4G)5G + 6% 5d4 6s 6p ((<4>3G)4G)5F
	44546.8	44356.0	190.8	16% 5d4 6s 6p ((<4>3G)4G)5F + 10% 5d4 6s 6p ((<4>3G)4G)5G
				+ 8% 5d4 6s 6p ((<4>3D)4D)5F + 6% 5d5 6p (<5>4G)5G
	46506.4	45236.0	1270.4	24% 5d3 6s2 6p (<3>2G)3H + 10% 5d3 6s2 6p (<3>2G)3G
				+ 6% 5d3 6s2 6p (<3>2H)1H + 5% 5d4 6s 6p ((<4>3G)2G)3H
	45451.7	45621.0	-169.3	10% 5d3 6s2 6p (<3>4F)3G + 7% 5d3 6s2 6p (<3>2G)3H
				+ 7% 5d4 6s 6p ((<4>3G)4G)5G + 6% 5d4 6s 6p ((<4>3H)4H)3I
	45789.1	46202.0	-412.9	32% 5d4 6s 6p ((<4>3D)4D)5F + 14% 5d5 6p (<5>4D)5F
				+ 11% 5d4 6s 6p ((<4>5D)4D)5F + 9% 5d5 6p (<5>4G)5F
	43034.1	46381.0	-3346.9	19% 5d4 6s 6p ((<4>3H)4H)5G + 10% 5d3 6s2 6p (<3>2G)1H
				+ 7% 5d4 6s 6p ((<4>3F)4F)5G + 6% 5d4 6s 6p ((<4>3G)4G)5G
	47850.8	47120.0	730.8	16% 5d4 6s 6p ((<4>3F)4F)5F + 11% 5d3 6s2 6p (<3>4F)5F
				+ 6% 5d4 6s 6p ((<4>3G)4G)3H + 6% 5d4 6s 6p ((<4>5D)4D)5F
	49073.9	47944.0	1129.9	16% 5d3 6s2 6p (<3>2G)1H + 10% 5d4 6s 6p ((<4>5D)4D)5F
				+ 6% 5d4 6s 6p ((<4>3G)2G)1H + 5% 5d3 6s2 6p (<3>2G)3G
	48138.4	48125.0	13.4	17% 5d4 6s 6p ((<4>3H)2H)3H + 16% 5d4 6s 6p ((<4>1I)2I)3I
				+ 8% 5d4 6s 6p ((<4>3H)4H)5G + 7% 5d4 6s 6p ((<4>3H)4H)3H
	49187.9	48984.0	203.9	13% 5d4 6s 6p ((<4>1I)2I)3I + 8% 5d4 6s 6p ((<4>3D)4D)5F
				+ 7% 5d4 6s 6p ((<4>3F)4F)5G + 6% 5d4 6s 6p ((<4>3G)4G)5F
	50137.5	49600.0	537.5	11% 5d4 6s 6p ((<4>3G)4G)3H + 9% 5d4 6s 6p ((<4>1I)2I)3I
				+ 8% 5d4 6s 6p ((<4>3H)4H)5G + 6% 5d4 6s 6p ((<4>3H)2H)3H
	50806.1	49962.0	844.1	11% 5d4 6s 6p ((<4>1I)2I)3I + 10% 5d4 6s 6p ((<4>3H)2H)1H
				+ 7% 5d4 6s 6p ((<4>3F)2F)3G + 6% 5d3 6s2 6p (<3>2H)3I
	51290.7	50445.0	845.7	24% 5d3 6s2 6p (<3>2H)1H + 6% 5d4 6s 6p ((<4>1I)2I)1H
				+ 5% 5d4 6s 6p ((<4>1G)2G)3H + 5% 5d4 6s 6p ((<4>1I)2I)3H

52395.5	51368.0	1027.5	13% 5d5 6p	(<5>4G)5H	+ 8% 5d4 6s 6p	((<4>3G)4G)5F
			+ 7% 5d4 6s 6p	((<4>5D)4D)5F	+ 6% 5d3 6s2 6p	(<3>4F)5F
52081.1	51704.0	377.1	17% 5d5 6p	(<5>4G)5H	+ 12% 5d4 6s 6p	((<4>1I)2I)3I
			+ 12% 5d4 6s 6p	((<4>3H)2H)3H	+ 6% 5d4 6s 6p	((<4>3H)4H)3H
52774.1	52355.0	419.1	12% 5d4 6s 6p	((<4>3H)4H)3I	+ 9% 5d4 6s 6p	((<4>3G)2G)3H
