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THEORETICAL L-SHELL COSTER-KRONIG ENERGIES

$11 \leq Z \leq 103$ *

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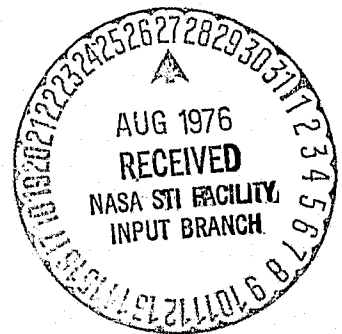
(NASA-TM-X-74159) THEORETICAL L-SHELL
COSTER-KRONIG ENERGIES $11 >$ OR EQUAL TO $Z >$
OR EQUAL TO 103 (NASA) 71 p HC \$4.50

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Relativistic relaxed-orbital calculations of L-shell Coster-Kronig transition energies have been performed ab initio for all possible transitions in atoms with atomic numbers $11 \leq Z \leq 103$. Hartree-Fock-Slater wave functions served as zeroth-order eigenfunctions to compute the expectation of the total Hamiltonian. A first-order approximation to the local approximation was thus included. Quantum-electrodynamic corrections were made. Each transition energy was computed as the difference between results of separate self-consistent-field calculations for the initial, singly ionized state and the final two-hole state. The following quantities are listed: total transition energy, "electric" (Dirac-Hartree-Fock-Slater) contribution, magnetic and retardation contributions, and contributions due to vacuum polarization and self energy.

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INTRODUCTION

Coster-Kronig processes are radiationless transitions in which an inner-shell vacancy is transferred from one subshell of an atom to another, less tightly bound subshell in the same principal shell.¹ Among Auger processes, Coster-Kronig transitions have certain special characteristics:

(1) High intensity. If Coster-Kronig transitions are energetically possible, they tend to provide the dominant channel. Thus, while the decay of an inner-shell vacancy in a heavy atom must normally be described by hundreds or thousands of matrix elements, the problem is greatly simplified if Coster-Kronig transitions are possible, as these will govern the decay rate.²⁻⁴

(2) Low transition energy. The kinetic energy of the continuum electron emitted in a radiationless transition is

$$E_{\infty\ell A} = E_{n''\ell''} - E_{n\ell} - E_{n'\ell'}^* \quad (1)$$

The subscripts pertain to the states indicated in Fig. 1; $E_{n'\ell'}$ and $E_{n\ell}$ are (absolute values of) neutral-atom binding energies, while $E_{n'\ell'}^*$ is the binding energy of the $n'\ell'$ electron in the presence of an $n\ell$ vacancy. In Coster-Kronig transitions, $E_{n''\ell''} - E_{n\ell}$ is the difference between the binding energies of two subshells in the same shell, which is relatively small. In many cases this subshell binding-energy difference is smaller than $E_{n'\ell'}^*$, whence the transition is energetically impossible (indicated by a negative entry in Tables I and II). Many Coster-Kronig transitions are thus only possible in discrete regions of the periodic table.⁵ The onset or cutoff of Coster-Kronig transitions at certain atomic numbers causes discontinuities in the initial-state lifetimes, or widths, when considered as functions of

atomic number.^{2,6-8} The exact atomic numbers at which given cutoffs occur have not yet been established in all cases. Experimental methods to measure Coster-Kronig rates (and cutoffs) have been based on x-ray-x-ray coincidences,^{5-7,9,10} coincidences between x-rays and conversion electrons,⁸ and studies of x-ray satellites.¹¹ One major purpose of the present computations is to establish theoretical Coster-Kronig cutoff points. For example, Table I places the $L_1-L_3M_{4,5}$ transition cutoff at $Z=50$, in agreement with recent experimental evidence from $L\alpha$ x-ray satellite measurements.^{11,12}

(3) Steep energy dependence of the transition rate. Theoretical Coster-Kronig transition probabilities exhibit great sensitivity to the transition energy and to the atomic potential.¹³⁻¹⁵ Thus, the $L_2-L_3M_4$ rate in Cu rises from zero to 15 m.a.u. (milli atomic units) between threshold and 1 eV, and to 20 m.a.u. at 5 eV transition energy.¹³ The $N_2-N_4N_5$ rate in Sn rises from 0.74 to 7.4 m.a.u. if the energy is allowed to vary from 10 to 35 eV; a further increase in transition energy causes the rate to drop again to 3 m.a.u. at 60 eV.¹⁵ It follows that accurate energy calculations are required before reliable transition rates can be computed.¹⁶

Because most Coster-Kronig energies are so low and the rates are so sensitive to the transition energy, the effect of extraatomic relaxation^{14,15,17,18} can substantially alter the transition rates and level widths. Information on the magnitude of the solid-state relaxation energy is as yet fragmentary; comparison of the present calculated free-atom Coster-Kronig transition energies with measurements on solid materials can be expected to yield such information.

THEORY

The Coster-Kronig transition energies listed in Tables I and II are the differences between separately computed average total energies of the initial and final atomic systems. The averages extend over configurations; if the reader wishes to compute multiplet splittings, he can obtain the necessary electrostatic F and G Slater integrals from the authors.

Energies were computed by the same method that we employed previously to calculate binding energies.¹⁹ Wave functions generated with a relativistic Hartree-Fock-Slater code²⁰ were used as zeroth-order eigenfunctions to compute the expectation of the total Hamiltonian,

$$H = \sum_{i=1}^N [c\vec{\alpha}_i \cdot \vec{p}_i + \beta_i c^2 + V_n(r_i)] + \sum_{i<j}^N \frac{1}{r_{ij}} \quad (2)$$

Thus, a first-order correction to the local approximation is made. The total electric energy (kinetic and electrostatic interaction energies) computed in this manner generally agrees to a few parts in 10^6 with results from full Hartree-Fock calculations, yet very much less computer time is required.¹⁹ In calculating the orbital wave functions, the Coulomb potential of the nucleus $V_n(r_i)$ was taken to be that of a uniformly charged sphere, and Kohn-Sham exchange²¹ was chosen.

The Breit interaction energy was included to take account of the exchange of a single transverse photon between any two atomic electrons. The Breit interaction can be expressed as

$$H_{Br} = - \frac{1}{r_{12}} [\vec{\alpha}_1 \cdot \vec{\alpha}_2 \cos \omega r_{12} + (1 - \cos \omega r_{12})] \quad (3)$$

in atomic units, where the $\vec{\alpha}_i$ are Dirac matrices, α is the fine structure constant and $\omega = \alpha |\epsilon_1 - \epsilon_2|$ is the difference between orbital eigenvalues of the

two electrons.²²⁻²⁵ This version of the Breit interaction is convenient for computational purposes and is applicable when a local potential is used, as in our DHFS model.²⁵ We followed the formalism of Grant²⁶ in handling the angular algebra. The expectation of the Breit interaction is treated as the sum of two terms, viz., magnetic and retardation energies.^{19,26-30} Contributions from these terms to the Coster-Kronig energies are listed separately in Tables I and II.

The vacuum polarization correction was computed through first-order perturbation theory. Terms of order $\alpha(Z\alpha)$, $\alpha^2(Z\alpha)$, $\alpha(Z\alpha)^3$, $\alpha(Z\alpha)^5$, and $\alpha(Z\alpha)^7$ were calculated according to the method of Huang and Hughes.³¹ The leading term proportional to $\alpha(Z\alpha)$, known as the Uehling potential,³² is listed under "E(V-P)" in Tables I and II, while all terms of higher order are combined under "E(H-VP)."

The self-energy contributions to the L Coster-Kronig energies were obtained from Mohr's calculations of 2s and $2p_{1/2}$ Coulomb shifts.³³ We take approximate account of screening, relaxation, and finite nuclear extent by using the same correction factors as employed for the vacuum polarization and applying them to Mohr's point-Coulomb self-energy shifts. The 2s correction factors were also used with the $2p_{1/2}$ self-energy shifts.

In the present calculations, electron-electron Coulomb correlation corrections have not been included. These corrections, typically of a few eV, may become important near energy thresholds.

COMPARISON WITH RESULTS FROM OTHER APPROACHES

Earlier attempts at deriving Coster-Kronig and Auger energies have been based on semi-empirical approaches. The neutral-atom binding energies $E_{n'l}$

and $E_{n\ell}$ [cf. Eq. (1)] are taken from x-ray³⁴ or ESCA³⁵ determinations. The simplest way of estimating $E_{n'\ell}^*$ is by the so-called "Z+1 rule," which specifies that the effect of the $n\ell$ vacancy on the binding energy of the $n'\ell$ electron can be approximated by taking the $n'\ell$ binding energy in the neutral atom of the next-higher atomic number:³⁶

$$E_{\infty\ell A}(Z) \cong E_{n''\ell''}(Z) - E_{n\ell}(Z) - E_{n'\ell}(Z+1) \quad (4)$$

The "Z+1 rule" leads to excessive transition energies, whence a "modified Z+1 rule" was introduced,³⁶ on which e.g. the Auger energy tables of Coughlan and Clausing³⁷ are based:

$$E_{\infty\ell A}(Z) \cong E_{n''\ell''}(Z) - \frac{1}{2}[E_{n\ell}(Z) + E_{n\ell}(Z+1) + E_{n'\ell}(Z) + E_{n'\ell}(Z+1)] \quad (5)$$

Coster-Kronig energies are generally underestimated if Eq. (5) is employed.

Quite good semi-empirical estimates of Coster-Kronig energies are attained if $E_{n'\ell}^*$ is calculated by the transition-state method.^{38,39} An even more sophisticated semi-empirical method has recently been applied by Larkins⁴⁰ to the case of K-LL Auger energies; ab initio K-LL energies have been calculated by Briançon and Desclaux.⁴²

In Table III, we compare results from transition-state calculations⁴² with Coster-Kronig energies computed according to Eqs. (4) and (5) and with the ab initio calculations from the present work, for selected elements. For Ar we also indicate experimental data.⁴³

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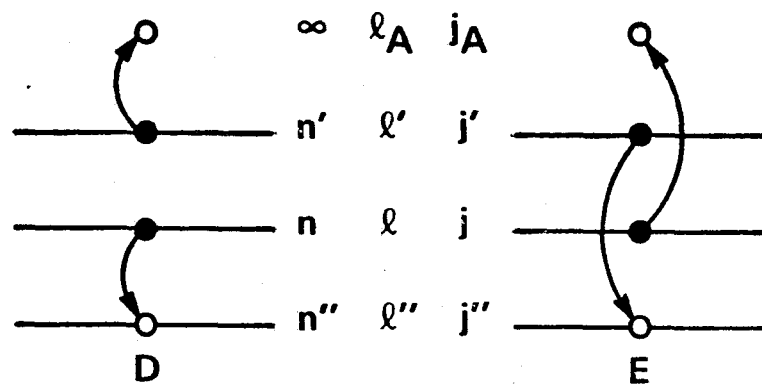


FIG. 1 Quantum numbers that label states involved
in direct and exchange radiationless
transitions

EXPLANATION OF TABLES

All energies are listed in electron volts

TABLE I. L_1 Coster-Kronig Energies, $11 \leq Z \leq 103$

and

TABLE II. L_2 Coster-Kronig Energies, $11 \leq Z \leq 103$

FINAL STATE	Final two-hole configuration, $n'lj, n'l'j'$ in Fig. 1. $2p_{1/2} = 2p_{1/2}$, etc.
E(TOT)	Total average Coster-Kronig energy
E(DHFS)	Dirac-Hartree-Fock-Slater "electric" energy
E(MAG)	Magnetic-energy contribution to the Coster-Kronig energy
E(RET)	Retardation-energy contribution
E(V-P)	Contribution to the Coster-Kronig energy from higher-order vacuum polarization correction terms
E(SELF)	Self-energy contribution to the Coster-Kronig energy
SODIUM, etc.	Element
3S1, etc.	Ground-state configuration
Z=11, etc.	Atomic number
A=23, etc.	Mass number of most abundant isotope, for which nuclear radius is computed
R	Nuclear radius in atomic units

TABLE I. L_1 Coster-Kronig Energies, $11 \leq Z \leq 103$

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
SODIUM 3S1							
		Z=11 A=23	R=6.44904E-05 A.U.				
2P1/2 3S1/2	21.1677	21.1080	.01313	-.00294	.00066	.000005	-.01120
2P3/2 3S1/2	21.2741	21.2675	-.00014	-.00294	.00066	.000005	-.01094
MAGNESIUM 3S2							
		Z=12 A=24	R=6.54118E-05 A.U.				
2P1/2 3S1/2	24.3951	24.3937	.02045	-.00435	.00100	.000007	-.01570
2P3/2 3S1/2	24.6657	24.6828	.00157	-.00434	.00100	.000007	-.01533
ALUMINUM 3P1							
		Z=13 A=27	R=6.80310E-05 A.U.				
2P1/2 3S1/2	25.2532	25.2506	.02985	-.00609	.00143	.000010	-.02255
2P1/2 3P1/2	31.6275	31.6235	.03153	-.00662	.00160	.000011	-.02255
2P3/2 3S1/2	26.0968	26.1197	.00367	-.00604	.00143	.000010	-.02200
2F3/2 3P1/2	32.0438	32.0651	.00571	-.00661	.00160	.000011	-.02200
SILICON 3P2							
		Z=14 A=28	R=6.68607E-05 A.U.				
2P1/2 3S1/2	25.5688	25.5649	.04146	-.00823	.00199	.000013	-.03130
2P1/2 3P1/2	34.8395	34.8333	.04428	-.00899	.00224	.000015	-.03130
2P3/2 3S1/2	27.1572	27.1876	.03621	-.00910	.00199	.000013	-.03053
2F3/2 3P1/2	35.9312	35.9589	.00954	-.00892	.00224	.000015	-.03053
PHOSPHORUS 3P3							
		Z=15 A=31	R=7.12371E-05 A.U.				
2P1/2 3S1/2	26.2528	26.2471	.05591	-.01073	.00269	.000017	-.04216
2P1/2 3P1/2	38.0766	38.0676	.05990	-.01178	.00305	.000019	-.04216
2P1/2 3P3/2	36.9415	36.9372	.05525	-.01167	.00305	.000019	-.04216
2P3/2 3S1/2	27.9480	27.9865	.01044	-.01058	.00289	.000017	-.04111
2P3/2 3P1/2	39.2205	39.2591	.01513	-.01172	.00305	.000019	-.04111
2P3/2 3P3/2	38.8932	38.9334	.00952	-.01168	.00305	.000019	-.04111
SULFUR 3P4							
		Z=16 A=32	R=7.19950E-05 A.U.				
2P1/2 3S1/2	26.7694	26.7617	.07316	-.01366	.00357	.000021	-.05542
2P1/2 3P1/2	41.1876	41.1753	.07869	-.01507	.00406	.000024	-.05542
2P1/2 3P3/2	40.2111	40.2048	.07278	-.01519	.00406	.000024	-.05542
2P3/2 3S1/2	28.5858	28.6339	.01562	-.01351	.00357	.000021	-.05402
2P3/2 3P1/2	42.3969	42.4396	.02228	-.01505	.00407	.000024	-.05402
2P3/2 3P3/2	42.3174	42.3672	.01509	-.01499	.00407	.000024	-.05402
CHLORINE 3P5							
		Z=17 A=35	R=7.41780E-05 A.U.				
2P1/2 3S1/2	26.4146	26.4051	.09311	-.01699	.00464	.000026	-.07133
2P1/2 3P1/2	43.8300	43.8144	.10041	-.01882	.00531	.000030	-.07133
2P1/2 3P3/2	43.0772	43.0691	.09311	-.01899	.00531	.000030	-.07133
2P3/2 3S1/2	28.3797	28.4393	.02213	-.01688	.00465	.000027	-.06952
2P3/2 3P1/2	45.1320	45.1844	.03063	-.01888	.00532	.000030	-.06952
2P3/2 3P3/2	45.3663	45.4276	.02167	-.01880	.00532	.000030	-.06952
ARGON 3P6							
		Z=18 A=40	R=7.75542E-05 A.U.				
2P1/2 3S1/2	26.3113	26.3001	.11625	-.02080	.00595	.000032	-.09020
2P1/2 3P1/2	46.7524	46.7333	.12551	-.02309	.00683	.000037	-.09020
2P1/2 3P3/2	46.2668	46.2567	.11669	-.02330	.00683	.000037	-.09020
2P3/2 3S1/2	28.4684	28.5413	.02476	-.02076	.00595	.000032	-.08789
2P3/2 3P1/2	48.1895	48.2533	.04053	-.02327	.00684	.000037	-.08789
2F3/2 3P3/2	48.7812	48.8558	.02960	-.02317	.00684	.000037	-.08789

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
POTASSIUM							
	4S1	Z=19 A=39	R=7.69025E-05	A.U.			
2P1/2 3S1/2	19.1097	19.0932	.14556	-.02559	.00754	.000038	-.11103
2P1/2 3P1/2	42.7871	42.7592	.15881	-.02869	.00874	.000044	-.11103
2P1/2 3P3/2	42.2901	42.2743	.14703	-.02899	.00874	.000044	-.11103
2P1/2 4S1/2	71.9094	71.9000	.13829	-.02633	.00842	.000042	-.11103
2P3/2 3S1/2	21.9103	21.9950	.04044	-.02555	.00755	.000038	-.10819
2P3/2 3P1/2	44.7557	44.8234	.05567	-.02895	.00875	.000044	-.10819
2P3/2 3P3/2	45.5051	45.5922	.04107	-.02883	.00875	.000044	-.10819
2P3/2 4S1/2	74.7061	74.7986	.03354	-.02629	.00343	.000042	-.10819
CALCIUM							
	4S2	Z=20 A=40	R=7.75542E-05	A.U.			
2P1/2 3S1/2	10.9399	10.9169	.17976	-.03110	.00944	.000044	-.13515
2P1/2 3P1/2	37.6681	37.6296	.19764	-.03512	.01103	.000051	-.13515
2P1/2 3P3/2	37.1901	37.1673	.18241	-.03552	.01103	.000051	-.13515
2P1/2 4S1/2	76.4876	76.4749	.16893	-.03165	.01055	.000049	-.13515
2P3/2 3S1/2	14.5198	14.6196	.05338	-.03104	.00946	.000044	-.13168
2P3/2 3P1/2	40.3066	40.3888	.07384	-.03546	.01105	.000051	-.13168
2P3/2 3P3/2	41.2395	41.3404	.05495	-.03527	.01105	.000051	-.13168
2P3/2 4S1/2	80.0613	80.1709	.04305	-.03161	.01057	.000049	-.13168
SCANDIUM							
	3D1	Z=21 A=45	R=8.06597E-05	A.U.			
2P1/2 3S1/2	8.6942	8.6630	.22317	-.03851	.01164	.000050	-.16515
2P1/2 3P1/2	36.6731	36.6225	.24550	-.04347	.01363	.000058	-.16515
2P1/2 3P3/2	37.7181	37.6864	.22651	-.04383	.01363	.000058	-.16515
2P1/2 3D3/2	71.9152	71.9103	.19296	-.03656	.01392	.000058	-.16515
2P1/2 4S1/2	81.7780	81.7610	.20776	-.03877	.01308	.000056	-.16515
2P3/2 3S1/2	13.6897	13.8079	.06633	-.03728	.01166	.000050	-.16092
2P3/2 3P1/2	40.6619	40.7580	.09382	-.04273	.01365	.000058	-.16092
2P3/2 3P3/2	43.2093	43.3284	.07046	-.04238	.01365	.000058	-.16092
2P3/2 3D3/2	76.4197	76.5603	.04318	-.03643	.01354	.000056	-.16092
2P3/2 4S1/2	86.6565	86.8278	.05416	-.03772	.01310	.000056	-.16092
TITANIUM							
	3D2	Z=22 A=48	R=8.24137E-05	A.U.			
2P1/2 3S1/2	6.2213	6.1805	.27299	-.04714	.01421	.000055	-.19933
2P1/2 3P1/2	35.3740	35.3092	.30053	-.05317	.01666	.000064	-.19933
2P1/2 3P3/2	38.1420	38.1004	.27721	-.05347	.01666	.000064	-.19933
2P1/2 3D3/2	76.2167	76.2059	.23814	-.04464	.01654	.000064	-.19933
2P1/2 4S1/2	87.1713	87.1490	.25261	-.04704	.01602	.000062	-.19933
2P3/2 3S1/2	12.8938	13.0332	.08475	-.04420	.01424	.000055	-.19425
2P3/2 3P1/2	40.9764	41.0887	.11607	-.05082	.01669	.000065	-.19425
2P3/2 3P3/2	45.3370	45.4772	.08754	-.05027	.01670	.000065	-.19425
2P3/2 3D3/2	82.3451	82.5097	.05613	-.04315	.01657	.000064	-.19425
2P3/2 4S1/2	93.7005	93.8566	.06649	-.04449	.01606	.000062	-.19425
VANADIUM							
	3D3	Z=23 A=51	R=8.40961E-05	A.U.			
2P1/2 3S1/2	3.5435	3.4916	.32988	-.05713	.01719	.000059	-.23813
2P1/2 3P1/2	33.8008	33.7196	.36342	-.06437	.02018	.000070	-.23813
2P1/2 3P3/2	38.4914	38.4338	.33509	-.06458	.02018	.000070	-.23813
2P1/2 3D3/2	80.6202	80.6020	.29033	-.05408	.02004	.000069	-.23813
2P1/2 4S1/2	92.6269	92.5999	.30426	-.05663	.01945	.000067	-.23813
2P3/2 3S1/2	12.1721	12.3361	.10262	-.05182	.01724	.000060	-.23211
2P3/2 3P1/2	41.2975	41.4284	.14066	-.05978	.02023	.000070	-.23211
2P3/2 3P3/2	47.6695	47.8341	.10620	-.05896	.02023	.000070	-.23211
2P3/2 3D3/2	88.6543	88.8462	.07063	-.05056	.02009	.000069	-.23211
2P3/2 4S1/2	101.0513	101.2357	.08010	-.05145	.01950	.000067	-.23211

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
CHROMIUM							
	3D5 4S1	Z=24 A=52	R=8.46422E-05 A.U.				
2P1/2 3S1/2	8.3666	8.3041	.39432	-.06792	.02054	.000062	-.28452
2P1/2 3P1/2	39.7755	39.6795	.43258	-.07621	.02406	.000073	-.28452
2P1/2 3P3/2	45.2382	45.1747	.40022	-.07637	.02407	.000073	-.28452
2P1/2 3D3/2	92.1779	92.1522	.35065	-.06446	.02391	.000073	-.28452
2P1/2 3D5/2	92.4367	92.4224	.34142	-.06654	.02391	.000073	-.28452
2P1/2 4S1/2	99.4054	99.3725	.36084	-.06685	.02340	.000071	-.28452
2P3/2 3S1/2	18.6649	18.8546	.12828	-.06147	.02061	.000062	-.27739
2P3/2 3P1/2	48.9175	49.0696	.17166	-.07059	.02413	.000073	-.27739
2P3/2 3P3/2	56.0957	56.2861	.13239	-.06528	.02414	.000073	-.27739
2P3/2 3D3/2	101.8847	102.1050	.09301	-.05999	.02396	.000073	-.27739
2P3/2 3D5/2	103.0532	103.2925	.07301	-.05896	.02398	.000073	-.27739
2P3/2 4S1/2	109.4727	109.6891	.09867	-.06119	.02347	.000071	-.27739
MANGANESE							
	3D5	Z=25 A=55	R=6.62396E-05 A.U.				
2P1/2 3S1/2	-2.1200	-2.1957	.46105	-.07901	.02455	.000064	-.33096
2P1/2 3P1/2	32.1605	32.0434	.50803	-.08894	.02867	.000075	-.33096
2P1/2 3P3/2	38.3023	38.2242	.46930	-.08917	.02868	.000075	-.33096
2P1/2 3D3/2	90.3758	90.3430	.40967	-.07469	.02870	.000075	-.33096
2P1/2 3D5/2	90.6635	90.6496	.39756	-.07743	.02870	.000075	-.33096
2P1/2 4S1/2	104.0207	103.9789	.42254	-.07780	.02794	.000073	-.33096
2P3/2 3S1/2	10.2500	10.4680	.15071	-.07062	.02465	.000064	-.32278
2P3/2 3P1/2	43.2615	43.4530	.20381	-.08155	.02897	.000075	-.32278
2P3/2 3P3/2	51.2821	51.4995	.15674	-.08036	.02896	.000075	-.32278
2P3/2 3D3/2	102.0639	102.3167	.10991	-.06884	.02880	.000075	-.32278
2P3/2 3D5/2	103.4305	103.7083	.08365	-.06749	.02880	.000075	-.32278
2P3/2 4S1/2	116.1696	116.4182	.11637	-.07025	.02804	.000073	-.32278
IRON							
	3D6	Z=26 A=56	R=6.67591E-05 A.U.				
2P1/2 3S1/2	-5.1640	-5.2507	.53400	-.09024	.02903	.000062	-.38616
2P1/2 3P1/2	32.2312	32.0965	.58823	-.10161	.03416	.000073	-.38616
2P1/2 3P3/2	37.6249	37.5344	.54445	-.10204	.03418	.000073	-.38616
2P1/2 3D3/2	95.7139	95.6764	.47483	-.08519	.03398	.000073	-.38616
2P1/2 3D5/2	95.8590	95.8365	.46302	-.08841	.03397	.000073	-.38616
2P1/2 4S1/2	110.2861	110.2403	.48752	-.08876	.03311	.000071	-.38616
2P3/2 3S1/2	8.8967	9.1435	.18308	-.08233	.02916	.000062	-.37676
2P3/2 3P1/2	44.9860	45.1789	.24430	-.09484	.03429	.000073	-.37676
2P3/2 3P3/2	52.3276	52.5728	.19097	-.09362	.03431	.000073	-.37676
2P3/2 3D3/2	109.0523	109.3389	.13616	-.08023	.03410	.000073	-.37676
2P3/2 3D5/2	110.3468	110.6603	.10775	-.07864	.03410	.000073	-.37676
2P3/2 4S1/2	124.1696	124.4540	.14062	-.08157	.03324	.000071	-.37676
COBALT							
	3D7	Z=27 A=59	R=8.82815E-05 A.U.				
2P1/2 3S1/2	-8.0664	-8.1643	.61347	-.10233	.03410	.000057	-.44739
2P1/2 3P1/2	32.5773	32.4242	.67556	-.11526	.04015	.000067	-.44739
2P1/2 3P3/2	37.1517	37.0483	.62650	-.11593	.04018	.000068	-.44739
2P1/2 3D3/2	101.5596	101.5177	.54578	-.09648	.03995	.000067	-.44739
2P1/2 3D5/2	101.5525	101.5253	.53481	-.10022	.03995	.000067	-.44739
2P1/2 4S1/2	116.6059	116.5563	.55845	-.10054	.03898	.000065	-.44739
2P3/2 3S1/2	7.9150	8.1934	.21931	-.09535	.03428	.000057	-.43672
2P3/2 3P1/2	47.1952	47.4117	.28943	-.10960	.04032	.000068	-.43672
2P3/2 3P3/2	53.8071	54.0824	.22940	-.10836	.04035	.000068	-.43672
2P3/2 3D3/2	116.7778	117.1015	.16574	-.09291	.04012	.000067	-.43672
2P3/2 3D5/2	117.9897	118.3419	.13542	-.09106	.04012	.000067	-.43672
2P3/2 4S1/2	132.4519	132.7755	.16806	-.09414	.03915	.000066	-.43672

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
NICKEL							
	3D8	Z=28 A=58	R=8.77799E-05 A.U.				
2P1/2 3S1/2	-11.5581	-11.6672	.69969	-.11528	.03983	.000048	-.51518
2P1/2 3P1/2	32.4676	32.2953	.77044	-.12992	.04692	.000056	-.51518
2P1/2 3P3/2	36.1961	36.0394	.71569	-.13086	.04695	.000056	-.51518
2P1/2 3D3/2	107.1939	107.1481	.62271	-.10853	.04670	.000056	-.51518
2P1/2 3D5/2	107.0263	106.9944	.61321	-.11286	.04670	.000056	-.51518
2P1/2 4S1/2	123.0477	122.9947	.63566	-.11315	.04561	.000055	-.51518
2P3/2 3S1/2	6.6020	6.9153	.25958	-.10978	.04006	.000048	-.50315
2P3/2 3P1/2	49.2064	49.4489	.33941	-.12591	.04714	.000057	-.50315
2P3/2 3P3/2	55.0220	55.3304	.27222	-.12467	.04718	.000057	-.50315
2P3/2 3D3/2	124.5492	124.9135	.19880	-.10696	.04693	.000056	-.50315
2P3/2 3D5/2	125.6692	126.0633	.16693	-.10482	.04692	.000056	-.50315
2P3/2 4S1/2	141.1125	141.4788	.19903	-.10808	.04584	.000055	-.50315
COPPER							
	4S1	Z=29 A=63	R=9.02331E-05 A.U.				
2P1/2 3S1/2	-5.7280	-5.8424	.79032	-.12806	.04610	.000033	-.59395
2P1/2 3P1/2	41.9986	41.8151	.86749	-.14409	.05423	.000039	-.59395
2P1/2 3P3/2	43.2903	43.1661	.80936	-.14554	.05427	.000039	-.59395
2P1/2 3D3/2	121.9892	121.9459	.70379	-.12061	.05406	.000038	-.59395
2P1/2 3D5/2	121.4869	121.4522	.69984	-.12523	.05399	.000038	-.59395
2P1/2 4S1/2	131.0789	131.0297	.71550	-.12544	.05307	.000038	-.59395
2P3/2 3S1/2	14.3671	14.7176	.31111	-.12760	.04640	.000033	-.58044
2P3/2 3P1/2	60.6439	60.9167	.39842	-.14530	.05452	.000039	-.58044
2P3/2 3P3/2	64.1084	64.4522	.32633	-.14430	.05456	.000039	-.58044
2P3/2 3D3/2	141.2943	141.7029	.24184	-.12432	.05429	.000038	-.58044
2P3/2 3D5/2	142.0554	142.4895	.21402	-.12204	.05428	.000038	-.58044
2P3/2 4S1/2	151.1570	151.5704	.23662	-.12500	.05336	.000038	-.58044
ZINC							
	4S2	Z=30 A=64	R=9.07080E-05 A.U.				
2P1/2 3S1/2	-18.7905	-18.9205	.89322	-.14378	.05347	.000011	-.67289
2P1/2 3P1/2	32.4063	32.1949	.98343	-.16219	.06303	.000013	-.67289
2P1/2 3P3/2	34.1431	34.0003	.91647	-.16385	.06308	.000013	-.67289
2P1/2 3D3/2	119.3625	119.3123	.79525	-.13497	.06278	.000013	-.67289
2P1/2 3D5/2	118.8524	118.8123	.79082	-.14062	.06278	.000013	-.67289
2P1/2 4S1/2	136.3799	136.3224	.80984	-.14088	.06143	.000013	-.67289
2P3/2 3S1/2	4.6190	5.0132	.35323	-.14324	.05365	.000011	-.65803
2P3/2 3P1/2	54.2773	54.5805	.45503	-.16357	.06341	.000013	-.65803
2P3/2 3P3/2	58.3217	58.7065	.37215	-.16241	.06346	.000013	-.65803
2P3/2 3D3/2	141.8828	142.3411	.27609	-.13953	.06316	.000013	-.65803
2P3/2 3D5/2	142.7954	143.2845	.24253	-.13673	.06315	.000013	-.65803
2P3/2 4S1/2	159.7654	160.2334	.27253	-.14037	.06161	.000012	-.65803
GALLIUM							
	4P1	Z=31 A=69	R=9.30112E-05 A.U.				
2P1/2 3S1/2	-34.5405	-34.6837	1.00311	-.16025	.06137	-.000019	-.76107
2P1/2 3P1/2	19.8237	19.5855	1.10804	-.18136	.07257	-.000022	-.76107
2P1/2 3P3/2	22.3560	22.1966	1.03110	-.18323	.07264	-.000022	-.76107
2P1/2 3D3/2	114.0275	113.9734	.89287	-.15000	.07232	-.000022	-.76107
2P1/2 3D5/2	113.6360	113.5937	.88787	-.15681	.07231	-.000022	-.76107
2P1/2 4S1/2	139.2601	139.1971	.91067	-.15722	.07060	-.000022	-.76107
2P1/2 4P1/2	146.4556	146.3886	.91494	-.15848	.07166	-.000022	-.76107
2P3/2 3S1/2	-7.2904	-6.8441	.39609	-.15945	.06186	-.000019	-.74478
2P3/2 3P1/2	45.4433	45.7835	.51430	-.18279	.07305	-.000023	-.74478
2P3/2 3P3/2	50.4228	50.8568	.41912	-.18140	.07313	-.000023	-.74478
2P3/2 3D3/2	140.2660	140.6026	.31081	-.15538	.07280	-.000023	-.74478
2P3/2 3D5/2	141.4747	142.0331	.27060	-.15149	.07274	-.000023	-.74478
2P3/2 4S1/2	166.4694	166.9930	.30653	-.15645	.07109	-.000022	-.74478
2P3/2 4P1/2	173.5564	174.0750	.31195	-.15790	.07214	-.000023	-.74478

FINAL STATE	E (TOT)	E (DHFS)	E (MAG)	E (RET)	E (V-P)	E (H-VP)	E (SELF)
GERMANIUM							
	4P2	Z=32 A=74	R=9.52057E-05 A.U.				
2P1/2 3S1/2	-51.5809	-51.7389	1.12267	-.17794	.07012	-.000058	-.85680
2P1/2 3P1/2	5.9703	5.7021	1.24396	-.20203	.06318	-.000069	-.85680
2P1/2 3P3/2	9.4530	9.2748	1.15593	-.20412	.08328	-.000069	-.85680
2P1/2 3D3/2	107.5826	107.5234	.99930	-.16615	.06293	-.000069	-.85680
2P1/2 3D5/2	107.3403	107.2949	.99357	-.17424	.06292	-.000069	-.85680
2P1/2 4S1/2	142.0119	141.9429	1.01971	-.17467	.08078	-.000067	-.85680
2P1/2 4P1/2	151.9162	151.8410	1.02634	-.17640	.06214	-.000066	-.85680
2P3/2 3S1/2	-20.0182	-19.5153	.44224	-.17674	.07073	-.000059	-.83910
2P3/2 3P1/2	35.8077	36.1677	.57876	-.20340	.06374	-.000070	-.83910
2P3/2 3P3/2	41.8809	42.3681	.46984	-.20173	.06369	-.000070	-.83910
2P3/2 3D3/2	136.0514	138.6310	.34833	-.17230	.08354	-.000070	-.83910
2P3/2 3D5/2	139.5561	140.1793	.30070	-.16823	.08353	-.000070	-.83910
2P3/2 4S1/2	173.5118	174.1004	.34271	-.17355	.08139	-.000069	-.83910
2P3/2 4P1/2	183.2832	183.8645	.35059	-.17548	.08275	-.000070	-.83910
ARSENIC							
	4P3	Z=33 A=75	R=9.56326E-05 A.U.				
2P1/2 3P3/2	-4.4032	-4.6036	1.29337	-.22628	.09506	-.000130	-.96159
2P1/2 3D3/2	100.4579	100.3917	1.11626	-.18308	.09470	-.000130	-.96159
2P1/2 3D5/2	100.2187	100.1683	1.11008	-.19260	.09469	-.000130	-.96159
2P1/2 4S1/2	144.9352	144.8600	1.13783	-.19300	.09205	-.000126	-.96159
2P1/2 4P1/2	156.8530	156.7695	1.14669	-.19522	.09376	-.000128	-.96159
2P1/2 4P3/2	156.5045	156.4301	1.13786	-.19548	.09376	-.000128	-.96159
2P3/2 3S1/2	-33.4546	-32.8932	.49598	-.19526	.08054	-.000111	-.94250
2P3/2 3P1/2	25.8138	26.2339	.65237	-.22550	.09570	-.000132	-.94250
2P3/2 3P3/2	32.6339	33.1756	.52878	-.22362	.09583	-.000132	-.94250
2P3/2 3D3/2	135.3957	136.0408	.39249	-.19043	.09546	-.000132	-.94250
2P3/2 3D5/2	137.0655	137.7613	.33706	-.18565	.09549	-.000132	-.94250
2P3/2 4S1/2	181.0087	181.6609	.34344	-.19179	.09281	-.000128	-.94250
2P3/2 4P1/2	192.7761	193.4245	.39396	-.19428	.09452	-.000131	-.94250
2P3/2 4P3/2	192.6435	193.3027	.38309	-.19416	.09453	-.000131	-.94250
SELENIUM							
	4P4	Z=34 A=80	R=9.77122E-05 A.U.				
2P1/2 3P3/2	-19.3892	-19.6139	1.44194	-.24992	.10810	-.000207	-1.07517
2P1/2 3D3/2	92.2801	92.2062	1.24260	-.20102	.10771	-.000207	-1.07517
2P1/2 3D5/2	92.0634	92.0070	1.23622	-.21215	.10770	-.000207	-1.07517
2P1/2 4S1/2	147.5791	147.4977	1.26463	-.21240	.10450	-.000200	-1.07517
2P1/2 4P1/2	161.7661	161.6740	1.27598	-.21515	.10662	-.000204	-1.07517
2P1/2 4P3/2	161.6988	161.6178	1.26520	-.21548	.10663	-.000204	-1.07517
2P3/2 3S1/2	-47.6835	-47.0591	.55416	-.21496	.09135	-.000176	-1.05477
2P3/2 3P1/2	15.0994	15.5623	.73230	-.24909	.10889	-.000210	-1.05477
2P3/2 3P3/2	22.7634	23.3636	.59273	-.24702	.10905	-.000210	-1.05477
2P3/2 3D3/2	132.1697	132.8853	.44049	-.20974	.10866	-.000210	-1.05477
2P3/2 3D5/2	134.0225	134.7964	.37658	-.20417	.10864	-.000210	-1.05477
2P3/2 4S1/2	188.7088	189.4425	.42867	-.21109	.10545	-.000204	-1.05477
2P3/2 4P1/2	202.7271	203.4488	.43994	-.21418	.10757	-.000208	-1.05477
2P3/2 4P3/2	202.9062	203.6409	.42671	-.21403	.10758	-.000208	-1.05477
BROMINE							
	4P5	Z=35 A=79	R=9.73034E-05 A.U.				
2P1/2 3P3/2	-35.2453	-35.4961	1.60156	-.27497	.12246	-.000303	-1.19795
2P1/2 3D3/2	83.2790	83.1968	1.37827	-.21990	.12208	-.000302	-1.19795
2P1/2 3D5/2	83.1041	83.0416	1.37142	-.23274	.12207	-.000302	-1.19795
2P1/2 4S1/2	149.9227	149.8350	1.39942	-.23270	.11824	-.000293	-1.19795
2P1/2 4P1/2	166.7145	166.6142	1.41385	-.23603	.12082	-.000299	-1.19795
2P1/2 4P3/2	166.9810	166.8939	1.40102	-.23648	.12083	-.000299	-1.19795
2P3/2 3S1/2	-62.2900	-61.6028	.61580	-.23571	.10326	-.000257	-1.17634
2P3/2 3P1/2	4.0702	4.5798	.81764	-.27404	.12346	-.000307	-1.17634
2P3/2 3P3/2	12.5312	13.1949	.66110	-.27183	.12366	-.000308	-1.17634
2P3/2 3D3/2	128.6396	129.4314	.49171	-.23015	.12325	-.000308	-1.17634
2P3/2 3D5/2	130.6945	131.5530	.41860	-.22372	.12323	-.000308	-1.17634

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
BROMINE 4P5 Z=35 A=79 R=9.73034E-05 A.U.							
2P3/2 4S1/2	196.6268	197.4439	.47149	-.23135	.11941	-.000298	-1.17634
2P3/2 4P1/2	213.2317	214.0333	.48821	-.23514	.12199	-.000304	-1.17634
2P3/2 4P3/2	213.7749	214.5921	.47241	-.23496	.12200	-.000304	-1.17634
KRYPTON 4P6 Z=36 A=84 R=9.93144E-05 A.U.							
2P1/2 3P3/2	-51.6318	-52.1102	1.77265	-.30145	.13832	-.000421	-1.33069
2P1/2 3D3/2	73.6095	73.5189	1.52351	-.23970	.13790	-.000420	-1.33069
2P1/2 3D5/2	73.4990	73.4301	1.51656	-.25445	.13788	-.000420	-1.33069
2P1/2 4S1/2	152.7073	152.6156	1.54351	-.25405	.13334	-.000406	-1.33069
2P1/2 4P1/2	172.0181	171.9097	1.56119	-.25809	.13646	-.000415	-1.33069
2P1/2 4P3/2	172.6661	172.5732	1.54605	-.25857	.13647	-.000416	-1.33069
2P3/2 3P1/2	-7.4640	-6.9044	.90996	-.30058	.13450	-.000427	-1.30801
2P3/2 3P3/2	2.1281	2.8608	.73412	-.29811	.13976	-.000428	-1.30801
2P3/2 3D3/2	125.0000	125.8745	.54032	-.25167	.13933	-.000428	-1.30801
2P3/2 3D5/2	127.2786	128.2286	.46329	-.24431	.13931	-.000428	-1.30801
2P3/2 4S1/2	205.5436	206.4510	.51891	-.25271	.13478	-.000413	-1.30801
2P3/2 4P1/2	224.6492	225.5378	.53917	-.25721	.13769	-.000423	-1.30801
2P3/2 4P3/2	225.6043	226.5113	.52056	-.25701	.13791	-.000423	-1.30801
RUBIDIUM 5S1 Z=37 A=85 R=9.97069E-05 A.U.							
2P1/2 3P3/2	-77.2123	-77.5280	1.96223	-.33091	.15600	-.000565	-1.47101
2P1/2 3D3/2	55.0334	54.9259	1.88557	-.26195	.15555	-.000564	-1.47101
2P1/2 3D5/2	55.0631	54.9999	1.67802	-.27875	.15553	-.000564	-1.47101
2P1/2 4S1/2	149.8976	149.7942	1.70247	-.27751	.15063	-.000544	-1.47101
2P1/2 4P1/2	171.6141	171.4892	1.72503	-.28244	.15388	-.000556	-1.47101
2P1/2 4P3/2	172.4877	172.3823	1.70609	-.28307	.15351	-.000558	-1.47101
2P1/2 5S1/2	195.9808	195.8859	1.64227	-.27871	.15293	-.000554	-1.47101
2P3/2 3P3/2	-16.3441	-15.5435	.81683	-.32711	.15775	-.000575	-1.44752
2P3/2 3D3/2	113.1754	114.1321	.60963	-.27558	.15730	-.000575	-1.44752
2P3/2 3D5/2	115.7759	116.8184	.51547	-.26717	.15727	-.000574	-1.44752
2P3/2 4S1/2	209.5602	210.5799	.57252	-.27594	.15178	-.000554	-1.44752
2P3/2 4P1/2	231.0559	232.0314	.59839	-.28148	.15563	-.000568	-1.44752
2P3/2 4P3/2	232.2902	233.2889	.57492	-.28122	.15566	-.000568	-1.44752
2P3/2 5S1/2	255.6614	256.6691	.56285	-.27718	.15468	-.000565	-1.44752
STRONTIUM 5S2 Z=38 A=88 R=1.00866E-04 A.U.							
2P1/2 3P3/2	-104.0794	-104.4358	2.16608	-.36216	.17540	-.000738	-1.62218
2P1/2 3D3/2	34.9943	34.8679	1.85978	-.28541	.17494	-.000736	-1.62218
2P1/2 3D5/2	35.2384	35.1393	1.85158	-.30444	.17451	-.000738	-1.62218
2P1/2 4S1/2	146.7207	146.6055	1.87187	-.30207	.16831	-.000709	-1.62218
2P1/2 4P1/2	170.8430	170.7007	1.93022	-.30605	.17301	-.000729	-1.62218
2P1/2 4P3/2	171.9829	171.8646	1.87694	-.30862	.17305	-.000729	-1.62218
2P1/2 5S1/2	202.3843	202.2809	1.85762	-.30298	.17166	-.000724	-1.62218
2P3/2 3P3/2	-35.6350	-34.7652	.90537	-.35780	.17753	-.000752	-1.59811
2P3/2 3D3/2	100.5506	101.5957	.67751	-.30082	.17706	-.000752	-1.59811
2P3/2 3D5/2	103.5072	104.6490	.57129	-.29128	.17703	-.000752	-1.59811
2P3/2 4S1/2	213.9115	215.0117	.62643	-.30024	.17043	-.000723	-1.59811
2P3/2 4P1/2	237.7580	238.8279	.66081	-.30695	.17513	-.000743	-1.59811
2P3/2 4P3/2	239.3117	240.4100	.63201	-.30663	.17517	-.000743	-1.59811
2P3/2 5S1/2	269.5713	270.6820	.61475	-.30110	.17380	-.000737	-1.59811
YTRIUM 4D1 Z=39 A=89 R=1.01247E-04 A.U.							
2P1/2 3P3/2	-127.7536	-128.1546	2.39063	-.39693	.19625	-.000944	-1.78819
2P1/2 3D3/2	17.8535	17.7445	2.05437	-.31202	.19581	-.000943	-1.78819
2P1/2 3D5/2	18.6597	18.5417	2.04470	-.33337	.19578	-.000943	-1.78819
2P1/2 4S1/2	147.3175	147.1894	2.05864	-.32951	.18808	-.000905	-1.78819
2P1/2 4P1/2	172.5050	172.3445	2.09254	-.33654	.19366	-.000932	-1.78819

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
YTTRIUM							
	401	Z=39 A=89	R=1.01247E-04 A.U.				
2P1/2 4P3/2	174.9617	174.8299	2.06453	-.33729	.19372	-.000932	-1.78819
2P1/2 4D3/2	205.4005	205.3006	2.02293	-.32729	.19335	-.000931	-1.78819
2P1/2 5S1/2	209.5620	209.4503	2.03644	-.32982	.14216	-.000925	-1.78819
2P3/2 3P3/2	-50.8822	-49.9264	1.00035	-.39029	.19886	-.000963	-1.76379
2P3/2 3D3/2	91.7247	92.6669	.75184	-.32763	.15837	-.000962	-1.76379
2P3/2 3L5/2	95.3613	96.6127	.63180	-.31680	.19833	-.000962	-1.76379
2P3/2 4S1/2	222.8619	224.0740	.68784	-.32584	.15063	-.000924	-1.76379
2F3/2 4F1/2	247.7441	246.9199	.72652	-.33377	.14622	-.000951	-1.76379
2F3/2 4F3/2	250.6547	251.8642	.64214	-.33326	.14027	-.000951	-1.76379
2P3/2 4D3/2	280.8008	282.0365	.65830	-.32518	.14591	-.000950	-1.76379
2P3/2 5S1/2	295.0779	296.3051	.66923	-.32645	.19473	-.000944	-1.76379
ZIRCONIUM							
	402	Z=40 A=90	R=1.01625E-04 A.U.				
2P1/2 3P3/2	-152.2329	-152.6827	2.63160	-.43398	.21911	-.001187	-1.96575
2P1/2 3D3/2	.0961	-.0786	2.26336	-.34038	.21862	-.001187	-1.96575
2P1/2 3D5/2	1.4762	1.3369	2.25184	-.36420	.21858	-.001186	-1.96575
2P1/2 4S1/2	147.7114	147.5690	2.25827	-.35864	.20966	-.001137	-1.96575
2P1/2 4F1/2	173.8175	173.6367	2.29830	-.36684	.21622	-.001172	-1.96575
2P1/2 4F3/2	177.7053	177.6303	2.26516	-.36754	.21630	-.001173	-1.96575
2P1/2 4D3/2	211.1976	211.0884	2.21581	-.35564	.21592	-.001171	-1.96575
2F1/2 5S1/2	216.7434	216.6221	2.23199	-.35835	.21458	-.001164	-1.96575
2P3/2 3P3/2	-65.1407	-65.0959	1.10000	-.42435	.22220	-.001212	-1.94139
2P3/2 3D3/2	82.9921	84.2338	.62966	-.35565	.22169	-.001212	-1.94139
2P3/2 3D5/2	87.2793	88.6490	.69473	-.34342	.22165	-.001211	-1.94139
2P3/2 4S1/2	232.3975	233.7305	.74896	-.35248	.21274	-.001162	-1.94139
2P3/2 4F1/2	258.1698	259.4602	.79459	-.36174	.21929	-.001197	-1.94139
2P3/2 4F3/2	262.6302	263.9602	.75419	-.36099	.21937	-.001198	-1.94139
2P3/2 4D3/2	295.7099	297.0707	.71431	-.35148	.21900	-.001196	-1.94139
2F3/2 5S1/2	301.3769	302.7292	.72542	-.35279	.21766	-.001189	-1.94139
NI OBIUM							
	405 5S1	Z=41 A=93	R=1.02742E-04 A.U.				
2P1/2 3D5/2	-11.4981	-11.6623	2.48065	-.39894	.24303	-.001469	-2.15905
2P1/2 4S1/2	152.5376	152.3787	2.47795	-.39133	.23252	-.001407	-2.15905
2P1/2 4F1/2	178.1437	177.9408	2.52366	-.40070	.24046	-.001452	-2.15905
2P1/2 4F3/2	184.7840	184.6200	2.48506	-.40114	.24056	-.001453	-2.15905
2P1/2 4D3/2	220.3634	220.2416	2.42966	-.38761	.24021	-.001451	-2.15905
2P1/2 5S1/2	224.7015	224.5696	2.44346	-.39000	.23898	-.001444	-2.15905
2P3/2 3P3/2	-76.0802	-74.9353	1.20460	-.46012	.24728	-.001503	-2.13512
2P3/2 3D3/2	79.1032	80.4649	.91344	-.38524	.24676	-.001502	-2.13512
2P3/2 3D5/2	84.6132	86.1137	.76084	-.37138	.24671	-.001502	-2.13512
2P3/2 4S1/2	247.3239	248.7916	.81261	-.38038	.23660	-.001440	-2.13512
2P3/2 4F1/2	272.5735	273.9921	.86484	-.39100	.24414	-.001485	-2.13512
2P3/2 4F3/2	279.7323	281.1964	.81813	-.38981	.24424	-.001486	-2.13512
2P3/2 4D3/2	314.9456	316.4476	.77386	-.37911	.24389	-.001484	-2.13512
2P3/2 5S1/2	319.3854	320.8763	.78334	-.38033	.24266	-.001476	-2.13512
POLYBENUM							
	405 5S1	Z=42 A=98	R=1.04551E-04 A.U.				
2P1/2 3D5/2	-30.2513	-30.4413	2.71342	-.43120	.27005	-.001802	-2.36052
2P1/2 4S1/2	153.5573	153.3835	2.69920	-.42161	.25849	-.001723	-2.36052
2P1/2 4F1/2	181.1914	180.9671	2.75156	-.43220	.26720	-.001781	-2.36052
2P1/2 4F3/2	187.6877	187.5077	2.70782	-.43281	.26733	-.001782	-2.36052
2P1/2 4D3/2	227.0902	226.9594	2.64330	-.41717	.26496	-.001780	-2.36052
2P1/2 4D5/2	227.6941	227.5697	2.63944	-.41973	.26695	-.001780	-2.36052
2P1/2 5S1/2	232.5119	232.3710	2.65752	-.41994	.26558	-.001771	-2.36052
2P3/2 3P3/2	-91.3713	-90.1303	1.32215	-.49879	.27503	-.001845	-2.33759
2P3/2 3D3/2	70.6043	72.0804	1.00592	-.41705	.27445	-.001845	-2.33759
2P3/2 3D5/2	76.4585	78.1275	.83766	-.40167	.27444	-.001845	-2.33759
2P3/2 4S1/2	258.9223	260.5257	.68350	-.41038	.26287	-.001766	-2.33759
2P3/2 4F1/2	286.1769	287.7239	.94316	-.42237	.27159	-.001824	-2.33759

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
MOLYBDENUM 405 5S1 Z=42 A=96 R=1.04551E-04 A.U.							
2P3/2 4P3/2	293.2298	294.8284	.89018	-.42111	.27171	-.001825	-2.33759
2P3/2 4C3/2	332.2450	333.8834	.83835	-.40670	.27134	-.001823	-2.33759
2P3/2 4D5/2	333.1162	334.7720	.82180	-.40749	.27133	-.001823	-2.33759
2P3/2 5S1/2	337.7907	339.4233	.84665	-.40962	.26997	-.001814	-2.33759
TECHNETIUM 406 5S1 Z=43 A=99 R=1.04905E-04 A.U.							
2P1/2 3D5/2	-49.5671	-49.8020	2.96038	-.46478	.29944	-.002188	-2.57796
2P1/2 4S1/2	154.4449	154.2589	2.93277	-.45298	.28627	-.002090	-2.57796
2P1/2 4P1/2	184.1647	183.9211	2.99233	-.46486	.29626	-.002163	-2.57796
2P1/2 4P3/2	190.4524	190.2586	2.94310	-.46568	.29644	-.002164	-2.57796
2P1/2 4C3/2	233.8142	233.6770	2.86910	-.44781	.29605	-.002162	-2.57796
2P1/2 4C5/2	234.3861	234.2560	2.86503	-.45080	.29604	-.002162	-2.57796
2P1/2 5S1/2	240.3974	240.2503	2.88369	-.45097	.24452	-.002151	-2.57796
2P3/2 3P3/2	-106.4366	-105.0900	1.44652	-.53955	.30527	-.002244	-2.55663
2P3/2 3D3/2	62.3919	63.9929	1.10367	-.45048	.30471	-.002244	-2.55663
2P3/2 3D5/2	68.6817	70.4505	.91893	-.43349	.30484	-.002244	-2.55663
2P3/2 4S1/2	271.2701	273.0217	.95747	-.44181	.29147	-.002145	-2.55663
2P3/2 4P1/2	300.5676	302.2751	1.02512	-.45525	.30146	-.002218	-2.55663
2P3/2 4P3/2	307.4606	309.2143	.96546	-.45393	.30164	-.002219	-2.55663
2P3/2 4C3/2	350.4172	352.2086	.90574	-.43971	.30125	-.002217	-2.55663
2P3/2 4C5/2	351.2871	353.0961	.88684	-.43828	.30124	-.002217	-2.55663
2P3/2 5S1/2	357.1504	356.9372	.91306	-.44078	.29973	-.002206	-2.55663
RUTHENIUM 407 5S1 Z=44 A=102 R=1.05954E-04 A.U.							
2P1/2 3D5/2	-69.7561	-70.0022	3.22184	-.49964	.33133	-.002635	-2.80476
2P1/2 4S1/2	155.3054	155.1024	3.17927	-.48545	.31640	-.002513	-2.80476
2P1/2 4P1/2	187.1776	186.9093	3.24653	-.49867	.32784	-.002604	-2.80476
2P1/2 4P3/2	193.2006	192.9882	3.19148	-.49971	.32804	-.002606	-2.80476
2P1/2 4C3/2	240.6218	240.4736	3.10737	-.47947	.32763	-.002604	-2.80476
2P1/2 4C5/2	241.1572	241.0167	3.10321	-.48294	.32762	-.002604	-2.80476
2P1/2 5S1/2	246.1582	246.0033	3.12232	-.48305	.32593	-.002590	-2.80476
2P3/2 3P3/2	-121.4773	-120.0224	1.57784	-.58240	.33812	-.002705	-2.78578
2P3/2 3D3/2	54.2635	55.9932	1.20679	-.48555	.33755	-.002706	-2.78578
2P3/2 3D5/2	60.9673	62.8804	1.00476	-.46688	.33748	-.002705	-2.78578
2P3/2 4S1/2	284.5261	286.4320	1.03460	-.47469	.32255	-.002584	-2.78578
2P3/2 4P1/2	315.9731	317.8065	1.11075	-.48965	.33399	-.002674	-2.78578
2P3/2 4P3/2	322.6262	324.5247	1.04402	-.48829	.33419	-.002676	-2.78578
2P3/2 4C3/2	369.6081	371.5590	.97592	-.47213	.33378	-.002674	-2.78578
2P3/2 4C5/2	370.4689	372.4394	.95465	-.47049	.33377	-.002674	-2.78578
2P3/2 5S1/2	377.3205	379.2683	.98160	-.47305	.33208	-.002660	-2.78578
RHODIUM 408 5S1 Z=45 A=103 R=1.06300E-04 A.U.							
2P1/2 3D5/2	-90.9060	-91.1826	3.49834	-.53575	.36569	-.003148	-3.04878
2P1/2 4S1/2	156.4104	156.1932	3.43088	-.51892	.34904	-.003000	-3.04878
2P1/2 4P1/2	190.4986	190.2078	3.51421	-.53355	.36204	-.003111	-3.04878
2P1/2 4P3/2	196.2132	195.9845	3.45314	-.53488	.36225	-.003114	-3.04878
2P1/2 4C3/2	247.8095	247.6533	3.35832	-.51209	.36186	-.003111	-3.04878
2P1/2 4C5/2	248.3052	248.1570	3.35428	-.51607	.36185	-.003111	-3.04878
2P1/2 5S1/2	256.4557	256.2900	3.37370	-.51614	.35959	-.003095	-3.04878
2P3/2 3P3/2	-136.5559	-135.0221	1.71597	-.62738	.37381	-.003236	-3.03294
2P3/2 3D3/2	46.1248	47.9949	1.31514	-.52227	.37322	-.003236	-3.03294
2P3/2 3D5/2	53.2636	55.3337	1.09900	-.50184	.37314	-.003237	-3.03294
2P3/2 4S1/2	299.0199	301.0940	1.11464	-.50902	.35629	-.003089	-3.03294
2P3/2 4P1/2	332.6606	334.6530	1.20007	-.52559	.36424	-.003200	-3.03294
2P3/2 4P3/2	339.0416	341.1066	1.12582	-.52420	.36453	-.003203	-3.03294
2P3/2 4C3/2	390.1720	392.2961	1.04693	-.50600	.36411	-.003201	-3.03294
2P3/2 4C5/2	391.0203	393.1662	1.07524	-.50411	.36404	-.003200	-3.03294
2P3/2 5S1/2	399.0199	401.1427	1.05283	-.50676	.36723	-.003184	-3.03294

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
PALLADIUM							
	4D10	Z=46 A=106	R=1.07322E-04	A.U.			
2P1/2 3D5/2	-106.8765	-107.1843	3.79156	-.57218	.40274	-.003731	-3.31258
2P1/2 4S1/2	162.6790	162.4522	3.71143	-.55245	.36392	-.003553	-3.31258
2P1/2 4P1/2	199.1453	198.8375	3.79389	-.56834	.39852	-.003687	-3.31258
2P1/2 4P3/2	203.4408	203.2009	3.71745	-.57004	.39862	-.003691	-3.31258
2P1/2 4D3/2	259.4794	259.3197	3.62262	-.54504	.39840	-.003688	-3.31258
2P1/2 4D5/2	259.7874	259.6351	3.61948	-.54925	.39839	-.003686	-3.31258
2P3/2 3P3/2	-145.5925	-143.8935	1.87007	-.67630	.41193	-.003841	-3.30081
2F3/2 3D3/2	44.3166	46.3354	1.43662	-.56234	.41134	-.003644	-3.30081
2F3/2 3D5/2	51.6313	53.8654	1.19949	-.54021	.41123	-.003843	-3.30081
2F3/2 4S1/2	319.5793	321.8326	1.20518	-.54648	.39242	-.003665	-3.30081
2P3/2 4P1/2	355.5624	357.7460	1.29836	-.56442	.40702	-.003749	-3.30081
2P3/2 4P3/2	360.5715	362.8143	1.21766	-.56315	.40731	-.003683	-3.30081
2P3/2 4D3/2	416.1384	418.4476	1.13145	-.54291	.40690	-.003600	-3.30081
2P3/2 4D5/2	416.6038	419.1348	1.10757	-.54088	.40688	-.003600	-3.30081
SILVER							
	5S1	Z=47 A=107	R=1.07658E-04	A.U.			
2P1/2 3D5/2	-135.3749	-135.7172	4.09834	-.61164	.44376	-.004407	-3.58377
2P1/2 4S1/2	158.1006	157.8557	3.99917	-.58880	.42250	-.004191	-3.58377
2P1/2 4P1/2	196.8085	196.4712	4.09262	-.60652	.43910	-.004355	-3.58377
2P1/2 4P3/2	201.7896	201.5286	4.01811	-.60845	.43946	-.004360	-3.58377
2P1/2 4D3/2	262.1266	261.9575	3.90034	-.58014	.43900	-.004357	-3.58377
2P1/2 4D5/2	262.5406	262.3782	3.89674	-.58521	.43898	-.004357	-3.58377
2P1/2 5S1/2	272.8025	272.6225	3.91654	-.58520	.43675	-.004334	-3.58377
2P3/2 3P3/2	-166.0668	-164.2289	2.01320	-.72384	.45441	-.004544	-3.57716
2P3/2 3D3/2	30.8111	32.9921	1.54757	-.60071	.45381	-.004548	-3.57716
2P3/2 3D5/2	36.9030	41.3188	1.25873	-.57649	.45369	-.004547	-3.57716
2P3/2 4S1/2	330.7021	333.1499	1.28327	-.58203	.43245	-.004331	-3.57716
2P3/2 4P1/2	368.9174	371.2631	1.38699	-.60208	.44904	-.004495	-3.57716
2P3/2 4P3/2	374.6379	377.0725	1.29831	-.60066	.44940	-.004500	-3.57716
2P3/2 4D3/2	434.4563	436.9646	1.20239	-.57799	.44893	-.004497	-3.57716
2P3/2 4D5/2	435.2754	437.8099	1.17381	-.57555	.44891	-.004497	-3.57716
2P3/2 5S1/2	445.3648	447.8953	1.20298	-.57650	.44664	-.004474	-3.57716
CADMIUM							
	5S2	Z=48 A=114	R=1.09956E-04	A.U.			
2P1/2 3D5/2	-165.8031	-166.1862	4.42265	-.65252	.46810	-.005177	-3.87000
2P1/2 4S1/2	152.8433	152.5779	4.30248	-.62624	.46415	-.004917	-3.87000
2P1/2 4P1/2	193.8781	193.5080	4.40818	-.64594	.48295	-.005115	-3.87000
2P1/2 4P3/2	199.6290	199.3441	4.32481	-.64817	.48339	-.005122	-3.87000
2P1/2 4D3/2	264.2677	264.0833	4.19292	-.61627	.48287	-.005118	-3.87000
2P1/2 4D5/2	264.8015	264.6271	4.18897	-.62229	.48266	-.005118	-3.87000
2P1/2 5S1/2	280.2603	280.0653	4.21243	-.62218	.47986	-.005085	-3.87000
2P3/2 3P3/2	-187.3945	-185.4094	2.16265	-.77323	.50042	-.005346	-3.86974
2P3/2 3D3/2	16.5057	18.8582	1.66323	-.64042	.49462	-.005352	-3.86974
2P3/2 3D5/2	25.4393	28.0471	1.38158	-.61399	.49969	-.005351	-3.86974
2P3/2 4S1/2	342.3429	344.9969	1.36381	-.61870	.47574	-.005091	-3.86974
2P3/2 4P1/2	382.8557	385.3938	1.46341	-.64104	.49456	-.005289	-3.86974
2P3/2 4P3/2	389.3519	392.0296	1.36185	-.63947	.49499	-.005295	-3.86974
2P3/2 4D3/2	453.4612	456.1805	1.27546	-.61420	.49448	-.005292	-3.86974
2P3/2 4D5/2	454.4509	457.2010	1.24181	-.61131	.49445	-.005292	-3.86974
2P3/2 5S1/2	469.7378	472.4600	1.27601	-.61463	.49145	-.005259	-3.86974
INDIUM							
	5P1	Z=49 A=115	P=1.10277E-04	A.U.			
2P1/2 3D5/2	-199.2509	-199.6699	4.76103	-.69433	.53539	-.006044	-4.17707
2P1/2 4S1/2	145.6766	145.3471	4.61833	-.66443	.50843	-.005732	-4.17707
2P1/2 4P1/2	188.7673	188.3691	4.73782	-.68431	.52970	-.005970	-4.17707
2P1/2 4P3/2	195.5832	195.2804	4.64438	-.68874	.53023	-.005979	-4.17707
2P1/2 4D3/2	264.4508	264.2593	4.49794	-.65308	.52469	-.005975	-4.17707
2P1/2 4D5/2	265.2494	265.0698	4.49309	-.66007	.52467	-.005975	-4.17707
2P1/2 5S1/2	285.5423	285.3382	4.52104	-.65997	.52602	-.005933	-4.17707

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
INDIUM							
	5P1	Z=49 A=115	R=1.10277E-04	A.U.			
2P1/2 5P1/2	291.9103	291.6982	4.52839	-.66170	.52846	-.005960	-4.17707
2P3/2 3P3/2	-210.5253	-208.3732	2.31267	-.82357	.54960	-.006252	-4.18451
2P3/2 3D3/2	.4072	2.9517	1.77793	-.68063	.54901	-.006260	-4.18451
2P3/2 3D5/2	10.2743	13.0962	1.471e5	-.65162	.54886	-.006258	-4.18451
2P3/2 4S1/2	353.3926	356.2759	1.440e3	-.65561	.52193	-.005947	-4.18451
2P3/2 4P1/2	395.9488	398.7014	1.57528	-.68041	.54318	-.006185	-4.18451
2P3/2 4P3/2	403.5784	406.4423	1.46172	-.67863	.54371	-.006193	-4.18451
2P3/2 4D3/2	471.8257	474.7793	1.34459	-.65063	.54316	-.006190	-4.18451
2P3/2 4D5/2	473.1314	476.1210	1.30516	-.64722	.54315	-.006189	-4.18451
2P3/2 5S1/2	493.2269	496.1835	1.34573	-.65115	.55945	-.006147	-4.18451
2P3/2 5P1/2	499.5450	502.4923	1.35461	-.65318	.54193	-.006175	-4.18451
TIN							
	5P2	Z=50 A=118	R=1.11228E-04	A.U.			
2P1/2 3D5/2	-234.0356	-234.4943	5.11805	-.73756	.56632	-.007023	-4.50130
2P1/2 4S1/2	138.4012	138.1061	4.95063	-.70367	.55610	-.006052	-4.50130
2P1/2 4P1/2	183.5922	183.1636	5.06473	-.72790	.58000	-.006936	-4.50130
2P1/2 4P3/2	191.6111	191.2887	4.98046	-.73056	.58069	-.006947	-4.50130
2P1/2 4D3/2	264.6954	264.4959	4.81050	-.69085	.58015	-.006944	-4.50130
2P1/2 4D5/2	265.7836	265.5979	4.81274	-.69891	.58011	-.006943	-4.50130
2P1/2 5S1/2	291.1553	290.9415	4.84503	-.69873	.57573	-.006889	-4.50130
2P1/2 5P1/2	299.5547	299.3297	4.85543	-.70097	.57875	-.006925	-4.50130
2P3/2 3D5/2	-4.8813	-1.6316	1.56427	-.69067	.60195	-.007286	-4.51796
2P3/2 4S1/2	365.6603	368.8088	1.51790	-.69327	.57173	-.006915	-4.51796
2P3/2 4P1/2	410.2868	413.2684	1.66859	-.72075	.55566	-.007200	-4.51796
2P3/2 4P3/2	415.1664	422.2919	1.54264	-.71873	.55632	-.007210	-4.51796
2P3/2 4D3/2	491.5991	494.8028	1.41358	-.68784	.55577	-.007207	-4.51796
2P3/2 4D5/2	493.2446	496.4901	1.36785	-.69387	.55573	-.007206	-4.51796
2P3/2 5S1/2	516.3940	521.6011	1.41512	-.68843	.59135	-.007153	-4.51796
2P3/2 5P1/2	526.7324	529.9268	1.42738	-.69103	.54437	-.007189	-4.51796
ANTIMONY							
	5P3	Z=51 A=121	R=1.12162E-04	A.U.			
2P1/2 3D5/2	-270.5364	-271.0412	5.49612	-.78169	.64116	-.008125	-4.84468
2P1/2 4S1/2	130.3931	130.0798	5.30191	-.74352	.60732	-.007685	-4.84468
2P1/2 4P1/2	177.9194	177.4565	5.45157	-.77018	.63425	-.008024	-4.84468
2P1/2 4P3/2	186.9159	186.5749	5.33590	-.77318	.63502	-.008037	-4.84468
2P1/2 4D3/2	264.4466	264.2369	5.15711	-.72913	.63445	-.008034	-4.84468
2P1/2 4D5/2	265.6681	265.4741	5.15071	-.73837	.63442	-.008034	-4.84468
2P1/2 5S1/2	296.6732	296.4488	5.18591	-.73806	.62420	-.007966	-4.84468
2P1/2 5P1/2	306.6562	306.4176	5.19928	-.74065	.63284	-.008012	-4.84468
2P1/2 5P3/2	306.8795	306.6536	5.18689	-.74122	.63251	-.008013	-4.84468
2P3/2 3D5/2	-20.4438	-17.1555	1.60380	-.73065	.65923	-.008447	-4.87220
2P3/2 4S1/2	378.5447	381.9303	1.60063	-.73157	.62540	-.008007	-4.87220
2P3/2 4P1/2	425.4546	428.6764	1.76865	-.76225	.65223	-.008346	-4.87220
2P3/2 4P3/2	435.3654	438.7446	1.62829	-.76004	.65309	-.008359	-4.87220
2P3/2 4D3/2	512.1886	515.6552	1.48747	-.72604	.65253	-.008356	-4.87220
2P3/2 4D5/2	514.0182	517.5325	1.43524	-.72150	.65248	-.008355	-4.87220
2P3/2 5S1/2	544.7632	548.2554	1.48761	-.72661	.64727	-.008288	-4.87220
2P3/2 5P1/2	554.6986	558.1549	1.50315	-.72984	.65092	-.008333	-4.87220
2P3/2 5P3/2	555.0193	558.4904	1.48806	-.72963	.65099	-.008335	-4.87220
TELLURIUM							
	5P4	Z=52 A=130	R=1.14877E-04	A.U.			
2P1/2 3D5/2	-308.6022	-309.1528	5.89336	-.82696	.70011	-.009363	-5.20650
2P1/2 4S1/2	121.8631	121.5301	5.67023	-.78421	.66232	-.008845	-5.20650
2P1/2 4P1/2	171.7844	171.2345	5.83663	-.81345	.69251	-.009245	-5.20650
2P1/2 4P3/2	181.8599	181.4904	5.70869	-.81682	.69343	-.009262	-5.20650
2P1/2 4D3/2	263.8433	263.6223	5.51213	-.76817	.65285	-.009259	-5.20650
2P1/2 4D5/2	265.2184	265.0151	5.50493	-.77866	.69261	-.009259	-5.20650
2P1/2 5S1/2	302.0247	301.7888	5.54306	-.77819	.68667	-.009174	-5.20650
2P1/2 5P1/2	313.8328	313.5799	5.55905	-.78149	.69103	-.009232	-5.20650

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(-VP)	E(SELF)
TELLURIUM							
	5P4	Z=52 A=130	R=1.14877E-04	A.U.			
2P1/2 5P3/2	314.5314	314.2933	5.54472	-.78199	.69111	-.009234	-5.20650
2P3/2 3D5/2	-36.1007	-32.5588	1.76520	-.77152	.72097	-.009755	-5.24675
2P3/2 4S1/2	392.3544	396.0150	1.68366	-.77141	.68319	-.009237	-5.24675
2P3/2 4P1/2	441.6357	445.1131	1.87031	-.80466	.71337	-.009637	-5.24675
2P3/2 4P3/2	452.6827	456.3120	1.71512	-.80227	.71428	-.009654	-5.24675
2P3/2 4D3/2	533.8910	537.6374	1.56128	-.76497	.71370	-.009651	-5.24675
2P3/2 4D5/2	535.9246	539.7250	1.50212	-.75981	.71365	-.009650	-5.24675
2P3/2 5S1/2	572.4740	576.2286	1.55474	-.76551	.70752	-.009560	-5.24675
2P3/2 5P1/2	584.2064	587.9419	1.57825	-.76930	.71189	-.009624	-5.24675
2P3/2 5P3/2	585.0153	588.7682	1.56065	-.76911	.71156	-.009626	-5.24675
IODINE							
	5P5	Z=53 A=127	R=1.13987E-04	A.U.			
2P1/2 3D5/2	-348.2176	-348.8213	6.31012	-.87327	.76356	-.010751	-5.58592
2P1/2 4S1/2	112.8091	112.4535	6.05587	-.82563	.72144	-.010143	-5.58592
2P1/2 4P1/2	165.1332	164.5921	6.24003	-.85757	.75520	-.010614	-5.58592
2P1/2 4P3/2	176.3585	175.9612	6.09693	-.86135	.75629	-.010635	-5.58592
2P1/2 4D3/2	262.8156	262.5809	5.88353	-.80780	.75570	-.010633	-5.58592
2P1/2 4D5/2	264.3663	264.1512	5.87564	-.81965	.75565	-.010632	-5.58592
2P1/2 5S1/2	307.4970	307.2432	5.91557	-.81886	.74851	-.010528	-5.58592
2P1/2 5P1/2	321.0542	320.7846	5.93523	-.82280	.75366	-.010600	-5.58592
2P1/2 5P3/2	322.1446	321.8926	5.91841	-.82340	.75376	-.010602	-5.58592
2P3/2 3D5/2	-51.7649	-47.9550	1.86788	-.81316	.78757	-.011226	-5.64098
2P3/2 4S1/2	407.1846	411.1359	1.76633	-.81148	.74547	-.010617	-5.64098
2P3/2 4P1/2	456.8282	462.5761	1.97277	-.84784	.77922	-.011088	-5.64098
2P3/2 4P3/2	471.0834	474.9988	1.80168	-.84527	.78031	-.011110	-5.64098
2P3/2 4D3/2	556.7135	560.7562	1.63413	-.80448	.77471	-.011107	-5.64098
2P3/2 4D5/2	558.9716	563.0751	1.56761	-.79867	.77966	-.011106	-5.64098
2P3/2 5S1/2	601.8308	605.8856	1.62943	-.80481	.77252	-.011003	-5.64098
2P3/2 5P1/2	615.3032	619.3349	1.65204	-.80933	.77767	-.011075	-5.64098
2P3/2 5P3/2	616.5180	620.5700	1.63136	-.80912	.77777	-.011077	-5.64098
XENON							
	5P6	Z=54 A=132	R=1.15463E-04	A.U.			
2P1/2 3D5/2	-389.6098	-390.2663	6.74707	-.92056	.63165	-.012303	-5.98935
2P1/2 4S1/2	102.9795	102.6040	6.45932	-.86771	.78481	-.011591	-5.98935
2P1/2 4P1/2	157.7614	157.1804	6.66247	-.90248	.82247	-.012143	-5.98935
2P1/2 4P3/2	170.2441	169.8214	6.50719	-.90671	.82376	-.012170	-5.98935
2P1/2 4D3/2	261.1951	260.9494	6.27206	-.84798	.82316	-.012166	-5.98935
2P1/2 4D5/2	262.9431	262.7194	6.26339	-.86128	.82311	-.012167	-5.98935
2P1/2 5S1/2	312.6536	312.3945	6.30591	-.86025	.81484	-.012041	-5.98935
2P1/2 5P1/2	328.1141	327.8305	6.32907	-.86480	.82086	-.012129	-5.98935
2P1/2 5P3/2	329.5685	329.3054	6.30896	-.86541	.82101	-.012133	-5.98935
2P3/2 3D5/2	-67.5811	-63.4826	1.97234	-.85560	.85924	-.012876	-6.06157
2P3/2 4S1/2	422.8636	427.1281	1.84899	-.85218	.81241	-.012164	-6.06157
2P3/2 4P1/2	476.9324	480.9719	2.07658	-.89183	.85006	-.012716	-6.06157
2P3/2 4P3/2	490.4962	494.7197	1.88850	-.88908	.85135	-.012742	-6.06157
2P3/2 4D3/2	580.5676	584.9292	1.70654	-.84460	.85074	-.012740	-6.06157
2P3/2 4D5/2	583.0724	587.5019	1.63222	-.83811	.85068	-.012739	-6.06157
2P3/2 5S1/2	632.4946	636.8720	1.69917	-.84483	.84242	-.012613	-6.06157
2P3/2 5P1/2	647.8626	652.2128	1.72567	-.85004	.84844	-.012702	-6.06157
2P3/2 5P3/2	649.4674	653.8416	1.70119	-.84972	.84859	-.012705	-6.06157
CESIUM							
	6S1	Z=55 A=134	R=1.16043E-04	A.U.			
2P1/2 3D5/2	-437.7455	-438.4705	7.21196	-.97057	.90531	-.014042	-6.40770
2P1/2 4S1/2	87.5540	87.1452	6.88658	-.91220	.85329	-.013213	-6.40770
2P1/2 4P1/2	144.8117	144.1755	7.11250	-.95001	.89522	-.013857	-6.40770
2P1/2 4P3/2	158.8219	158.3596	6.94180	-.95467	.89675	-.013890	-6.40770
2P1/2 4D3/2	254.2060	253.9362	6.68567	-.89041	.85613	-.013689	-6.40770
2P1/2 4D5/2	256.2426	255.9975	6.67579	-.90522	.85607	-.013668	-6.40770
2P1/2 5S1/2	314.2691	313.9887	6.71863	-.90334	.88630	-.013732	-6.40770

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
CESIUM							
	6S1	Z=55 A=134	R=1.16043E-04	A.U.			
2P1/2 5P1/2	331.5003	331.1896	6.74740	-.90872	.89352	-.013843	-6.40770
2P1/2 5P3/2	333.4687	333.1825	6.72362	-.90962	.89370	-.013847	-6.40770
2P1/2 6S1/2	352.1386	351.8648	6.70804	-.90454	.89178	-.013817	-6.40770
2P3/2 3D5/2	-88.3760	-83.9818	2.08330	-.90014	.93694	-.014731	-6.49955
2P3/2 4S1/2	434.7123	439.2991	1.93656	-.89485	.88453	-.013901	-6.49955
2P3/2 4P1/2	491.2237	495.5619	2.18705	-.93799	.92665	-.014545	-6.49955
2P3/2 4P3/2	506.3666	510.9068	1.98052	-.93501	.92836	-.014574	-6.49955
2P3/2 4D3/2	600.6173	605.5069	1.78344	-.88663	.92775	-.014577	-6.49955
2P3/2 4D5/2	603.6605	608.4258	1.70048	-.87937	.92768	-.014576	-6.49955
2P3/2 5S1/2	661.3722	666.0647	1.77068	-.88612	.91792	-.014420	-6.49955
2P3/2 5P1/2	678.5019	683.1799	1.80325	-.89229	.92514	-.014531	-6.49955
2P3/2 5P3/2	680.6310	685.3379	1.77388	-.89201	.92532	-.014535	-6.49955
2P3/2 6S1/2	699.2447	703.9622	1.76054	-.88738	.92341	-.014505	-6.49955
BARIUM							
	6S2	Z=56 A=136	R=1.17187E-04	A.U.			
2P1/2 3D5/2	-488.0044	-488.8019	7.69900	-1.02150	.98430	-.015980	-6.84828
2P1/2 4S1/2	70.9416	70.4480	7.33749	-.95726	.92663	-.015016	-6.84828
2P1/2 4F1/2	130.7187	130.0244	7.58331	-.99822	.97322	-.015765	-6.84828
2P1/2 4P3/2	146.3937	145.8900	7.39610	-1.00334	.97502	-.015806	-6.84828
2P1/2 4D3/2	246.2170	245.9220	7.11792	-.93323	.97440	-.015806	-6.84828
2P1/2 4D5/2	248.5718	248.3043	7.10696	-.94969	.97432	-.015805	-6.84828
2P1/2 5S1/2	315.6749	315.3728	7.14998	-.94683	.96286	-.015613	-6.84828
2P1/2 5P1/2	334.6598	334.3210	7.18455	-.95311	.97140	-.015750	-6.84828
2P1/2 5P3/2	337.0752	336.7658	7.15601	-.95420	.97164	-.015756	-6.84828
2P1/2 6S1/2	360.7598	360.4675	7.13488	-.94756	.96901	-.015713	-6.84828
2P3/2 3D5/2	-109.4882	-104.7792	2.19118	-.94526	1.02049	-.016804	-6.96259
2P3/2 4S1/2	447.1790	452.1093	2.02324	-.93795	.96283	-.015841	-6.96259
2P3/2 4P1/2	506.1764	510.8328	2.29612	-.98474	1.00941	-.016590	-6.96259
2P3/2 4P3/2	523.0362	527.9139	2.07185	-.98152	1.01121	-.016630	-6.96259
2P3/2 4D3/2	621.8718	626.9106	1.85889	-.92902	1.01056	-.016630	-6.96259
2P3/2 4D5/2	625.0832	630.2061	1.76673	-.92094	1.01049	-.016628	-6.96259
2P3/2 5S1/2	691.8572	696.9249	1.83989	-.92764	.99904	-.016437	-6.96259
2P3/2 5P1/2	710.7196	715.7469	1.87921	-.93489	1.00758	-.016574	-6.96259
2P3/2 5P3/2	713.3188	718.3807	1.84403	-.93455	1.00782	-.016580	-6.96259
2P3/2 6S1/2	736.9383	742.0152	1.82549	-.92846	1.00520	-.016536	-6.96259
LANTHANUM							
	5D1	Z=57 A=139	R=1.17469E-04	A.U.			
2P1/2 3D5/2	-536.6700	-537.5459	8.21700	-1.07560	1.06840	-.018122	-7.31572
2P1/2 4S1/2	57.0356	56.5541	7.81466	-1.00505	1.00461	-.017008	-7.31572
2P1/2 4P1/2	119.2327	118.4756	8.08376	-1.04933	1.05625	-.017675	-7.31572
2P1/2 4P3/2	136.8031	136.2545	7.87882	-1.05492	1.05337	-.017925	-7.31572
2P1/2 4D3/2	240.8611	240.5378	7.57801	-.97876	1.05774	-.017926	-7.31572
2P1/2 4D5/2	243.7506	243.4580	7.56547	-.99689	1.05766	-.017924	-7.31572
2P1/2 5S1/2	319.9274	319.6016	7.60746	-.99261	1.04452	-.017655	-7.31572
2P1/2 5P1/2	339.6371	339.2685	7.64775	-1.00000	1.05443	-.017861	-7.31572
2P1/2 5P3/2	343.2785	342.9445	7.61352	-1.00107	1.05474	-.017869	-7.31572
2P1/2 5D3/2	365.9828	365.6813	7.57127	-.99031	1.05414	-.017860	-7.31572
2P1/2 6S1/2	369.9731	369.6609	7.58688	-.99294	1.05183	-.017820	-7.31572
2P3/2 3D5/2	-127.0428	-121.9956	2.30899	-.99120	1.10972	-.019105	-7.45564
2P3/2 4S1/2	464.3165	469.6161	2.10971	-.98160	1.04595	-.017992	-7.45564
2P3/2 4P1/2	525.7004	530.6991	2.41046	-1.03226	1.09758	-.018859	-7.45564
2P3/2 4P3/2	544.5081	549.7488	2.16293	-1.02875	1.09970	-.018904	-7.45564
2P3/2 4D3/2	647.5242	652.9378	1.93392	-.97201	1.09906	-.018910	-7.45564
2P3/2 4D5/2	651.3152	656.8261	1.83171	-.96302	1.09896	-.018908	-7.45564
2P3/2 5S1/2	727.1426	732.5933	1.90740	-.96963	1.08884	-.018678	-7.45564
2P3/2 5P1/2	746.7161	752.1197	1.95310	-.97794	1.09575	-.018845	-7.45564
2P3/2 5P3/2	750.5606	756.0046	1.91206	-.97744	1.09605	-.018852	-7.45564
2P3/2 5D3/2	773.1266	778.5467	1.67783	-.96843	1.09544	-.018844	-7.45564
2P3/2 6S1/2	777.1723	782.6353	1.88838	-.97007	1.09315	-.018803	-7.45564