			+ 8% 5d3 6s2 6p	(<3>2H)1H	+ 6% 5d3 6s2 6p	(<3>2H)3I
53103.0	52758.0	345.0	12% 5d4 6s 6p	((<4>1G)2G)3G	+ 9% 5d5 6p	(<5>4G)3H
			+ 6% 5d5 6p	(<5>4G)5G	+ 6% 5d4 6s 6p	((<4>3F)4F)5F
53862.7	53212.0	650.7	14% 5d5 6p	(<5>4G)3G	+ 11% 5d5 6p	(<5>4G)5H
			+ 9% 5d5 6p	(<5>4G)5G	+ 6% 5d3 6s2 6p	(<3>2G)3G
53194.3	53575.0	-380.8	9% 5d5 6p	(<5>4G)5H	+ 7% 5d5 6p	(<5>4G)5G
			+ 7% 5d4 6s 6p	((<4>1G)2G)3H	+ 6% 5d3 6s2 6p	(<3>2H)3G
55009.2	54218.0	791.2	14% 5d5 6p	(<5>4G)5H	+ 9% 5d5 6p	(<5>4G)3H
			+ 6% 5d4 6s 6p	((<4>1G)2G)3G	+ 5% 5d5 6p	(<5>4G)3G
55455.4	54525.0	930.4	15% 5d3 6s2 6p	(<3>2H)3G	+ 10% 5d4 6s 6p	((<4>3H)2H)1H
			+ 9% 5d5 6p	(<5>4G)5G	+ 5% 5d4 6s 6p	((<4>3H)2H)3H
55492.2	54809.0	683.2	9% 5d5 6p	(<5>4G)5G	+ 9% 5d4 6s 6p	((<4>3G)2G)1H
			+ 9% 5d5 6p	(<5>4G)3G	+ 7% 5d4 6s 6p	((<4>1I)2I)3H
55987.9	55038.0	949.9	16% 5d4 6s 6p	((<4>1I)2I)3H	+ 7% 5d3 6s2 6p	(<3>2G)1H
			+ 6% 5d3 6s2 6p	(<3>2H)3G	+ 6% 5d3 6s2 6p	(<3>2H)3I
55795.5	55218.0	577.5	10% 5d4 6s 6p	((<4>3H)2H)3I	+ 8% 5d5 6p	(<5>4G)3H
			+ 7% 5d5 6p	(<5>2I)3I	+ 6% 5d4 6s 6p	((<4>3H)2H)1H
56280.5	56038.0	242.5	11% 5d5 6p	(<5>2I)3H	+ 10% 5d3 6s2 6p	(<3>2H)3H
			+ 9% 5d4 6s 6p	((<4>3H)2H)3H	+ 8% 5d5 6p	(<5>4G)3H
57143.5	56500.0	643.5	12% 5d5 6p	(<5>4G)5F	+ 7% 5d4 6s 6p	((<4>1I)2I)3H
			+ 6% 5d4 6s 6p	((<4>3H)2H)1H	+ 6% 5d3 6s2 6p	(<3>2G)3G
57560.8	57483.0	77.8	8% 5d3 6s2 6p	(<3>2G)3H	+ 7% 5d4 6s 6p	((<4>3G)2G)3H
			+ 7% 5d4 6s 6p	((<4>1F)2F)3G	+ 6% 5d4 6s 6p	((<4>1G)2G)1H
58179.4	57683.0	496.4	17% 5d5 6p	(<5>4G)5F	+ 9% 5d4 6s 6p	((<2>3F)4F)5F
			+ 7% 5d4 6s 6p	((<4>1F)2F)3G	+ 6% 5d4 6s 6p	((<4>5D)6D)5F
58562.7	58063.0	499.7	20% 5d4 6s 6p	((<4>3H)2H)1H	+ 12% 5d4 6s 6p	((<4>1I)2I)3H
			+ 11% 5d4 6s 6p	((<4>3H)2H)3I	+ 7% 5d4 6s 6p	((<4>3H)2H)3G
59149.6	58427.0	722.6	9% 5d5 6p	(<5>4G)5F	+ 6% 5d4 6s 6p	((<4>3G)2G)3H
			+ 5% 5d4 6s 6p	((<4>3H)2H)1H	+ 5% 5d5 6p	(<5>2I)3I
58904.0	58703.0	201.0	19% 5d4 6s 6p	((<2>3F)4F)5F	+ 14% 5d5 6p	(<5>4D)5F
			+ 7% 5d3 6s2 6p	(<3>2H)3G	+ 5% 5d4 6s 6p	((<2>3F)4F)5G
59263.6	59688.0	-424.4	20% 5d5 6p	(<5>4D)5F	+ 12% 5d4 6s 6p	((<2>3F)4F)5F
			+ 9% 5d3 6s2 6p	(<3>2G)3G	+ 8% 5d4 6s 6p	((<4>3F)4F)3G
59673.3	60351.0	-677.7	22% 5d5 6p	(<5>2G)3G	+ 10% 5d4 6s 6p	((<4>3G)2G)3G
			+ 6% 5d4 6s 6p	((<4>3G)2G)1H	+ 5% 5d5 6p	(<5>4D)5F
60229.2	61052.0	-822.8	34% 5d4 6s 6p	((<2>3F)4F)5G	+ 9% 5d4 6s 6p	((<4>3F)4F)5G
			+ 5% 5d4 6s 6p	((<4>3D)4D)5F	+ 5% 5d5 6p	(<3>2F)3G
60741.4	61364.0	-622.6	17% 5d4 6s 6p	((<4>3G)4G)3G	+ 13% 5d4 6s 6p	((<2>1G)2G)3G
			+ 6% 5d5 6p	(<5>2I)3I	+ 6% 5d3 6s2 6p	(<3>2H)3G
61476.6	61782.0	-305.4	17% 5d5 6p	(<3>4F)5G	+ 13% 5d5 6p	(<5>2F)3G
			+ 12% 5d4 6s 6p	((<2>3F)4F)5G	+ 6% 5d4 6s 6p	((<2>1G)2G)3H
62154.5	62044.0	110.5	20% 5d5 6p	(<5>2I)3I	+ 15% 5d5 6p	(<5>2I)1H
			+ 7% 5d4 6s 6p	((<2>3F)4F)5G	+ 4% 5d5 6p	(<3>2H)3I
-	62842.0	-	7% 5d4 6s 6p	((<4>1F)2F)3G	+ 6% 5d5 6p	(<5>2I)3I
			+ 6% 5d4 6s 6p	((<2>1G)2G)3H	+ 6% 5d4 6s 6p	((<4>3F)2F)3G
-	63794.0	-	12% 5d5 6p	(<5>2G)1H	+ 11% 5d5 6p	(<5>2I)3I
			+ 10% 5d5 6p	(<5>4G)3G	+ 8% 5d4 6s 6p	((<4>3H)4H)3I
-	64699.0	-	13% 5d5 6p	(<3>2H)3I	+ 10% 5d3 6s2 6p	(<3>2F)3G
			+ 8% 5d4 6s 6p	((<4>1F)2F)3G	+ 7% 5d5 6p	(<5>2F)3G
-	65323.0	-	10% 5d5 6p	(<3>2F)3G	+ 7% 5d4 6s 6p	((<2>1G)2G)3G
			+ 6% 5d4 6s 6p	((<4>1G)2G)3G	+ 6% 5d3 6s2 6p	(<3>2F)3G
-	65685.0	-	23% 5d5 6p	(<3>2H)3I	+ 15% 5d5 6p	(<3>4F)3G
			+ 9% 5d5 6p	(<3>4F)5G	+ 6% 5d5 6p	(<5>2I)3H
-	66037.0	-	17% 5d5 6p	(<5>2I)3H	+ 14% 5d5 6p	(<3>4F)5F
			+ 8% 5d4 6s 6p	((<2>3F)2F)3G	+ 7% 5d4 6s 6p	((<4>3G)4G)3H
-	66785.0	-	25% 5d5 6p	(<3>2H)3H	+ 9% 5d5 6p	(<5>2G)3H
			+ 6% 5d4 6s 6p	((<4>3G)4G)3G	+ 6% 5d4 6s 6p	((<4>3G)2G)3G
-	67000.0	-	17% 5d5 6p	(<3>4F)5G	+ 11% 5d5 6p	(<5>2I)3H
			+ 10% 5d4 6s 6p	((<2>3F)2F)3G	+ 7% 5d5 6p	(<3>2F)3G
-	67280.0	-	18% 5d5 6p	(<3>4F)5F	+ 10% 5d5 6p	(<3>2H)3G
			+ 9% 5d5 6p	(<3>2H)3I	+ 6% 5d4 6s 6p	((<4>3G)2G)3G
-	67737.0	-	27% 5d5 6p	(<3>4F)5F	+ 9% 5d5 6p	(<3>2H)3I
			+ 8% 5d4 6s 6p	((<2>1G)2G)3H	+ 6% 5d5 6p	(<5>2I)3H
-	68209.0	-	16% 5d4 6s 6p	((<2>1G)2G)3H	+ 10% 5d5 6p	(<3>2F)3G
			+ 9% 5d4 6s 6p	((<4>1G)2G)3H	+ 7% 5d4 6s 6p	((<2>3F)4F)3G
-	68975.0	-	13% 5d5 6p	(<3>2H)3H	+ 10% 5d5 6p	(<3>4F)3G