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
CERIUM 4F2 Z=56 A=140 R=1.17750E-04 A.U.							
2P1/2 3D5/2	-564.1706	-565.1384	8.77795	-1.13233	1.15826	-.020492	-7.81561
2P1/2 4S1/2	61.9243	61.4040	8.31919	-1.05314	1.08904	-.019231	-7.81561
2P1/2 4P1/2	125.1564	124.3429	8.60618	-1.10010	1.14521	-.020214	-7.81561
2P1/2 4P3/2	145.5271	144.9375	8.38306	-1.10523	1.14766	-.020274	-7.81561
2P1/2 4D3/2	250.2264	249.8722	8.06860	-1.02558	1.14701	-.020276	-7.81561
2P1/2 4D5/2	256.2695	255.9526	8.04945	-1.04355	1.14692	-.020275	-7.81561
2P1/2 4F5/2	369.2512	369.0263	7.93451	-1.01909	1.14529	-.020244	-7.81561
2P1/2 5S1/2	331.8165	331.4801	8.07516	-1.03669	1.13353	-.020030	-7.81561
2P1/2 5P1/2	351.8663	351.5087	8.11312	-1.04346	1.14372	-.020209	-7.81561
2P1/2 5P3/2	355.0951	354.7521	8.07930	-1.04457	1.14405	-.020217	-7.81561
2P1/2 6S1/2	379.8078	379.4884	8.05048	-1.03639	1.14111	-.020166	-7.81561
2P3/2 3D5/2	-121.3661	-119.9731	2.45091	-1.04293	1.20538	-.021063	-7.98473
2P3/2 4S1/2	502.2980	507.9860	2.20999	-1.02901	1.13619	-.020402	-7.98473
2P3/2 4P1/2	564.2700	570.0664	2.53102	-1.08285	1.14234	-.021385	-7.98473
2P3/2 4P3/2	586.3310	591.9581	2.26252	-1.07825	1.14478	-.021445	-7.98473
2P3/2 4L3/2	689.9668	695.7743	2.02361	-1.01910	1.14413	-.021447	-7.98473
2P3/2 4D5/2	696.9251	702.8355	1.91025	-1.00850	1.14402	-.021445	-7.98473
2P3/2 4F5/2	809.4457	815.4222	1.83249	-.99519	1.14236	-.021414	-7.98473
2P3/2 5S1/2	772.1060	777.9728	1.97132	-1.01279	1.18065	-.021201	-7.98473
2P3/2 5P1/2	792.0473	797.8687	2.01445	-1.02062	1.15084	-.021380	-7.98473
2P3/2 5P3/2	795.4457	801.3076	1.97322	-1.02013	1.19117	-.021388	-7.98473
2P3/2 6S1/2	820.0672	825.9704	1.94708	-1.01249	1.18823	-.021336	-7.98473
PRASEODYMIUM 4F3 Z=59 A=141 R=1.18030E-04 A.U.							
2P1/2 3D5/2	-603.2070	-604.2648	9.34977	-1.18873	1.25463	-.023120	-8.33472
2P1/2 4S1/2	57.2596	56.6995	8.83902	-1.10152	1.17898	-.021682	-8.33472
2P1/2 4P1/2	122.2177	121.3379	9.14852	-1.15171	1.24048	-.022803	-8.33472
2P1/2 4P3/2	145.1671	144.5327	8.90541	-1.15674	1.24331	-.022876	-8.33472
2P1/2 4D3/2	252.2293	251.8439	8.57249	-1.07215	1.24266	-.022880	-8.33472
2P1/2 4D5/2	260.2860	259.9433	8.54861	-1.09085	1.24256	-.022878	-8.33472
2P1/2 4F5/2	378.1252	377.8821	8.42356	-1.06378	1.24087	-.022844	-8.33472
2P1/2 5S1/2	339.9557	339.6000	8.56692	-1.08204	1.22811	-.022803	-8.33472
2P1/2 5P1/2	360.6513	360.2521	8.60659	-1.08905	1.23919	-.022805	-8.33472
2P1/2 5P3/2	364.2672	363.9054	8.56993	-1.09016	1.23958	-.022816	-8.33472
2P1/2 6S1/2	389.6170	389.2815	8.53770	-1.08124	1.23646	-.022758	-8.33472
2P3/2 3D5/2	-125.1531	-119.3824	2.57435	-1.09213	1.30828	-.024509	-8.53671
2P3/2 4S1/2	532.8051	538.9105	2.29636	-1.07462	1.23266	-.023072	-8.53671
2P3/2 4P1/2	596.9065	602.6632	2.64228	-1.13219	1.24413	-.024193	-8.53671
2P3/2 4P3/2	621.1548	627.1444	2.35071	-1.12679	1.24695	-.024265	-8.53671
2P3/2 4D3/2	727.1165	733.3465	2.09891	-1.06425	1.24629	-.024269	-8.53671
2P3/2 4D5/2	736.1161	742.4593	1.97381	-1.05224	1.24618	-.024267	-8.53671
2P3/2 4F5/2	853.4722	859.8868	1.88908	-1.03719	1.24446	-.024233	-8.53671
2P3/2 5S1/2	815.4029	821.7072	2.03005	-1.05540	1.26174	-.023992	-8.53671
2P3/2 5P1/2	835.9662	842.2225	2.07538	-1.06355	1.24282	-.024195	-8.53671
2P3/2 5P3/2	839.7744	846.0741	2.03097	-1.06297	1.24320	-.024205	-8.53671
2P3/2 6S1/2	865.0502	871.3741	2.00142	-1.05460	1.24004	-.024148	-8.53671
NEODYMIUM 4F4 Z=60 A=144 R=1.18861E-04 A.U.							
2P1/2 3D5/2	-642.9964	-644.1475	9.94468	-1.24581	1.35775	-.026024	-8.87947
2P1/2 4S1/2	52.5732	51.9725	9.37956	-1.15020	1.27519	-.024391	-8.87947
2P1/2 4P1/2	119.2570	115.3158	9.71262	-1.20379	1.34240	-.025665	-8.87947
2P1/2 4P3/2	144.9452	144.2689	9.44549	-1.20661	1.34566	-.025752	-8.87947
2P1/2 4D3/2	254.3365	253.9188	9.09682	-1.11895	1.34501	-.025758	-8.87947
2P1/2 4D5/2	264.5149	264.1457	9.06787	-1.13837	1.34488	-.025755	-8.87947
2P1/2 4F5/2	387.2561	386.9932	8.93363	-1.10870	1.34312	-.025719	-8.87947
2P1/2 5S1/2	348.2803	347.9045	9.07902	-1.12761	1.32932	-.025447	-8.87947
2P1/2 5P1/2	369.4277	369.0057	9.12064	-1.13483	1.34133	-.025675	-8.87947
2P1/2 5P3/2	373.4608	373.0792	9.08094	-1.13593	1.34178	-.025648	-8.87947
2P1/2 6S1/2	399.3891	399.0361	9.04602	-1.12636	1.33848	-.025625	-8.87947
2P3/2 3D5/2	-127.4912	-121.3171	2.64487	-1.14153	1.41872	-.027608	-9.11644
2P3/2 4S1/2	565.4939	572.0442	2.37625	-1.12025	1.33618	-.026035	-9.11644

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
NEOLYMIUM 4F4 Z=60 A=144 R=1.18861E-04 A.U.							
2P3/2 4P1/2	631.2962	637.4699	2.75036	-1.18169	1.40336	-.027309	-9.11844
2P3/2 4P3/2	658.3242	664.8046	2.43424	-1.17541	1.40661	-.027395	-9.11844
2P3/2 4D3/2	766.5742	773.2539	2.16465	-1.10944	1.40595	-.027401	-9.11844
2P3/2 4D5/2	777.7230	784.5269	2.03200	-1.09540	1.40582	-.027399	-9.11844
2P3/2 4F5/2	899.9549	906.8398	1.94100	-1.07910	1.40462	-.027361	-9.11844
2P3/2 5S1/2	861.0860	867.8555	2.08366	-1.09789	1.39026	-.027090	-9.11844
2P3/2 5P1/2	882.0996	888.8183	2.13110	-1.10634	1.40228	-.027319	-9.11844
2P3/2 5P3/2	886.0376	893.0928	2.08355	-1.10563	1.40271	-.027331	-9.11844
2P3/2 6S1/2	912.1791	918.9705	2.05162	-1.09672	1.39742	-.027268	-9.11844
PRGMETHIUM 4F5 Z=61 A=145 R=1.19136E-04 A.U.							
2P1/2 3D5/2	-683.4024	-684.6517	10.56345	-1.30346	1.46812	-.029230	-9.44959
2P1/2 4S1/2	47.9103	47.2655	9.94170	-1.19906	1.37810	-.027378	-9.44959
2P1/2 4P1/2	116.3263	115.3096	10.29965	-1.25600	1.45144	-.028822	-9.44959
2P1/2 4P3/2	144.9280	144.1989	10.01320	-1.26076	1.45514	-.028926	-9.44959
2P1/2 4D3/2	256.6083	256.1557	9.64251	-1.16590	1.45453	-.028934	-9.44959
2P1/2 4D5/2	269.0165	268.6190	9.60764	-1.18601	1.45441	-.028932	-9.44959
2P1/2 4F5/2	396.7116	396.4267	9.46444	-1.15358	1.45255	-.028892	-9.44959
2P1/2 5S1/2	356.7926	356.3944	9.61196	-1.17319	1.43762	-.028586	-9.44959
2P1/2 5P1/2	378.4810	378.0335	9.65549	-1.18064	1.45064	-.028843	-9.44959
2P1/2 5P3/2	382.9434	382.5395	9.61290	-1.18176	1.45116	-.028858	-9.44959
2P1/2 6S1/2	409.2635	408.8906	9.57512	-1.17149	1.44765	-.028788	-9.44959
2P3/2 3D5/2	-128.1366	-121.5335	2.81143	-1.19098	1.53726	-.031169	-9.72983
2P3/2 4S1/2	600.5161	607.5392	2.45447	-1.16575	1.44731	-.029319	-9.72983
2P3/2 4P1/2	668.0256	674.6427	2.85412	-1.23120	1.52062	-.030762	-9.72983
2P3/2 4P3/2	697.9999	704.9481	2.51207	-1.22396	1.52436	-.030865	-9.72983
2P3/2 4D3/2	807.5070	815.6639	2.23462	-1.15450	1.52366	-.030873	-9.72983
2P3/2 4D5/2	821.9109	829.2038	2.08357	-1.13932	1.52354	-.030870	-9.72983
2P3/2 4F5/2	949.0805	956.4532	1.98701	-1.12073	1.52166	-.030830	-9.72983
2P3/2 5S1/2	909.2674	916.5299	2.13179	-1.14022	1.50677	-.030525	-9.72983
2P3/2 5P1/2	936.6198	938.0280	2.18155	-1.14897	1.51979	-.030782	-9.72983
2P3/2 5P3/2	935.4790	942.7369	2.13069	-1.14622	1.52028	-.030796	-9.72983
2P3/2 6S1/2	961.7200	969.0063	2.09611	-1.13861	1.51678	-.030727	-9.72983
SAMARIUM 4F6 Z=62 A=152 R=1.21288E-04 A.U.							
2P1/2 3D5/2	-724.5769	-725.9287	11.20581	-1.36146	1.58596	-.032762	-10.04575
2P1/2 4S1/2	43.1166	42.4234	10.52441	-1.24782	1.46798	-.030669	-10.04575
2P1/2 4P1/2	113.2721	112.1821	10.90845	-1.30833	1.56789	-.032300	-10.04575
2P1/2 4P3/2	144.9565	144.1770	10.59833	-1.31288	1.57220	-.032424	-10.04575
2P1/2 4D3/2	258.9015	258.4126	10.20821	-1.21266	1.57154	-.032436	-10.04575
2P1/2 4D5/2	273.6461	273.2186	10.16784	-1.23355	1.57138	-.032432	-10.04575
2P1/2 4F5/2	406.3515	406.0408	10.01804	-1.19858	1.56940	-.032388	-10.04575
2P1/2 5S1/2	365.5306	365.1084	10.16515	-1.21853	1.55333	-.032046	-10.04575
2P1/2 5P1/2	387.7645	387.2909	10.21050	-1.22619	1.56741	-.032335	-10.04575
2P1/2 5P3/2	392.6714	392.2424	10.16667	-1.22756	1.56795	-.032351	-10.04575
2P1/2 6S1/2	419.3910	418.9964	10.12475	-1.21638	1.56427	-.032276	-10.04575
2P3/2 3D5/2	-127.1239	-120.0676	2.92756	-1.24092	1.66421	-.035042	-10.37210
2P3/2 4S1/2	637.8321	645.3538	2.52861	-1.21155	1.56626	-.032949	-10.37210
2P3/2 4P1/2	707.0557	714.1402	2.95717	-1.28116	1.64613	-.034580	-10.37210
2P3/2 4P3/2	740.1489	747.5906	2.58736	-1.27286	1.65042	-.034703	-10.37210
2P3/2 4D3/2	852.8854	860.5450	2.29735	-1.19987	1.64974	-.034714	-10.37210
2P3/2 4D5/2	868.6495	876.4577	2.13198	-1.18251	1.64958	-.034711	-10.37210
2P3/2 4F5/2	1000.8068	1008.6981	2.03035	-1.16247	1.64760	-.034666	-10.37210
2P3/2 5S1/2	960.0990	967.0797	2.17885	-1.18266	1.63154	-.034325	-10.37210
2P3/2 5P1/2	982.1943	989.9181	2.22904	-1.19171	1.64561	-.034613	-10.37210
2P3/2 5P3/2	987.2583	995.0750	2.17473	-1.19087	1.64617	-.034630	-10.37210
2P3/2 6S1/2	1013.9392	1021.7461	2.13791	-1.18066	1.64247	-.034554	-10.37210

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
EUROPIUM 4F7 Z=63 A=153 R=1.21288E-04 A.U.							
2P1/2 3D5/2	-767.5392	-769.0165	11.89909	-1.42317	1.71205	-.036648	-10.67399
2P1/2 4S1/2	37.7828	37.0409	11.14138	-1.29664	1.66042	-.034286	-10.67399
2P1/2 4F1/2	110.6324	109.4601	11.55034	-1.36028	1.69239	-.036125	-10.67399
2P1/2 4P3/2	144.1968	143.3575	11.21751	-1.36526	1.69731	-.036272	-10.67399
2P1/2 4D3/2	262.7024	262.1716	10.80311	-1.25865	1.69665	-.036287	-10.67399
2P1/2 4D5/2	276.8309	276.3645	10.76155	-1.28137	1.69650	-.036283	-10.67399
2P1/2 4F5/2	416.3515	416.0163	10.59367	-1.24271	1.69441	-.036235	-10.67399
2P1/2 4F7/2	419.4931	419.2313	10.52280	-1.24327	1.69441	-.036234	-10.67399
2P1/2 5S1/2	374.2242	373.7758	10.74496	-1.26360	1.67706	-.035852	-10.67399
2P1/2 5P1/2	397.2444	396.7420	10.79194	-1.27170	1.69227	-.036175	-10.67399
2P1/2 5P3/2	402.3018	401.8484	10.74350	-1.27287	1.69294	-.036195	-10.67399
2P1/2 6S1/2	429.6845	429.2676	10.69925	-1.26126	1.68900	-.036112	-10.67399
2P3/2 3D5/2	-125.3989	-117.6723	3.05737	-1.29337	1.66066	-.039326	-11.05190
2P3/2 4S1/2	677.1131	665.1648	2.59931	-1.25624	1.69410	-.036965	-11.05190
2P3/2 4P1/2	749.0066	756.5896	3.05622	-1.32970	1.78103	-.038804	-11.05190
2P3/2 4P3/2	784.0161	791.9821	2.65980	-1.32092	1.78594	-.038950	-11.05190
2P3/2 4D3/2	901.2778	909.4751	2.35164	-1.24334	1.78525	-.038964	-11.05190
2P3/2 4D5/2	916.4461	924.8022	2.17744	-1.22575	1.78508	-.038961	-11.05190
2P3/2 4F5/2	1055.4050	1063.8533	2.06244	-1.20290	1.76300	-.036912	-11.05190
2P3/2 4F7/2	1056.5670	1067.0873	1.99050	-1.20293	1.76292	-.036910	-11.05190
2P3/2 5S1/2	1013.3909	1021.7283	2.21124	-1.22385	1.76565	-.038930	-11.05190
2P3/2 5P1/2	1036.2697	1044.5474	2.26539	-1.23321	1.78086	-.038852	-11.05190
2P3/2 5P3/2	1041.5286	1049.8626	2.25760	-1.23227	1.78149	-.038872	-11.05190
2P3/2 6S1/2	1068.8271	1077.1944	2.16733	-1.22144	1.77755	-.038788	-11.05190

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
CERCIUM 4F7 5D1 Z=64 A=156 R=1.22595E-04 A.U.							
2P1/2 3E5/2	-621.4237	-623.0143	12.58912	-1.48106	1.84884	-.040425	-11.32335
2P1/2 4S1/2	22.7598	21.9669	11.75907	-1.34495	1.73037	-.038251	-11.32335
2P1/2 4F1/2	96.0173	96.7589	12.20429	-1.41254	1.82536	-.040337	-11.32335
2P1/2 4P3/2	134.6647	133.7705	11.64989	-1.41789	1.85101	-.040304	-11.32335
2P1/2 4D3/2	257.0963	256.5233	11.41076	-1.30419	1.83034	-.040523	-11.32335
2P1/2 4D5/2	272.4327	271.9303	11.36476	-1.32864	1.83017	-.040519	-11.32335
2P1/2 4F5/2	418.3091	417.9502	11.18087	-1.28619	1.82801	-.040466	-11.32335
2P1/2 4F7/2	421.9351	421.6592	11.09856	-1.28681	1.82799	-.040466	-11.32335
2P1/2 5S1/2	378.8246	378.3403	11.34949	-1.31005	1.80823	-.040014	-11.32335
2P1/2 5P1/2	402.5967	402.0500	11.40404	-1.31900	1.82538	-.040391	-11.32335
2P1/2 5P3/2	409.0888	408.5975	11.34908	-1.32018	1.82616	-.040416	-11.32335
2P1/2 5D3/2	435.9655	435.5241	11.28411	-1.30428	1.82532	-.040401	-11.32335
2P1/2 6S1/2	439.6030	439.1514	11.30065	-1.30723	1.82183	-.040321	-11.32335
2P3/2 3D5/2	-131.9638	-123.9182	3.14918	-1.33930	1.94693	-.044060	-11.75832
2P3/2 4S1/2	709.3423	717.9625	2.64700	-1.29798	1.83052	-.041368	-11.75832
2P3/2 4P1/2	783.6147	791.7287	3.13844	-1.37614	1.92547	-.043466	-11.75832
2P3/2 4P3/2	821.7577	830.2843	2.71093	-1.36665	1.93111	-.043640	-11.75832
2P3/2 4D3/2	942.8936	951.6634	2.38009	-1.28429	1.93041	-.043658	-11.75832
2P3/2 4D5/2	959.3097	968.2496	2.19713	-1.26527	1.93021	-.043653	-11.75832
2P3/2 4F5/2	1104.5937	1113.6359	2.07057	-1.23989	1.92805	-.043601	-11.75832
2P3/2 4F7/2	1108.2359	1117.3629	1.98683	-1.23993	1.92797	-.043599	-11.75832
2P3/2 5S1/2	1065.2325	1074.1530	2.23633	-1.26364	1.90827	-.043149	-11.75832
2P3/2 5P1/2	1086.8522	1097.7040	2.29885	-1.27427	1.92544	-.043326	-11.75832
2P3/2 5P3/2	1095.5621	1104.4772	2.23371	-1.27316	1.92621	-.043351	-11.75832
2P3/2 5D3/2	1122.2892	1131.2457	2.18026	-1.26027	1.92534	-.043335	-11.75832
2P3/2 6S1/2	1125.9770	1134.9280	2.19019	-1.26129	1.92186	-.043455	-11.75832

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
TERBIUM 4F9 Z=65 A=156 R=1.22595E-04 A.U.							
2P1/2 3D5/2	-655.9021	-657.6549	13.36913	-1.54848	1.99046	-.045607	-12.01272
2P1/2 4S1/2	20.6662	20.8059	12.44422	-1.39312	1.86464	-.042610	-12.01272
2P1/2 4P1/2	105.0741	103.7207	12.40703	-1.46332	1.96730	-.044939	-12.01272
2P1/2 4P3/2	147.7777	141.8064	12.52459	-1.46913	1.97372	-.045143	-12.01272
2P1/2 4D3/2	270.6608	270.0356	12.05895	-1.34895	1.97304	-.045166	-12.01272
2P1/2 4D5/2	283.4514	282.8953	12.01693	-1.37585	1.97286	-.045162	-12.01272
2P1/2 4F5/2	437.0425	436.6456	11.81412	-1.32998	1.97053	-.045104	-12.01272

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
TERBIUM 4F9 Z=65 A=156 R=1.22595E-04 A.U.							
2P1/2 4F7/2	439.7544	439.4308	11.74159	-1.33065	1.97052	-0.045102	-12.01272
2P1/2 5S1/2	391.6748	391.3636	11.97078	-1.35268	1.95040	-0.044628	-12.01272
2P1/2 5P1/2	416.4938	415.9234	12.02107	-1.36103	1.96809	-0.045030	-12.01272
2P1/2 5P3/2	421.8970	421.3518	11.95622	-1.36219	1.96892	-0.045057	-12.01272
2P1/2 6S1/2	450.3936	449.9212	11.91469	-1.34929	1.96450	-0.044957	-12.01272
2P3/2 3D5/2	-116.2966	-107.7534	3.31417	-1.40002	2.10336	-0.044270	-12.51142
2P3/2 4S1/2	763.3166	772.5149	2.72687	-1.34512	1.97761	-0.046291	-12.51142
2P3/2 4F1/2	840.7192	849.3813	3.24422	-1.42653	2.08021	-0.046602	-12.51142
2P3/2 4P3/2	879.9396	889.0401	2.79987	-1.41674	2.08361	-0.046507	-12.51142
2P3/2 4D3/2	1006.5080	1015.8677	2.44412	-1.32945	2.08591	-0.046829	-12.51142
2P3/2 4C5/2	1020.3859	1029.9192	2.25188	-1.31067	2.08570	-0.046824	-12.51142
2P3/2 4F5/2	1173.3714	1183.0223	2.10852	-1.28262	2.08339	-0.048766	-12.51142
2P3/2 4F7/2	1176.1050	1185.8302	2.03434	-1.28266	2.08333	-0.048764	-12.51142
2P3/2 5S1/2	1128.3276	1137.8663	2.26290	-1.30514	2.08325	-0.048289	-12.51142
2P3/2 5P1/2	1152.7995	1162.2726	2.32117	-1.31512	2.08092	-0.048691	-12.51142
2P3/2 5P3/2	1158.4090	1167.9461	2.25519	-1.31385	2.08174	-0.048718	-12.51142
2P3/2 6S1/2	1186.6188	1196.3957	2.20744	-1.30168	2.07733	-0.048618	-12.51142
DYSPROSIUM 4F10 Z=66 A=164 R=1.24127E-04 A.U.							
2P1/2 3D5/2	-901.2523	-903.1512	14.14853	-1.61195	2.14378	-0.050744	-12.73073
2P1/2 4S1/2	20.9178	19.9963	13.13301	-1.44063	2.00729	-0.047389	-12.73073
2P1/2 4P1/2	102.1916	100.7427	13.62527	-1.51430	2.11863	-0.049990	-12.73073
2P1/2 4P3/2	142.1717	141.1311	13.21624	-1.52060	2.12593	-0.050231	-12.73073
2P1/2 4D3/2	274.8728	274.1984	12.72330	-1.39319	2.12526	-0.050259	-12.73073
2P1/2 4D5/2	286.9491	286.3462	12.63111	-1.42231	2.12504	-0.050254	-12.73073
2P1/2 4F5/2	447.7924	447.3640	12.45920	-1.37250	2.12261	-0.050191	-12.73073
2P1/2 4F7/2	450.2719	449.9165	12.38707	-1.37329	2.12258	-0.050190	-12.73073
2P1/2 5S1/2	401.0047	400.4604	12.61990	-1.39615	2.10093	-0.049660	-12.73073
2P1/2 5P1/2	426.4434	425.8371	12.67189	-1.40474	2.11998	-0.050108	-12.73073
2P1/2 5P3/2	431.9756	431.4279	12.61358	-1.40587	2.12090	-0.050139	-12.73073
2P1/2 6S1/2	461.0128	460.5106	12.55903	-1.39234	2.11623	-0.050030	-12.73073
2P3/2 3D5/2	-108.6191	-99.5180	3.43636	-1.45350	2.27095	-0.055014	-13.29993
2P3/2 4S1/2	810.5232	820.3500	2.77879	-1.38850	2.13455	-0.051661	-13.29993
2P3/2 4P1/2	890.7667	900.0208	3.32833	-1.47402	2.24583	-0.054261	-13.29993
2P3/2 4P3/2	932.2992	942.0215	2.84270	-1.46367	2.25310	-0.054501	-13.29993
2P3/2 4D3/2	1063.6502	1073.6463	2.47722	-1.37126	2.25240	-0.054528	-13.29993
2P3/2 4D5/2	1076.8353	1087.0137	2.27562	-1.35191	2.25217	-0.054522	-13.29993
2P3/2 4F5/2	1237.0531	1247.3614	2.11736	-1.32107	2.24974	-0.054459	-13.29993
2P3/2 4F7/2	1239.5544	1249.9372	2.04298	-1.32110	2.24967	-0.054457	-13.29993
2P3/2 5S1/2	1190.3944	1200.5905	2.27396	-1.34426	2.22807	-0.053929	-13.29993
2P3/2 5P1/2	1215.6179	1225.7452	2.33445	-1.35455	2.24709	-0.054376	-13.29993
2P3/2 5P3/2	1221.4241	1231.6185	2.26520	-1.35327	2.24801	-0.054407	-13.29993
2P3/2 6S1/2	1250.3712	1260.6083	2.21424	-1.34047	2.24336	-0.054298	-13.29993
HOLMIUM 4F11 Z=67 A=165 R=1.24379E-04 A.U.							
2P1/2 3D5/2	-947.3974	-949.4570	14.95892	-1.67587	2.30756	-0.056369	-13.47466
2P1/2 4S1/2	15.0071	14.0132	13.84930	-1.48768	2.15960	-0.052612	-13.47466
2P1/2 4P1/2	99.2054	97.6493	14.37068	-1.56464	2.28024	-0.055519	-13.47466
2P1/2 4P3/2	141.6134	140.4933	13.93342	-1.57140	2.28854	-0.055802	-13.47466
2P1/2 4D3/2	279.2191	278.4858	13.41246	-1.43654	2.28767	-0.055836	-13.47466
2P1/2 4D5/2	290.5532	289.8434	13.37075	-1.46607	2.28763	-0.055830	-13.47466
2P1/2 4F5/2	458.7960	458.3259	13.12977	-1.41429	2.28507	-0.055761	-13.47466
2P1/2 4F7/2	461.0330	460.6357	13.05771	-1.41503	2.28504	-0.055760	-13.47466
2P1/2 5S1/2	410.3039	409.7164	13.29440	-1.43880	2.26172	-0.055172	-13.47466
2P1/2 5P1/2	436.5669	435.9145	13.34810	-1.44754	2.26221	-0.055668	-13.47466
2P1/2 5P3/2	442.3735	441.7835	13.26566	-1.44864	2.26324	-0.055706	-13.47466
2P1/2 6S1/2	471.8799	471.3386	13.22763	-1.43442	2.27835	-0.055586	-13.47466
2P3/2 3D5/2	-98.6970	-89.0108	3.55279	-1.50679	2.45066	-0.061336	-14.12148
2P3/2 4S1/2	860.6097	871.0453	2.82162	-1.43094	2.30260	-0.057581	-14.12148
2P3/2 4P1/2	943.7538	953.6284	3.40466	-1.52064	2.42338	-0.060467	-14.12148
2P3/2 4P3/2	987.7488	998.1236	2.88546	-1.50961	2.43164	-0.060769	-14.12148

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
HOLMIUM							
4F11	Z=67	A=165	R=1.24379E-04 A.U.				
2P3/2 4D3/2	1123.9692	1134.6323	2.50029	-1.41201	2.43094	-.060802	-14.12148
2P3/2 4D5/2	1136.4335	1147.2885	2.28894	-1.39199	2.43069	-.060796	-14.12148
2P3/2 4F5/2	1304.0286	1315.0256	2.11545	-1.35833	2.42812	-.060727	-14.12148
2P3/2 4F7/2	1306.2869	1317.3580	2.04142	-1.35835	2.42805	-.060725	-14.12148
2P3/2 5S1/2	1255.6705	1266.5543	2.27535	-1.38233	2.40482	-.060138	-14.12148
2P3/2 5P1/2	1281.7805	1292.5923	2.33791	-1.39289	2.42930	-.060534	-14.12148
2P3/2 5P3/2	1287.7992	1298.6819	2.26456	-1.39148	2.42633	-.060671	-14.12148
2P3/2 6S1/2	1317.2128	1328.1412	2.21032	-1.37805	2.42142	-.060552	-14.12148
ERBIUM							
4F12	Z=68	A=166	R=1.24630E-04 A.U.				
2P1/2 3D5/2	-594.5546	-996.7731	15.80080	-1.74003	2.48228	-.062522	-14.26200
2P1/2 4S1/2	8.7098	7.6502	14.59167	-1.53375	2.32200	-.058320	-14.26200
2P1/2 4P1/2	95.8940	94.2348	15.14436	-1.61417	2.45259	-.061564	-14.26200
2P1/2 4P3/2	140.6900	139.6959	14.67737	-1.62143	2.46201	-.061896	-14.26200
2P1/2 4D3/2	283.4872	282.7013	14.12725	-1.47880	2.46134	-.061436	-14.26200
2P1/2 4D5/2	294.0564	293.3455	14.08666	-1.51293	2.46107	-.061929	-14.26200
2P1/2 4F5/2	469.8421	469.3375	13.82487	-1.54884	2.45838	-.061855	-14.26200
2P1/2 4F7/2	471.8245	471.3916	13.75409	-1.45566	2.45834	-.061853	-14.26200
2P1/2 5S1/2	419.6540	419.0305	13.99364	-1.48030	2.43332	-.061201	-14.26200
2P1/2 5P1/2	446.7584	446.0658	14.04922	-1.48923	2.45534	-.061751	-14.26200
2P1/2 5P3/2	452.7887	452.1629	13.98344	-1.49034	2.45652	-.061794	-14.26200
2P1/2 6S1/2	482.8874	482.3134	13.92174	-1.47539	2.45130	-.061664	-14.26200
2P3/2 3D5/2	-86.6042	-76.2870	3.66279	-1.55985	2.64315	-.068289	-14.99498
2P3/2 4S1/2	913.4914	924.6867	2.85280	-1.47204	2.46298	-.064090	-14.99498
2P3/2 4P1/2	999.5965	1010.1405	3.47078	-1.56601	2.61350	-.067333	-14.99498
2P3/2 4P3/2	1046.2155	1057.2922	2.91756	-1.55448	2.62288	-.067663	-14.99498
2P3/2 4D3/2	1187.3912	1198.7723	2.51068	-1.45127	2.62218	-.067702	-14.99498
2P3/2 4D5/2	1195.1118	1210.6927	2.29065	-1.43082	2.62190	-.067695	-14.99498
2P3/2 4F5/2	1374.2277	1385.9648	2.10036	-1.39401	2.61918	-.067619	-14.99498
2P3/2 4F7/2	1376.2327	1386.0429	2.02734	-1.39402	2.61910	-.067617	-14.99498
2P3/2 5S1/2	1324.1799	1335.8016	2.25513	-1.41901	2.59414	-.066967	-14.99498
2P3/2 5P1/2	1351.1284	1362.6746	2.32495	-1.42985	2.61616	-.067517	-14.99498
2P3/2 5P3/2	1357.3734	1368.9947	2.25219	-1.42830	2.61732	-.067559	-14.99498
2P3/2 6S1/2	1387.3754	1399.0450	2.19486	-1.41422	2.61212	-.067429	-14.99498
THULIUM							
4F13	Z=69	A=169	R=1.25376E-04 A.U.				
2P1/2 3D5/2	-1042.4719	-1044.8589	16.67465	-1.80425	2.66851	-.069244	-15.08265
2P1/2 4S1/2	2.2739	1.1435	15.36133	-1.57876	2.49500	-.064552	-15.08265
2P1/2 4P1/2	92.5050	90.7356	15.94665	-1.66268	2.63623	-.068165	-15.08265
2P1/2 4P3/2	140.2592	138.9857	15.44819	-1.67042	2.64691	-.068553	-15.08265
2P1/2 4D3/2	287.9351	287.0919	14.86799	-1.51976	2.64626	-.068601	-15.08265
2P1/2 4D5/2	297.7199	296.9535	14.82824	-1.55657	2.64599	-.068594	-15.08265
2P1/2 4F5/2	481.1931	480.6499	14.54523	-1.49403	2.64313	-.068512	-15.08265
2P1/2 4F7/2	482.9120	482.4386	14.47635	-1.49490	2.64308	-.068510	-15.08265
2P1/2 5S1/2	429.0420	428.3780	14.71865	-1.52040	2.61620	-.067788	-15.08265
2P1/2 5P1/2	457.0025	456.2670	14.77618	-1.52953	2.63987	-.068397	-15.08265
2P1/2 5P3/2	463.2736	462.6075	14.70663	-1.53064	2.64118	-.068446	-15.08265
2P1/2 6S1/2	493.9608	493.3497	14.64131	-1.51496	2.63568	-.068305	-15.08265
2P3/2 3D5/2	-71.9385	-60.9543	3.76553	-1.61244	2.84914	-.075928	-15.91046
2P3/2 4S1/2	969.5657	981.5102	2.87330	-1.51185	2.67577	-.071239	-15.91046
2P3/2 4P1/2	1058.6919	1069.9428	3.52764	-1.61015	2.81694	-.074851	-15.91046
2P3/2 4P3/2	1108.1051	1119.9232	2.93797	-1.59798	2.82756	-.075237	-15.91046
2P3/2 4D3/2	1254.3241	1266.4627	2.50936	-1.48407	2.82686	-.075283	-15.91046
2P3/2 4D5/2	1265.2776	1277.6250	2.27990	-1.46811	2.82656	-.075275	-15.91046
2P3/2 4F5/2	1448.0617	1460.5793	2.07243	-1.42808	2.82369	-.075193	-15.91046
2P3/2 4F7/2	1449.8046	1462.3936	2.00110	-1.42808	2.82360	-.075190	-15.91046
2P3/2 5S1/2	1396.0564	1408.4564	2.24183	-1.45395	2.75079	-.074409	-15.91046
2P3/2 5P1/2	1423.8507	1436.1798	2.30912	-1.46511	2.82344	-.075078	-15.91046
2P3/2 5P3/2	1430.3462	1442.7406	2.22681	-1.46341	2.82176	-.075128	-15.91046
2P3/2 6S1/2	1460.9359	1473.3669	2.16695	-1.44869	2.81620	-.074985	-15.91046