			+ 6% 5d5 6p	(<3>2H)3I	+ 6% 5d4 6s 6p	((<4>3G)4G)3H
-	69583.0	-	16% 5d5 6p	(<5>2G)3H	+ 14% 5d4 6s 6p	((<2>1G)2G)3G
			+ 8% 5d5 6p	(<3>2H)3I	+ 7% 5d3 6s2 6p	(<3>2F)3G
-	70654.0	-	14% 5d5 6p	(<5>2G)1H	+ 9% 5d4 6s 6p	((<4>3H)2H)3G
			+ 8% 5d4 6s 6p	((<4>1I)2I)1H	+ 8% 5d4 6s 6p	((<4>3H)4H)3G

		-	71453.0	-		12%	5d5	6p	(<5>2G)3G	+ 11%	5d5	6p	(<3>4F)3G
					+ 10%	5d5	6p		(<3>2H)3G	+ 7%	5d5	6p	(<5>2I)3H
		-	71565.0	-		15%	5d5	6p	(<3>4F)3G	+ 10%	5d4	6s 6p	((<2>3F)2F)3G
					+ 9%	5d5	6p		(<3>2F)3G	+ 8%	5d5	6p	(<3>2H)1H
		-	72535.0	-		21%	5d5	6p	(<5>2G)3H	+ 12%	5d4	6s 6p	((<4>1G)2G)3H
					+ 8%	5d4	6s	6p	((<2>1G)2G)3H	+ 7%	5d4	6s 6p	((<4>1G)2G)1H
		-	73497.0	-		19%	5d5	6p	(<3>2H)1H	+ 17%	5d5	6p	(<5>2I)1H
					+ 12%	5d5	6p		(<3>2H)3H	+ 10%	5d5	6p	(<5>2G)1H
		-	75249.0	-		20%	5d5	6p	(<5>2G)3G	+ 14%	5d5	6p	(<5>2F)3G
					+ 10%	5d4	6s	6p	((<4>3G)2G)3G	+ 7%	5d5	6p	(<3>2H)3H
		-	77383.0	-		16%	5d5	6p	(<3>2H)3G	+ 11%	5d5	6p	(<5>2F)3G
					+ 11%	5d5	6p		(<3>2G)3H	+ 7%	5d4	6s 6p	((<4>1I)2I)1H
		-	78054.0	-		17%	5d5	6p	(<3>2H)1H	+ 11%	5d5	6p	(<5>2G)1H
					+ 10%	5d4	6s	6p	((<4>1I)2I)1H	+ 10%	5d5	6p	(<3>2G)3G
		-	79900.0	-		17%	5d4	6s 6p	((<2>1G)2G)1H	+ 14%	5d4	6s 6p	((<2>3F)2F)3G
					+ 14%	5d4	6s	6p	((<4>1G)2G)1H	+ 10%	5d5	6p	(<3>2G)1H
		-	81151.0	-		26%	5d5	6p	(<3>2G)3H	+ 15%	5d5	6p	(<3>2G)1H
					+ 11%	5d5	6p		(<3>2G)3G	+ 8%	5d4	6s 6p	((<2>3F)2F)3G
		-	82771.0	-		39%	5d5	6p	(<3>2G)3H	+ 13%	5d4	6s 6p	((<2>1G)2G)1H
					+ 9%	5d4	6s	6p	((<4>1G)2G)1H	+ 6%	5d4	6s 6p	((<2>3F)2F)3G
		-	85329.0	-		61%	5d5	6p	(<3>2G)3G	+ 7%	5d4	6s 6p	((<2>3F)4F)3G
					+ 6%	5d4	6s	6p	((<2>3F)2F)3G	+ 5%	5d5	6p	(<3>2G)1H
		-	87633.0	-		49%	5d5	6p	(<3>2G)1H	+ 22%	5d4	6s 6p	((<2>1G)2G)1H
					+ 6%	5d4	6s	6p	((<4>1I)2I)1H	+ 4%	5d5	6p	(<3>2G)3H
6	29643.1	29350.0	293.1		89%	5d4	6s	6p	((<4>5D)6D)7F	+ 7%	5d4	6s 6p	((<4>3F)4F)5G
	38203.1	37792.0	411.1		28%	5d4	6s	6p	((<4>3H)4H)5I	+ 28%	5d4	6s 6p	((<4>3H)4H)5H
					+ 23%	5d4	6s	6p	((<4>3G)4G)5H	+ 6%	5d4	6s 6p	((<4>3G)4G)5G
	41171.4	38063.0	3108.4		56%	5d3	6s2	6p	(<3>4F)5G	+ 11%	5d3	6s2 6p	(<3>2G)3H
					+ 8%	5d4	6s	6p	((<4>3F)4F)5G	+ 8%	5d4	6s 6p	((<4>3H)4H)5G
	41417.5	40634.0	783.5		23%	5d4	6s	6p	((<4>3H)4H)5I	+ 23%	5d4	6s 6p	((<4>3H)4H)5H
					+ 7%	5d4	6s	6p	((<4>3G)4G)5G	+ 6%	5d4	6s 6p	((<4>1G)2G)3H
	42239.1	41143.0	1096.1		31%	5d4	6s	6p	((<4>3H)4H)5G	+ 21%	5d4	6s 6p	((<4>3G)4G)5G
					+ 9%	5d5	6p		(<5>4G)5G	+ 7%	5d4	6s 6p	((<4>3H)4H)3H
	44390.4	42192.0	2198.4		28%	5d4	6s	6p	((<4>3H)4H)5I	+ 9%	5d4	6s 6p	((<4>3H)4H)5H
					+ 8%	5d4	6s	6p	((<4>3H)4H)3I	+ 7%	5d4	6s 6p	((<4>3F)4F)5G
	44492.4	44288.0	204.4		14%	5d3	6s2	6p	(<3>2H)3H	+ 12%	5d3	6s2 6p	(<3>2H)1I
					+ 9%	5d4	6s	6p	((<4>3F)4F)5G	+ 9%	5d4	6s 6p	((<4>3H)2H)1I
	46106.2	44829.0	1277.2		41%	5d4	6s	6p	((<4>3G)4G)5H	+ 11%	5d4	6s 6p	((<4>3H)4H)5H
					+ 8%	5d3	6s2	6p	(<3>2H)3H	+ 7%	5d4	6s 6p	((<4>3H)4H)5I
	47541.6	46119.0	1422.6		13%	5d3	6s2	6p	(<3>2H)3H	+ 9%	5d4	6s 6p	((<4>1I)2I)3K
					+ 8%	5d3	6s2	6p	(<3>2H)3I	+ 8%	5d4	6s 6p	((<4>3H)2H)3I
	46672.2	46618.0	54.2		13%	5d4	6s	6p	((<4>3G)4G)3H	+ 13%	5d4	6s 6p	((<4>1I)2I)3H
					+ 12%	5d4	6s	6p	((<4>3F)4F)5G	+ 10%	5d4	6s 6p	((<4>3H)4H)5G
	48684.7	47167.0	1517.7		20%	5d3	6s2	6p	(<3>2G)3H	+ 9%	5d4	6s 6p	((<4>3G)4G)5H
					+ 8%	5d4	6s	6p	((<4>3H)4H)5G	+ 7%	5d4	6s 6p	((<4>3G)2G)3H
	50429.2	48180.0	2249.2		14%	5d4	6s	6p	((<4>3H)2H)1I	+ 12%	5d4	6s 6p	((<4>3G)4G)5G
					+ 11%	5d5	6p		(<5>4G)5G	+ 10%	5d4	6s 6p	((<4>3H)4H)5G
	50951.9	49088.0	1863.9		37%	5d4	6s	6p	((<4>1I)2I)3I	+ 16%	5d4	6s 6p	((<4>3H)2H)3H
					+ 11%	5d4	6s	6p	((<4>1I)2I)3K	+ 7%	5d4	6s 6p	((<4>3H)4H)3I
	51978.7	50419.0	1559.7		40%	5d4	6s	6p	((<4>1I)2I)3K	+ 19%	5d3	6s2 6p	(<3>2H)3I
					+ 11%	5d3	6s2	6p	(<3>2H)1I	+ 7%	5d3	6s2 6p	(<3>2H)3H
	52856.0	51484.0	1372.0		16%	5d4	6s	6p	((<4>3H)2H)3H	+ 13%	5d4	6s 6p	((<4>3H)4H)3H
					+ 11%	5d4	6s	6p	((<4>1I)2I)3I	+ 11%	5d3	6s2 6p	(<3>2H)3I
	53228.4	51882.0	1346.4		22%	5d5	6p		(<5>4G)3H	+ 9%	5d5	6p	(<5>4G)5H
					+ 8%	5d4	6s	6p	((<4>1G)2G)3H	+ 7%	5d3	6s2 6p	(<3>2H)3H
	54733.4	52197.0	2536.4		28%	5d5	6p		(<5>4G)5H	+ 18%	5d5	6p	(<5>4G)5G
					+ 8%	5d4	6s	6p	((<4>3G)4G)3H	+ 7%	5d4	6s 6p	((<4>1G)2G)3H