FINAL STATE	E (TOT)	E (DHFS)	E (MAG)	E (RET)	E (V-P)	E (H-VP)	E (SELF)
YTTERBIUM							
	4F14	Z=70 A=174	R=1.26600E-04	A.U.			
2P1/2 4S1/2	-4.4771	-5.6824	16.16166	-1.62278	2.67914	-.071346	-15.94138
2P1/2 4P1/2	88.8613	86.9765	10.77989	-1.71014	2.83161	-.075365	-15.94138
2P1/2 4P3/2	139.5548	138.1974	16.24928	-1.71847	2.84382	-.075815	-15.94138
2P1/2 4D3/2	292.3980	291.4936	15.63791	-1.55947	2.84318	-.075872	-15.94138
2P1/2 4D5/2	301.3772	300.5513	15.59934	-1.59909	2.84290	-.075865	-15.94138
2P1/2 4F5/2	492.6876	492.1024	15.29440	-1.53193	2.83987	-.075775	-15.94138
2P1/2 4F7/2	494.1356	493.6179	15.22784	-1.53282	2.83982	-.075773	-15.94138
2P1/2 5S1/2	438.5876	437.8795	15.47272	-1.55924	2.81058	-.074974	-15.94138
2P1/2 5P1/2	467.4199	466.6366	15.53226	-1.56854	2.83639	-.075647	-15.94138
2P1/2 5P3/2	473.9456	473.2355	15.45902	-1.56969	2.83786	-.075704	-15.94138
2P1/2 6S1/2	505.0333	504.3907	15.39081	-1.55329	2.83200	-.075549	-15.94138
2P3/2 3D5/2	-54.7090	-43.0174	3.86154	-1.66469	3.06945	-.084310	-16.87362
2P3/2 4S1/2	1028.8053	1041.5435	2.88293	-1.55036	2.86191	-.079082	-16.87362
2P3/2 4P1/2	1121.0132	1133.0134	3.57511	-1.65306	3.03446	-.083098	-16.87362
2P3/2 4P3/2	1173.4016	1180.0054	2.94708	-1.64021	3.04648	-.083548	-16.87362
2P3/2 4D3/2	1324.7516	1337.6924	2.49603	-1.52541	3.04578	-.083603	-16.87362
2P3/2 4D5/2	1334.9180	1348.0767	2.25706	-1.50396	3.04545	-.083594	-16.87362
2P3/2 4F5/2	1525.5182	1538.8619	2.03157	-1.46054	3.04242	-.083504	-16.87362
2P3/2 4F7/2	1526.9502	1540.4029	1.96266	-1.46052	3.04232	-.083501	-16.87362
2P3/2 5S1/2	1471.5692	1484.7929	2.20651	-1.48742	3.01355	-.082704	-16.87362
2P3/2 5P1/2	1500.2395	1513.3798	2.27661	-1.49883	3.03889	-.083375	-16.87362
2P3/2 5P3/2	1506.9650	1520.2090	2.18467	-1.49697	3.04036	-.083432	-16.87362
2P3/2 6S1/2	1537.9723	1551.2500	2.12621	-1.48152	3.03451	-.083277	-16.87362
LUTETIUM							
	5D1	Z=71 A=175	R=1.26843E-04	A.U.			
2P1/2 4S1/2	-21.5335	-22.8250	16.97962	-1.66481	2.87530	-.078746	-16.81986
2P1/2 4P1/2	74.6381	72.6195	17.63741	-1.75633	3.04062	-.083219	-16.81986
2P1/2 4P3/2	129.5187	124.0640	17.06909	-1.76504	3.05428	-.083746	-16.81986
2P1/2 4D3/2	286.8881	285.9086	16.42677	-1.59720	3.05364	-.083813	-16.81986
2P1/2 4D5/2	296.8224	295.9267	16.38543	-1.63932	3.05327	-.083802	-16.81986
2P1/2 4F5/2	495.3919	494.7524	16.06034	-1.56739	3.05011	-.083706	-16.81986
2P1/2 4F7/2	497.1575	496.6327	15.98667	-1.56840	3.05006	-.083704	-16.81986
2P1/2 5S1/2	443.4949	442.7190	16.25920	-1.59809	3.01746	-.082773	-16.81986
2P1/2 5P1/2	473.1664	472.3047	16.32784	-1.60854	3.04581	-.083546	-16.81986
2P1/2 5P3/2	481.4683	480.6886	16.24513	-1.60958	3.04762	-.083617	-16.81986
2P1/2 5D3/2	514.2562	513.5490	16.15239	-1.58807	3.04031	-.083589	-16.81986
2P1/2 6S1/2	516.0043	515.2858	16.17230	-1.59163	3.04117	-.083442	-16.81986
2P3/2 3D5/2	-45.0697	-32.6415	3.91211	-1.70780	3.30590	-.093517	-17.86491
2P3/2 4S1/2	1081.3442	1094.9189	2.85864	-1.58323	3.10249	-.082678	-17.86491
2P3/2 4P1/2	1176.3574	1189.1430	3.59491	-1.69112	3.26772	-.092150	-17.86491
2P3/2 4P3/2	1232.9752	1246.4053	2.92352	-1.67733	3.28132	-.092675	-17.86491
2P3/2 4D3/2	1388.8063	1402.5883	2.45152	-1.55653	3.28063	-.092739	-17.86491
2P3/2 4D5/2	1399.9589	1413.9735	2.19637	-1.53360	3.28026	-.092728	-17.86491
2P3/2 4F5/2	1597.7642	1611.9954	1.95622	-1.48696	3.27706	-.092630	-17.86491
2P3/2 4F7/2	1599.6145	1613.9024	1.87964	-1.48691	3.27695	-.092627	-17.86491
2P3/2 5S1/2	1546.0571	1560.1364	2.14985	-1.51708	3.24450	-.091701	-17.86491
2P3/2 5P1/2	1575.5559	1589.5403	2.23005	-1.52994	3.27283	-.092472	-17.86491
2P3/2 5P3/2	1584.0942	1598.1713	2.13358	-1.52784	3.27458	-.092542	-17.86491
2P3/2 5D3/2	1616.7173	1630.8567	2.05481	-1.51001	3.27326	-.092514	-17.86491
2P3/2 6S1/2	1618.5137	1632.6474	2.06673	-1.51126	3.26815	-.092367	-17.86491
HAFNIUM							
	5D2	Z=72 A=180	R=1.28039E-04	A.U.			
2P1/2 4S1/2	-39.5824	-40.9660	17.83494	-1.70647	3.08370	-.086791	-17.74179
2P1/2 4P1/2	59.4680	57.3071	18.53407	-1.80226	3.26266	-.091767	-17.74179
2P1/2 4P3/2	118.8405	117.2815	17.92644	-1.81142	3.27811	-.092380	-17.74179
2P1/2 4D3/2	280.7825	279.7218	17.25175	-1.63428	3.27749	-.092458	-17.74179
2P1/2 4D5/2	291.7660	290.7956	17.20648	-1.67895	3.27709	-.092447	-17.74179
2P1/2 4F5/2	497.8236	497.1262	16.89959	-1.60187	3.27376	-.092342	-17.74179
2P1/2 4F7/2	500.0008	499.3656	16.77873	-1.60307	3.27371	-.092340	-17.74179
2P1/2 5S1/2	448.6071	447.7614	17.07750	-1.63589	3.23713	-.091265	-17.74179
2P1/2 5P1/2	479.0545	478.1112	17.15605	-1.64758	3.26872	-.092149	-17.74179

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
HAFNIUM 5D2 Z=72 A=180 R=1.28039E-04 A.U.							
2P1/2 5P3/2	489.3293	488.4766	17.06459	-1.64863	3.27060	-.092234	-17.74179
2P1/2 5D3/2	524.4847	523.7099	16.96425	-1.62495	3.26946	-.092206	-17.74179
2P1/2 6S1/2	527.1829	526.3964	16.98542	-1.62879	3.26371	-.092036	-17.74179
2P3/2 3D5/2	-33.4166	-20.1657	3.95462	-1.74960	3.55659	-.103606	-18.91086
2P3/2 4S1/2	1136.6935	1151.1541	2.82374	-1.61443	3.33806	-.097090	-18.91086
2P3/2 4P1/2	1234.5563	1248.1736	3.60641	-1.72766	3.51691	-.102063	-18.91086
2P3/2 4P3/2	1295.7097	1310.0148	2.88901	-1.71289	3.53230	-.102674	-18.91086
2P3/2 4D3/2	1456.0669	1470.7394	2.39537	-1.58582	3.52161	-.102749	-18.91086
2P3/2 4D5/2	1466.2966	1483.2193	2.12298	-1.56132	3.53120	-.102737	-18.91086
2P3/2 4F5/2	1673.5797	1688.7099	1.66666	-1.51121	3.52766	-.102632	-18.91086
2P3/2 4F7/2	1675.7826	1690.9975	1.78200	-1.51112	3.52774	-.102628	-18.91086
2P3/2 5S1/2	1624.5496	1639.5363	2.07905	-1.54457	3.49125	-.101555	-18.91086
2P3/2 5P1/2	1654.8128	1669.6919	2.17033	-1.55895	3.52262	-.102439	-18.91086
2P3/2 5P3/2	1665.3344	1680.3162	2.06326	-1.55656	3.52489	-.102323	-18.91086
2P3/2 5D3/2	1700.3118	1715.3596	1.97928	-1.53722	3.52354	-.102495	-18.91086
2P3/2 6S1/2	1703.0601	1718.1019	1.99220	-1.53861	3.51779	-.102325	-18.91086
TANTALUM 5D3 Z=73 A=181 R=1.26276E-04 A.U.							
2P1/2 4S1/2	-58.5078	-59.9791	18.72706	-1.74735	3.30575	-.095540	-18.71856
2P1/2 4P1/2	43.4712	41.1689	19.47010	-1.84760	3.49941	-.101067	-18.71856
2P1/2 4P3/2	107.7780	106.1187	18.81990	-1.85715	3.51669	-.101780	-18.71856
2P1/2 4D3/2	274.3322	273.1950	16.11164	-1.67031	3.51630	-.101872	-18.71856
2P1/2 4D5/2	286.4588	285.4182	18.06293	-1.71773	3.51583	-.101858	-18.71856
2P1/2 4F5/2	499.8769	499.1263	17.69401	-1.63544	3.51237	-.101746	-18.71856
2P1/2 4F7/2	502.4391	501.7790	17.60472	-1.63664	3.51230	-.101743	-18.71856
2P1/2 5S1/2	453.7568	452.8467	17.93056	-1.67266	3.47130	-.100503	-18.71856
2P1/2 5P1/2	484.9139	483.8937	18.01949	-1.68562	3.50645	-.101512	-18.71856
2P1/2 5P3/2	497.3345	496.4150	17.91726	-1.68654	3.50893	-.101616	-18.71856
2P1/2 5D3/2	534.9825	534.1470	17.80860	-1.66049	3.50756	-.101588	-18.71856
2P1/2 6S1/2	538.6718	537.8238	17.83146	-1.66465	3.50112	-.101392	-18.71856
2P3/2 3D5/2	-19.3787	-5.2645	3.98488	-1.78917	3.82924	-.114656	-20.02454
2P3/2 4S1/2	1195.2731	1210.6834	2.77468	-1.64324	3.59023	-.107393	-20.02454
2P3/2 4P1/2	1296.0326	1310.5421	3.60616	-1.76198	3.78375	-.112917	-20.02454
2P3/2 4P3/2	1362.0387	1377.2821	2.83974	-1.74613	3.80115	-.113626	-20.02454
2P3/2 4D3/2	1526.9605	1542.5670	2.32365	-1.61255	3.80048	-.113715	-20.02454
2P3/2 4D5/2	1540.3635	1556.2550	2.03310	-1.58636	3.80002	-.113702	-20.02454
2P3/2 4F5/2	1752.9669	1769.0826	1.76061	-1.53273	3.79651	-.113588	-20.02454
2P3/2 4F7/2	1755.5617	1771.7686	1.66740	-1.53258	3.79637	-.113583	-20.02454
2P3/2 5S1/2	1707.0557	1723.0140	1.99269	-1.56966	3.75555	-.112348	-20.02454
2P3/2 5P1/2	1738.0170	1753.8540	2.09590	-1.58665	3.79067	-.113357	-20.02454
2P3/2 5P3/2	1750.7020	1766.6526	1.97718	-1.58288	3.79312	-.113460	-20.02454
2P3/2 5D3/2	1788.1555	1804.1763	1.68729	-1.56190	3.79174	-.113432	-20.02454
2P3/2 6S1/2	1791.8997	1807.9153	1.90006	-1.56324	3.78533	-.113237	-20.02454
TUNGSTEN 5D4 Z=74 A=184 R=1.28981E-04 A.U.							
2P1/2 4S1/2	-78.2233	-79.8148	19.65781	-1.78743	3.54180	-.105039	-19.71567
2P1/2 4P1/2	26.7256	24.2472	20.44601	-1.89207	3.75125	-.111172	-19.71567
2P1/2 4P3/2	96.0465	94.2544	19.75080	-1.90200	3.77099	-.112000	-19.71567
2P1/2 4D3/2	267.2464	266.0010	19.00783	-1.70506	3.77044	-.112107	-19.71567
2P1/2 4D5/2	280.6089	279.4669	18.95520	-1.75536	3.76991	-.112090	-19.71567
2P1/2 4F5/2	501.3691	500.5350	18.56297	-1.66756	3.76631	-.111971	-19.71567
2P1/2 4F7/2	504.3383	503.6034	18.46516	-1.66883	3.76619	-.111967	-19.71567
2P1/2 5S1/2	458.7211	457.7170	18.61787	-1.70795	3.72039	-.110542	-19.71567
2P1/2 5P1/2	490.5194	489.3913	18.91841	-1.72239	3.75945	-.111643	-19.71567
2P1/2 5P3/2	505.2659	504.2489	18.80538	-1.72323	3.76236	-.111818	-19.71567
2P1/2 5D3/2	545.4137	544.4679	18.68680	-1.69450	3.76096	-.111791	-19.71567
2P1/2 6S1/2	550.2633	549.3250	18.71003	-1.69666	3.75367	-.111569	-19.71567
2P3/2 3D5/2	-2.7012	12.3004	4.00323	-1.82682	4.11867	-.126750	-21.16989
2P3/2 4S1/2	1256.9588	1273.3469	2.71026	-1.66959	3.85975	-.118663	-21.16989
2P3/2 4P1/2	1360.6572	1376.0838	3.59302	-1.79398	4.06903	-.124792	-21.16989
2P3/2 4P3/2	1431.8507	1448.0599	2.77463	-1.77699	4.08869	-.125617	-21.16989

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
TUNGSTEN							
	5D4	Z=74 A=184	R=1.26981E-04	A.U.			
2P3/2 4D3/2	1601.3691	1617.9775	2.23585	-1.63665	4.08804	-.125719	-21.16989
2P3/2 4D5/2	1616.0370	1632.9281	1.92561	-1.60865	4.08753	-.125704	-21.16989
2F3/2 4F5/2	1835.9526	1853.0794	1.63616	-1.55134	4.08365	-.125581	-21.16989
2P3/2 4F7/2	1838.9549	1856.1839	1.53394	-1.55113	4.08370	-.125576	-21.16989
2P3/2 5S1/2	1793.5293	1810.4900	1.88692	-1.59159	4.03805	-.124156	-21.16989
2P3/2 5P1/2	1825.1191	1841.9438	2.00268	-1.60928	4.07706	-.125306	-21.16989
2P3/2 5P3/2	1840.1492	1857.0995	1.87109	-1.60604	4.07995	-.125430	-21.16989
2F3/2 5D3/2	1800.0828	1897.1082	1.77459	-1.58326	4.07854	-.125402	-21.16989
2F3/2 6S1/2	1884.9879	1902.0080	1.78636	-1.58480	4.07147	-.125161	-21.16989
RHENIUM							
	5D5	Z=75 A=187	R=1.29678E-04	A.U.			
2P1/2 4S1/2	-98.8121	-100.5077	20.61288	-1.82061	3.79300	-.115353	-20.77409
2P1/2 4P1/2	9.2725	0.6301	21.44923	-1.92992	4.01932	-.122146	-20.77409
2P1/2 4P3/2	83.9078	81.9966	20.70717	-1.94040	4.04161	-.123106	-20.77409
2P1/2 4D3/2	260.0671	256.7290	19.92710	-1.73279	4.04109	-.123229	-20.77409
2P1/2 4D5/2	274.3761	273.1479	19.87121	-1.78619	4.04051	-.123211	-20.77409
2P1/2 4F5/2	502.7681	501.8673	19.45387	-1.69263	4.03674	-.123082	-20.77409
2P1/2 4F7/2	505.9324	505.1392	19.34775	-1.69398	4.03660	-.123077	-20.77409
2P1/2 5S1/2	463.7547	462.7130	19.72837	-1.73669	3.98555	-.121445	-20.77409
2P1/2 5P1/2	497.4147	496.1958	19.83902	-1.75213	4.02865	-.122753	-20.77409
2P1/2 5P3/2	512.8140	511.7171	19.71465	-1.75324	4.03227	-.122904	-20.77409
2P1/2 5D3/2	556.3031	555.3057	19.58528	-1.72179	4.03084	-.122877	-20.77409
2P1/2 5D5/2	557.8118	556.8242	19.59072	-1.72665	4.03070	-.122873	-20.77409
2F1/2 6S1/2	562.1486	561.1389	19.61034	-1.72691	4.02301	-.122626	-20.77409
2P3/2 3D3/2	-56.7882	-42.3100	5.64425	-2.02140	4.03083	-.140060	-22.39184
2P3/2 3D5/2	16.5480	32.4938	4.02246	-1.86460	4.42840	-.134983	-22.39184
2P3/2 4S1/2	1322.1161	1339.5450	2.64157	-1.69557	4.14798	-.130987	-22.39184
2P3/2 4P1/2	1428.9212	1445.3248	3.57754	-1.82565	4.37418	-.137777	-22.39184
2P3/2 4P3/2	1525.4739	1522.7107	2.70499	-1.80759	4.39636	-.138734	-22.39184
2P3/2 4L3/2	1679.9019	1697.5556	2.14127	-1.66007	4.39575	-.138853	-22.39184
2P3/2 4D5/2	1655.5457	1713.4995	1.81203	-1.63035	4.39518	-.138835	-22.39184
2P3/2 4F5/2	1923.0564	1941.2612	1.50358	-1.56912	4.39133	-.138702	-22.39184
2P3/2 4F7/2	1926.2560	1944.5715	1.39270	-1.56885	4.39116	-.138696	-22.39184
2P3/2 5S1/2	1884.3275	1902.3559	1.77308	-1.61282	4.34023	-.137069	-22.39184
2P3/2 5P1/2	1917.7325	1935.6101	1.90109	-1.63148	4.38351	-.138376	-22.39184
2P3/2 5P3/2	1933.4308	1951.4463	1.75659	-1.62860	4.38691	-.138526	-22.39184
2P3/2 5D3/2	1976.6950	1994.7925	1.65108	-1.60367	4.38547	-.138499	-22.39184
2P3/2 5D5/2	1978.3143	1996.4383	1.62250	-1.60146	4.38532	-.138494	-22.39184
2P3/2 6S1/2	1982.6034	2000.6973	1.66362	-1.60513	4.37766	-.138248	-22.39184
OSMIUM							
	5D6	Z=76 A=190	R=1.30368E-04	A.U.			
2P1/2 4P1/2	-8.9126	-11.7503	22.49090	-1.96516	4.30457	-.134052	-21.85855
2P1/2 4P3/2	71.3767	69.3174	21.69953	-1.97626	4.32971	-.135164	-21.85855
2P1/2 4D3/2	252.5585	251.0999	20.88072	-1.75750	4.32924	-.135306	-21.85855
2F1/2 4D5/2	267.6593	266.5170	20.82171	-1.81419	4.32859	-.135286	-21.85855
2P1/2 4F5/2	503.8943	502.9000	20.37797	-1.71461	4.32466	-.135147	-21.85855
2P1/2 4F7/2	507.2705	506.3924	20.26341	-1.71607	4.32449	-.135141	-21.85855
2P1/2 5S1/2	469.1273	467.9426	20.67103	-1.76219	4.26771	-.133277	-21.85855
2F1/2 5P1/2	504.6279	503.2911	20.79332	-1.77687	4.31565	-.134761	-21.85855
2P1/2 5P3/2	520.6975	519.4939	20.65776	-1.78035	4.31964	-.134941	-21.85855
2P1/2 5D3/2	567.6059	566.5111	20.51605	-1.74596	4.31821	-.134917	-21.85855
2P1/2 5D5/2	569.2033	568.1194	20.51099	-1.75166	4.31806	-.134912	-21.85855
2P1/2 6S1/2	574.4625	573.3757	20.54212	-1.75171	4.30956	-.134632	-21.85855
2P3/2 3D3/2	-30.0516	-23.6735	5.73253	-2.06517	4.76243	-.154537	-23.65340
2P3/2 3D5/2	38.8354	55.7556	4.02849	-1.90065	4.75978	-.154451	-23.65340
2P3/2 4S1/2	1391.0057	1409.5096	2.55682	-1.71903	4.45618	-.144452	-23.65340
2P3/2 4P1/2	1500.9756	1518.3869	3.54844	-1.85496	4.70055	-.151968	-23.65340
2F3/2 4P3/2	1583.2284	1601.5260	2.61847	-1.85576	4.72557	-.153075	-23.65340
2P3/2 4D3/2	1762.6283	1781.3617	2.02901	-1.66077	4.72500	-.153213	-23.65340
2P3/2 4D5/2	1779.2424	1798.3439	1.87497	-1.64926	4.72437	-.153192	-23.65340
2P3/2 4F5/2	2014.4095	2033.7278	1.35177	-1.58396	4.72033	-.153050	-23.65340

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
GSMIUM							
	506	Z=76 A=190	R=1.30368E-04 A.U.				
2P3/2 4F7/2	2017.8258	2037.2638	1.23192	-1.58365	4.72014	-.153043	-23.65340
2P3/2 5S1/2	1979.9159	1999.0488	1.63932	-1.63110	4.66349	-.151164	-23.65340
2P3/2 5P1/2	2015.1666	2034.1528	1.78019	-1.65175	4.71140	-.152667	-23.65340
2P3/2 5P3/2	2031.5720	2050.6892	1.62186	-1.64823	4.71538	-.152847	-23.65340
2F3/2 5D3/2	2078.2401	2097.4465	1.50690	-1.62102	4.71392	-.152821	-23.65340
2P3/2 5D5/2	2079.9616	2099.1977	1.47484	-1.61850	4.71376	-.152816	-23.65340
2P3/2 6S1/2	2085.1906	2104.3958	1.51775	-1.62233	4.70531	-.152536	-23.65340
IRIDIUM							
	509	Z=77 A=193	R=1.31050E-04 A.U.				
2P1/2 4P1/2	-19.9160	-22.9290	23.57107	-1.99469	4.60427	-.146832	-23.02079
2P1/2 4P3/2	66.2434	64.0579	22.72839	-2.00654	4.63258	-.148117	-23.02079
2P1/2 4D3/2	252.6612	251.1056	21.86865	-1.77620	4.63219	-.148281	-23.02079
2P1/2 4D5/2	266.6531	267.2193	21.80792	-1.83651	4.63146	-.148256	-23.02079
2P1/2 4F5/2	512.5984	511.5346	21.33581	-1.73063	4.62735	-.148109	-23.02079
2P1/2 4F7/2	516.0170	515.0775	21.21349	-1.73225	4.62716	-.148103	-23.02079
2P1/2 5S1/2	481.6785	480.4162	21.64617	-1.78185	4.56476	-.146000	-23.02079
2P1/2 5P1/2	519.3730	517.9464	21.77712	-1.79940	4.61733	-.147666	-23.02079
2P1/2 5P3/2	534.1413	532.6586	21.63060	-1.80123	4.62157	-.147681	-23.02079
2P1/2 5D3/2	584.7673	583.6003	21.47982	-1.76502	4.62062	-.147868	-23.02079
2P1/2 5D5/2	585.8993	584.7425	21.47554	-1.77080	4.62070	-.147864	-23.02079
2P3/2 3D3/2	-10.3684	5.9795	5.83226	-2.11171	5.11341	-.170229	-25.01162
2P3/2 3D5/2	72.1082	90.0711	4.64791	-1.93961	5.11051	-.170132	-25.01162
2P3/2 4S1/2	1471.6715	1491.3260	2.47876	-1.74462	4.78197	-.159032	-25.01162
2P3/2 4P1/2	1584.8361	1603.3299	3.52786	-1.88651	5.04581	-.167339	-25.01162
2P3/2 4P3/2	1673.0096	1692.4442	2.53790	-1.86621	5.07399	-.168619	-25.01162
2P3/2 4D3/2	1857.5923	1877.4815	1.92126	-1.70349	5.07348	-.168778	-25.01162
2P3/2 4D5/2	1874.9760	1895.2006	1.59333	-1.67034	5.07278	-.168754	-25.01162
2P3/2 4F5/2	2117.9661	2138.4753	1.20313	-1.60071	5.06856	-.168602	-25.01162
2P3/2 4F7/2	2121.4252	2142.0624	1.07505	-1.60038	5.06835	-.168594	-25.01162
2P3/2 5S1/2	2087.3486	2107.6654	1.50631	-1.65108	5.06609	-.166498	-25.01162
2P3/2 5P1/2	2124.8078	2144.9451	1.65658	-1.67274	5.05862	-.168163	-25.01162
2P3/2 5P3/2	2139.9024	2160.2024	1.48600	-1.66921	5.06324	-.168376	-25.01162
2P3/2 5D3/2	2190.2909	2210.6876	1.36094	-1.63992	5.06208	-.168363	-25.01162
2P3/2 5D5/2	2191.5420	2211.9682	1.32920	-1.63732	5.06194	-.168356	-25.01162
PLATINUM							
	509 6S1	Z=78 A=195	R=1.31501E-04 A.U.				
2P1/2 4P1/2	-43.5601	-46.8131	24.69198	-2.02489	4.92915	-.160880	-24.18237
2P1/2 4P3/2	49.0509	46.6784	23.79357	-2.03735	4.96103	-.162363	-24.18237
2P1/2 4D3/2	240.5302	238.8170	22.89237	-1.79493	4.96071	-.162552	-24.18237
2P1/2 4D5/2	257.7780	256.1939	22.82790	-1.85879	4.95991	-.162525	-24.18237
2P1/2 4F5/2	509.2766	508.0865	22.32764	-1.74643	4.95561	-.162366	-24.18237
2P1/2 4F7/2	513.0497	511.9913	22.19589	-1.74815	4.95540	-.162358	-24.18237
2P1/2 5S1/2	483.2957	481.8957	22.65785	-1.80142	4.88593	-.159959	-24.18237
2P1/2 5P1/2	522.7189	521.1367	22.80252	-1.82023	4.94411	-.161845	-24.18237
2P1/2 5P3/2	535.1454	537.7204	22.64242	-1.82251	4.94951	-.162100	-24.18237
2P1/2 5D3/2	593.2603	591.9822	22.47680	-1.78244	4.94820	-.162085	-24.18237
2P1/2 5D5/2	594.8809	593.5943	22.47235	-1.78931	4.94804	-.162080	-24.18237
2P1/2 6S1/2	599.8631	598.5554	22.50187	-1.78932	4.93926	-.161776	-24.18237
2P3/2 3P3/2	-423.3583	-407.4412	7.95261	-2.79077	5.48989	-.186567	-26.38249
2P3/2 3D3/2	9.7475	27.0877	5.88326	-2.14846	5.49504	-.167572	-26.38249
2P3/2 3D5/2	97.2639	116.3205	4.00916	-1.96771	5.49166	-.187464	-26.38249
2P3/2 4S1/2	1544.6966	1565.5335	2.34413	-1.75979	5.13642	-.175150	-26.38249
2P3/2 4P1/2	1661.1521	1680.7512	3.45416	-1.90759	5.42117	-.184324	-26.38249
2P3/2 4P3/2	1755.6225	1776.4240	2.34993	-1.88603	5.45290	-.165601	-26.38249
2P3/2 4D3/2	1945.4142	1966.4896	1.75584	-1.71522	5.45245	-.185983	-26.38249
2P3/2 4D5/2	1964.0810	1985.5121	1.36574	-1.68005	5.45167	-.185957	-26.38249
2P3/2 4F5/2	2214.5877	2236.3200	.99481	-1.60608	5.44725	-.185793	-26.38249
2P3/2 4F7/2	2218.3991	2240.2693	.85673	-1.60569	5.44701	-.185784	-26.38249
2P3/2 5S1/2	2188.9308	2210.4617	1.31744	-1.66018	5.37772	-.183391	-26.38249
2P3/2 5P1/2	2228.1032	2249.4352	1.49352	-1.68357	5.43586	-.165277	-26.38249
2P3/2 5P3/2	2244.8760	2266.3865	1.29606	-1.67987	5.44125	-.165531	-26.38249

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
PLATINUM							
	5D9 6S1	Z=78 A=195	R=1.31501E-04	A.U.			
2P3/2 5D3/2	2298.7532	2320.3683	1.16087	-1.64787	5.43990	-.185515	-26.38249
2P3/2 5D5/2	2300.4930	2322.1422	1.12389	-1.64486	5.43973	-.185509	-26.38249
2P3/2 6S1/2	2305.4297	2327.0495	1.16559	-1.64873	5.43101	-.185207	-26.38249
GOLD							
	6S1	Z=79 A=197	R=1.31949E-04	A.U.			
2P1/2 4P1/2	-63.6623	-67.1395	25.85426	-2.05008	5.27278	-.176021	-25.42376
2P1/2 4P3/2	35.7343	33.1929	24.89752	-2.06325	5.30365	-.177731	-25.42376
2P1/2 4C3/2	232.4032	230.5519	23.95287	-1.80826	5.30841	-.177947	-25.42376
2P1/2 4D5/2	250.7967	249.0817	23.88505	-1.87590	5.30754	-.177918	-25.42376
2P1/2 4F5/2	509.9952	508.6951	23.35534	-1.75680	5.30303	-.177746	-25.42376
2P1/2 4F7/2	514.0376	512.8806	23.21434	-1.75868	5.30241	-.177735	-25.42376
2P1/2 5S1/2	468.9908	467.4745	23.72476	-1.81565	5.22597	-.175018	-25.42376
2P1/2 5P1/2	530.4405	528.7246	23.86245	-1.83563	5.29003	-.177141	-25.42376
2P1/2 5P3/2	547.6092	546.0645	23.68790	-1.83829	5.29630	-.177444	-25.42376
2P1/2 5D3/2	605.4095	604.0016	23.50903	-1.79483	5.29495	-.177432	-25.42376
2P1/2 5D5/2	607.1102	605.7148	23.50419	-1.80243	5.29477	-.177426	-25.42376
2P1/2 6S1/2	612.9488	611.5321	23.53460	-1.80248	5.28523	-.177087	-25.42376
2P3/2 3P3/2	-404.1458	-387.2035	8.07586	-2.85380	5.89572	-.205316	-27.85472
2P3/2 3D3/2	37.6506	56.0648	5.93026	-2.18472	5.90145	-.206441	-27.85472
2P3/2 3D5/2	130.3856	150.5782	3.96576	-1.99535	5.89796	-.206320	-27.85472
2P3/2 4S1/2	1626.3387	1648.4463	2.19997	-1.77374	5.51356	-.192672	-27.85472
2P3/2 4P1/2	1746.1293	1766.9204	3.37327	-1.92758	5.82071	-.202791	-27.85472
2P3/2 4P3/2	1647.6301	1869.4862	2.25144	-1.90473	5.85041	-.204493	-27.85472
2P3/2 4C3/2	2042.3584	2064.7086	1.57873	-1.72554	5.85603	-.204702	-27.85472
2P3/2 4D5/2	2062.1969	2084.9231	1.16647	-1.68841	5.85517	-.204673	-27.85472
2P3/2 4F5/2	2320.3618	2343.4070	.77333	-1.60989	5.85054	-.204496	-27.85472
2P3/2 4F7/2	2324.4527	2347.6457	.62542	-1.60945	5.85027	-.204466	-27.85472
2P3/2 5S1/2	2299.7129	2322.5491	1.11428	-1.66766	5.77364	-.201774	-27.85472
2P3/2 5P1/2	2340.9005	2363.5169	1.29511	-1.69258	5.83766	-.203897	-27.85472
2P3/2 5P3/2	2358.4303	2381.2430	1.09094	-1.68868	5.84391	-.204199	-27.85472
2P3/2 5D3/2	2415.7393	2438.6645	.94525	-1.65412	5.84253	-.204186	-27.85472
2P3/2 5D5/2	2417.8076	2440.7705	.90437	-1.65073	5.84233	-.204176	-27.85472
2P3/2 6S1/2	2423.6004	2446.5335	.94741	-1.65474	5.83282	-.203841	-27.85472
MERCURY							
	6S2	Z=80 A=200	P=1.32616E-04	A.U.			
2P1/2 4P1/2	-89.8060	-93.5955	27.06137	-2.02980	5.64048	-.192488	-26.69011
2P1/2 4P3/2	16.6836	14.0680	25.84239	-2.02302	5.68081	-.194457	-26.69011
2P1/2 4D3/2	218.6703	216.6245	25.07175	-1.82179	5.68067	-.194704	-26.69011
2P1/2 4D5/2	238.4319	236.5508	24.97737	-1.89123	5.67970	-.194670	-26.69011
2P1/2 4F5/2	505.2187	503.7682	24.42623	-1.76614	5.67499	-.194487	-26.69011
2P1/2 4F7/2	509.6524	508.3557	24.27446	-1.76794	5.67473	-.194476	-26.69011
2P1/2 5S1/2	489.8046	488.1321	24.79190	-1.82739	5.58952	-.191386	-26.69011
2P1/2 5P1/2	533.3973	531.4043	24.96545	-1.84880	5.66021	-.193781	-26.69011
2P1/2 5P3/2	552.4992	550.7936	24.77406	-1.85168	5.66747	-.194140	-26.69011
2P1/2 5D3/2	613.8507	612.2937	24.57917	-1.80380	5.66591	-.194126	-26.69011
2P1/2 5D5/2	615.8753	614.3329	24.57343	-1.81243	5.66566	-.194117	-26.69011
2P1/2 6S1/2	625.1379	623.5721	24.60819	-1.81229	5.65365	-.193680	-26.69011
2P3/2 3P3/2	-387.1005	-368.5267	7.33206	-2.64257	6.33221	-.225863	-29.36964
2P3/2 3D3/2	64.0160	83.4990	5.98499	-2.21375	6.33857	-.227120	-29.36964
2P3/2 3D5/2	162.2366	183.6248	3.90411	-2.03046	6.33478	-.226985	-29.36964
2P3/2 4S1/2	1707.3077	1730.7014	2.08081	-1.81260	5.91915	-.211871	-29.36964
2P3/2 4P1/2	1830.5184	1852.5019	3.25731	-1.89844	6.25030	-.223020	-29.36964
2P3/2 4P3/2	1939.1607	1962.4541	1.86296	-1.85224	6.29044	-.224980	-29.36964
2P3/2 4D3/2	2139.1461	2162.8075	1.37142	-1.72609	6.29013	-.225219	-29.36964
2P3/2 4D5/2	2160.3899	2184.4594	.92793	-1.69177	6.28919	-.225186	-29.36964
2P3/2 4F5/2	2426.0988	2450.5011	.51607	-1.60806	6.28453	-.224990	-29.36964
2P3/2 4F7/2	2430.5833	2455.1442	.35704	-1.60740	6.28404	-.224985	-29.36964
2P3/2 5S1/2	2411.0675	2435.2559	.87211	-1.66402	6.19405	-.221903	-29.36964
2P3/2 5P1/2	2454.2812	2478.2292	1.07108	-1.69485	6.26969	-.224296	-29.36964
2P3/2 5P3/2	2473.8687	2498.0292	.84744	-1.69057	6.27691	-.224655	-29.36964
2P3/2 5D3/2	2534.9266	2559.2087	.68941	-1.65267	6.27533	-.224639	-29.36964

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
MERCURY 6S2 Z=80 A=200 R=1.32616E-04 A.U.							
2P3/2 5D5/2	2537.1126	2561.4380	.64258	-1.64877	6.27508	-.224629	-29.36964
2P3/2 6S1/2	2546.3285	2570.6206	.69185	-1.65323	6.26309	-.224194	-29.36964
THALLIUM 6P1 Z=61 A=205 R=1.33712E-04 A.U.							
2P1/2 4P3/2	-4.0222	-6.8232	27.00704	-2.03701	6.07444	-.212486	-28.03101
2P1/2 4D3/2	203.1539	200.9428	26.20801	-1.82763	6.07441	-.212770	-28.03101
2F1/2 4D5/2	224.4069	222.3708	26.10678	-1.90085	6.07335	-.212732	-28.03101
2P1/2 4F5/2	498.7692	497.1870	25.52611	-1.76882	6.06840	-.212535	-28.03101
2P1/2 4F7/2	503.6406	502.2233	25.36343	-1.77070	6.06812	-.212523	-28.03101
2P1/2 5S1/2	489.4957	487.6843	25.91152	-1.83389	5.97376	-.209019	-28.03101
2P1/2 5P1/2	534.7950	532.7447	26.10216	-1.85681	6.05164	-.211713	-28.03101
2P1/2 5P3/2	556.0655	554.2162	25.89231	-1.85994	6.06008	-.212140	-28.03101
2P1/2 5D3/2	620.8770	614.1876	25.68172	-1.80771	6.05849	-.212130	-28.03101
2P1/2 5D5/2	623.4522	621.7800	25.67459	-1.81752	6.05823	-.212120	-28.03101
2P1/2 6S1/2	635.4481	633.7981	25.71616	-1.81744	6.04350	-.211585	-28.03101
2P1/2 6P1/2	642.4084	640.6881	25.72855	-1.81916	6.05386	-.211934	-28.03101
2P3/2 3P3/2	-367.0397	-347.2763	7.33730	-2.67603	6.79691	-.246210	-30.99333
2P3/2 3D3/2	92.8559	113.5547	5.97841	-2.23823	6.80396	-.249613	-30.99333
2P3/2 3D5/2	196.8685	219.5656	3.79257	-2.04674	6.79982	-.249462	-30.99333
2P3/2 4S1/2	1791.6670	1816.5101	1.86889	-1.81653	6.35060	-.232738	-30.99333
2P3/2 4P1/2	1918.2483	1941.5712	3.11144	-1.90347	6.70744	-.245010	-30.99333
2P3/2 4P3/2	2034.7127	2059.4303	1.62366	-1.85322	6.75253	-.247263	-30.99333
2P3/2 4D3/2	2239.8309	2264.9257	1.11889	-1.72517	6.75231	-.247535	-30.99333
2P3/2 4D5/2	2262.5527	2288.1197	.64942	-1.68684	6.75126	-.247498	-30.99333
2P3/2 4F5/2	2535.8353	2561.7126	.21555	-1.59843	6.74618	-.247294	-30.99333
2P3/2 4F7/2	2540.7535	2566.8008	.04518	-1.59768	6.74585	-.247281	-30.99333
2P3/2 5S1/2	2526.9731	2552.6298	.59082	-1.66213	6.65173	-.243787	-30.99333
2P3/2 5P1/2	2571.9860	2597.3782	.80901	-1.69095	6.72957	-.246480	-30.99333
2P3/2 5P3/2	2593.6580	2619.2825	.56408	-1.68630	6.73797	-.246906	-30.99333
2P3/2 5D3/2	2658.1497	2683.9039	.39498	-1.64535	6.73634	-.246893	-30.99333
2P3/2 5D5/2	2660.9085	2686.7125	.34103	-1.64065	6.73606	-.246883	-30.99333
2P3/2 6S1/2	2672.8568	2698.6616	.39915	-1.64603	6.72176	-.246348	-30.99333
2P3/2 6P1/2	2679.7770	2705.5191	.41456	-1.64839	6.73174	-.246698	-30.99333
LEAD 6P2 Z=82 A=208 R=1.34361E-04 A.U.							
2P1/2 4P3/2	-25.2107	-28.2228	26.21328	-2.04612	6.49382	-.231998	-29.41693
2P1/2 4D3/2	187.1939	184.7923	27.38537	-1.82844	6.49391	-.232319	-29.41693
2P1/2 4D5/2	210.0278	207.8127	27.27722	-1.90569	6.44297	-.232277	-29.41693
2P1/2 4F5/2	491.9695	490.2316	26.66566	-1.76636	6.48757	-.232065	-29.41693
2P1/2 4F7/2	497.3009	495.7393	26.49169	-1.76835	6.46727	-.232052	-29.41693
2P1/2 5S1/2	489.2120	487.2382	27.07131	-1.83539	6.38290	-.226086	-29.41693
2F1/2 5P1/2	536.3376	534.0972	27.27968	-1.85981	6.46861	-.231112	-29.41693
2P1/2 5P3/2	556.0282	558.0113	27.05029	-1.86324	6.47839	-.231618	-29.41693
2P1/2 5D3/2	626.2706	626.4257	26.82334	-1.80643	6.47675	-.231612	-29.41693
2P1/2 5D5/2	631.4301	629.6049	26.81472	-1.81745	6.47646	-.231601	-29.41693
2P1/2 6S1/2	646.1760	644.3192	26.86239	-1.81725	6.45957	-.230953	-29.41693
2P1/2 6P1/2	655.2513	653.3675	26.88024	-1.81962	6.47140	-.231376	-29.41693
2P3/2 3P3/2	-342.9533	-321.9465	7.31663	-2.70446	7.29490	-.272594	-32.68128
2P3/2 3D3/2	125.7852	147.7509	5.94524	-2.25803	7.30250	-.274150	-32.68128
2P3/2 3D5/2	235.8480	254.9100	3.65311	-2.05799	7.29614	-.273984	-32.68128
2P3/2 4S1/2	1880.9635	1907.2472	1.62539	-1.81500	6.81272	-.255497	-32.68128
2P3/2 4P1/2	2010.9384	2035.6563	2.93641	-1.90310	7.19709	-.268990	-32.68128
2P3/2 4P3/2	2135.7097	2161.9118	1.35148	-1.84843	7.24771	-.271578	-32.68128
2P3/2 4D3/2	2345.9944	2372.5877	.83379	-1.71651	7.24759	-.271897	-32.68128
2P3/2 4D5/2	2397.3677	2397.4134	.33710	-1.67609	7.24644	-.271845	-32.68128
2P3/2 4F5/2	2651.1467	2678.5609	-.11962	-1.58281	7.24111	-.271627	-32.68128
2P3/2 4F7/2	2656.5282	2684.1241	-.30183	-1.58196	7.24075	-.271612	-32.68128
2P3/2 5S1/2	2648.8314	2676.0186	.27546	-1.65037	7.13605	-.267657	-32.68128
2P3/2 5P1/2	2695.6522	2722.5491	.51399	-1.66125	7.22232	-.270682	-32.68128
2P3/2 5P3/2	2719.7696	2746.9197	.24650	-1.67623	7.23206	-.271196	-32.68128
2P3/2 5D3/2	2787.6678	2814.9561	.06586	-1.63209	7.23038	-.271178	-32.68128