	54896.0	53815.0	1081.0		22%	5d4	6s	6p	((<4>1I)2I)3H	+ 12%	5d4	6s 6p	((<4>1G)2G)3H
					+ 8%	5d4	6s	6p	((<4>3G)4G)5G	+ 8%	5d5	6p	(<5>4G)5G
	55847.7	54028.0	1819.7		17%	5d4	6s	6p	((<4>1I)2I)3I	+ 13%	5d4	6s 6p	((<4>3G)2G)3H
					+ 13%	5d4	6s	6p	((<4>3H)4H)3I	+ 11%	5d3	6s2 6p	(<3>2H)3I
	56526.6	54761.0	1765.6		27%	5d5	6p		(<5>4G)5H	+ 16%	5d5	6p	(<5>4G)5G
					+ 7%	5d4	6s	6p	((<4>3G)4G)5G	+ 6%	5d4	6s 6p	((<4>1I)2I)3H
	57149.0	55080.0	2069.0		16%	5d4	6s	6p	((<4>3H)2H)1I	+ 11%	5d4	6s 6p	((<4>3H)4H)3I
					+ 10%	5d5	6p		(<5>4G)5H	+ 8%	5d3	6s2 6p	(<3>2H)3I
	57702.3	56122.0	1580.3		15%	5d5	6p		(<5>4G)3H	+ 12%	5d3	6s2 6p	(<3>2H)1I
					+ 12%	5d4	6s	6p	((<4>3H)2H)3H	+ 9%	5d5	6p	(<5>4G)5G
	57919.2	57015.0	904.2		19%	5d5	6p		(<5>2I)3I	+ 17%	5d4	6s 6p	((<4>3H)2H)3I
					+ 14%	5d5	6p		(<5>2I)3K	+ 7%	5d4	6s 6p	((<4>3H)2H)1I
	58761.0	58069.0	692.0		18%	5d5	6p		(<5>2I)3K	+ 15%	5d4	6s 6p	((<4>3G)2G)3H
					+ 11%	5d4	6s	6p	((<4>3H)2H)1I	+ 7%	5d4	6s 6p	((<4>1I)2I)3H
	59128.8	58313.0	815.8		21%	5d4	6s	6p	((<4>3H)2H)3I	+ 18%	5d5	6p	(<5>2I)3K
					+ 7%	5d5	6p		(<5>2I)1I	+ 7%	5d4	6s 6p	((<4>1I)2I)3H
	59410.5	58900.0	510.5		27%	5d5	6p		(<5>2I)3K	+ 14%	5d4	6s 6p	((<4>1I)2I)1I
					+ 9%	5d3	6s2	6p	(<3>2G)3H	+ 7%	5d5	6p	(<5>2I)3H

	60414.8	61102.0	-687.2		23%	5d5 6p	(<5>2I)1I	+ 16%	5d3 6s2 6p	(<3>2H)1I
				+ 15%	5d5 6p	(<5>2I)3H	+ 12%	5d4 6s 6p	((<4>1I)2I)1I	
	62524.0	61501.0	1023.0		66%	5d4 6s 6p	((<2>3F)4F)5G	+ 7%	5d4 6s 6p	((<4>3F)4F)5G
				+ 5%	5d4 6s 6p	((<2>1G)2G)3H	+ 4%	5d5 6p	(<5>2G)3H	
	62687.5	63211.0	-523.5		43%	5d5 6p	(<5>2I)3I	+ 15%	5d4 6s 6p	((<4>3H)4H)3I
				+ 12%	5d4 6s 6p	((<4>3H)2H)3I	+ 5%	5d5 6p	(<3>2H)3H	
	63532.8	63999.0	-466.2		37%	5d5 6p	(<3>4F)5G	+ 21%	5d5 6p	(<5>2G)3H
				+ 10%	5d4 6s 6p	((<2>1G)2G)3H	+ 5%	5d4 6s 6p	((<4>3G)4G)3H	
	-	66337.0	-		22%	5d5 6p	(<3>4F)5G	+ 9%	5d4 6s 6p	((<4>3H)4H)3H
				+ 8%	5d4 6s 6p	((<4>3G)2G)3H	+ 8%	5d4 6s 6p	((<4>3G)4G)3H	
	-	67435.0	-		18%	5d5 6p	(<3>2H)3I	+ 17%	5d5 6p	(<3>4F)5G
				+ 10%	5d5 6p	(<3>2H)3H	+ 9%	5d5 6p	(<3>2H)1I	
	-	67658.0	-		33%	5d5 6p	(<5>2I)3H	+ 18%	5d4 6s 6p	((<4>3G)4G)3H