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
LEAD 6P2							
		Z=82 A=208	R=1.34361E-04	A.U.			
2P3/2 5D5/2	2791.0291	2818.3740	.00442	-1.62694	7.23006	-.271166	-32.68128
2P3/2 6S1/2	2805.7094	2833.0095	.07129	-1.63260	7.21320	-.270520	-32.68128
2P3/2 6P1/2	2814.7476	2842.0186	.09195	-1.63574	7.22503	-.270942	-32.68128
BISMUTH 6P3							
		Z=83 A=209	R=1.34576E-04	A.U.			
2P1/2 4P3/2	-46.1861	-51.4357	29.46795	-2.04939	6.94042	-.253084	-30.85625
2P1/2 4D3/2	169.5497	166.9313	28.61065	-1.82319	6.94063	-.253446	-30.85625
2P1/2 4D5/2	194.0145	191.5442	26.49509	-1.90459	6.93941	-.253401	-30.85625
2P1/2 4F5/2	483.5719	481.6532	27.85199	-1.75761	6.93394	-.253173	-30.85625
2P1/2 4F7/2	489.3645	487.6341	27.66605	-1.75987	6.93362	-.253159	-30.85625
2P1/2 5S1/2	487.6367	485.4760	28.27624	-1.83093	6.81832	-.246677	-30.85625
2P1/2 5P1/2	536.8189	534.3662	28.50530	-1.85660	6.91254	-.252070	-30.85625
2P1/2 5P3/2	562.8624	560.6529	28.25520	-1.86065	6.92383	-.252667	-30.85625
2P1/2 5D3/2	634.8180	632.7931	28.01067	-1.79897	6.92214	-.252666	-30.85625
2P1/2 5C5/2	638.3524	636.3501	28.00073	-1.81137	6.92162	-.252654	-30.85625
2P1/2 6S1/2	656.4264	654.3908	28.05272	-1.81105	6.90205	-.251879	-30.85625
2P1/2 6P1/2	667.1359	665.0679	28.07434	-1.81379	6.91606	-.252389	-30.85625
2P1/2 6P3/2	669.6635	667.6216	28.04804	-1.81452	6.91708	-.252447	-30.85625
2P3/2 3P3/2	-315.9786	-293.6146	7.27922	-2.72803	7.82838	-.299177	-34.44436
2P3/2 3D3/2	161.7655	185.0523	5.89476	-2.27308	7.82680	-.300910	-34.44436
2P3/2 3C5/2	278.1251	303.6078	3.49482	-2.06441	7.83200	-.290728	-34.44436
2P3/2 4S1/2	1974.1178	2001.9818	1.36181	-1.80866	7.30754	-.260296	-34.44436
2P3/2 4P1/2	2107.5966	2133.7657	2.74616	-1.89725	7.72144	-.295119	-34.44436
2P3/2 4P3/2	2241.0644	2268.8118	1.05481	-1.83803	7.77823	-.298086	-34.44436
2P3/2 4D3/2	2456.6274	2484.7702	.52367	-1.70214	7.77823	-.298438	-34.44436
2P3/2 4D5/2	2482.6511	2511.2772	-.00065	-1.65962	7.77696	-.296391	-34.44436
2P3/2 4F5/2	2771.0025	2800.0158	-.48083	-1.56135	7.77137	-.296157	-34.44436
2P3/2 4F7/2	2776.8534	2806.0605	-.67521	-1.56040	7.77097	-.298140	-34.44436
2P3/2 5S1/2	2775.5409	2804.3217	-.06591	-1.63285	7.65599	-.298438	-34.44436
2P3/2 5P1/2	2624.4044	2852.6675	.19398	-1.66577	7.75015	-.297064	-34.44436
2P3/2 5P3/2	2850.8967	2879.6352	-.09745	-1.66044	7.76139	-.297658	-34.44436
2P3/2 5D3/2	2922.4813	2951.3673	-.29078	-1.61290	7.75968	-.297656	-34.44436
2P3/2 5C5/2	2926.2263	2955.1761	-.36003	-1.60709	7.75932	-.297642	-34.44436
2P3/2 6S1/2	2944.2340	2973.1356	-.28634	-1.61357	7.73958	-.296868	-34.44436
2P3/2 6P1/2	2954.9073	2983.7733	-.26068	-1.61716	7.75354	-.297378	-34.44436
2P3/2 6P3/2	2957.4843	2986.3803	-.29204	-1.61675	7.75458	-.297435	-34.44436
POLONIUM 6P4							
		Z=84 A=209	R=1.34576E-04	A.U.			
2P1/2 4P3/2	-71.6783	-75.1793	30.76628	-2.04670	7.41615	-.275874	-32.35882
2P1/2 4D3/2	151.4404	148.5920	29.87870	-1.81176	7.41653	-.276285	-32.35882
2P1/2 4D5/2	177.6222	174.9837	29.75592	-1.89753	7.41517	-.276233	-32.35882
2P1/2 4F5/2	474.8062	472.6945	29.08007	-1.74305	7.40945	-.275989	-32.35882
2P1/2 4F7/2	481.0934	479.1825	28.88177	-1.74518	7.40911	-.275974	-32.35882
2P1/2 5S1/2	486.2519	483.8921	29.52821	-1.82051	7.28163	-.270917	-32.35882
2P1/2 5P1/2	537.5373	534.6581	29.77538	-1.84787	7.38524	-.274713	-32.35882
2P1/2 5P3/2	566.0895	563.6745	29.50312	-1.85215	7.35826	-.275415	-32.35882
2P1/2 5D3/2	641.7652	639.5487	29.23950	-1.78531	7.35657	-.275424	-32.35882
2P1/2 5D5/2	645.6898	643.4985	29.22856	-1.79919	7.35618	-.275408	-32.35882
2P1/2 6S1/2	667.1366	664.9104	29.28495	-1.79872	7.37325	-.274488	-32.35882
2P1/2 6P1/2	679.3312	677.0669	29.31028	-1.80182	7.38972	-.275100	-32.35882
2P1/2 6P3/2	682.5032	680.2691	29.27991	-1.80285	7.39101	-.275174	-32.35882
2P3/2 3P3/2	-284.4385	-260.6814	7.21213	-2.74575	8.40014	-.328166	-36.29543
2P3/2 3D3/2	202.3397	227.0223	5.81602	-2.28251	8.40943	-.330093	-36.29543
2P3/2 3C5/2	325.2770	352.2581	3.30509	-2.06506	8.40416	-.329889	-36.29543
2P3/2 4S1/2	2072.6421	2102.1391	1.06458	-1.79641	7.83763	-.307328	-36.29543
2P3/2 4P1/2	2205.7056	2237.4032	2.52352	-1.88521	8.28316	-.323547	-36.29543
2P3/2 4P3/2	2352.3789	2381.7540	.72157	-1.82109	8.34683	-.326999	-36.29543
2P3/2 4D3/2	2573.2652	2603.0447	.17760	-1.68124	8.34695	-.327395	-36.29543
2P3/2 4D5/2	2601.0304	2631.3201	-.37587	-1.63658	8.34556	-.327342	-36.29543
2P3/2 4F5/2	2896.9626	2927.6587	-.88017	-1.53315	8.33949	-.327090	-36.29543
2P3/2 4F7/2	2903.3104	2934.2129	-1.09719	-1.53208	8.33925	-.327071	-36.29543

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
POLONIUM							
	6P4	Z=84 A=209	R=1.34576E-04 A.U.				
2P3/2 5S1/2	2906.9166	2939.3747	-0.44420	-1.60884	8.21237	-0.322031	-36.29543
2P3/2 5P1/2	2959.8682	2989.9794	-0.16186	-1.64382	8.31574	-0.325827	-36.29543
2P3/2 5P3/2	2988.8907	3019.3010	-0.47689	-1.63817	8.32869	-0.326526	-36.29543
2P3/2 5D3/2	3064.1701	3094.7374	-0.68523	-1.58703	8.32694	-0.326531	-36.29543
2P3/2 5D5/2	3068.3278	3098.9665	-0.76267	-1.58059	8.32655	-0.326515	-36.29543
2P3/2 6S1/2	3089.7016	3120.2894	-0.68278	-1.58763	8.30366	-0.325598	-36.29543
2P3/2 6P1/2	3101.8489	3132.3948	-0.65266	-1.59173	8.32011	-0.326209	-36.29543
2P3/2 6F3/2	3105.0793	3135.6601	-0.68907	-1.59140	8.32137	-0.326282	-36.29543
ASTATINE							
	6P5	Z=85 A=210	R=1.34790E-04 A.U.				
2P1/2 4P3/2	-95.6308	-99.4144	32.11108	-2.03771	7.92214	-0.300482	-33.91146
2P1/2 4D3/2	132.9205	129.8107	31.19347	-1.79396	7.92266	-0.300944	-33.91146
2P1/2 4D5/2	160.9092	158.0217	31.06290	-1.88423	7.92116	-0.300886	-33.91146
2P1/2 4F5/2	465.7328	463.3980	30.35356	-1.72184	7.91517	-0.306825	-33.91146
2P1/2 4F7/2	472.5494	470.4286	30.14209	-1.72399	7.91461	-0.300608	-33.91146
2P1/2 5S1/2	484.4477	481.8608	30.82221	-1.80353	7.77462	-0.294916	-33.91146
2P1/2 5P1/2	537.6758	534.9411	31.08958	-1.83227	7.88602	-0.299159	-33.91146
2P1/2 5P3/2	569.1107	566.4624	30.79373	-1.83702	7.90298	-0.299982	-33.91146
2P1/2 5D3/2	646.5032	646.0669	30.51143	-1.76492	7.90125	-0.299999	-33.91146
2P1/2 5D5/2	652.6562	650.4483	30.49878	-1.78028	7.90085	-0.299982	-33.91146
2P1/2 6S1/2	677.8403	675.3964	30.55943	-1.77963	7.87441	-0.298899	-33.91146
2P1/2 6P1/2	691.8519	689.3627	30.59010	-1.78325	7.89343	-0.299618	-33.91146
2P1/2 6P3/2	695.6049	693.1516	30.55367	-1.78436	7.89516	-0.299717	-33.91146
2P3/2 3P3/2	-248.2079	-222.9955	7.11407	-2.75716	9.01220	-0.359758	-38.22179
2P3/2 3D3/2	247.6691	273.8086	5.70770	-2.28601	9.02255	-0.361902	-38.22179
2P3/2 3D5/2	377.6569	406.2033	3.08313	-2.05966	9.01663	-0.361668	-38.22179
2P3/2 4S1/2	2176.6884	2208.0872	.73295	-1.77797	8.40483	-0.336773	-38.22179
2P3/2 4F1/2	2317.5885	2346.8794	2.26770	-1.86632	8.88416	-0.356113	-38.22179
2P3/2 4P3/2	2470.0056	2501.0770	.35065	-1.79727	8.95552	-0.358507	-38.22179
2P3/2 4D3/2	2696.2635	2727.7480	-0.20605	-1.65349	8.95577	-0.358953	-38.22179
2P3/2 4D5/2	2725.8594	2757.8821	-0.78961	-1.60662	8.95424	-0.358893	-38.22179
2P3/2 4F5/2	3029.3846	3061.8336	-1.31886	-1.49787	8.94810	-0.358624	-38.22179
2P3/2 4F7/2	3036.2579	3068.9263	-1.53897	-1.49668	8.94760	-0.358602	-38.22179
2P3/2 5S1/2	3048.6420	3080.8496	-0.86304	-1.57766	8.80767	-0.352931	-38.22179
2P3/2 5P1/2	3101.7225	3133.5521	-0.55711	-1.61471	8.92120	-0.357172	-38.22179
2P3/2 5P3/2	3133.4489	3165.6028	-0.90153	-1.60871	8.93610	-0.357992	-38.22179
2P3/2 5D3/2	3212.4201	3244.7408	-1.12134	-1.55393	8.93432	-0.358006	-38.22179
2P3/2 5D5/2	3217.0196	3249.4195	-1.20728	-1.54672	8.93388	-0.357987	-38.22179
2P3/2 6S1/2	3241.9298	3274.2761	-1.12076	-1.55437	8.90751	-0.356907	-38.22179
2P3/2 6P1/2	3255.8929	3286.1898	-1.08484	-1.55913	8.92652	-0.357626	-38.22179
2P3/2 6P3/2	3259.7103	3292.0485	-1.12819	-1.55869	8.92822	-0.357724	-38.22179
RADCN							
	6P6	Z=86 A=222	R=1.37310E-04 A.U.				
2P1/2 4P3/2	-121.0851	-125.1895	33.50404	-2.02183	8.45579	-0.326965	-35.50667
2P1/2 4D3/2	112.9471	109.5384	32.55540	-1.76904	8.45650	-0.327485	-35.50667
2P1/2 4D5/2	142.8367	139.6631	32.41683	-1.86401	8.45485	-0.327420	-35.50667
2P1/2 4F5/2	455.3100	452.7159	31.67274	-1.69343	8.44859	-0.327142	-35.50667
2P1/2 4F7/2	462.6804	460.3128	31.44902	-1.69579	8.44817	-0.327122	-35.50667
2P1/2 5S1/2	481.7977	478.9476	32.16313	-1.77962	8.29402	-0.320727	-35.50667
2P1/2 5P1/2	537.4001	534.1715	32.45239	-1.80980	8.41811	-0.325457	-35.50667
2P1/2 5P3/2	571.7340	568.8144	32.13266	-1.81531	8.43529	-0.326421	-35.50667
2P1/2 5D3/2	654.8272	652.1343	31.83002	-1.73753	8.43348	-0.326446	-35.50667
2P1/2 5D5/2	659.6338	656.9815	31.81703	-1.75470	8.43308	-0.326429	-35.50667
2P1/2 6S1/2	688.2025	685.5042	31.88097	-1.75363	8.40277	-0.325160	-35.50667
2P1/2 6P1/2	703.9541	701.2035	31.91629	-1.75765	8.42465	-0.326002	-35.50667
2P1/2 6P3/2	708.6276	705.9182	31.67437	-1.75899	8.42661	-0.326128	-35.50667
2P3/2 3P3/2	-207.4966	-180.7706	6.98455	-2.76208	9.66269	-0.354102	-40.21704
2P3/2 3D3/2	297.5567	325.2107	5.57081	-2.28331	9.67399	-0.396476	-40.21704
2P3/2 3D5/2	434.5189	464.6857	2.82646	-2.04761	9.66760	-0.346219	-40.21704
2P3/2 4S1/2	2266.0898	2319.0570	.36392	-1.75270	9.00739	-0.368772	-40.21704
2P3/2 4F1/2	2430.4663	2461.4099	1.97971	-1.84060	9.52259	-0.388311	-40.21704

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
RADGN 6P6 Z=86 A=222 R=1.37310E-04 A.U.							
2P3/2 4P3/2	2593.1799	2626.0142	-0.06104	-1.76589	9.60248	-0.392762	-40.21704
2P3/2 4D3/2	2824.8576	2858.1137	-0.63025	-1.61820	9.60289	-0.393265	-40.21704
2P3/2 4D5/2	2856.3772	2890.2004	-1.24509	-1.56906	9.60120	-0.393198	-40.21704
2P3/2 4F5/2	3167.5050	3201.7749	-1.79983	-1.45485	9.59476	-0.392909	-40.21704
2P3/2 4F7/2	3174.9335	3209.4364	-2.03371	-1.45351	9.59422	-0.392885	-40.21704
2P3/2 5S1/2	3194.5752	3228.6002	-1.32299	-1.53899	9.44054	-0.386512	-40.21704
2P3/2 5P1/2	3250.0481	3283.6613	-0.99117	-1.57829	9.58452	-0.391238	-40.21704
2P3/2 5P3/2	3284.6600	3318.6242	-1.36460	-1.57195	9.58162	-0.392199	-40.21704
2P3/2 5D3/2	3367.3037	3401.4450	-1.59658	-1.51329	9.57982	-0.392222	-40.21704
2P3/2 5D5/2	3372.3751	3406.6038	-1.69343	-1.50535	9.57933	-0.392202	-40.21704
2P3/2 6S1/2	3400.8648	3435.0373	-1.60002	-1.51363	9.54914	-0.390936	-40.21704
2P3/2 6P1/2	3416.5630	3450.6783	-1.55651	-1.51896	9.57100	-0.391780	-40.21704
2P3/2 6P3/2	3421.3069	3455.4697	-1.60842	-1.51852	9.57312	-0.391903	-40.21704
FRANCIUM 7S1 Z=87 A=223 R=1.37516E-04 A.U.							
2P1/2 4P3/2	-151.0181	-155.4739	34.95303	-2.00043	9.03032	-0.355690	-37.17142
2P1/2 4D3/2	88.5006	84.7625	33.97305	-1.73850	9.03125	-0.356275	-37.17142
2P1/2 4D5/2	120.4055	116.9162	33.82584	-1.83831	9.02943	-0.356202	-37.17142
2P1/2 4F5/2	440.5294	437.6469	33.04022	-1.65931	9.02288	-0.355905	-37.17142
2P1/2 4F7/2	448.4861	445.8446	32.80804	-1.66165	9.02243	-0.355883	-37.17142
2P1/2 5S1/2	475.1814	472.0398	33.55407	-1.75018	8.85287	-0.348701	-37.17142
2P1/2 5P1/2	532.9712	529.4185	33.87117	-1.78172	8.98462	-0.353969	-37.17142
2P1/2 5P3/2	570.2626	567.0452	33.52306	-1.78747	9.00830	-0.355096	-37.17142
2P1/2 5D3/2	657.0545	654.0789	33.19956	-1.70388	9.00652	-0.355134	-37.17142
2P1/2 5D5/2	662.4307	659.4891	33.18479	-1.72268	9.00603	-0.355114	-37.17142
2P1/2 6S1/2	695.8641	692.8867	33.25283	-1.72111	8.97074	-0.353606	-37.17142
2P1/2 6P1/2	713.2527	710.2126	33.29549	-1.72565	8.95625	-0.354605	-37.17142
2P1/2 6P3/2	719.0913	716.0999	33.24603	-1.72741	8.95897	-0.354666	-37.17142
2P1/2 7S1/2	734.1361	731.1630	33.22769	-1.72076	8.99204	-0.354482	-37.17142
2P3/2 3P3/2	-165.4719	-137.1532	6.82111	-2.76082	10.36673	-0.431684	-42.31400
2P3/2 3D3/2	348.8116	378.0532	5.40260	-2.27499	10.37909	-0.434311	-42.31400
2P3/2 3D5/2	493.2333	525.1041	2.53486	-2.02978	10.37212	-0.434026	-42.31400
2P3/2 4S1/2	2397.5684	2432.3896	-0.04107	-1.72173	9.65942	-0.403777	-42.31400
2P3/2 4P1/2	2545.6975	2578.3734	1.65868	-1.80873	10.21330	-0.425164	-42.31400
2P3/2 4P3/2	2719.3509	2754.0336	-0.51332	-1.72781	10.30271	-0.430249	-42.31400
2P3/2 4D3/2	2956.4536	2991.5660	-1.09462	-1.57629	10.30330	-0.430814	-42.31400
2P3/2 4D5/2	2990.0084	3025.7186	-1.74217	-1.52478	10.30144	-0.430739	-42.31400
2P3/2 4F5/2	3308.7366	3344.9151	-2.32281	-1.40498	10.29469	-0.430430	-42.31400
2P3/2 4F7/2	3316.7624	3353.1871	-2.57064	-1.40352	10.29409	-0.430402	-42.31400
2P3/2 5S1/2	3344.0090	3379.9387	-1.82386	-1.49370	10.12508	-0.423246	-42.31400
2P3/2 5P1/2	3401.4185	3436.9022	-1.46700	-1.53491	10.26075	-0.428512	-42.31400
2P3/2 5P3/2	3439.2453	3475.1084	-1.87162	-1.52817	10.28033	-0.429634	-42.31400
2P3/2 5D3/2	3525.5624	3561.6132	-2.12016	-1.46547	10.27850	-0.429669	-42.31400
2P3/2 5D5/2	3531.2177	3567.3649	-2.22463	-1.46570	10.27795	-0.429645	-42.31400
2P3/2 6S1/2	3564.5695	3600.6588	-2.12465	-1.46531	10.24276	-0.428142	-42.31400
2P3/2 6P1/2	3581.8962	3617.9174	-2.07490	-1.47139	10.26826	-0.428141	-42.31400
2P3/2 6P3/2	3587.8160	3623.8934	-2.13403	-1.47099	10.27091	-0.428249	-42.31400
2P3/2 7S1/2	3602.8313	3638.9246	-2.14927	-1.46504	10.26407	-0.429018	-42.31400
RADIUM 7S2 Z=88 A=226 R=1.38130E-04 A.U.							
2P1/2 4P3/2	-182.2537	-167.0948	36.45306	-1.97088	9.64078	-0.386654	-38.89522
2P1/2 4D3/2	62.7908	58.6695	35.44155	-1.69970	9.64195	-0.387311	-38.89522
2P1/2 4D5/2	96.8144	92.9764	35.28500	-1.80450	9.63995	-0.387229	-38.89522
2P1/2 4F5/2	424.5982	421.3948	34.46930	-1.61688	9.63308	-0.386910	-38.89522
2P1/2 4F7/2	433.1805	430.2314	34.21808	-1.61943	9.63251	-0.386883	-38.89522
2P1/2 5S1/2	467.6948	464.2300	35.00513	-1.71261	9.44632	-0.378834	-38.89522
2P1/2 5P1/2	527.7087	523.7981	35.34137	-1.74548	9.55464	-0.384691	-38.89522
2P1/2 5P3/2	568.4190	564.8705	34.96432	-1.75175	9.61715	-0.386035	-38.89522
2P1/2 5D3/2	658.8913	655.6003	34.61891	-1.66201	9.61535	-0.386057	-38.89522
2P1/2 5D5/2	664.8781	661.6239	34.60334	-1.68271	9.61480	-0.386033	-38.89522
2P1/2 6S1/2	703.4877	700.1995	34.67400	-1.68034	9.57399	-0.384255	-38.89522

FINAL STATE		E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
RADIUM		7S2	Z=88 A=226	R=1.36130E-04 A.U.				
2P1/2	6P1/2	722.4517	719.1298	34.72446	-1.68541	9.60346	-.385429	-36.89522
2P1/2	6F3/2	729.4296	726.1250	34.66612	-1.68748	9.60685	-.385633	-38.89522
2P1/2	7S1/2	748.3731	745.0933	34.64170	-1.67901	9.59752	-.385243	-38.89522
2F3/2	3P3/2	-116.4462	-88.4566	6.61760	-2.75139	11.12023	-.472615	-44.50347
2P3/2	3D3/2	405.1246	436.0318	5.19701	-2.25897	11.13371	-.475518	-44.50347
2P3/2	3D5/2	557.3240	590.9789	2.20163	-2.00402	11.12611	-.475201	-44.50347
2F3/2	4S1/2	2514.8242	2551.5851	-4.8978	-1.68279	10.35698	-.441886	-44.50347
2P3/2	4P1/2	2666.7556	2701.2420	1.29888	-1.76857	10.95206	-.465271	-44.50347
2P3/2	4P3/2	2851.9823	2868.5987	-1.01307	-1.68092	11.05216	-.471077	-44.50347
2P3/2	4D3/2	3094.5482	3131.6202	-1.60595	-1.52562	11.05293	-.471710	-44.50347
2P3/2	4D5/2	3130.2412	3167.9246	-2.28753	-1.47168	11.05089	-.471625	-44.50347
2F3/2	4F5/2	3456.5824	3494.7542	-2.89472	-1.34615	11.04380	-.471295	-44.50347
2P3/2	4F7/2	3465.2352	3503.6667	-3.15739	-1.34455	11.04313	-.471263	-44.50347
2P3/2	5S1/2	3500.3379	3538.2693	-2.37366	-1.43954	10.85749	-.473241	-44.50347
2P3/2	5P1/2	3559.9566	3597.3955	-1.98917	-1.48266	11.00572	-.469096	-44.50347
2P3/2	5P3/2	3601.2238	3639.0723	-2.42708	-1.47569	11.02813	-.470404	-44.50347
2P3/2	5D3/2	3691.1930	3729.2402	-2.69085	-1.40874	11.02626	-.470452	-44.50347
2P3/2	5D5/2	3697.5484	3735.6209	-2.80510	-1.39914	11.02558	-.470922	-44.50347
2P3/2	6S1/2	3735.9985	3774.0926	-2.69892	-1.40804	10.98494	-.468652	-44.50347
2P3/2	6P1/2	3754.9230	3792.5470	-2.64030	-1.41489	11.01444	-.469827	-44.50347
2P3/2	6P3/2	3761.9628	3800.0430	-2.70996	-1.41443	11.01773	-.470026	-44.50347
2P3/2	7S1/2	3780.8662	3818.9704	-2.73082	-1.40676	11.00846	-.469640	-44.50347

ACTINIUM		6D1	Z=89 A=227	R=1.38334E-04 A.U.				
2P1/2	4P3/2	-212.0958	-217.3515	38.01680	-1.93585	10.28949	-.419958	-40.69481
2P1/2	4D3/2	38.4531	33.9586	36.97456	-1.65548	10.29091	-.420693	-40.69481
2P1/2	4D5/2	74.7559	70.5401	36.80791	-1.76539	10.28870	-.420602	-40.69481
2P1/2	4F5/2	410.1633	406.6308	35.95518	-1.56890	10.28151	-.420262	-40.69481
2P1/2	4F7/2	419.4574	416.1745	35.68844	-1.57149	10.28097	-.420234	-40.69481
2P1/2	5S1/2	462.0164	458.2012	36.51424	-1.66957	10.07660	-.411222	-40.69481
2P1/2	5P1/2	524.1544	519.8566	36.87563	-1.70380	10.23848	-.417723	-40.69481
2P1/2	5P3/2	566.6245	564.7175	36.46741	-1.71050	10.26420	-.419253	-40.69481
2P1/2	5D3/2	662.6227	658.9892	36.09969	-1.61443	10.26238	-.419321	-40.69481
2P1/2	5D5/2	669.3521	665.7991	36.08227	-1.63694	10.26176	-.419293	-40.69481
2P1/2	6S1/2	713.0419	709.4172	36.15506	-1.63363	10.21534	-.417231	-40.69481
2P1/2	6P1/2	733.0089	729.2995	36.21296	-1.63920	10.24904	-.418595	-40.69481
2P1/2	6P3/2	741.5639	737.9215	36.14403	-1.64112	10.25319	-.418849	-40.69481
2P1/2	6L3/2	761.6741	758.0705	36.09370	-1.62754	10.25103	-.418773	-40.69481
2P1/2	7S1/2	763.1121	759.4991	36.11456	-1.63124	10.24290	-.418414	-40.69481
2P3/2	3P3/2	-63.2814	-31.5225	6.37241	-2.73377	11.92713	-.517134	-46.80751
2P3/2	3D3/2	469.6121	502.2796	4.95414	-2.23555	11.94179	-.520337	-46.80751
2P3/2	3D5/2	629.9492	665.4880	1.82560	-1.97045	11.93351	-.519985	-46.80751
2P3/2	4S1/2	2640.9520	2679.7582	-.98294	-1.63593	11.10355	-.483314	-46.80751
2P3/2	4P1/2	2796.6964	2833.0930	.89760	-1.72013	11.74273	-.508865	-46.80751
2P3/2	4P3/2	2994.1699	3032.8451	-1.56170	-1.62521	11.85479	-.515485	-46.80751
2P3/2	4D3/2	3242.1941	3281.2935	-2.16499	-1.46637	11.85570	-.516193	-46.80751
2P3/2	4D5/2	3280.1859	3319.9483	-2.88240	-1.40985	11.85346	-.516099	-46.80751
2P3/2	4F5/2	3614.1197	3654.3916	-3.51623	-1.27848	11.84602	-.515744	-46.80751
2P3/2	4F7/2	3623.4582	3664.0074	-3.79463	-1.27668	11.84529	-.515709	-46.80751
2P3/2	5S1/2	3666.6528	3706.6749	-2.97283	-1.37664	11.64162	-.506731	-46.80751
2P3/2	5P1/2	3728.3786	3767.8776	-2.55953	-1.42211	11.60340	-.513230	-46.80751
2P3/2	5P3/2	3773.4271	3813.3679	-3.03318	-1.41438	11.82898	-.514753	-46.80751
2P3/2	5D3/2	3866.8956	3907.0464	-3.31225	-1.34311	11.82711	-.514816	-46.80751
2P3/2	5D5/2	3873.9713	3914.2376	-3.43786	-1.33257	11.82642	-.514786	-46.80751
2P3/2	6S1/2	3917.5400	3957.7465	-3.32466	-1.34166	11.78001	-.512724	-46.80751
2P3/2	6P1/2	3937.4223	3977.5372	-3.25781	-1.34931	11.81379	-.514093	-46.80751
2P3/2	6P3/2	3946.0881	3986.2791	-3.33841	-1.34865	11.81789	-.514344	-46.80751
2P3/2	6D3/2	3966.1156	4006.3380	-3.37833	-1.33794	11.81570	-.514267	-46.80751
2P3/2	7S1/2	3967.5808	4007.7988	-3.36465	-1.33953	11.80760	-.513908	-46.80751

FINAL STATE	F(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
THORIUM 6D2 Z=90 A=232 R=1.39342E-04 A.U.							
2P1/2 4P3/2	-242.4409	-248.2098	39.63822	-1.89224	10.97712	-4.55787	-42.54840
2P1/2 4D3/2	13.5870	8.6504	38.56551	-1.60266	10.97880	-4.56608	-42.54840
2P1/2 4D5/2	52.2930	47.6516	36.38768	-1.71777	10.97639	-4.56506	-42.54840
2P1/2 4F5/2	395.3683	391.4187	37.49753	-1.51222	10.96885	-4.56143	-42.54840
2P1/2 4F7/2	405.3683	401.7048	37.21463	-1.51481	10.96823	-4.56111	-42.54840
2P1/2 5S1/2	456.0570	451.6447	38.08054	-1.61803	10.74427	-4.46039	-42.54840
2P1/2 5P1/2	520.3290	515.5953	38.46821	-1.65356	10.92069	-4.53242	-42.54840
2P1/2 5P3/2	568.4194	564.5067	38.02679	-1.66069	10.95003	-4.55020	-42.54840
2P1/2 5D3/2	666.3190	662.2963	37.63004	-1.55807	10.94821	-4.55106	-42.54840
2P1/2 5D5/2	673.9312	669.9529	37.61674	-1.58249	10.94755	-4.55076	-42.54840
2P1/2 6S1/2	722.8238	718.8161	37.69205	-1.57821	10.85494	-4.52694	-42.54840
2P1/2 6P1/2	743.4416	739.3380	37.75728	-1.58422	10.93325	-4.54271	-42.54840
2P1/2 6P3/2	753.7694	749.7416	37.67880	-1.58630	10.93831	-4.54585	-42.54840
2P1/2 6D3/2	775.8015	771.8193	37.61940	-1.57038	10.93612	-4.54511	-42.54840
2P1/2 7S1/2	777.8411	773.8491	37.64207	-1.57443	10.92686	-4.54092	-42.54840
2P3/2 3P3/2	-1.6276	31.4790	6.08052	-2.70665	12.74937	-5.65570	-49.20424
2P3/2 3D3/2	540.6574	575.1606	4.66806	-2.20327	12.80529	-5.69100	-49.20424
2P3/2 3L5/2	709.4669	746.9697	1.40167	-1.92775	12.79628	-5.68710	-49.20424
2P3/2 4S1/2	2774.2012	2815.2383	-1.52557	-1.57996	11.90102	-5.28370	-49.20424
2P3/2 4P1/2	2933.9002	2972.2847	.45087	-1.66216	12.58727	-5.56262	-49.20424
2P3/2 4P3/2	3144.3527	3185.1323	-2.16450	-1.55939	12.71238	-5.63603	-49.20424
2P3/2 4D3/2	3397.8196	3439.0494	-2.77740	-1.39713	12.71357	-5.64593	-49.20424
2P3/2 4D5/2	3438.2325	3480.1602	-3.53215	-1.33794	12.71111	-5.64488	-49.20424
2P3/2 4F5/2	3779.7623	3822.2212	-4.19326	-1.20057	12.70330	-5.64109	-49.20424
2P3/2 4F7/2	3789.8263	3832.5786	-4.46878	-1.19858	12.70249	-5.64069	-49.20424
2P3/2 5S1/2	3641.1545	3883.4037	-3.62651	-1.30373	12.47930	-5.54035	-49.20424
2P3/2 5P1/2	3905.0378	3946.6821	-3.18304	-1.35135	12.65561	-5.61237	-49.20424
2P3/2 5P3/2	3954.1278	3996.2480	-3.69479	-1.34500	12.68480	-5.63005	-49.20424
2P3/2 5D3/2	4051.0703	4053.4115	-3.98951	-1.26728	12.66251	-5.63037	-49.20424
2P3/2 5D5/2	4059.0039	4101.4713	-4.12646	-1.25577	12.68215	-5.63052	-49.20424
2P3/2 6S1/2	4107.8020	4150.2098	-4.00755	-1.26505	12.62968	-5.60676	-49.20424
2P3/2 6P1/2	4128.3341	4170.6374	-3.93126	-1.27348	12.66797	-5.62253	-49.20424
2P3/2 6P3/2	4138.7770	4181.1670	-4.02261	-1.27256	12.67298	-5.62565	-49.20424
2P3/2 6L3/2	4160.7218	4203.1478	-4.06974	-1.26030	12.67078	-5.62490	-49.20424
2P3/2 7S1/2	4162.7922	4205.2139	-4.05490	-1.26203	12.66156	-5.62074	-49.20424
PRITACTINIUM 5F2 6D1 Z=91 A=231 R=1.39141E-04 A.U.							
2P1/2 4P3/2	-260.8027	-267.0056	41.32180	-1.63702	11.71257	-4.94412	-44.50005
2P1/2 4D3/2	.8138	-4.5889	40.22243	-1.53881	11.71448	-4.95325	-44.50005
2P1/2 4D5/2	42.0354	36.9474	40.03041	-1.65902	11.71186	-4.95213	-44.50005
2P1/2 4F5/2	392.3577	387.9849	39.10844	-1.44470	11.70351	-4.94822	-44.50005
2P1/2 4F7/2	403.6144	399.5478	38.80535	-1.44709	11.70314	-4.94785	-44.50005
2P1/2 5S1/2	462.1042	457.4774	39.70593	-1.55461	11.45916	-4.83600	-44.50005
2P1/2 5P1/2	527.8659	522.6803	40.11788	-1.59128	11.65061	-4.91544	-44.50005
2P1/2 5P3/2	580.7222	575.9909	39.63886	-1.59779	11.68392	-4.93599	-44.50005
2P1/2 5D3/2	679.1282	674.7007	39.22932	-1.49023	11.68214	-4.93706	-44.50005
2P1/2 5D5/2	689.3977	685.0218	39.20300	-1.51477	11.66144	-4.93674	-44.50005
2P1/2 5F5/2	786.8614	782.5838	39.07946	-1.46363	11.67515	-4.93357	-44.50005
2P1/2 6S1/2	739.6543	735.2600	39.26742	-1.50806	11.62808	-4.91120	-44.50005
2P1/2 6P1/2	760.6487	756.1582	39.33019	-1.51339	11.66662	-4.92819	-44.50005
2P1/2 6P3/2	771.0533	766.6828	39.24671	-1.51516	11.67215	-4.93169	-44.50005
2P1/2 6D3/2	792.4145	788.0514	39.18540	-1.49907	11.65987	-4.93090	-44.50005
2P1/2 7S1/2	794.0014	789.6307	39.20566	-1.50275	11.66054	-4.92661	-44.50005
2P3/2 3P1/2	-771.2564	-745.2051	16.04460	-2.96139	13.20001	-5.86429	-51.74805
2P3/2 3P3/2	80.1254	115.6841	5.76358	-2.67414	13.71826	-6.18378	-51.74805
2P3/2 3D3/2	631.5094	667.9313	4.38715	-2.17421	13.73546	-6.22262	-51.74805
2P3/2 3D5/2	809.4578	849.0283	.95441	-1.88066	13.72564	-6.21829	-51.74805
2P3/2 4S1/2	2428.1326	2971.3130	-2.09608	-1.51897	12.76014	-5.77488	-51.74805
2P3/2 4P1/2	3091.6235	3132.1021	-.02059	-1.59870	13.49865	-5.07909	-51.74805
2P3/2 4P3/2	3315.6976	3358.7144	-2.80119	-1.48742	13.63639	-6.16486	-51.74805
2P3/2 4D3/2	3574.6381	3618.1084	-3.42035	-1.32233	13.63781	-6.17367	-51.74805
2P3/2 4D5/2	3617.5804	3661.7865	-4.21566	-1.26026	13.63512	-6.17250	-51.74805
2P3/2 4F5/2	3966.3052	4011.0593	-4.89892	-1.11716	13.62690	-6.16843	-51.74805