				+ 14%	5d4 6s 6p	((<4>3G)2G)3H	+ 8%	5d5 6p	(<3>2H)3I	
	-	68794.0	-		27%	5d4 6s 6p	((<4>1I)2I)1I	+ 19%	5d5 6p	(<3>2H)3H
				+ 16%	5d5 6p	(<5>2I)1I	+ 5%	5d5 6p	(<3>2H)1I	
	-	69267.0	-		38%	5d5 6p	(<3>2H)3I	+ 15%	5d4 6s 6p	((<2>1G)2G)3H
				+ 9%	5d5 6p	(<3>2H)1I	+ 7%	5d5 6p	(<5>2I)1I	
	-	70678.0	-		46%	5d5 6p	(<3>2H)1I	+ 16%	5d4 6s 6p	((<2>1G)2G)3H
				+ 9%	5d5 6p	(<3>2H)3H	+ 6%	5d5 6p	(<5>2I)1I	
	-	72359.0	-		22%	5d5 6p	(<5>2G)3H	+ 14%	5d5 6p	(<5>2I)1I
				+ 13%	5d5 6p	(<3>2H)3H	+ 12%	5d4 6s 6p	((<4>1G)2G)3H	
	-	75016.0	-		24%	5d5 6p	(<5>2G)3H	+ 19%	5d5 6p	(<3>2H)3H
				+ 13%	5d5 6p	(<3>2H)1I	+ 7%	5d4 6s 6p	((<4>1I)2I)1I	
	-	82365.0	-		91%	5d5 6p	(<3>2G)3H			
7	39709.0	39809.0	-100.0		46%	5d4 6s 6p	((<4>3H)4H)5H	+ 29%	5d4 6s 6p	((<4>3H)4H)5I
				+ 13%	5d4 6s 6p	((<4>3G)4G)5H	+ 6%	5d4 6s 6p	((<4>1I)2I)3I	
	43411.5	42659.0	752.5		52%	5d4 6s 6p	((<4>3H)4H)5I	+ 35%	5d4 6s 6p	((<4>3H)4H)5H
				+ 5%	5d4 6s 6p	((<4>1I)2I)3I	+ 4%	5d4 6s 6p	((<4>3G)4G)5H	
	44970.8	44789.0	181.8		36%	5d4 6s 6p	((<4>3G)4G)5H	+ 19%	5d4 6s 6p	((<4>3H)4H)3I
				+ 13%	5d4 6s 6p	((<4>3H)2H)3I	+ 11%	5d4 6s 6p	((<4>1I)2I)3K	
	48250.7	48077.0	173.7		28%	5d4 6s 6p	((<4>3G)4G)5H	+ 14%	5d5 6p	(<5>4G)5H
				+ 13%	5d3 6s2 6p	(<3>2H)3I	+ 11%	5d4 6s 6p	((<4>3H)4H)5H	
51296.9		50788.0	508.9		63%	5d4 6s 6p	((<4>1I)2I)3I	+ 13%	5d4 6s 6p	((<4>3H)4H)3I
				+ 9%	5d5 6p	(<5>2I)3I	+ 4%	5d4 6s 6p	((<4>1I)2I)3K	
	55690.8	51540.0	4150.8		67%	5d4 6s 6p	((<4>1I)2I)3K	+ 16%	5d3 6s2 6p	(<3>2H)3I
				+ 6%	5d4 6s 6p	((<4>1I)2I)3I	+ 4%	5d4 6s 6p	((<4>3H)4H)5I	
	56557.2	54179.0	2378.2		61%	5d5 6p	(<5>4G)5H	+ 17%	5d4 6s 6p	((<4>3G)4G)5H
				+ 9%	5d4 6s 6p	((<4>3H)4H)3I	+ 5%	5d5 6p	(<3>2H)3I	
	56790.6	55660.0	1130.6		51%	5d3 6s2 6p	(<3>2H)3I	+ 20%	5d4 6s 6p	((<4>3H)4H)3I
				+ 9%	5d5 6p	(<5>4G)5H	+ 9%	5d4 6s 6p	((<4>1I)2I)3I	
	59347.0	57842.0	1505.0		36%	5d4 6s 6p	((<4>3H)2H)3I	+ 23%	5d4 6s 6p	((<4>1I)2I)1K
				+ 20%	5d5 6p	(<5>2I)1K	+ 10%	5d5 6p	(<5>2I)3I	
	61180.9	58927.0	2253.9		43%	5d5 6p	(<5>2I)3K	+ 28%	5d5 6p	(<5>2I)1K
				+ 16%	5d5 6p	(<5>2I)3I	+ 5%	5d4 6s 6p	((<4>1I)2I)1K	