FINAL STATE	E(TOT)	E(OHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
PROTACTINIUM 5F2 6D1 Z=91 A=231 R=1.39141E-04 A.U.							
2P3/2 4F7/2	3977.6379	4022.7062	-5.21476	-1.11470	13.62601	-.616798	-51.74805
2P3/2 5S1/2	4036.8366	4061.3498	-4.31796	-1.22428	13.38277	-.605654	-51.74805
2P3/2 5P1/2	4102.1533	4146.0610	-3.84629	-1.27388	13.57410	-.613596	-51.74805
2P3/2 5P3/2	4155.6268	4200.0474	-4.40021	-1.26392	13.60723	-.615840	-51.74805
2F3/2 5D3/2	4253.4469	4298.0983	-4.70816	-1.18487	13.60538	-.615741	-51.74805
2P3/2 5D5/2	4264.0438	4308.8325	-4.85801	-1.17153	13.60457	-.615704	-51.74805
2P3/2 5F5/2	4361.2730	4406.1271	-4.93421	-1.15477	13.59831	-.615388	-51.74805
2P3/2 6S1/2	4314.1989	4358.9384	-4.74676	-1.17867	13.54937	-.613158	-51.74805
2F3/2 6P1/2	4335.1041	4379.7383	-4.67445	-1.18668	13.58986	-.614956	-51.74805
2P3/2 6P3/2	4345.6481	4390.3732	-4.77177	-1.18539	13.59531	-.615202	-51.74805
2P3/2 6D3/2	4366.8932	4411.6573	-4.82142	-1.17257	13.59303	-.615123	-51.74805
2P3/2 7S1/2	4368.5062	4413.2678	-4.80865	-1.17401	13.58376	-.614696	-51.74805
URANIUM 5F3 6D1 Z=92 A=238 R=1.40533E-04 A.U.							
2P1/2 4D3/2	-18.6752	-24.6151	41.93307	-1.46467	12.49121	-.536896	-46.48277
2P1/2 4D5/2	25.1840	19.5786	41.72675	-1.59019	12.48837	-.536773	-46.48277
2P1/2 4F5/2	382.9455	378.0817	40.76957	-1.36664	12.48001	-.536354	-46.48277
2P1/2 4F7/2	395.2943	390.7556	40.44761	-1.36899	12.47917	-.536310	-46.48277
2P1/2 5S1/2	461.9232	456.8118	41.38645	-1.48147	12.21310	-.523881	-46.48277
2P1/2 5P1/2	529.4659	523.7542	41.82560	-1.51924	12.42076	-.532636	-46.48277
2P1/2 5P3/2	586.9013	581.6782	41.30786	-1.52557	12.45857	-.535009	-46.48277
2P1/2 5D3/2	687.3393	682.4350	40.87764	-1.41219	12.45676	-.535136	-46.48277
2P1/2 5D5/2	699.5473	694.7002	40.84678	-1.43779	12.45602	-.535102	-46.48277
2P1/2 5F5/2	800.9465	796.2099	40.70772	-1.40315	12.44957	-.534771	-46.48277
2P1/2 6S1/2	752.9567	748.0983	40.90700	-1.42932	12.39578	-.532271	-46.48277
2P1/2 6P1/2	774.4954	769.5339	40.97305	-1.43457	12.43993	-.534153	-46.48277
2P1/2 6P3/2	796.0698	781.1952	40.88191	-1.43624	12.44627	-.534500	-46.48277
2P1/2 6D3/2	807.6624	802.8393	40.81547	-1.41893	12.44391	-.534479	-46.48277
2P1/2 7S1/2	809.4365	804.6000	40.83613	-1.42276	12.43397	-.534013	-46.48277
2P3/2 3P1/2	-738.1894	-710.6276	16.24981	-2.93956	14.13242	-.639631	-54.36478
2P3/2 3P3/2	162.8142	200.3968	5.37834	-2.62831	14.70797	-.675772	-54.36478
2P3/2 3D3/2	723.5105	761.9269	4.03151	-2.12959	14.72649	-.680040	-54.36478
2P3/2 3D5/2	910.8278	952.5408	4.43579	-1.82036	14.71589	-.679566	-54.36478
2P3/2 4S1/2	3083.6579	3129.1613	-2.73764	-1.44520	13.67512	-.630853	-54.36478
2P3/2 4P1/2	3251.0737	3293.7174	-.55784	-1.52201	14.46494	-.663996	-54.36478
2P3/2 4P3/2	3489.5510	3534.8841	-3.51396	-1.40152	14.62096	-.673750	-54.36478
2P3/2 4D3/2	3754.0085	3799.7984	-4.13941	-1.23362	14.62264	-.674731	-54.36478
2P3/2 4D5/2	3799.6015	3846.1661	-4.97632	-1.16859	14.61969	-.674601	-54.36478
2P3/2 4F5/2	4155.7129	4202.8441	-5.68379	-1.01954	14.61103	-.674164	-54.36478
2P3/2 4F7/2	4168.1415	4215.6070	-6.02002	-1.01666	14.61006	-.674113	-54.36478
2P3/2 5S1/2	4235.5161	4282.4131	-5.08387	-1.13134	14.34473	-.661724	-54.36478
2P3/2 5P1/2	4302.5980	4348.8451	-4.58121	-1.18299	14.55233	-.670480	-54.36478
2P3/2 5P3/2	4360.6687	4407.4672	-5.17902	-1.17172	14.58992	-.672840	-54.36478
2P3/2 5D3/2	4460.4971	4507.5366	-5.50105	-1.08879	14.58807	-.672964	-54.36478
2P3/2 5D5/2	4473.0451	4520.2335	-5.66396	-1.07388	14.58719	-.672923	-54.36478
2P3/2 5F5/2	4574.1908	4621.4540	-5.75194	-1.05468	14.58077	-.672592	-54.36478
2P3/2 6S1/2	4526.3442	4573.4882	-5.55587	-1.08042	14.52717	-.670102	-54.36478
2P3/2 6P1/2	4547.7895	4594.8214	-5.47817	-1.08818	14.57122	-.671980	-54.36478
2P3/2 6P3/2	4559.4739	4606.6044	-5.58426	-1.08654	14.57747	-.672383	-54.36478
2P3/2 6D3/2	4580.9771	4628.1498	-5.63791	-1.07280	14.57510	-.672301	-54.36478
2P3/2 7S1/2	4582.7766	4629.9471	-5.62483	-1.07429	14.56522	-.671838	-54.36478
NEPTUNIUM 5F4 6D1 Z=93 A=237 R=1.40336E-04 A.U.							
2P1/2 4D3/2	-37.8706	-44.3596	43.70066	-1.37851	13.32518	-.581776	-48.57660
2P1/2 4D5/2	8.7480	2.6139	43.47975	-1.50952	13.32206	-.581638	-48.57660
2P1/2 4F5/2	373.9484	368.5826	42.46683	-1.27653	13.31328	-.581190	-48.57660
2P1/2 4F7/2	387.4554	382.4396	42.14381	-1.27865	13.31235	-.581140	-48.57660
2P1/2 5S1/2	462.0019	456.3957	43.12446	-1.39640	13.02209	-.567331	-48.57660
2P1/2 5P1/2	531.3241	525.0742	43.59143	-1.43530	13.24738	-.576974	-48.57660
2P1/2 5P3/2	593.6099	587.8847	43.03266	-1.44132	13.29020	-.579709	-48.57660
2P1/2 5D3/2	695.9924	690.6021	42.58027	-1.32196	13.28850	-.579866	-48.57660

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
NEPTUNIUM							
	5F4 6D1	Z=93 A=237	R=1.40336E-04 A.U.				
2P1/2 5L5/2	710.2551	704.9277	42.54469	-1.34854	13.28764	-5.79826	-48.57660
2P1/2 5F5/2	815.5074	810.3021	42.39083	-1.31050	13.28103	-5.79479	-48.57660
2P1/2 6S1/2	766.7228	761.3907	42.60168	-1.33844	13.22219	-5.76694	-48.57660
2P1/2 6P1/2	788.7925	783.3508	42.67041	-1.34352	13.27020	-5.78773	-48.57660
2P1/2 6P3/2	801.5192	796.1714	42.57132	-1.34507	13.27741	-5.79244	-48.57660
2P1/2 6D3/2	823.5841	818.2909	42.50083	-1.32680	13.27493	-5.79159	-48.57660
2P1/2 7S1/2	825.4755	820.1755	42.52164	-1.33066	13.26432	-5.76653	-48.57660
2P3/2 3P1/2	-698.9837	-669.7892	16.42345	-2.90754	15.13896	-6.97590	-57.15173
2P3/2 3P3/2	254.2255	293.9791	4.92867	-2.57031	15.77825	-7.386460	-57.15173
2P3/2 3D3/2	824.2736	864.8259	3.61881	-2.07448	15.79820	-7.43141	-57.15173
2P3/2 3D5/2	1021.3520	1065.3561	-1.14809	-1.74839	15.78672	-7.42619	-57.15173
2P3/2 4S1/2	3248.4409	3296.4226	-3.44521	-1.35994	14.66433	-6.89115	-57.15173
2P3/2 4P1/2	3419.8561	3464.8112	-1.15620	-1.43336	15.51143	-7.25202	-57.15173
2P3/2 4P3/2	3673.8540	3721.3483	-4.29919	-1.30276	15.68564	-7.36288	-57.15173
2P3/2 4D3/2	3443.5499	3991.8134	-4.92966	-1.13228	15.68756	-7.37376	-57.15173
2P3/2 4D5/2	3491.9162	4040.9949	-5.80996	-1.06417	15.68435	-7.37231	-57.15173
2P3/2 4F5/2	4355.4105	4405.0749	-6.54212	-0.90900	15.67525	-7.36764	-57.15173
2P3/2 4F7/2	4368.9994	4419.0191	-6.89979	-0.90567	15.67418	-7.36707	-57.15173
2P3/2 5S1/2	4444.3405	4493.7786	-5.92264	-1.02567	15.38486	-7.22948	-57.15173
2P3/2 5P1/2	4513.1844	4561.9258	-5.38780	-1.07932	15.61001	-7.32590	-57.15173
2P3/2 5P3/2	4578.1230	4625.4563	-6.03222	-1.06662	15.65260	-7.35310	-57.15173
2P3/2 5L3/2	4677.8651	4727.4496	-6.36828	-0.97978	15.65076	-7.35458	-57.15173
2P3/2 5D5/2	4692.4835	4742.2289	-6.54487	-0.96321	15.64980	-7.35412	-57.15173
2P3/2 5F5/2	4797.4693	4847.2987	-6.64425	-0.94157	15.64319	-7.35065	-57.15173
2P3/2 6S1/2	4748.6323	4798.5379	-6.43714	-0.96902	15.56456	-7.32291	-57.15173
2P3/2 6P1/2	4770.8106	4820.3964	-6.35528	-0.97692	15.63250	-7.34368	-57.15173
2P3/2 6P3/2	4783.6500	4833.3420	-6.47003	-0.97499	15.63960	-7.34833	-57.15173
2P3/2 6D3/2	4805.6146	4855.3516	-6.52748	-0.96037	15.63714	-7.34748	-57.15173
2P3/2 7S1/2	4607.5331	4857.2688	-6.51451	-0.96182	15.62658	-7.34244	-57.15173
PLUTONIUM							
	5F6	Z=94 A=244	R=1.41704E-04 A.U.				
2P1/2 4D5/2	-1.7330	-8.4827	45.30543	-1.41724	14.20015	-6.29671	-50.70892
2P1/2 4F5/2	370.7517	364.7947	44.27895	-1.17481	14.15093	-6.29192	-50.70892
2P1/2 4F7/2	385.6876	380.1001	43.91221	-1.17657	14.18989	-6.29135	-50.70892
2P1/2 5S1/2	467.9729	461.7875	44.93225	-1.29938	13.87434	-6.13846	-50.70892
2P1/2 5P1/2	538.7733	531.8996	45.42842	-1.33930	14.11793	-6.24432	-50.70892
2P1/2 5P3/2	606.2048	599.8951	44.82423	-1.34436	14.16634	-6.27576	-50.70892
2P1/2 5D3/2	705.2884	703.3270	44.35331	-1.21993	14.16471	-6.27763	-50.70892
2P1/2 5D5/2	726.5165	720.6255	44.31051	-1.24665	14.16377	-6.27718	-50.70892
2P1/2 5F5/2	834.3430	828.5820	44.14601	-1.20568	14.15693	-6.27353	-50.70892
2P1/2 6S1/2	783.9518	778.0679	44.35592	-1.23386	14.09512	-6.24375	-50.70892
2P1/2 6P1/2	806.3004	800.3061	44.42232	-1.23816	14.14566	-6.26601	-50.70892
2P1/2 6P3/2	819.1408	813.2443	44.31848	-1.23939	14.15350	-6.27122	-50.70892
2P1/2 7S1/2	841.5825	835.7365	44.26588	-1.22472	14.14032	-6.26516	-50.70892
2P3/2 3P1/2	-647.6799	-616.8194	16.58967	-2.86944	16.20746	-7.60316	-60.02790
2P3/2 3P3/2	360.4912	402.4766	4.43102	-2.50320	16.91722	-8.06499	-60.02790
2P3/2 3D3/2	439.7960	982.5335	3.17836	-2.01529	16.93897	-8.11646	-60.02790
2P3/2 3D5/2	1147.1609	1193.5171	-0.77529	-1.66822	16.92623	-8.11056	-60.02790
2P3/2 4S1/2	3428.5655	3479.0927	-4.19724	-1.26637	15.71866	-7.52333	-60.02790
2P3/2 4P1/2	3603.9849	3651.3123	-1.79666	-1.33567	16.62441	-7.91589	-60.02790
2P3/2 4P3/2	3873.6772	3924.0210	-5.13611	-1.19440	16.81878	-8.04174	-60.02790
2P3/2 4D3/2	4149.2591	4200.0622	-5.76899	-1.02182	16.82102	-8.05381	-60.02790
2P3/2 4D5/2	4250.5173	4252.1788	-6.69546	-0.95042	16.81748	-8.05221	-60.02790
2P3/2 4F5/2	4571.2414	4623.5048	-7.44940	-0.78928	16.80789	-8.04718	-60.02790
2P3/2 4F7/2	4586.2559	4638.8988	-7.83178	-0.78529	16.80672	-8.04655	-60.02790
2P3/2 5S1/2	4669.3844	4721.4338	-6.81382	-0.91048	16.44218	-7.89422	-60.02790
2P3/2 5P1/2	4739.6885	4790.9937	-6.24686	-0.96606	16.73568	-8.00008	-60.02790
2P3/2 5P3/2	4807.7875	4859.7277	-6.94162	-0.95132	16.78381	-8.03138	-60.02790
2P3/2 5D3/2	4910.2039	4962.4045	-7.29021	-0.86116	16.78202	-8.03310	-60.02790
2P3/2 5D5/2	4927.7970	4980.1714	-7.48183	-0.84239	16.78099	-8.03262	-60.02790
2P3/2 5F5/2	5035.3417	5087.8063	-7.58933	-0.81861	16.77416	-8.02896	-60.02790
2P3/2 6S1/2	4985.0999	5037.4439	-7.38238	-0.84631	16.71251	-7.99926	-60.02790
2P3/2 6P1/2	5007.3587	5059.5821	-7.30293	-0.85346	16.76299	-8.02152	-60.02790

FINAL STATE	E(TOT)	E(OHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
PLUTONIUM 5F6 Z=94 A=244 R=1.41704E-04 A.U.							
2P3/2 6P3/2	5020.2950	5072.6293	-7.42348	-.85099	16.77071	-.802666	-60.02790
2P3/2 7S1/2	5042.6685	5095.0498	-7.47168	-.83727	16.75760	-.802063	-60.02790
AMEFICIUM 5F7 Z=95 A=243 R=1.41510E-04 A.U.							
2P1/2 4D5/2	-18.6740	-26.0777	47.19382	-1.31088	15.14452	-.681544	-52.94221
2P1/2 4F5/2	351.6238	355.0539	46.12658	-1.05825	15.13479	-.681030	-52.94221
2P1/2 4F7/2	377.2522	371.0991	45.74265	-1.06004	15.13365	-.680966	-52.94221
2P1/2 5S1/2	467.6708	461.0719	46.80372	-1.18852	14.78994	-.664017	-52.94221
2P1/2 5P1/2	540.9673	533.4329	47.32751	-1.22892	15.05370	-.675845	-52.94221
2P1/2 5P3/2	613.0121	606.0813	46.67788	-1.23404	15.10843	-.679258	-52.94221
2P1/2 5D3/2	719.5332	712.9681	46.18276	-1.10278	15.10579	-.679474	-52.94221
2P1/2 5D5/2	736.85e2	730.3658	46.13776	-1.13147	15.10579	-.679425	-52.94221
2P1/2 5F5/2	849.7775	843.4316	45.95519	-1.08673	15.09871	-.679041	-52.94221
2P1/2 5F7/2	852.7856	846.4875	45.90848	-1.08757	15.09837	-.679022	-52.94221
2P1/2 6S1/2	798.2603	791.7881	46.17544	-1.11654	15.03126	-.675732	-52.94221
2P1/2 6F1/2	821.5243	814.9344	46.24499	-1.12078	15.08610	-.676185	-52.94221
2P1/2 6P3/2	834.9e03	828.4764	46.13166	-1.12172	15.09494	-.678783	-52.94221
2P1/2 7S1/2	858.0190	851.5903	46.07432	-1.10622	15.08091	-.678128	-52.94221
2P3/2 3P1/2	-596.3897	-563.7399	16.70131	-2.81417	17.36320	-.828713	-63.07140
2P3/2 3P3/2	469.2773	513.6371	3.86163	-2.42046	18.15131	-.880877	-63.07140
2P3/2 3D3/2	1058.3487	1103.4302	2.63406	-1.93242	18.17475	-.886517	-63.07140
2P3/2 3D5/2	1275.8755	1324.7229	-1.47583	-1.57522	18.16088	-.885864	-63.07140
2P3/2 4S1/2	3611.8740	3665.0984	-5.03101	-1.15715	16.85660	-.821417	-63.07140
2P3/2 4P1/2	3791.4665	3841.3085	-2.51453	-1.22163	17.82964	-.864101	-63.07140
2P3/2 4P3/2	4077.9835	4131.0164	-6.06062	-1.06901	18.04653	-.878382	-63.07140
2P3/2 4D3/2	4359.2918	4412.7864	-6.69852	-.89401	18.04907	-.879718	-63.07140
2P3/2 4D5/2	4413.4321	4467.8259	-7.66820	-.81982	18.04521	-.879340	-63.07140
2P3/2 4F5/2	4791.9245	4846.9433	-8.45158	-.65195	18.03509	-.879001	-63.07140
2P3/2 4F7/2	4607.6687	4863.0844	-8.85141	-.64776	18.03361	-.878930	-63.07140
2P3/2 5S1/2	4899.1345	4953.5490	-7.79365	-.77865	17.65124	-.862044	-63.07140
2P3/2 5P1/2	4971.7211	5025.7400	-7.19293	-.83579	17.95484	-.873670	-63.07140
2P3/2 5P3/2	5044.4466	5099.1449	-7.93897	-.81988	18.00926	-.877264	-63.07140
2P3/2 5D3/2	5150.2755	5205.2465	-8.30469	-.72495	18.00746	-.877466	-63.07140
2P3/2 5D5/2	5167.9585	5223.1137	-8.50737	-.70538	18.00634	-.877414	-63.07140
2P3/2 5F5/2	5280.5753	5335.8335	-8.63037	-.67871	17.99927	-.877029	-63.07140
2P3/2 5F7/2	5283.6040	5336.9108	-8.67831	-.67899	17.99893	-.877010	-63.07140
2P3/2 6S1/2	5229.2256	5284.3594	-8.41259	-.70811	17.93200	-.873730	-63.07140
2P3/2 6P1/2	5252.3961	5307.4020	-8.32989	-.71521	17.98676	-.876181	-63.07140
2P3/2 6P3/2	5265.9352	5321.0606	-8.46032	-.71238	17.99550	-.876773	-63.07140
2P3/2 7S1/2	5286.9218	5344.0986	-8.51293	-.69787	17.98153	-.876119	-63.07140
CURIUM 5F7 6D1 Z=96 A=247 R=1.42282E-04 A.U.							
2P1/2 4D5/2	-42.4262	-50.5578	49.13769	-1.19109	16.14362	-.737170	-55.22143
2P1/2 4F5/2	345.5247	338.2468	48.03075	-.92827	16.13349	-.736625	-55.22143
2P1/2 4F7/2	362.2804	355.4110	47.62497	-.92979	16.13217	-.736550	-55.22143
2P1/2 5S1/2	461.1606	453.6732	48.73388	-1.06471	15.75765	-.717755	-55.22143
2P1/2 5P1/2	536.3487	528.0732	49.29018	-1.10583	16.04307	-.730515	-55.22143
2P1/2 5P3/2	614.0514	606.4213	48.59219	-1.11093	16.10493	-.734666	-55.22143
2P1/2 5D3/2	723.5651	716.3177	46.07306	-.97260	16.10325	-.734914	-55.22143
2P1/2 5D5/2	742.3420	735.1749	48.02437	-1.00310	16.10214	-.734858	-55.22143
2P1/2 5F5/2	860.2746	853.2654	47.82465	-.95438	16.09479	-.734451	-55.22143
2P1/2 5F7/2	863.8436	856.8899	47.77040	-.95528	16.09440	-.734430	-55.22143
2P1/2 6S1/2	808.6475	801.5013	48.06700	-.98748	16.01877	-.730654	-55.22143
2P1/2 6P1/2	832.6953	825.4170	48.14546	-.99206	16.07976	-.733421	-55.22143
2P1/2 6P3/2	848.1816	841.0204	48.01965	-.99301	16.09016	-.734134	-55.22143
2P1/2 6D3/2	871.9276	864.8309	47.93677	-.97193	16.08731	-.734035	-55.22143
2P1/2 7S1/2	873.4593	866.3563	47.95951	-.97623	16.07450	-.733390	-55.22143
2P3/2 3P1/2	-542.3926	-510.8778	16.75870	-2.74482	18.55571	-.902892	-66.22152
2P3/2 3P3/2	580.8029	627.6437	3.19174	-2.31981	19.47055	-.961775	-66.22152
2P3/2 3D3/2	1179.5790	1227.1020	2.00574	-1.83499	19.49574	-.967949	-66.22152
2P3/2 3D5/2	1407.8556	1459.3489	-2.28286	-1.46234	19.48064	-.967227	-66.22152

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FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
CURIUM							
	5F7 6D1	Z=96 A=247	R=1.42282E-04 A.U.				
2P3/2 4S1/2	3798.4044	3854.4414	-5.96189	-1.03173	18.07470	-.896530	-66.22152
2P3/2 4P1/2	3982.1456	4034.6076	-3.32379	-1.09079	19.11701	-.942898	-66.22152
2P3/2 4P3/2	4286.5050	4342.3431	-7.09080	-.92550	19.35864	-.959088	-66.22152
2P3/2 4D3/2	4573.4674	4629.7862	-7.72974	-.74877	19.36181	-.960370	-66.22152
2P3/2 4D5/2	4630.7756	4686.0183	-8.74706	-.67129	19.35758	-.960372	-66.22152
2P3/2 4F5/2	5016.8546	5074.7438	-9.55803	-.49677	19.34694	-.959795	-66.22152
2P3/2 4F7/2	5033.6989	5092.0067	-9.97998	-.49213	19.34552	-.959716	-66.22152
2P3/2 5S1/2	5132.5195	5191.2137	-8.87436	-.62955	18.97225	-.940991	-66.22152
2P3/2 5P1/2	5208.1829	5265.0254	-8.23625	-.68882	19.25755	-.953752	-66.22152
2P3/2 5P3/2	5286.5814	5344.1500	-9.03696	-.67125	19.31903	-.957879	-66.22152
2P3/2 5D3/2	5395.3757	5453.2276	-9.41792	-.57169	19.31719	-.958113	-66.22152
2P3/2 5D5/2	5414.5204	5472.5699	-9.63522	-.55065	19.31595	-.958052	-66.22152
2P3/2 5F5/2	5532.1332	5590.2962	-9.77117	-.52128	19.30859	-.957644	-66.22152
2P3/2 5F7/2	5535.7190	5593.9382	-9.82677	-.52153	19.30821	-.957623	-66.22152
2P3/2 6S1/2	5480.6695	5538.7175	-9.53147	-.55393	19.23279	-.953809	-66.22152
2P3/2 6P1/2	5504.6377	5562.5220	-9.43813	-.56174	19.29369	-.956622	-66.22152
2P3/2 6P3/2	5520.2269	5578.2428	-9.58238	-.55870	19.30400	-.957330	-66.22152
2P3/2 6D3/2	5543.9314	5602.0015	-9.65079	-.54159	19.30106	-.957226	-66.22152
2P3/2 7S1/2	5545.4338	5603.5034	-9.63663	-.54327	19.28639	-.956588	-66.22152
BERKELIUM							
	5F9	Z=97 A=247	R=1.42282E-04 A.U.				
2P1/2 4D5/2	-53.8289	-62.7534	51.18124	-1.05557	17.21152	-.756969	-57.61577
2P1/2 4F5/2	342.2399	334.2043	50.02857	-.78167	17.20081	-.756383	-57.61577
2P1/2 4F7/2	359.4181	351.8042	49.61015	-.78357	17.19935	-.756299	-57.61577
2P1/2 5S1/2	466.5133	458.2810	50.75532	-.92429	16.79253	-.775533	-57.61577
2P1/2 5P1/2	544.3254	535.2550	51.34017	-.96516	17.10070	-.789498	-57.61577
2P1/2 5P3/2	626.3337	617.9523	50.59140	-.97038	17.17045	-.754252	-57.61577
2P1/2 5D3/2	735.8750	731.6960	50.04510	-.82472	17.16888	-.794539	-57.61577
2P1/2 5D5/2	757.2344	749.3381	49.99654	-.85764	17.16762	-.794478	-57.61577
2P1/2 5F5/2	880.4608	872.7399	49.77561	-.80464	17.15998	-.794048	-57.61577
2P1/2 5F7/2	883.3724	875.7060	49.72220	-.80564	17.15962	-.754027	-57.61577
2P1/2 6S1/2	826.4243	818.5690	50.01955	-.83846	17.08001	-.789986	-57.61577
2P1/2 6P1/2	891.5291	843.5420	50.09363	-.84202	17.14420	-.752944	-57.61577
2P1/2 6P3/2	866.2777	858.4129	49.96143	-.84265	17.15549	-.793731	-57.61577
2P1/2 7S1/2	890.2773	882.4763	49.89567	-.82560	17.13964	-.752966	-57.61577
2P3/2 3P1/2	-474.2961	-437.8167	16.81458	-2.66676	19.92232	-.983536	-69.56604
2P3/2 3P3/2	715.3612	764.8032	2.49270	-2.21222	20.89359	-1.049982	-69.56604
2P3/2 3D3/2	1324.1981	1374.2913	1.33497	-1.72611	20.92067	-1.056735	-69.56604
2P3/2 3D5/2	1563.1586	1617.3631	-3.05707	-1.34969	20.90423	-1.055936	-69.56604
2P3/2 4S1/2	4008.4009	4067.3778	-6.92246	-.89854	19.38858	-.978416	-69.56604
2P3/2 4P1/2	4196.4477	4251.6494	-4.16066	-.95125	20.50500	-1.028752	-69.56604
2P3/2 4P3/2	4519.4221	4578.1913	-8.15772	-.77301	20.77468	-1.047099	-69.56604
2P3/2 4D3/2	4812.3116	4871.5435	-8.80096	-.59417	20.77799	-1.048734	-69.56604
2P3/2 4D5/2	4872.5840	4932.8001	-9.86048	-.51443	20.77337	-1.048514	-69.56604
2P3/2 4F5/2	5266.7222	5327.6117	-10.70524	-.33249	20.76213	-1.047894	-69.56604
2P3/2 4F7/2	5283.9841	5345.3060	-11.14075	-.32791	20.76059	-1.047806	-69.56604
2P3/2 5S1/2	5392.0775	5452.7858	-9.99921	-.47105	20.35510	-1.027117	-69.56604
2P3/2 5P1/2	5469.3478	5529.1502	-9.32750	-.53088	20.66312	-1.041083	-69.56604
2P3/2 5P3/2	5552.0619	5612.6389	-10.18513	-.51244	20.73244	-1.045810	-69.56604
2P3/2 5D3/2	5664.6627	5725.7378	-10.58606	-.40755	20.73063	-1.046079	-69.56604
2P3/2 5D5/2	5682.5994	5743.6799	-10.81130	-.38644	20.72930	-1.046014	-69.56604
2P3/2 5F5/2	5805.4927	5866.7019	-10.96539	-.35384	20.72166	-1.045582	-69.56604
2P3/2 5F7/2	5808.4268	5864.6905	-11.01428	-.35408	20.72124	-1.045559	-69.56604
2P3/2 6S1/2	5751.6440	5812.7214	-10.72495	-.38682	20.64192	-1.041534	-69.56604
2P3/2 6P1/2	5776.6460	5837.5798	-10.63561	-.39372	20.70604	-1.044489	-69.56604
2P3/2 6P3/2	5791.4936	5852.5649	-10.78711	-.39009	20.71719	-1.045268	-69.56604
2P3/2 7S1/2	5815.4199	5876.5504	-10.84712	-.37418	20.70137	-1.044505	-69.56604

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
CALIFORNIUM 5F10 Z=98 A=251 R=1.43046E-04 A.U.							
2P1/2 4D5/2	-71.9274	-81.7170	53.28665	-.90458	18.34179	-.861019	-60.07330
2P1/2 4F5/2	332.0795	323.2129	52.08936	-.61954	18.33052	-.860393	-60.07330
2P1/2 4F7/2	350.0479	341.6207	51.65349	-.62155	18.32889	-.860298	-60.07330
2P1/2 5S1/2	465.3348	456.2846	52.64292	-.76880	17.88668	-.837342	-60.07330
2P1/2 5P1/2	545.5626	535.6192	53.45950	-.80959	18.21936	-.852618	-60.07330
2P1/2 5P3/2	632.9549	623.7464	52.65664	-.81482	18.29800	-.858062	-60.07330
2P1/2 5D3/2	750.0829	741.2939	52.08625	-.66183	18.29625	-.858378	-60.07330
2P1/2 5D5/2	767.4210	758.7232	52.03065	-.69660	18.29542	-.858340	-60.07330
2P1/2 5F5/2	895.8009	887.2907	51.79433	-.64001	18.28705	-.857862	-60.07330
2P1/2 5F7/2	898.6497	890.1958	51.73946	-.64109	18.28668	-.857840	-60.07330
2P1/2 6S1/2	840.4232	831.7752	52.05000	-.67554	18.20016	-.853373	-60.07330
2P1/2 6P1/2	866.4578	857.6703	52.12667	-.67874	18.26949	-.856613	-60.07330
2P1/2 6P3/2	881.9146	873.2582	51.98415	-.67914	18.28219	-.857512	-60.07330
2P1/2 7S1/2	906.3652	897.7761	51.91524	-.66148	18.26536	-.856688	-60.07330
2P3/2 3P1/2	-402.5207	-363.9772	16.80986	-2.57298	21.33859	-1.070992	-73.04796
2P3/2 3P3/2	853.9195	906.0953	1.08026	-2.08479	22.41065	-1.145933	-73.04796
2P3/2 3D3/2	1472.7696	1525.5566	.56921	-1.60072	22.44574	-1.153313	-73.04796
2P3/2 3D5/2	1723.0927	1780.1090	-4.02842	-1.21530	22.42782	-1.152429	-73.04796
2P3/2 4S1/2	4222.7961	4284.8548	-7.99016	-.74739	20.79431	-1.067460	-73.04796
2P3/2 4P1/2	4415.1336	4473.2056	-5.09815	-.79313	21.98431	-1.122053	-73.04796
2P3/2 4P3/2	4757.8251	4819.6661	-9.33933	-.60086	22.28997	-1.142832	-73.04796
2P3/2 4D3/2	5056.5706	5118.8746	-9.98489	-.42021	22.29369	-1.144636	-73.04796
2P3/2 4D5/2	5120.1012	5183.4337	-11.09105	-.33771	22.28863	-1.144392	-73.04796
2P3/2 4F5/2	5522.1179	5586.1486	-11.96753	-.14845	22.27678	-1.143727	-73.04796
2P3/2 4F7/2	5540.1727	5604.6541	-12.42114	-.14371	22.27508	-1.143628	-73.04796
2P3/2 5S1/2	5656.5131	5720.3764	-11.23548	-.29340	21.83433	-1.120758	-73.04796
2P3/2 5P1/2	5736.1846	5799.0324	-10.52627	-.35438	22.16684	-1.136035	-73.04796
2P3/2 5P3/2	5824.3035	5868.0271	-11.44455	-.33455	22.24493	-1.141444	-73.04796
2P3/2 5D3/2	5940.5886	6004.6232	-11.86353	-.22449	22.24312	-1.141752	-73.04796
2P3/2 5D5/2	5958.3007	6022.5516	-12.10027	-.20266	22.24167	-1.141679	-73.04796
2P3/2 5F5/2	6086.4049	6150.7974	-12.27004	-.16699	22.23371	-1.141222	-73.04796
2P3/2 5F7/2	6089.2787	6153.7285	-12.32673	-.16721	22.23325	-1.141196	-73.04796
2P3/2 6S1/2	6031.2266	6095.4841	-12.01805	-.20180	22.14706	-1.136747	-73.04796
2P3/2 6P1/2	6057.1549	6121.2602	-11.92509	-.20856	22.21629	-1.139985	-73.04796
2P3/2 6P3/2	6072.7126	6136.9650	-12.08793	-.20449	22.22885	-1.140875	-73.04796
2P3/2 7S1/2	6097.0829	6161.3980	-12.15118	-.18793	22.21206	-1.140051	-73.04796
EINSTEINIUM 5F11 Z=99 A=254 R=1.43614E-04 A.U.							
2P1/2 4D5/2	-90.3262	-101.0739	55.46992	-.73647	19.54576	-.929820	-62.60167
2P1/2 4F5/2	321.6581	311.6680	54.22706	-.44000	19.53387	-.929149	-62.60167
2P1/2 4F7/2	340.4446	331.1120	53.77335	-.44216	19.53213	-.929045	-62.60167
2P1/2 5S1/2	463.8450	453.8883	55.00872	-.59624	19.65156	-.903681	-62.60167
2P1/2 5P1/2	546.5303	535.6203	55.65833	-.63675	19.41046	-.920375	-62.60167
2P1/2 5P3/2	639.6061	629.4791	54.79815	-.64196	19.49904	-.926600	-62.60167
2P1/2 5D3/2	760.3722	750.6852	54.19937	-.48116	19.49746	-.926969	-62.60167
2P1/2 5D5/2	777.6475	768.0514	54.14744	-.51878	19.49601	-.926896	-62.60167
2P1/2 5F5/2	911.3914	902.0016	53.88778	-.45755	19.46764	-.926409	-62.60167
2P1/2 5F7/2	914.1760	904.8447	53.83090	-.45872	19.48721	-.926383	-62.60167
2P1/2 6S1/2	854.6079	845.0772	54.15563	-.49504	19.39328	-.921452	-62.60167
2P1/2 6P1/2	881.5856	871.9071	54.23495	-.49785	19.46808	-.924997	-62.60167
2P1/2 6P3/2	897.7976	888.2591	54.08189	-.49806	19.48237	-.926024	-62.60167
2P1/2 7S1/2	922.6759	913.2086	54.00932	-.47966	19.46445	-.925132	-62.60167
2P3/2 3P1/2	-322.9155	-282.2205	16.75773	-2.46444	22.65956	-1.166097	-76.68174
2P3/2 3P3/2	1003.7347	1058.7623	.78867	-1.94023	24.05625	-1.250593	-76.68174
2P3/2 3D3/2	1632.6836	1688.2786	-.28298	-1.45907	24.08742	-1.258648	-76.68174
2P3/2 3D5/2	1894.7368	1954.7229	-5.04945	-1.06509	24.06769	-1.257670	-76.68174
2P3/2 4S1/2	4448.7802	4514.0474	-9.14772	-.58038	22.30721	-1.164556	-76.68174
2P3/2 4P1/2	4645.4602	4706.5185	-6.12053	-.61830	23.58604	-1.223724	-76.68174
2P3/2 4P3/2	5008.9350	5073.9739	-10.62015	-.41095	23.92123	-1.247254	-76.68174
2P3/2 4D3/2	5313.5783	5379.0791	-11.26641	-.22879	23.92535	-1.249239	-76.68174
2P3/2 4D5/2	5380.4998	5447.0746	-12.42036	-.14358	23.91982	-1.248959	-76.68174
2P3/2 4F5/2	5790.4331	5857.7324	-13.32993	.05327	23.90733	-1.248256	-76.68174
2P3/2 4F7/2	5809.3068	5877.0749	-13.80184	.05817	23.90547	-1.248147	-76.68174

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
EINSTEINIUM 5F11 Z=99 A=254 R=1.43614E-04 A.U.							
2P3/2 5S1/2	5933.8203	6000.9671	-12.57027	-.09841	23.42655	-1.222881	-76.68174
2P3/2 5P1/2	6015.9351	6062.0537	-11.82217	-.16037	23.76526	-1.239575	-76.68174
2P3/2 5P3/2	6109.7413	6170.7396	-12.60502	-.13905	23.87325	-1.245762	-76.68174
2P3/2 5D3/2	6229.7103	6297.0327	-13.24236	-.02364	23.87143	-1.246111	-76.68174
2P3/2 5D5/2	6247.3696	6314.9194	-13.49077	-.00109	23.86984	-1.246031	-76.68174
2P3/2 5F5/2	6380.7484	6448.4528	-13.67634	.03773	23.86149	-1.245543	-76.68174
2P3/2 5F7/2	6383.5547	6451.3191	-13.73565	.03753	23.86100	-1.245514	-76.68174
2P3/2 6S1/2	6324.1765	6391.7447	-13.41225	.00101	23.76739	-1.240602	-76.68174
2P3/2 6P1/2	6351.6459	6418.4509	-13.31564	-.00557	23.84210	-1.244144	-76.68174
2P3/2 6P3/2	6367.3561	6434.9181	-13.49029	-.00105	23.85623	-1.245161	-76.68174
2P3/2 7S1/2	6392.1514	6459.7799	-13.55707	.01620	23.83835	-1.244270	-76.68174
FERMIUM 5F12 Z=100 A=257 R=1.44177E-04 A.U.							
2P1/2 4D5/2	-109.2462	-121.0524	57.73512	-.55007	20.82630	-1.003526	-65.20163
2P1/2 4F5/2	310.7521	299.9393	56.44530	-.24163	20.81377	-1.002808	-65.20163
2P1/2 4F7/2	330.3788	320.0414	55.97404	-.24418	20.81163	-1.002690	-65.20163
2P1/2 5S1/2	461.7931	450.8281	57.25694	-.40545	20.26981	-.974688	-65.20163
2P1/2 5P1/2	546.9817	535.0040	57.94094	-.44546	20.67676	-.992910	-65.20163
2P1/2 5P3/2	646.0617	634.9176	57.01971	-.45059	20.77646	-1.000022	-65.20163
2P1/2 5D3/2	770.5020	759.8174	56.39368	-.28188	20.77489	-1.000438	-65.20163
2P1/2 5D5/2	787.7133	777.1233	56.34076	-.32206	20.77328	-1.000356	-65.20163
2P1/2 5F5/2	926.7650	916.4175	56.06080	-.25639	20.76454	-.999839	-65.20163
2P1/2 5F7/2	929.5070	919.2005	56.00140	-.25759	20.76410	-.999812	-65.20163
2P1/2 6S1/2	868.5365	856.0249	56.34144	-.29594	20.66210	-.994369	-65.20163
2P1/2 6P1/2	896.4702	885.8019	56.42372	-.29833	20.74277	-.998244	-65.20163
2P1/2 6P3/2	913.4717	902.9530	56.25921	-.29829	20.75883	-.999416	-65.20163
2P1/2 7S1/2	936.7339	928.2900	56.18342	-.27923	20.73981	-.998454	-65.20163
2P3/2 3P1/2	-235.2118	-192.2754	16.65567	-2.34034	24.44142	-1.269348	-80.47376
2P3/2 3P3/2	1165.2397	1223.2407	-.20485	-1.77758	25.61979	-1.364581	-80.47376
2P3/2 3D3/2	1804.3813	1862.9024	-1.22696	-1.30014	25.85317	-1.373366	-80.47376
2P3/2 3D5/2	2078.5768	2141.6551	-6.16617	-.89798	25.83194	-1.372287	-80.47376
2P3/2 4S1/2	4686.7446	4755.3515	-10.40052	-.39649	25.93416	-1.270280	-80.47376
2P3/2 4P1/2	4887.8182	4951.9819	-7.23167	-.42566	25.30219	-1.334363	-80.47376
2P3/2 4P3/2	5273.1863	5341.5527	-12.00519	-.20231	25.67584	-1.360982	-80.47376
2P3/2 4D3/2	5583.7710	5652.5996	-12.65371	-.01837	25.66041	-1.363167	-80.47376
2P3/2 4D5/2	5654.2238	5724.1712	-13.85413	.06906	25.67435	-1.362865	-80.47376
2P3/2 4F5/2	6072.1123	6142.8108	-14.79746	.27372	25.66116	-1.362102	-80.47376
2P3/2 4F7/2	6091.6326	6163.0183	-15.28782	.27876	25.65912	-1.361579	-80.47376
2P3/2 5S1/2	6224.4178	6294.9804	-14.00857	.11495	25.13892	-1.334086	-80.47376
2P3/2 5P1/2	6309.0162	6378.4846	-13.22007	.05217	25.52563	-1.352308	-80.47376
2P3/2 5P3/2	6408.8313	6479.2359	-14.27118	.07508	25.62466	-1.359376	-80.47376
2P3/2 5D3/2	6332.4573	6603.1993	-14.72722	.19597	25.62263	-1.359770	-80.47376
2P3/2 5D5/2	6550.0403	6621.0204	-14.98747	.21920	25.62110	-1.359681	-80.47376
2P3/2 5F5/2	6688.7447	6759.8935	-15.18956	.26131	25.61236	-1.359164	-80.47376
2P3/2 5F7/2	6691.4773	6762.6885	-15.25129	.26114	25.61184	-1.359132	-80.47376
2P3/2 6S1/2	6630.7142	6701.7217	-14.91283	.22261	25.51024	-1.353712	-80.47376
2P3/2 6P1/2	6658.5310	6729.3677	-14.81240	.21625	25.59079	-1.357583	-80.47376
2P3/2 6P3/2	6675.6379	6746.6420	-14.99948	.22126	25.60666	-1.358742	-80.47376
2P3/2 7S1/2	6700.8118	6771.8858	-15.06926	.23912	25.58771	-1.357783	-80.47376
RENDELEVIUM 5F13 Z=101 A=256 R=1.43990E-04 A.U.							
2P1/2 4D5/2	-128.3417	-141.2714	60.08266	-.34359	22.19828	-1.082768	-67.92486
2P1/2 4F5/2	299.7126	287.8132	58.74460	-.02326	22.18508	-1.082000	-67.92486
2P1/2 4F7/2	320.2147	308.8090	58.25522	-.02581	22.18298	-1.081870	-67.92486
2P1/2 5S1/2	459.5035	447.4700	59.58819	-.19466	21.61584	-1.050965	-67.92486
2P1/2 5P1/2	547.2422	534.1313	60.30766	-.23392	22.03291	-1.070837	-67.92486
2P1/2 5P3/2	652.6612	640.4367	59.32219	-.23898	22.14507	-1.078454	-67.92486
2P1/2 5D3/2	780.8327	769.0876	58.66795	-.06210	22.14356	-1.079425	-67.92486
2P1/2 5D5/2	797.9480	786.3016	58.61369	-.10490	22.14160	-1.079335	-67.92486
2P1/2 5F5/2	942.4166	931.0092	58.31330	-.03470	22.13263	-1.078783	-67.92486
2P1/2 5F7/2	945.0602	933.7156	58.25202	-.03598	22.13213	-1.078752	-67.92486