	-	60144.0	-		44%	5d5 6p	(<5>2I)3K	+ 18%	5d5 6p	(<5>2I)1K
				+ 11%	5d4 6s 6p	((<4>3H)2H)3I	+ 9%	5d5 6p	(<5>2I)3I	
	-	64171.0	-		50%	5d5 6p	(<5>2I)3I	+ 12%	5d4 6s 6p	((<4>3H)4H)3I
				+ 11%	5d5 6p	(<5>2I)1K	+ 9%	5d4 6s 6p	((<4>3H)2H)3I	
	-	67361.0	-		57%	5d4 6s 6p	((<4>1I)2I)1K	+ 11%	5d4 6s 6p	((<4>3H)2H)3I
				+ 9%	5d4 6s 6p	((<4>3H)4H)3I	+ 9%	5d5 6p	(<5>2I)1K	
	-	70704.0	-		68%	5d5 6p	(<3>2H)3I	+ 13%	5d5 6p	(<5>2I)1K
				+ 6%	5d5 6p	(<5>2I)3K	+ 5%	5d4 6s 6p	((<4>1I)2I)1K	
8	-	43398.0	-		90%	5d4 6s 6p	((<4>3H)4H)5I	+ 10%	5d4 6s 6p	((<4>1I)2I)3K
	-	53067.0	-		90%	5d4 6s 6p	((<4>1I)2I)3K	+ 10%	5d4 6s 6p	((<4>3H)4H)5I
	-	61166.0	-		100%	5d5 6p	(<5>2I)3K			

4. Conclusions

The spectrum of pure tungsten was recorded in our laboratory on 1.5 m Wadsworth spectrograph in the wavelength region 2100-4900 Å using Mercury as an impurity for the purpose of calibration. We used the computer program MOSFIT for calibration. The ab initio calculations were performed using the RD Cowan computer code. The reported levels were used to run the least square fitted (LSF) parametric calculations. The least square fit (LSF) for previously

reported thirty even parity energy levels of configuration $5d^46s^2$ in neutral tungsten have been obtaining with sigma 552 cm^{-1}. Also, least square fitted (LSF) for 358 reported energy levels of odd parity configurations $5d^46s6p$, $5d^36s^26p$, and 5d56p have been obtained. In this work 102 transition belonging to the configuration $5d^46s^2$ and $5d^46s6p$ have been observed in the 2100-4900 Å wavelength region.

Acknowledgements

Authors are thankful to the Department of Physics, AMU, Aligarh, India for providing facilities. One of the author (Abid Husain) is thankful to the University Grants Commission (UGC), New Delhi, Government of India for providing financial support.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

All the authors contributed significantly in writing this article. The authors read and approved the final manuscript.

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