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
MENDELEVIUM 5F13 Z=101 A=256 R=1.43990E-04 A.U.							
2P1/2 6S1/2	882.6152	871.0603	58.60744	-.07640	22.02144	-1.072751	-67.92486
2P1/2 6P1/2	911.5188	899.7980	58.69252	-.07829	22.10839	-1.076982	-67.92486
2P1/2 6P3/2	929.4711	917.9096	58.51626	-.07802	22.12643	-1.078316	-67.92486
2F1/2 7S1/2	955.0326	943.5498	58.43702	-.05824	22.10618	-1.077278	-67.92486
2P3/2 3F1/2	-136.4664	-93.1597	16.49408	-2.19903	26.25410	-1.381824	-84.49402
2P3/2 3P3/2	1339.5971	1400.7536	-1.30752	-1.59498	27.72919	-1.489140	-84.49402
2P3/2 3D3/2	1989.0105	2000.6360	-2.27554	-1.12211	27.76486	-1.498712	-84.49402
2P3/2 3D5/2	2275.7872	2342.1391	-7.38974	-.71236	27.74170	-1.497517	-84.49402
2P3/2 4S1/2	4937.7429	5009.8815	-11.76002	-.19414	25.69532	-1.385779	-84.49402
2P3/2 4P1/2	5143.2795	5210.7288	-8.44516	-.21392	27.15898	-1.455145	-84.49402
2P3/2 4P3/2	5551.7413	5623.6250	-13.50682	.02685	27.57552	-1.485251	-84.49402
2P3/2 4D3/2	5868.3114	5940.6557	-14.15530	.21201	27.58064	-1.487656	-84.49402
2P3/2 4D5/2	5942.4345	6015.9449	-15.40496	.30195	27.57397	-1.487320	-84.49402
2P3/2 4F5/2	6366.3172	6442.6060	-16.38299	.51464	27.56004	-1.486501	-84.49402
2P3/2 4F7/2	6388.9136	6463.7083	-16.69190	.51979	27.55760	-1.486364	-84.49402
2F3/2 5S1/2	6529.4402	6603.6115	-15.56273	.34837	26.99271	-1.455584	-84.49402
2P3/2 5P1/2	6616.5722	6689.5796	-14.73240	.28497	27.40951	-1.475457	-84.49402
2P3/2 5P3/2	6722.7237	6796.7366	-15.85582	.30956	27.52094	-1.483523	-84.49402
2P3/2 5D3/2	6850.0655	6924.4192	-16.33087	.43610	27.51910	-1.483967	-84.49402
2P3/2 5D5/2	6867.5515	6942.1553	-16.60313	.45999	27.51721	-1.483869	-84.49402
2P3/2 5F5/2	7011.6392	7086.4248	-16.82176	.50544	27.50807	-1.483318	-84.49402
2P3/2 5F7/2	7014.2923	7089.1425	-16.88570	.50530	27.50748	-1.483282	-84.49402
2P3/2 6S1/2	6952.0683	7026.7095	-16.53177	.46468	27.39721	-1.477306	-84.49402
2P3/2 6P1/2	6980.8507	7055.3113	-16.42773	.45863	27.48404	-1.481533	-84.49402
2P3/2 6P3/2	6998.9060	7073.5466	-16.62773	.46411	27.50186	-1.482853	-84.49402
2P3/2 7S1/2	7024.3773	7099.0895	-16.70070	.48266	27.48167	-1.481817	-84.49402
NOBELIUM 5F14 Z=102 A=254 R=1.43614E-04 A.U.							
2P1/2 4D5/2	-147.6513	-161.7787	62.51909	-.11587	23.66189	-1.167754	-70.76995
2P1/2 4F5/2	286.5046	275.4451	61.13153	.21690	23.64795	-1.166930	-70.76995
2P1/2 4F7/2	309.9160	297.3705	60.62455	.21410	23.64559	-1.166782	-70.76995
2P1/2 5S1/2	456.9172	443.7437	62.00932	.03726	23.02958	-1.132694	-70.76995
2P1/2 5P1/2	547.2355	532.9162	62.76576	-.00099	23.47887	-1.154344	-70.76995
2P1/2 5P3/2	659.3586	645.9815	61.71142	-.00586	23.60506	-1.163603	-70.76995
2P1/2 5D3/2	791.3199	778.4421	61.02892	.17937	23.60355	-1.164130	-70.76995
2P1/2 5D5/2	608.3073	795.5322	60.97360	.13382	23.60163	-1.164031	-70.76995
2P1/2 5F5/2	556.2527	945.7331	60.65223	.20868	23.59204	-1.163445	-70.76995
2P1/2 5F7/2	960.7990	948.3445	60.58904	.20736	23.59150	-1.163410	-70.76995
2P1/2 6S1/2	896.8142	884.1445	60.96028	.16475	23.47138	-1.156797	-70.76995
2P1/2 6P1/2	926.7012	913.8558	61.04829	.16344	23.56506	-1.161412	-70.76995
2P1/2 6P3/2	945.4549	932.7793	60.85911	.16406	23.58533	-1.162932	-70.76995
2P1/2 7S1/2	971.4452	958.8517	60.77696	.18445	23.56385	-1.161814	-70.76995
2P3/2 3P1/2	-32.2508	15.6130	16.27151	-2.03981	28.15180	-1.504180	-88.74810
2P3/2 3P3/2	1527.4971	1591.9949	-2.52317	-1.39155	29.79011	-1.625084	-88.74810
2P3/2 3D3/2	2187.2565	2252.1632	-3.43215	-.92421	29.82824	-1.635504	-88.74810
2P3/2 3D5/2	2487.0645	2556.8764	-8.72524	-.50733	29.80296	-1.634183	-88.74810
2P3/2 4S1/2	5202.4386	5278.3050	-13.22974	.02741	27.59586	-1.511802	-88.74810
2P3/2 4P1/2	5412.4827	5483.4005	-9.76258	.01818	29.16156	-1.586837	-88.74810
2P3/2 4P3/2	5845.3000	5920.8954	-15.12994	.27748	29.62000	-1.620879	-88.74810
2P3/2 4D3/2	6167.8983	6243.9511	-15.77652	.46349	29.83161	-1.623517	-88.74810
2P3/2 4D5/2	6245.6358	6323.1035	-17.67666	.55593	29.62428	-1.623143	-88.74810
2P3/2 4F5/2	6675.7518	6757.8261	-18.09034	.77689	29.60956	-1.622264	-88.74810
2P3/2 4F7/2	6701.2562	6779.8552	-18.61810	.78215	29.60711	-1.622112	-88.74810
2P3/2 5S1/2	6849.5674	6927.5441	-17.23644	.60269	28.99330	-1.588181	-88.74810
2P3/2 5P1/2	6939.2764	7016.0158	-16.36272	.53887	29.44234	-1.609813	-88.74810
2P3/2 5P3/2	7052.1434	7129.9404	-17.56287	.56526	29.56768	-1.619013	-88.74810
2P3/2 5D3/2	7183.2301	7261.3415	-18.05723	.69760	29.56561	-1.619511	-88.74810
2P3/2 5D5/2	7200.6027	7279.0260	-18.34165	.72213	29.56374	-1.619402	-88.74810
2P3/2 5F5/2	7350.1366	7428.7506	-18.57729	.77105	29.55415	-1.618815	-88.74810
2P3/2 5F7/2	7352.7060	7431.3917	-18.64323	.77093	29.55351	-1.618775	-88.74810
2P3/2 6S1/2	7288.9508	7367.4228	-16.27374	.72817	29.43368	-1.612191	-88.74810
2P3/2 6P1/2	7318.7159	7396.9965	-19.16557	.72242	29.52743	-1.616802	-88.74810
2P3/2 6P3/2	7337.5642	7416.0343	-18.37969	.72851	29.54747	-1.618307	-88.74810

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
NOBELIUM 5F14 Z=102 A=254 R=1.43614E-04 A.U.							
2P3/2 7S1/2	7363.4621	7442.0092	-18.45545	.74765	29.52604	-1.617189	-88.74810
LAWRENCIUM 6D1 Z=103 A=257 R=1.44177E-04 A.U.							
2P1/2 4D5/2	-175.6463	-191.1734	65.04301	.13268	25.20443	-1.258352	-73.59467
2P1/2 4F5/2	266.4382	254.0146	63.60815	.47783	25.18973	-1.257471	-73.59467
2P1/2 4F7/2	291.1132	277.2259	63.07668	.47524	25.16718	-1.257309	-73.59467
2P1/2 5S1/2	445.7170	431.2008	64.52345	.28930	24.51785	-1.219695	-73.59467
2P1/2 5P1/2	536.4226	522.6869	65.31999	.25201	25.00163	-1.243266	-73.59467
2P1/2 5P3/2	656.4752	643.7401	64.19269	.24742	25.14351	-1.253821	-73.59467
2P1/2 5D3/2	793.7796	779.5628	63.48266	.44119	25.14200	-1.254410	-73.59467
2P1/2 5D5/2	812.0521	797.9447	63.42328	.39323	25.13989	-1.254299	-73.59467
2P1/2 5F5/2	967.3029	953.4656	63.08321	.47274	25.12973	-1.253668	-73.59467
2P1/2 5F7/2	970.3456	956.5803	63.01308	.47137	25.12913	-1.253630	-73.59467
2P1/2 6S1/2	905.5386	891.5430	63.41634	.42497	24.95505	-1.246130	-73.59467
2P1/2 6P1/2	936.3247	922.1331	63.51566	.42360	25.09826	-1.251270	-73.59467
2P1/2 6P3/2	957.7540	943.7474	63.30812	.42429	25.12191	-1.253064	-73.59467
2P1/2 6D3/2	986.7345	972.8180	63.19480	.45178	25.11744	-1.252897	-73.59467
2P1/2 7S1/2	966.3574	972.4365	63.22331	.44623	25.05782	-1.251793	-73.59467
2P3/2 3S1/2	-380.1297	-310.0049	1.83558	-1.83228	24.26652	-1.350795	-93.06379
2P3/2 3P1/2	75.3094	125.7225	15.97265	-1.86026	30.17504	-1.636759	-93.06379
2P3/2 3P3/2	1720.9686	1788.8495	-3.87461	-1.16273	31.99414	-1.772913	-93.06379
2P3/2 3D3/2	2391.0433	2459.2706	-4.70939	-0.70481	32.03474	-1.784241	-93.06379
2P3/2 3D5/2	2704.5616	2777.8838	-10.20826	-0.27466	32.00730	-1.782787	-93.06379
2P3/2 4S1/2	5472.8565	5552.5042	-14.83495	.27199	29.62750	-1.648808	-93.06379
2P3/2 4P1/2	5687.3588	5761.7841	-11.23690	.27403	31.36130	-1.729890	-93.06379
2P3/2 4P3/2	6145.9260	6225.2858	-16.90014	.55354	31.61900	-1.768368	-93.06379
2P3/2 4D3/2	6474.5096	6554.3179	-17.53776	.73958	31.82493	-1.771247	-93.06379
2P3/2 4D5/2	6556.5457	6637.6240	-16.69607	.83531	31.81704	-1.770839	-93.06379
2P3/2 4F5/2	6998.3282	7080.2392	-19.94326	1.06442	31.80151	-1.769898	-93.06379
2P3/2 4F7/2	7021.0978	7103.5574	-20.49502	1.07008	31.79883	-1.769724	-93.06379
2P3/2 5S1/2	7177.0861	7258.9209	-19.05230	.88161	31.13198	-1.732272	-93.06379
2P3/2 5P1/2	7269.1671	7349.6844	-18.13073	.81713	31.61548	-1.755846	-93.06379
2P3/2 5P3/2	7389.9660	7471.6071	-19.41297	.84562	31.75642	-1.766334	-93.06379
2P3/2 5D3/2	7524.3715	7606.3889	-19.92483	.98364	31.75449	-1.766869	-93.06379
2P3/2 5D5/2	7543.0339	7625.3283	-20.22564	1.00957	31.75214	-1.766767	-93.06379
2P3/2 5F5/2	7697.8513	7780.3528	-20.47536	1.06171	31.74205	-1.766136	-93.06379
2P3/2 5F7/2	7700.9193	7783.4947	-20.54850	1.06165	31.74134	-1.766091	-93.06379
2P3/2 6S1/2	7636.3651	7718.7113	-20.14656	1.01499	31.60781	-1.758624	-93.06379
2P3/2 6P1/2	7667.0223	7749.1553	-20.02507	1.00874	31.71087	-1.763760	-93.06379
2P3/2 6P3/2	7686.5627	7770.9016	-20.25849	1.01516	31.73423	-1.765535	-93.06379
2P3/2 6D3/2	7717.4051	7799.8204	-20.35353	1.03762	31.72976	-1.765366	-93.06379
2P3/2 7S1/2	7717.0572	7799.4754	-20.33574	1.03534	31.71023	-1.764266	-93.06379

TABLE II. L_2 Coster-Kronig Energies, $11 \leq Z \leq 103$

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)	
SODIUM 3S1		Z=11 A=23	R=6.44904E-05 A.U.					
2P3/2 3S1/2	-13.976	-13.964	-.0123	-.0000	-.0000	-.00000	.0003	
MAGNESIUM 3S2		Z=12 A=24	R=6.54118E-05 A.U.					
2P3/2 3S1/2	-16.506	-16.489	-.0173	-.0001	-.0001	-.00000	.0004	
ALUMINUM 3P1		Z=13 A=27	R=6.80310E-05 A.U.					
2P3/2 3S1/2	-20.630	-20.606	-.0242	-.0001	-.0001	-.00000	.0005	
2P3/2 3P1/2	-14.663	-14.661	-.0221	-.0006	.0001	.00000	.0005	
SILICON 3P2		Z=14 A=28	R=6.88607E-05 A.U.					
2P3/2 3S1/2	-25.078	-25.046	-.0331	.0001	-.0002	-.00000	.0006	
2P3/2 3P1/2	-16.304	-16.274	-.0298	-.0007	.0001	.00000	.0008	
PHOSPHORUS 3P3		Z=15 A=31	R=7.12371E-05 A.U.					
2P3/2 3P1/2	-18.967	-18.930	-.0377	-.0010	.0001	.00000	.0010	
2P3/2 3P3/2	-19.295	-19.251	-.0433	-.0009	.0001	.00000	.0010	
SULFUR 3P4		Z=16 A=32	R=7.19950E-05 A.U.					
2P3/2 3P1/2	-21.850	-21.803	-.0468	-.0013	.0001	.00000	.0014	
2P3/2 3P3/2	-21.929	-21.876	-.0539	-.0012	.0001	.00000	.0014	
CHLORINE 3P5		Z=17 A=35	R=7.41780E-05 A.U.					
2P3/2 3P1/2	-25.283	-25.226	-.0573	-.0017	.0001	.00000	.0018	
2P3/2 3P3/2	-25.049	-24.983	-.0663	-.0016	.0001	.00000	.0018	
ARGON 3P6		Z=18 A=40	R=7.75542E-05 A.U.					
2P3/2 3P1/2	-28.514	-28.445	-.0693	-.0021	.0001	.00000	.0023	
2P3/2 3P3/2	-27.922	-27.842	-.0802	-.0020	.0001	.00000	.0023	
POTASSIUM 4S1		Z=19 A=39	R=7.69025E-05 A.U.					
2P3/2 3P1/2	-38.214	-38.133	-.0799	-.0033	.0002	.00000	.0028	
2P3/2 3P3/2	-37.464	-37.370	-.0945	-.0032	.0002	.00000	.0028	
2P3/2 4S1/2	-8.263	-8.163	-.1020	-.0006	-.0001	-.00000	.0028	
CALCIUM 4S2		Z=20 A=40	R=7.75542E-05 A.U.					
2P3/2 3P1/2	-49.024	-48.932	-.0912	-.0048	.0004	.00000	.0035	
2P3/2 3P3/2	-48.091	-47.980	-.1100	-.0046	.0004	.00000	.0035	
2P3/2 4S1/2	-9.269	-9.150	-.1219	-.0009	-.0001	-.00000	.0035	
SCANDIUM 3D1		Z=21 A=45	R=8.06597E-05 A.U.					
2P3/2 3P3/2	-52.069	-51.937	-.1317	-.0050	.0004	.00000	.0042	
2P3/2 3D3/2	-16.859	-16.705	-.1590	.0009	.0003	.00000	.0042	
2P3/2 4S1/2	-8.582	-8.438	-.1460	-.0003	-.0001	-.00000	.0042	

FINAL STATE	E(TCT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
TITANIUM							
	3D2	Z=22 A=46	R=8.24137E-05 A.U.				
2P3/2 3P3/2	-55.685	-55.727	-.1579	-.0051	.0005	.00000	.0051
2P3/2 3D3/2	-18.877	-18.695	-.1893	.0020	.0004	.00000	.0051
2P3/2 4S1/2	-7.521	-7.348	-.1789	.0007	-.0002	-.00000	.0051
VANADIUM							
	3D3	Z=23 A=51	R=8.40961E-05 A.U.				
2P3/2 3P3/2	-59.497	-59.310	-.1890	-.0047	.0006	.00000	.0060
2P3/2 3D3/2	-18.513	-18.296	-.2246	.0037	.0004	.00000	.0060
2P3/2 4S1/2	-6.116	-5.909	-.2151	.0023	-.0002	-.00000	.0060
CHROMIUM							
	3D5 4S1	Z=24 A=52	R=8.46422E-05 A.U.				
2P3/2 3D3/2	-11.411	-11.165	-.2565	.0038	.0003	.00000	.0071
2P3/2 3D5/2	-10.242	-9.970	-.2765	.0048	.0003	.00000	.0071
2P3/2 4S1/2	-3.823	-3.581	-.2508	.0026	-.0002	-.00000	.0071
MANGANESE							
	3D5	Z=25 A=55	R=8.62396E-05 A.U.				
2P3/2 3D3/2	-17.671	-17.386	-.2988	.0051	.0005	.00000	.0082
2P3/2 3D5/2	-16.304	-15.994	-.3251	.0065	.0005	.00000	.0082
2P3/2 4S1/2	-3.565	-3.284	-.2924	.0037	-.0002	-.00000	.0082
IRON							
	3D6	Z=26 A=56	R=8.67591E-05 A.U.				
2P3/2 3D3/2	-17.409	-17.088	-.3345	.0038	.0006	.00000	.0094
2P3/2 3D5/2	-16.114	-15.766	-.3630	.0054	.0006	.00000	.0094
2P3/2 4S1/2	-2.291	-1.973	-.3301	.0025	-.0002	-.00000	.0094
COBALT							
	3D7	Z=27 A=59	R=8.82815E-05 A.U.				
2P3/2 3D3/2	-16.526	-16.167	-.3725	.0019	.0007	.00000	.0107
2P3/2 3D5/2	-15.314	-14.927	-.4028	.0037	.0007	.00000	.0107
2P3/2 4S1/2	-.652	-.493	-.3702	.0007	-.0002	-.00000	.0107
NICKEL							
	3D8	Z=28 A=58	R=8.77799E-05 A.U.				
2P3/2 3D3/2	-15.716	-15.315	-.4127	-.0008	.0008	.00000	.0120
2P3/2 3D5/2	-14.596	-14.165	-.4446	.0014	.0008	.00000	.0120
2P3/2 4S1/2	.648	1.250	-.4125	-.0019	-.0002	-.00000	.0120
COPPER							
	4S1	Z=29 A=63	R=9.02331E-05 A.U.				
2P3/2 3D3/2	-6.183	-5.745	-.4449	-.0073	.0007	.00000	.0135
2P3/2 3D5/2	-5.422	-4.959	-.4728	-.0050	.0007	.00000	.0135
2P3/2 4S1/2	3.679	4.122	-.4482	-.0060	-.0003	-.00000	.0135
ZINC							
	4S2	Z=30 A=64	R=9.07080E-05 A.U.				
2P3/2 3D3/2	-12.663	-12.170	-.4599	-.0087	.0011	-.00000	.0149
2P3/2 3D5/2	-11.750	-11.226	-.5335	-.0059	.0011	-.00000	.0149
2P3/2 4S1/2	5.224	5.722	-.5035	-.0096	-.0002	-.00000	.0149

FINAL STATE	E(TCT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
GALLIUM							
	4P1	Z=31 A=69	R=9.30112E-05 A.U.				
2P3/2 3D5/2	-20.114	-19.523	-.6024	-.0064	.0014	-.00000	.0163
2P3/2 4S1/2	4.876	5.437	-.5664	-.0109	-.0003	-.00000	.0163
2P3/2 4P1/2	11.963	12.519	-.5610	-.0123	.0007	-.00000	.0163
GERMANIUM							
	4P2	Z=32 A=74	R=9.52057E-05 A.U.				
2P3/2 3D5/2	-29.158	-28.493	-.6765	-.0070	.0016	-.00000	.0177
2P3/2 4S1/2	4.798	5.428	-.6344	-.0124	-.0005	-.00000	.0177
2P3/2 4P1/2	14.569	15.192	-.6266	-.0143	.0009	-.00000	.0177
ARSENIC							
	4P3	Z=33 A=75	R=9.56326E-05 A.U.				
2P3/2 3D5/2	-38.961	-38.223	-.7509	-.0082	.0020	-.00000	.0191
2P3/2 4S1/2	4.982	5.683	-.7045	-.0144	-.0007	-.00000	.0191
2P3/2 4P1/2	16.749	17.440	-.6940	-.0169	.0010	-.00000	.0191
2P3/2 4P3/2	16.617	17.318	-.7049	-.0167	.0010	-.00000	.0191
SELENIUM							
	4P4	Z=34 A=80	R=9.77122E-05 A.U.				
2P3/2 3D5/2	-49.424	-48.607	-.8298	-.0098	.0023	-.00001	.0204
2P3/2 4S1/2	5.262	6.039	-.7797	-.0167	-.0009	.00000	.0204
2P3/2 4P1/2	19.280	20.045	-.7664	-.0199	.0012	-.00000	.0204
2P3/2 4P3/2	19.459	20.237	-.7796	-.0197	.0012	-.00000	.0204
BROMINE							
	4P5	Z=35 A=79	R=9.73034E-05 A.U.				
2P3/2 3D5/2	-60.284	-59.383	-.9137	-.0118	.0027	-.00001	.0216
2P3/2 4S1/2	5.649	6.508	-.8608	-.0194	-.0011	.00000	.0216
2P3/2 4P1/2	22.254	23.098	-.8441	-.0232	.0015	-.00001	.0216
2P3/2 4P3/2	22.797	23.657	-.8599	-.0230	.0015	-.00001	.0216
KRYPTON							
	4P6	Z=36 A=84	R=9.93144E-05 A.U.				
2P3/2 3D5/2	-71.339	-70.348	-1.0027	-.0141	.0032	-.00001	.0227
2P3/2 4S1/2	6.926	7.874	-.9471	-.0225	-.0014	.00000	.0227
2P3/2 4P1/2	26.031	26.951	-.9266	-.0270	.0018	-.00001	.0227
2P3/2 4P3/2	26.986	27.934	-.9455	-.0268	.0018	-.00001	.0227
RUBIDIUM							
	5S1	Z=37 A=85	R=9.97069E-05 A.U.				
2P3/2 3D5/2	-90.547	-89.463	-1.0935	-.0180	.0040	-.00002	.0235
2P3/2 4S1/2	3.257	4.299	-1.0364	-.0268	-.0015	.00000	.0235
2P3/2 4P1/2	24.733	25.750	-1.0106	-.0323	.0023	-.00001	.0235
2P3/2 4P3/2	25.967	27.008	-1.0340	-.0321	.0024	-.00001	.0235
2P3/2 5S1/2	49.338	50.388	-1.0461	-.0280	.0014	-.00001	.0235
STRONTIUM							
	5S2	Z=38 A=88	R=1.00866E-04 A.U.				
2P3/2 4S1/2	-.220	.922	-1.1324	-.0315	-.0017	.00000	.0241
2P3/2 4P1/2	23.627	24.738	-1.1000	-.0382	.0030	-.00002	.0241
2P3/2 4P3/2	25.180	26.320	-1.1288	-.0379	.0031	-.00002	.0241
2P3/2 5S1/2	55.440	56.593	-1.1461	-.0324	.0017	-.00001	.0241

FINAL STATE	F(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
YTTRIUM 401 Z=39 A=89 R=1.01247E-04 A.U.							
2P3/2 3D5/2	-126.542	-125.252	-1.2940	-.0266	.0056	-.00003	.0244
2P3/2 4S1/2	.959	2.210	-1.2380	-.0356	-.0021	.00000	.0244
2P3/2 4P1/2	25.841	27.056	-1.1953	-.0435	.0035	-.00002	.0244
2P3/2 4P3/2	26.751	30.000	-1.2336	-.0430	.0036	-.00002	.0244
2P3/2 4D3/2	58.897	60.172	-1.2675	-.0350	.0032	-.00002	.0244
2P3/2 5S1/2	63.175	64.441	-1.2566	-.0362	.0020	-.00002	.0244
ZIRCONIUM 402 Z=40 A=90 R=1.01625E-04 A.U.							
2P3/2 3D5/2	-142.459	-141.051	-1.4076	-.0306	.0064	-.00004	.0244
2P3/2 4S1/2	2.659	4.030	-1.3534	-.0396	-.0025	.00001	.0244
2P3/2 4P1/2	28.432	29.760	-1.3077	-.0489	.0041	-.00003	.0244
2P3/2 4P3/2	32.892	34.260	-1.3481	-.0481	.0042	-.00003	.0244
2P3/2 4D3/2	65.472	67.370	-1.3880	-.0386	.0038	-.00003	.0244
2P3/2 5S1/2	71.639	73.029	-1.3769	-.0399	.0024	-.00002	.0244
NIOBIUM 405 5S1 Z=41 A=93 R=1.02742E-04 A.U.							
2P3/2 3D5/2	-152.904	-151.367	-1.5345	-.0334	.0070	-.00005	.0239
2P3/2 4S1/2	9.806	11.311	-1.4827	-.0424	-.0031	.00001	.0239
2P3/2 4P1/2	35.056	36.511	-1.4305	-.0531	.0044	-.00004	.0239
2P3/2 4P3/2	42.215	43.715	-1.4772	-.0519	.0045	-.00004	.0239
2P3/2 4D3/2	77.432	78.967	-1.5215	-.0412	.0041	-.00004	.0239
2P3/2 5S1/2	81.668	83.395	-1.5120	-.0424	.0029	-.00003	.0239
POLYBODENUM 405 5S1 Z=42 A=96 R=1.04551E-04 A.U.							
2P3/2 3D5/2	-169.141	-167.480	-1.6509	-.0410	.0080	-.00007	.0229
2P3/2 4S1/2	13.283	14.919	-1.6051	-.0497	-.0036	.00001	.0229
2P3/2 4P1/2	40.538	42.117	-1.5454	-.0617	.0051	-.00005	.0229
2P3/2 4P3/2	47.591	49.221	-1.5984	-.0604	.0053	-.00005	.0229
2P3/2 4D3/2	86.606	88.276	-1.6502	-.0480	.0049	-.00005	.0229
2P3/2 4D5/2	87.479	89.165	-1.6668	-.0468	.0049	-.00005	.0229
2P3/2 5S1/2	92.152	93.816	-1.6419	-.0491	.0035	-.00004	.0229
TECHNETIUM 406 5S1 Z=43 A=99 R=1.04905E-04 A.U.							
2P3/2 3D5/2	-185.187	-183.394	-1.7732	-.0497	.0091	-.00009	.0213
2P3/2 4S1/2	17.401	19.177	-1.7347	-.0580	-.0040	.00001	.0213
2P3/2 4P1/2	46.719	48.430	-1.6670	-.0714	.0060	-.00006	.0213
2P3/2 4P3/2	53.600	55.369	-1.7266	-.0701	.0061	-.00006	.0213
2P3/2 4D3/2	96.549	98.364	-1.7864	-.0559	.0058	-.00006	.0213
2P3/2 4D5/2	97.418	99.251	-1.8053	-.0545	.0057	-.00006	.0213
2P3/2 5S1/2	103.262	105.042	-1.7741	-.0569	.0042	-.00005	.0213
RUTHENIUM 407 5S1 Z=44 A=102 R=1.05954E-04 A.U.							
2P3/2 3D5/2	-201.245	-199.313	-1.9011	-.0597	.0105	-.00011	.0190
2P3/2 4S1/2	22.314	24.239	-1.8713	-.0675	-.0045	.00001	.0150
2P3/2 4P1/2	53.761	55.613	-1.7951	-.0825	.0070	-.00008	.0190
2P3/2 4P3/2	60.414	62.331	-1.8619	-.0811	.0072	-.00008	.0190
2P3/2 4D3/2	107.356	109.366	-1.9300	-.0650	.0068	-.00008	.0190
2P3/2 4D5/2	108.257	110.246	-1.9512	-.0633	.0067	-.00008	.0190
2P3/2 5S1/2	115.109	117.075	-1.9243	-.0659	.0051	-.00006	.0190

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
RHOIDIUM 408 5S1 Z=45 A=103 R=1.06300E-04 A.U.							
2P3/2 3D5/2	-217.402	-215.324	-2.0350	-.0712	.0119	-.00013	.0158
2P3/2 4S1/2	28.354	30.436	-2.0153	-.0784	-.0049	.00002	.0158
2P3/2 4P1/2	61.994	63.995	-1.9299	-.0950	.0061	-.00059	.0158
2P3/2 4P3/2	68.375	70.449	-2.0042	-.0936	.0083	-.00010	.0158
2P3/2 4D3/2	119.506	121.639	-2.0811	-.0754	.0079	-.00010	.0158
2P3/2 4D5/2	120.354	122.509	-2.1047	-.0735	.0074	-.00009	.0158
2P3/2 5S1/2	128.354	130.485	-2.0772	-.0761	.0060	-.00006	.0158
PALLADIUM 4D10 Z=46 A=106 R=1.07322E-04 A.U.							
2P3/2 3D5/2	-227.632	-225.408	-2.1617	-.0871	.0130	-.00016	.0118
2P3/2 4S1/2	40.316	42.560	-2.1560	-.0934	-.0058	.00002	.0118
2P3/2 4P1/2	76.319	78.473	-2.0629	-.1113	.0086	-.00011	.0118
2P3/2 4P3/2	81.306	83.541	-2.1436	-.1101	.0091	-.00012	.0118
2P3/2 4D3/2	136.875	139.175	-2.2298	-.0898	.0067	-.00011	.0118
2P3/2 4L5/2	137.541	139.862	-2.2537	-.0878	.0067	-.00011	.0118
SILVER 5S1 Z=47 A=107 R=1.07656E-04 A.U.							
2P3/2 3D5/2	-249.014	-246.615	-2.3213	-.0991	.0155	-.00020	.0066
2P3/2 4S1/2	42.785	45.216	-2.3268	-.1046	-.0058	.00002	.0066
2P3/2 4P1/2	81.001	83.329	-2.2210	-.1245	.0100	-.00015	.0066
2P3/2 4P3/2	86.721	89.136	-2.3117	-.1232	.0112	-.00015	.0066
2P3/2 4D3/2	146.539	149.030	-2.4076	-.1006	.0107	-.00015	.0066
2P3/2 4D5/2	147.359	149.876	-2.4362	-.0961	.0107	-.00015	.0066
2P3/2 5S1/2	157.468	159.961	-2.4070	-.1011	.0085	-.00013	.0066
CADMIUM 5S2 Z=48 A=114 R=1.09456E-04 A.U.							
2P3/2 3D5/2	-271.248	-268.664	-2.4895	-.1122	.0183	-.00025	.0003
2P3/2 4S1/2	45.656	48.286	-2.5072	-.1169	-.0056	.00001	.0003
2P3/2 4P1/2	86.169	88.682	-2.3876	-.1393	.0132	-.00019	.0003
2P3/2 4P3/2	92.705	95.318	-2.4892	-.1377	.0136	-.00019	.0003
2P3/2 4D3/2	156.774	159.469	-2.5956	-.1124	.0131	-.00019	.0003
2P3/2 4D5/2	157.764	160.490	-2.6292	-.1095	.0131	-.00019	.0003
2P3/2 5S1/2	173.051	175.749	-2.5950	-.1128	.0101	-.00016	.0003
INDIUM 5P1 Z=49 A=115 R=1.10277E-04 A.U.							
2P3/2 3D5/2	-295.236	-292.452	-2.6715	-.1257	.0209	-.00030	-.0074
2P3/2 4S1/2	47.882	50.727	-2.7025	-.1295	-.0061	.00001	-.0074
2P3/2 4P1/2	90.438	93.153	-2.5661	-.1543	.0152	-.00023	-.0074
2P3/2 4P3/2	98.688	100.694	-2.6816	-.1525	.0157	-.00024	-.0074
2P3/2 4D3/2	166.315	169.231	-2.7986	-.1245	.0152	-.00023	-.0074
2P3/2 4D5/2	167.621	170.572	-2.8382	-.1211	.0151	-.00023	-.0074
2P3/2 5S1/2	187.716	190.635	-2.7976	-.1251	.0115	-.00019	-.0074
2P3/2 5P1/2	194.034	196.944	-2.7887	-.1271	.0139	-.00022	-.0074
TIN 5P2 Z=50 A=116 R=1.11228E-04 A.U.							
2P3/2 3D5/2	-316.314	-316.317	-2.8626	-.1407	.0237	-.00037	-.0167
2P3/2 4S1/2	51.248	54.323	-2.9090	-.1433	-.0065	.00000	-.0167
2P3/2 4P1/2	95.854	98.783	-2.7583	-.1708	.0174	-.00028	-.0167
2P3/2 4P3/2	104.754	107.806	-2.8849	-.1687	.0161	-.00029	-.0167
2P3/2 4D3/2	177.167	180.317	-3.0133	-.1379	.0175	-.00029	-.0167
2P3/2 4D5/2	178.812	182.004	-3.0540	-.1339	.0175	-.00029	-.0167
2P3/2 5S1/2	203.961	207.115	-3.0116	-.1384	.0131	-.00023	-.0167
2P3/2 5P1/2	212.300	215.441	-2.9995	-.1411	.0161	-.00027	-.0167

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
ANTIQUY							
	5P3	Z=51 A=121	R=1.12162E-04	A.U.			
ZP3/2 3D5/2	-343.956	-340.739	-3.0591	-.1572	.0269	-.00044	-.0275
ZP3/2 4S1/2	55.032	58.347	-3.1223	-.1586	-.0070	-.00000	-.0275
ZP3/2 4P1/2	101.942	105.093	-2.9542	-.1888	.0200	-.00034	-.0275
ZP3/2 4P3/2	111.873	115.161	-3.0546	-.1866	.0207	-.00035	-.0275
ZP3/2 4D3/2	188.676	192.072	-3.2354	-.1526	.0202	-.00035	-.0275
ZP3/2 4L5/2	190.506	193.949	-3.2876	-.1481	.0201	-.00035	-.0275
ZP3/2 5S1/2	221.271	224.672	-3.2353	-.1532	.0149	-.00028	-.0275
ZP3/2 5P1/2	231.166	234.572	-3.2147	-.1564	.0186	-.00033	-.0275
ZP3/2 5P3/2	231.507	234.907	-3.2348	-.1562	.0186	-.00033	-.0275
TELLURIUM							
	5P4	Z=52 A=130	R=1.14877E-04	A.U.			
ZP3/2 3D5/2	-368.604	-365.354	-3.2643	-.1756	.0364	-.00053	-.0402
ZP3/2 4S1/2	59.651	63.220	-3.3458	-.1755	-.0073	-.00001	-.0402
ZP3/2 4P1/2	106.932	112.316	-3.1592	-.2087	.0228	-.00041	-.0402
ZP3/2 4P3/2	119.979	123.517	-3.3144	-.2063	.0238	-.00043	-.0402
ZP3/2 4D3/2	201.186	204.842	-3.4682	-.1690	.0232	-.00042	-.0402
ZP3/2 4L5/2	203.221	206.930	-3.5274	-.1639	.0231	-.00042	-.0402
ZP3/2 5S1/2	239.771	243.434	-3.4698	-.1696	.0170	-.00034	-.0402
ZP3/2 5P1/2	251.503	255.147	-3.4512	-.1733	.0214	-.00040	-.0402
ZP3/2 5P3/2	252.312	255.973	-3.4686	-.1732	.0214	-.00040	-.0402
IODINE							
	5P5	Z=53 A=127	R=1.13987E-04	A.U.			
ZP3/2 3D5/2	-393.601	-390.104	-3.4805	-.1955	.0344	-.00063	-.0551
ZP3/2 4S1/2	65.148	68.987	-3.5820	-.1938	-.0077	-.00002	-.0551
ZP3/2 4P1/2	116.752	120.427	-3.3756	-.2302	.0261	-.00049	-.0551
ZP3/2 4P3/2	129.047	132.850	-3.5467	-.2276	.0272	-.00052	-.0551
ZP3/2 4L3/2	214.677	218.607	-3.7142	-.1868	.0266	-.00051	-.0551
ZP3/2 4D5/2	216.935	220.926	-3.7608	-.1810	.0265	-.00051	-.0551
ZP3/2 5S1/2	259.795	263.737	-3.7189	-.1871	.0194	-.00041	-.0551
ZP3/2 5P1/2	273.267	277.186	-3.6963	-.1917	.0245	-.00048	-.0551
ZP3/2 5P3/2	274.462	278.421	-3.7170	-.1914	.0246	-.00048	-.0551
XENON							
	5P6	Z=54 A=132	R=1.15463E-04	A.U.			
ZP3/2 3D5/2	-419.060	-415.101	-3.7076	-.2172	.0389	-.00075	-.0722
ZP3/2 4S1/2	71.365	75.510	-3.8310	-.2137	-.0079	-.00004	-.0722
ZP3/2 4P1/2	125.454	129.354	-3.6034	-.2534	.0297	-.00059	-.0722
ZP3/2 4P3/2	139.018	143.101	-3.7914	-.2506	.0310	-.00062	-.0722
ZP3/2 4L3/2	229.089	233.311	-3.9734	-.2062	.0304	-.00062	-.0722
ZP3/2 4D5/2	231.594	235.884	-4.0477	-.1997	.0303	-.00062	-.0722
ZP3/2 5S1/2	281.016	285.254	-3.9808	-.2064	.0221	-.00049	-.0722
ZP3/2 5P1/2	296.364	300.595	-3.9543	-.2116	.0281	-.00058	-.0722
ZP3/2 5P3/2	297.989	302.223	-3.9768	-.2113	.0262	-.00058	-.0722
CESIUM							
	6S1	Z=55 A=134	R=1.16043E-04	A.U.			
ZP3/2 3D5/2	-449.416	-445.184	-3.9420	-.2419	.0444	-.00090	-.0919
ZP3/2 4S1/2	73.672	78.097	-4.0867	-.2365	-.0076	-.00007	-.0919
ZP3/2 4P1/2	130.183	134.360	-3.8363	-.2798	.0343	-.00072	-.0919
ZP3/2 4P3/2	145.326	149.704	-4.0448	-.2768	.0359	-.00075	-.0919
ZP3/2 4D3/2	239.777	244.305	-4.2419	-.2284	.0352	-.00075	-.0919
ZP3/2 4D5/2	242.620	247.223	-4.3248	-.2211	.0352	-.00075	-.0919
ZP3/2 5S1/2	300.338	304.687	-4.2546	-.2279	.0254	-.00059	-.0919
ZP3/2 5P1/2	317.462	321.978	-4.2221	-.2341	.0326	-.00070	-.0919
ZP3/2 5P3/2	319.591	324.136	-4.2514	-.2338	.0326	-.00071	-.0919
ZP3/2 6S1/2	338.204	342.760	-4.2648	-.2292	.0309	-.00068	-.0919

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
BARIUM 6S2 Z=56 A=136 R=1.17167E-04 A.U.							
2P3/2 3D5/2	-480.214	-475.692	-4.1891	-.2666	.0506	-.00108	-.1143
2P3/2 4S1/2	76.453	81.197	-4.3610	-.2613	-.0071	-.00011	-.1143
2P3/2 4P1/2	135.450	139.920	-4.0862	-.3080	.0395	-.00086	-.1143
2P3/2 4P3/2	152.310	157.001	-4.3124	-.3048	.0413	-.00090	-.1143
2P3/2 4D3/2	251.146	255.998	-4.5254	-.2523	.0407	-.00090	-.1143
2P3/2 4D5/2	254.357	259.294	-4.6175	-.2442	.0406	-.00090	-.1143
2P3/2 5S1/2	321.131	326.012	-4.5444	-.2509	.0291	-.00071	-.1143
2P3/2 5P1/2	339.594	344.834	-4.5051	-.2582	.0377	-.00085	-.1143
2P3/2 5P3/2	342.593	347.468	-4.5402	-.2579	.0375	-.00085	-.1143
2P3/2 6S1/2	366.212	371.103	-4.5588	-.2518	.0353	-.00081	-.1143
LANTHANUM 5D1 Z=57 A=139 R=1.17469E-04 A.U.							
2P3/2 3D5/2	-507.525	-502.692	-4.4527	-.2959	.0568	-.00127	-.1399
2P3/2 4S1/2	83.834	86.919	-4.6520	-.2063	-.0070	-.00015	-.1399
2P3/2 4P1/2	145.218	150.002	-4.3512	-.3370	.0447	-.00102	-.1399
2P3/2 4P3/2	164.026	169.052	-4.5987	-.3335	.0468	-.00107	-.1399
2P3/2 4D3/2	267.042	272.241	-4.8277	-.2767	.0461	-.00107	-.1399
2P3/2 4D5/2	270.837	276.125	-4.9300	-.2677	.0460	-.00107	-.1399
2P3/2 5S1/2	346.660	351.896	-4.8543	-.2744	.0329	-.00084	-.1399
2P3/2 5P1/2	366.234	371.423	-4.8086	-.2827	.0428	-.00101	-.1399
2P3/2 5P3/2	370.078	375.308	-4.8496	-.2822	.0431	-.00101	-.1399
2P3/2 5D3/2	392.644	397.900	-4.8838	-.2737	.0425	-.00101	-.1399
2P3/2 6S1/2	396.690	401.938	-4.8733	-.2748	.0402	-.00097	-.1399
CERIUM 4F2 Z=58 A=140 R=1.17750E-04 A.U.							
2P3/2 3D5/2	-511.375	-506.239	-4.6953	-.3329	.0632	-.00148	-.1691
2P3/2 4S1/2	112.289	117.720	-4.9362	-.3189	-.0060	-.00022	-.1691
2P3/2 4P1/2	174.692	179.800	-4.6152	-.3728	.0502	-.00120	-.1691
2P3/2 4P3/2	196.322	201.692	-4.8837	-.3682	.0526	-.00126	-.1691
2P3/2 4D3/2	299.958	305.538	-5.1226	-.3090	.0520	-.00126	-.1691
2P3/2 4D5/2	306.916	312.569	-5.2360	-.2984	.0519	-.00126	-.1691
2P3/2 4F5/2	419.437	425.156	-5.3137	-.2851	.0502	-.00123	-.1691
2P3/2 5S1/2	382.097	387.707	-5.1749	-.3027	.0385	-.00102	-.1691
2P3/2 5P1/2	402.038	407.602	-5.1318	-.3106	.0467	-.00120	-.1691
2P3/2 5P3/2	405.437	411.041	-5.1730	-.3101	.0490	-.00120	-.1691
2P3/2 6S1/2	430.078	435.704	-5.1991	-.3024	.0461	-.00115	-.1691
PRASEODYMIUM 4F3 Z=59 A=141 R=1.18030E-04 A.U.							
2P3/2 3D5/2	-524.965	-519.489	-4.9749	-.3679	.0707	-.00173	-.2020
2P3/2 4S1/2	132.993	138.604	-5.2529	-.3504	-.0049	-.00029	-.2020
2P3/2 4P1/2	197.095	202.557	-4.9070	-.4080	.0566	-.00141	-.2020
2P3/2 4P3/2	221.343	227.088	-5.1985	-.4026	.0594	-.00149	-.2020
2P3/2 4D3/2	327.305	333.240	-5.4503	-.3401	.0567	-.00149	-.2020
2P3/2 4D5/2	336.304	342.353	-5.5754	-.3280	.0586	-.00149	-.2020
2P3/2 4F5/2	453.661	459.780	-5.6602	-.3130	.0569	-.00145	-.2020
2P3/2 5S1/2	415.591	421.601	-5.5192	-.3312	.0442	-.00121	-.2020
2P3/2 5P1/2	436.155	442.116	-5.4759	-.3394	.0552	-.00142	-.2020
2P3/2 5P3/2	439.963	445.968	-5.5183	-.3388	.0556	-.00143	-.2020
2P3/2 6S1/2	465.238	471.268	-5.5478	-.3304	.0525	-.00137	-.2020
NEODYMIUM 4F4 Z=60 A=144 R=1.18861E-04 A.U.							
2P3/2 3D5/2	-537.211	-531.373	-5.2712	-.4054	.0790	-.00202	-.2390
2P3/2 4S1/2	155.774	161.988	-5.5876	-.3841	-.0035	-.00039	-.2390
2P3/2 4P1/2	221.576	227.414	-5.2157	-.4456	.0637	-.00166	-.2390
2P3/2 4P3/2	248.604	254.749	-5.5318	-.4353	.0664	-.00175	-.2390
2P3/2 4D3/2	356.854	363.138	-5.7564	-.3733	.0663	-.00175	-.2390
2P3/2 4D5/2	368.003	374.471	-5.9340	-.3598	.0661	-.00175	-.2390

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
NEODYMIUM							
	4F4	Z=60 A=144	R=1.18661E-04	A.U.			
2P3/2 4F5/2	490.240	496.784	-6.0250	-.3430	.0544	-.00171	-.2390
2P3/2 5S1/2	451.366	457.800	-5.8824	-.3618	.0506	-.00144	-.2390
2P3/2 5P1/2	472.379	478.752	-5.8349	-.3702	.0526	-.00167	-.2390
2P3/2 5P3/2	476.607	483.037	-5.8825	-.3695	.0630	-.00168	-.2390
2P3/2 6S1/2	502.459	508.915	-5.9144	-.3606	.0597	-.00162	-.2390
PRASEMIUM							
	4F5	Z=61 A=145	R=1.19136E-04	A.U.			
2P3/2 3D5/2	-547.889	-541.663	-5.5861	-.4453	.0884	-.00235	-.2802
2P3/2 4S1/2	180.764	187.410	-5.9431	-.4200	-.0016	-.0050	-.2802
2P3/2 4P1/2	246.274	254.513	-5.5434	-.4855	.0717	-.00175	-.2802
2P3/2 4P3/2	276.248	284.819	-5.8855	-.4782	.0754	-.00205	-.2802
2P3/2 4D3/2	386.755	395.534	-6.1629	-.4088	.0748	-.00206	-.2802
2P3/2 4D5/2	402.159	409.074	-6.3140	-.3936	.0746	-.00206	-.2802
2P3/2 4F5/2	529.329	536.324	-6.4105	-.3750	.0727	-.00202	-.2802
2P3/2 5S1/2	489.516	496.400	-6.2657	-.3945	.0576	-.00171	-.2802
2P3/2 5P1/2	511.068	517.898	-6.2160	-.4032	.0709	-.00197	-.2802
2P3/2 5P3/2	515.727	522.607	-6.2668	-.4025	.0714	-.00198	-.2802
2P3/2 6S1/2	541.968	548.877	-6.3014	-.3929	.0679	-.00191	-.2802
SAMARIUM							
	4F6	Z=62 A=152	R=1.21288E-04	A.U.			
2P3/2 3D5/2	-556.999	-550.366	-5.9137	-.4886	.0985	-.00274	-.3264
2P3/2 4S1/2	207.957	215.056	-6.3126	-.4592	.0006	-.00064	-.3264
2P3/2 4P1/2	277.181	283.842	-5.8841	-.5288	.0805	-.00228	-.3264
2P3/2 4P3/2	310.274	317.292	-6.2537	-.5205	.0847	-.00240	-.3264
2P3/2 4D3/2	423.011	430.247	-6.5439	-.4475	.0841	-.00241	-.3264
2P3/2 4D5/2	438.775	446.160	-6.7093	-.4306	.0839	-.00241	-.3264
2P3/2 4F5/2	570.932	578.400	-6.8109	-.4101	.0819	-.00236	-.3264
2P3/2 5S1/2	530.224	537.582	-6.5644	-.4303	.0659	-.00202	-.3264
2P3/2 5P1/2	552.320	559.620	-6.6122	-.4354	.0799	-.00231	-.3264
2P3/2 5P3/2	557.424	564.777	-6.6665	-.4385	.0805	-.00233	-.3264
2P3/2 6S1/2	584.064	591.448	-6.7033	-.4283	.0768	-.00225	-.3264
EUROPIUM							
	4F7	Z=63 A=153	R=1.21288E-04	A.U.			
2P3/2 3D5/2	-565.572	-558.518	-6.2467	-.5369	.1102	-.00318	-.3779
2P3/2 4S1/2	236.940	244.519	-6.7047	-.4997	.0036	-.00082	-.3779
2P3/2 4P1/2	308.833	315.944	-6.2478	-.5732	.0906	-.00266	-.3779
2P3/2 4P3/2	343.643	351.336	-6.6442	-.5644	.0955	-.00261	-.3779
2P3/2 4D3/2	461.104	468.629	-6.9524	-.4868	.0948	-.00282	-.3779
2P3/2 4D5/2	476.275	484.157	-7.1266	-.4693	.0946	-.00282	-.3779
2P3/2 4F5/2	615.231	623.208	-7.2416	-.4464	.0925	-.00277	-.3779
2P3/2 4F7/2	618.393	626.442	-7.3135	-.4464	.0925	-.00277	-.3779
2P3/2 5S1/2	573.217	581.083	-7.0928	-.4673	.0752	-.00239	-.3779
2P3/2 5P1/2	596.056	603.932	-7.0387	-.4767	.0904	-.00271	-.3779
2P3/2 5P3/2	601.355	609.217	-7.0964	-.4758	.0910	-.00273	-.3779
2P3/2 6S1/2	628.654	636.549	-7.1367	-.4649	.0871	-.00264	-.3779
GADOLINIUM							
	4F7 5D1	Z=64 A=158	R=1.22595E-04	A.U.			
2P3/2 3D5/2	-582.681	-575.149	-6.6363	-.5806	.1234	-.00370	-.4350
2P3/2 4S1/2	258.675	266.731	-7.1385	-.5393	.0070	-.00103	-.4350
2P3/2 4P1/2	332.847	340.498	-6.6470	-.6174	.1019	-.00311	-.4350
2P3/2 4P3/2	371.040	379.053	-7.0746	-.6079	.1076	-.00328	-.4350
2P3/2 4D3/2	492.176	500.432	-7.3994	-.5256	.1069	-.00330	-.4350
2P3/2 4D5/2	506.592	517.018	-7.5884	-.5065	.1067	-.00324	-.4350
2P3/2 4F5/2	653.876	662.400	-7.7149	-.4812	.1045	-.00324	-.4350
2P3/2 4F7/2	657.518	666.132	-7.7487	-.4812	.1044	-.00324	-.4350
2P3/2 5S1/2	614.515	622.922	-7.5492	-.5049	.0847	-.00279	-.4350
2P3/2 5P1/2	638.134	646.473	-7.4866	-.5155	.1019	-.00317	-.4350

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
GADOLINIUM 4F7 5D1 Z=64 A=158 R=1.22595E-04 A.U.							
2P3/2 5P3/2	644.844	653.246	-7.5518	-.5144	.1027	-.00319	-.4350
2P3/2 5D3/2	671.571	680.015	-7.6052	-.5015	.1018	-.00318	-.4350
2P3/2 6S1/2	675.259	683.697	-7.5953	-.5026	.0983	-.00310	-.4350
TERBIUM 4F9 Z=65 A=158 R=1.22595E-04 A.U.							
2P3/2 3D5/2	-577.438	-569.468	-6.9580	-.6457	.1372	-.00427	-.4987
2P3/2 4S1/2	302.175	310.800	-7.5493	-.5903	.0114	-.00129	-.4987
2P3/2 4P1/2	379.578	387.666	-7.0279	-.6722	.1140	-.00361	-.4987
2P3/2 4P3/2	416.799	427.325	-7.4623	-.6625	.1204	-.00381	-.4987
2P3/2 4D3/2	545.367	554.153	-7.8280	-.5752	.1197	-.00383	-.4987
2P3/2 4D5/2	559.245	568.204	-8.0202	-.5564	.1195	-.00383	-.4987
2P3/2 4F5/2	712.230	721.307	-8.1636	-.5283	.1172	-.00377	-.4987
2P3/2 4F7/2	714.964	724.115	-8.2378	-.5284	.1172	-.00377	-.4987
2P3/2 5S1/2	667.186	676.151	-8.0092	-.5509	.0971	-.00329	-.4987
2P3/2 5P1/2	691.658	700.556	-7.9510	-.5608	.1146	-.00370	-.4987
2P3/2 5P3/2	697.268	706.231	-8.0169	-.5596	.1156	-.00372	-.4987
2P3/2 6S1/2	725.678	734.681	-8.0647	-.5474	.1112	-.00362	-.4987
DYSPROSIUM 4F10 Z=66 A=164 R=1.24127E-04 A.U.							
2P3/2 3D5/2	-580.425	-571.954	-7.3435	-.7060	.1530	-.00494	-.5692
2P3/2 4S1/2	338.717	347.914	-8.0011	-.6410	.0166	-.00159	-.5692
2P3/2 4P1/2	418.961	427.585	-7.4515	-.7265	.1276	-.00419	-.5692
2P3/2 4P3/2	460.493	469.595	-7.9372	-.7161	.1351	-.00443	-.5692
2P3/2 4D3/2	591.844	601.210	-8.3026	-.6237	.1344	-.00446	-.5692
2P3/2 4D5/2	605.030	614.577	-8.5040	-.6044	.1342	-.00445	-.5692
2P3/2 4F5/2	765.247	774.925	-8.6025	-.5735	.1318	-.00439	-.5692
2P3/2 4F7/2	767.749	777.501	-8.7369	-.5736	.1317	-.00439	-.5692
2P3/2 5S1/2	718.589	728.154	-8.5059	-.5967	.1101	-.00386	-.5692
2P3/2 5P1/2	743.812	753.309	-8.4454	-.6070	.1291	-.00430	-.5692
2P3/2 5P3/2	749.618	759.182	-8.5147	-.6057	.1300	-.00434	-.5692
2P3/2 6S1/2	778.565	788.172	-8.5656	-.5929	.1254	-.00423	-.5692
HOLMIUM 4F11 Z=67 A=165 R=1.24379E-04 A.U.							
2P3/2 3D5/2	-581.342	-572.339	-7.7504	-.7702	.1705	-.00570	-.6468
2P3/2 4S1/2	377.965	387.767	-8.4816	-.6944	.0226	-.00195	-.6468
2P3/2 4P1/2	461.109	470.300	-7.8985	-.7641	.1432	-.00486	-.6468
2P3/2 4P3/2	505.104	514.795	-8.4177	-.7730	.1514	-.00514	-.6468
2P3/2 4D3/2	641.324	651.304	-8.8029	-.6754	.1507	-.00517	-.6468
2P3/2 4D5/2	653.789	663.960	-9.0142	-.6554	.1505	-.00516	-.6468
2P3/2 4F5/2	821.384	831.697	-9.1877	-.6218	.1479	-.00509	-.6468
2P3/2 4F7/2	823.642	834.030	-9.2618	-.6218	.1478	-.00509	-.6468
2P3/2 5S1/2	773.026	783.226	-9.0278	-.6458	.1246	-.00451	-.6468
2P3/2 5P1/2	799.136	809.264	-8.9653	-.6563	.1451	-.00500	-.6468
2P3/2 5P3/2	805.154	815.354	-9.0386	-.6549	.1461	-.00504	-.6468
2P3/2 6S1/2	834.568	844.813	-9.0929	-.6415	.1412	-.00492	-.6468
ERBIUM 4F12 Z=68 A=166 R=1.24630E-04 A.U.							
2P3/2 3D5/2	-580.223	-570.655	-8.1793	-.8389	.1896	-.00657	-.7330
2P3/2 4S1/2	419.873	430.319	-8.9893	-.7511	.0297	-.00237	-.7330
2P3/2 4P1/2	505.978	515.773	-8.3714	-.8450	.1602	-.00562	-.7330
2P3/2 4P3/2	552.597	562.924	-8.9246	-.8335	.1696	-.00595	-.7330
2P3/2 4D3/2	693.772	704.404	-9.3315	-.7303	.1689	-.00599	-.7330
2P3/2 4D5/2	705.493	716.525	-9.5515	-.7099	.1686	-.00598	-.7330
2P3/2 4F5/2	880.609	891.597	-9.7418	-.6730	.1659	-.00590	-.7330
2P3/2 4F7/2	882.614	893.675	-9.8148	-.6731	.1658	-.00590	-.7330
2P3/2 5S1/2	830.561	841.434	-9.5770	-.6980	.1408	-.00525	-.7330
2P3/2 5P1/2	857.510	868.307	-9.5122	-.7069	.1628	-.00580	-.7330

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
ERBIUM							
	4F12	Z=68 A=166	R=1.24630E-04	A.U.			
2P3/2 3D5/2	863.755	874.627	-9.5899	-.7073	.1640	-.00584	-.7330
2P3/2 6S1/2	893.757	904.677	-9.6473	-.6932	.1586	-.00571	-.7330
THLLIUM							
	4F13	Z=69 A=169	R=1.25376E-04	A.U.			
2P3/2 3D5/2	-576.717	-566.549	-8.6323	-.9120	.2114	-.00757	-.8276
2F3/2 4S1/2	464.787	475.916	-9.5246	-.8115	.0360	-.00288	-.8276
2P5/2 4P1/2	553.913	564.348	-8.8702	-.9098	.1792	-.00649	-.8276
2P3/2 4P3/2	603.326	614.329	-9.4594	-.8976	.1898	-.00686	-.8276
2P5/2 4D3/2	749.545	760.868	-9.8885	-.7887	.1891	-.00692	-.8276
2F3/2 4D5/2	760.499	772.031	-10.1180	-.7677	.1888	-.00691	-.8276
2P3/2 4F5/2	943.283	954.985	-10.3254	-.7277	.1859	-.00683	-.8276
2P3/2 4F7/2	945.026	956.799	-10.3968	-.7277	.1856	-.00683	-.8276
2P5/2 5S1/2	891.278	902.852	-10.1562	-.7536	.1540	-.00611	-.8276
2P3/2 5P1/2	919.080	930.585	-10.0887	-.7647	.1827	-.00672	-.8276
2P3/2 5P3/2	925.567	937.152	-10.1710	-.7630	.1840	-.00677	-.8276
2F3/2 6S1/2	956.157	967.792	-10.2309	-.7483	.1784	-.00662	-.8276
YTTERBIUM							
	4F14	Z=70 A=174	R=1.26600E-04	A.U.			
2P3/2 3D5/2	-570.682	-559.877	-9.1066	-.9901	.2351	-.00870	-.9322
2P3/2 4S1/2	512.832	524.683	-10.0874	-.8758	.0476	-.00347	-.9322
2P3/2 4P1/2	609.040	616.153	-9.3952	-.9785	.2001	-.00749	-.9322
2P3/2 4P3/2	657.426	669.145	-10.0232	-.9656	.2121	-.00794	-.9322
2P3/2 4D3/2	808.778	820.832	-10.4743	-.8508	.2114	-.00799	-.9322
2P3/2 4D5/2	818.945	831.217	-10.7132	-.8294	.2111	-.00798	-.9322
2P3/2 4F5/2	1009.545	1022.002	-10.9387	-.7859	.2081	-.00789	-.9322
2F3/2 4F7/2	1011.017	1023.543	-11.0076	-.7859	.2080	-.00789	-.9322
2P3/2 5S1/2	955.596	967.933	-10.7638	-.8128	.1792	-.00709	-.9322
2P3/2 5P1/2	984.266	996.520	-10.6937	-.8242	.2045	-.00776	-.9322
2P3/2 5P3/2	991.012	1003.349	-10.7806	-.8224	.2060	-.00782	-.9322
2P3/2 6S1/2	1021.999	1034.390	-10.8441	-.8069	.2002	-.00766	-.9322
LUTETIUM							
	5D1	Z=71 A=175	R=1.26843E-04	A.U.			
2P3/2 3D5/2	-572.637	-561.126	-9.6556	-1.0628	.2621	-.01000	-1.0451
2P3/2 4S1/2	553.797	566.435	-10.7091	-.9382	.0587	-.00416	-1.0451
2P3/2 4P1/2	648.810	660.659	-9.9728	-1.0461	.2239	-.00863	-1.0451
2P3/2 4P3/2	705.428	717.921	-10.6442	-1.0323	.2375	-.00916	-1.0451
2P3/2 4D3/2	861.259	874.104	-11.1162	-.9115	.2366	-.00922	-1.0451
2P3/2 4D5/2	872.412	885.489	-11.3714	-.8886	.2364	-.00921	-1.0451
2F3/2 4F5/2	1070.237	1083.511	-11.6115	-.8419	.2332	-.00911	-1.0451
2P3/2 4F7/2	1072.067	1085.418	-11.6881	-.8419	.2331	-.00911	-1.0451
2P3/2 5S1/2	1018.510	1031.652	-11.4179	-.8720	.2007	-.00818	-1.0451
2P3/2 5P1/2	1048.009	1061.056	-11.3377	-.8649	.2290	-.00896	-1.0451
2P3/2 5P3/2	1056.547	1069.687	-11.4342	-.8828	.2308	-.00903	-1.0451
2P3/2 5D3/2	1089.170	1102.373	-11.5129	-.8650	.2294	-.00900	-1.0451
2P3/2 6S1/2	1090.567	1104.163	-11.5010	-.8662	.2243	-.00885	-1.0451
HAFNIUM							
	5D2	Z=72 A=180	R=1.28039E-04	A.U.			
2P3/2 3D5/2	-572.670	-560.413	-10.2287	-1.1397	.2918	-.01148	-1.1691
2P3/2 4S1/2	597.440	610.907	-11.3596	-1.0045	.0712	-.00496	-1.1691
2P3/2 4P1/2	695.303	707.926	-10.5769	-1.1177	.2501	-.00994	-1.1691
2P3/2 4P3/2	756.456	769.768	-11.2943	-1.1030	.2655	-.01055	-1.1691
2F3/2 4D3/2	916.813	930.492	-11.7679	-.9759	.2648	-.01062	-1.1691
2P3/2 4D5/2	929.045	942.972	-12.0603	-.9514	.2644	-.01061	-1.1691
2P3/2 4F5/2	1134.326	1148.463	-12.3167	-.9013	.2610	-.01051	-1.1691
2P3/2 4F7/2	1136.529	1150.750	-12.4013	-.9012	.2609	-.01050	-1.1691
2P3/2 5S1/2	1085.296	1099.289	-12.1043	-.9346	.2244	-.00943	-1.1691
2F3/2 5P1/2	1115.559	1129.445	-12.0130	-.9490	.2560	-.01031	-1.1691

FINAL STATE	E(TCT)	E(DHFS)	E(MAG)	E(KET)	E(V-P)	E(H-VP)	E(SELF)
HAFFNIUM 5D2 Z=72 A=180 R=1.28039E-04 A.U.							
2P3/2 5P3/2	1126.081	1140.069	-12.1200	-0.9466	.2581	-.01040	-1.1691
2P3/2 5D3/2	1161.058	1175.112	-12.2040	-0.9273	.2567	-.01037	-1.1691
2P3/2 6S1/2	1163.807	1177.855	-12.1911	-0.9287	.2510	-.01020	-1.1691
TANTALUM 5D3 Z=73 A=181 R=1.28276E-04 A.U.							
2P3/2 3D5/2	-570.536	-557.486	-10.8349	-1.2200	.3245	-.01316	-1.3060
2P3/2 4S1/2	644.116	658.462	-12.0451	-1.0741	.0355	-.00589	-1.3060
2F3/2 4P1/2	744.876	758.320	-11.2136	-1.1928	.2791	-.01142	-1.3060
2F3/2 4P3/2	810.882	825.060	-11.9800	-1.1770	.2965	-.01213	-1.3060
2F3/2 4D3/2	975.804	990.365	-12.4959	-1.0434	.2955	-.01222	-1.3060
2F3/2 4D5/2	989.207	1004.033	-12.7667	-1.0172	.2953	-.01220	-1.3060
2P3/2 4F5/2	1201.612	1216.661	-13.0591	-0.9636	.2918	-.01209	-1.3060
2P3/2 4F7/2	1204.405	1219.547	-13.1524	-0.9634	.2917	-.01208	-1.3060
2P3/2 5S1/2	1155.849	1170.792	-12.8271	-1.0005	.2508	-.01385	-1.3060
2P3/2 5P1/2	1166.860	1201.632	-12.7239	-1.0165	.2860	-.01186	-1.3060
2P3/2 5P3/2	1199.545	1214.431	-12.8426	-1.0137	.2884	-.01196	-1.3060
2P3/2 5D3/2	1236.999	1291.955	-12.9325	-0.9927	.2870	-.01193	-1.3060
2P3/2 6S1/2	1240.743	1255.694	-12.9197	-0.9941	.2806	-.01174	-1.3060
TUNGSTEN 5D4 Z=74 A=184 R=1.28981E-04 A.U.							
2P3/2 3D5/2	-565.941	-552.053	-11.4743	-1.3046	.3608	-.01506	-1.4542
2F3/2 4S1/2	693.719	708.993	-12.7673	-1.1473	.1019	-.00697	-1.4542
2P3/2 4P1/2	797.418	811.730	-11.8845	-1.2717	.3112	-.01310	-1.4542
2P3/2 4P3/2	868.611	893.706	-12.7029	-1.2547	.3308	-.01393	-1.4542
2P3/2 4D3/2	1038.130	1053.624	-13.2417	-1.1144	.3302	-.01403	-1.4542
2P3/2 4D5/2	1052.798	1068.575	-13.5519	-1.0864	.3297	-.01401	-1.4542
2P3/2 4F5/2	1272.713	1288.726	-13.6414	-1.0291	.3260	-.01369	-1.4542
2F3/2 4F7/2	1275.716	1291.830	-13.9436	-1.0289	.3258	-.01388	-1.4542
2P3/2 5S1/2	1230.290	1246.136	-13.5906	-1.0693	.2902	-.01246	-1.4542
2P3/2 5P1/2	1261.860	1277.590	-13.4749	-1.0870	.3192	-.01361	-1.4542
2P3/2 5P3/2	1276.910	1292.746	-13.6065	-1.0838	.3221	-.01374	-1.4542
2P3/2 5D3/2	1316.643	1332.755	-13.7030	-1.0610	.3207	-.01371	-1.4542
2P3/2 6S1/2	1321.749	1337.654	-13.6692	-1.0626	.3136	-.01349	-1.4542
RHENIUM 5D5 Z=75 A=187 R=1.29678E-04 A.U.							
2P3/2 3D5/2	-559.002	-544.246	-12.1212	-1.4002	.4004	-.01721	-1.6177
2P3/2 4S1/2	746.566	762.805	-13.5021	-1.2309	.1205	-.00822	-1.6177
2P3/2 4P1/2	853.371	868.585	-12.5661	-1.3610	.3467	-.01501	-1.6177
2P3/2 4P3/2	929.924	945.970	-13.4387	-1.3429	.3689	-.01597	-1.6177
2P3/2 4D3/2	1104.352	1120.815	-14.0024	-1.1954	.3683	-.01608	-1.6177
2P3/2 4D5/2	1119.996	1136.759	-14.3317	-1.1657	.3677	-.01607	-1.6177
2P3/2 4F5/2	1347.507	1364.521	-14.6401	-1.1045	.3636	-.01593	-1.6177
2P3/2 4F7/2	1350.706	1367.831	-14.7510	-1.1042	.3637	-.01593	-1.6177
2P3/2 5S1/2	1308.778	1325.616	-14.3706	-1.1482	.3127	-.01430	-1.6177
2P3/2 5P1/2	1342.183	1358.870	-14.2426	-1.1673	.3560	-.01561	-1.6177
2P3/2 5P3/2	1357.881	1374.706	-14.3871	-1.1640	.3594	-.01576	-1.6177
2P3/2 5D3/2	1401.145	1418.052	-14.4926	-1.1390	.3580	-.01573	-1.6177
2P3/2 5D5/2	1402.764	1419.698	-14.5212	-1.1368	.3578	-.01573	-1.6177
2P3/2 6S1/2	1407.053	1423.557	-14.4801	-1.1405	.3502	-.01548	-1.6177
OSMIUM 5D6 Z=76 A=190 R=1.30366E-04 A.U.							
2P3/2 3D5/2	-549.234	-533.563	-12.7997	-1.5018	.4452	-.01966	-1.7948
2P3/2 4S1/2	802.936	820.191	-14.2714	-1.3202	.1416	-.00966	-1.7948
2F3/2 4P1/2	912.906	929.066	-13.2798	-1.4561	.3860	-.01717	-1.7948
2F3/2 4P3/2	995.159	1012.208	-14.2097	-1.4369	.4110	-.01828	-1.7948
2P3/2 4D3/2	1174.559	1192.043	-14.7992	-1.2819	.4104	-.01842	-1.7948
2P3/2 4D5/2	1191.223	1209.025	-15.1482	-1.2504	.4098	-.01840	-1.7948

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
CSMIUM							
	506	Z=76 A=190	R=1.30368E-04 A.U.				
2P3/2 4F5/2	1426.340	1444.409	-15.4764	-1.1851	.4057	-.01825	-1.7948
2P3/2 4F7/2	1429.756	1447.945	-15.5963	-1.1848	.4056	-.01625	-1.7948
2P3/2 5S1/2	1391.846	1409.730	-15.1889	-1.2322	.3489	-.01639	-1.7948
2F3/2 5P1/2	1427.117	1444.834	-15.0460	-1.2529	.3908	-.01787	-1.7948
2P3/2 5P3/2	1443.502	1461.370	-15.2063	-1.2494	.4006	-.01805	-1.7948
2P3/2 5D3/2	1490.171	1508.128	-15.3213	-1.2222	.3493	-.01803	-1.7948
2P3/2 5D5/2	1491.892	1509.879	-15.3534	-1.2196	.3992	-.01802	-1.7948
2P3/2 6S1/2	1497.121	1515.077	-15.3105	-1.2235	.3907	-.01774	-1.7948
IRIDIUM							
	509	Z=77 A=193	R=1.31050E-04 A.U.				
2P3/2 3D5/2	-528.640	-512.023	-13.4765	-1.6173	.4903	-.02229	-1.9908
2P3/2 4S1/2	870.923	889.232	-15.0457	-1.4223	.1517	-.01119	-1.9906
2F3/2 4P1/2	984.090	1001.235	-13.9966	-1.5642	.4256	-.01949	-1.9908
2P3/2 4P3/2	1072.261	1090.350	-14.9865	-1.5439	.4537	-.02077	-1.9908
2P3/2 4D3/2	1256.844	1275.387	-15.6032	-1.3812	.4532	-.02043	-1.9908
2P3/2 4D5/2	1274.228	1293.106	-15.9711	-1.3480	.4525	-.02091	-1.9908
2P3/2 4F5/2	1517.218	1536.361	-16.3213	-1.2784	.4463	-.02076	-1.9908
2P3/2 4F7/2	1520.677	1539.968	-16.4494	-1.2760	.4481	-.02075	-1.9908
2P3/2 5S1/2	1486.600	1505.571	-16.0181	-1.3287	.3858	-.01865	-1.9908
2P3/2 5P1/2	1524.060	1542.851	-15.8679	-1.3504	.4384	-.02032	-1.9908
2P3/2 5P3/2	1539.154	1556.108	-16.0384	-1.3469	.4430	-.02053	-1.9908
2P3/2 5D3/2	1569.543	1608.593	-16.1635	-1.3176	.4416	-.02052	-1.9908
2P3/2 5D5/2	1590.794	1609.674	-16.1952	-1.3150	.4417	-.02051	-1.9906
PLATINUM							
	509 6S1	Z=78 A=195	R=1.31501E-04 A.U.				
2P3/2 3D5/2	-516.415	-498.765	-14.2420	-1.7281	.5461	-.02546	-2.2001
2P3/2 4S1/2	930.998	950.448	-15.9071	-1.5202	.1906	-.01315	-2.2001
2P3/2 4P1/2	1047.453	1065.665	-14.7970	-1.6660	.4754	-.02232	-2.2001
2P3/2 4P3/2	1142.124	1161.338	-15.8513	-1.6464	.5071	-.02380	-2.2001
2P3/2 4D3/2	1331.715	1351.404	-16.4953	-1.4756	.5067	-.02398	-2.2001
2P3/2 4D5/2	1350.382	1370.426	-16.8854	-1.4405	.5059	-.02396	-2.2001
2P3/2 4F5/2	1600.689	1621.234	-17.2564	-1.3665	.5019	-.02379	-2.2001
2P3/2 4F7/2	1604.700	1625.183	-17.3945	-1.3661	.5012	-.02378	-2.2001
2P3/2 5S1/2	1575.232	1595.376	-16.9337	-1.4206	.4319	-.02139	-2.2001
2F3/2 5P1/2	1614.404	1634.349	-16.7677	-1.4440	.4901	-.02328	-2.2001
2P3/2 5P3/2	1631.177	1651.301	-16.9551	-1.4402	.4955	-.02353	-2.2001
2P3/2 5D3/2	1685.054	1705.282	-17.0903	-1.4083	.4941	-.02352	-2.2001
2P3/2 5D5/2	1686.794	1707.056	-17.1273	-1.4053	.4939	-.02351	-2.2001
2P3/2 6S1/2	1691.731	1711.964	-17.0656	-1.4091	.4652	-.02321	-2.2001
GOLD							
	6S1	Z=79 A=197	R=1.31949E-04 A.U.				
2P3/2 3D5/2	-496.438	-477.706	-15.0285	-1.8493	.6057	-.02898	-2.4310
2P3/2 4S1/2	999.515	1020.162	-16.7942	-1.6277	.2212	-.01534	-2.4310
2P3/2 4P1/2	1119.306	1138.636	-15.6209	-1.7816	.5284	-.02545	-2.4310
2P3/2 4P3/2	1220.807	1241.202	-16.7428	-1.7587	.5641	-.02716	-2.4310
2P3/2 4D3/2	1415.535	1436.425	-17.4155	-1.5795	.5637	-.02737	-2.4310
2P3/2 4D5/2	1435.373	1456.639	-17.8277	-1.5424	.5628	-.02734	-2.4310
2P3/2 4F5/2	1693.538	1715.123	-18.2209	-1.4639	.5582	-.02716	-2.4310
2P3/2 4F7/2	1697.629	1719.362	-18.3688	-1.4635	.5579	-.02715	-2.4310
2P3/2 5S1/2	1672.869	1694.265	-17.8799	-1.5217	.4813	-.02444	-2.4310
2P3/2 5P1/2	1714.077	1735.235	-17.6991	-1.5466	.5453	-.02656	-2.4310
2P3/2 5P3/2	1731.607	1752.954	-17.9033	-1.5427	.5516	-.02686	-2.4310
2P3/2 5D3/2	1788.916	1810.380	-18.0490	-1.5081	.5502	-.02685	-2.4310
2P3/2 5D5/2	1790.984	1812.486	-18.0648	-1.5047	.5500	-.02684	-2.4310
2P3/2 6S1/2	1790.777	1818.249	-18.0468	-1.5087	.5405	-.02650	-2.4310

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
MERCURY							
	652	Z=80 A=200	R=1.32616E-04	A.U.			
2P3/2 3D5/2	-460.985	-458.043	-20.6826	-.2200	.6738	-.03304	-2.6795
2P3/2 4S1/2	1064.086	1089.034	-22.5059	-.0022	.2582	-.01793	-2.6795
2P3/2 4P1/2	1167.257	1210.834	-21.3294	-.0880	.5893	-.02906	-2.6795
2P3/2 4P3/2	1295.939	1320.786	-22.7237	-.0418	.6295	-.03104	-2.6795
2P3/2 4D3/2	1455.925	1521.139	-23.2153	.0823	.6291	-.03128	-2.6795
2P3/2 4D5/2	1517.169	1542.791	-23.5588	.1187	.6282	-.03124	-2.6795
2P3/2 4F5/2	1782.877	1808.833	-24.0706	.2024	.6233	-.03105	-2.6795
2F3/2 4F7/2	1787.362	1813.476	-24.2297	.2030	.6231	-.03104	-2.6795
2P3/2 5S1/2	1767.846	1793.588	-23.7146	.1424	.5361	-.02796	-2.6795
2F3/2 5F1/2	1811.060	1836.561	-23.5156	.1156	.6067	-.03035	-2.6795
2P3/2 5P3/2	1830.647	1856.361	-23.7393	.1199	.6159	-.03071	-2.6795
2F3/2 5D3/2	1891.705	1917.541	-23.8972	.1577	.6143	-.03070	-2.6795
2P3/2 5G5/2	1893.891	1919.770	-23.9441	.1616	.6141	-.03069	-2.6795
2P3/2 6S1/2	1903.107	1929.952	-23.8949	.1572	.6021	-.03025	-2.6795
THALLIUM							
	6P1	Z=81 A=205	R=1.33712E-04	A.U.			
2F3/2 3D5/2	-459.991	-435.602	-21.9054	-.2308	.7470	-.03755	-2.9623
2P3/2 4S1/2	1134.828	1161.343	-23.8291	-.0006	.2978	-.02083	-2.9623
2F3/2 4F1/2	1261.389	1286.404	-22.5866	-.0876	.6546	-.03310	-2.9623
2P3/2 4P3/2	1377.853	1404.263	-24.0743	-.0373	.6997	-.03535	-2.9623
2P3/2 4D3/2	1562.971	1609.756	-24.5791	.0907	.6995	-.03563	-2.9623
2P3/2 4D5/2	1605.733	1632.952	-25.0486	.1291	.6964	-.03559	-2.9623
2P3/2 4F5/2	1878.976	1906.545	-25.4825	.2175	.6933	-.03538	-2.9623
2P3/2 4F7/2	1883.894	1911.633	-25.6528	.2182	.6930	-.03537	-2.9623
2P3/2 5S1/2	1870.114	1897.462	-25.1072	.1538	.5989	-.03186	-2.9623
2P3/2 5P1/2	1915.127	1942.211	-24.8890	.1249	.6767	-.03457	-2.9623
2F3/2 5P3/2	1936.799	1964.115	-25.1339	.1296	.6851	-.03500	-2.9623
2F3/2 5G3/2	2001.290	2026.736	-25.3030	.1705	.6835	-.03446	-2.9623
2F3/2 5G5/2	2004.049	2031.545	-25.3570	.1751	.6832	-.03497	-2.9623
2P3/2 6S1/2	2016.037	2043.494	-25.2589	.1699	.6669	-.03444	-2.9623
2P3/2 6P1/2	2022.917	2050.352	-25.2834	.1675	.6769	-.03479	-2.9623
LEAD							
	6P2	Z=82 A=208	R=1.34361E-04	A.U.			
2P3/2 3D5/2	-434.909	-408.993	-23.1951	-.2418	.8279	-.04264	-3.2643
2P3/2 4S1/2	1210.226	1236.394	-25.2228	.0012	.3424	-.02415	-3.2643
2P3/2 4P1/2	1340.161	1366.753	-23.9098	-.0869	.7268	-.03764	-3.2643
2F3/2 4P3/2	1464.952	1493.009	-25.4967	-.0323	.7774	-.04023	-3.2643
2P3/2 4D3/2	1675.242	1703.684	-26.0144	.0997	.7773	-.04054	-3.2643
2F3/2 4D5/2	1699.610	1720.510	-26.5111	.1401	.7762	-.04050	-3.2643
2P3/2 4F5/2	1980.389	2009.658	-26.9678	.2334	.7708	-.04028	-3.2643
2P3/2 4F7/2	1985.771	2015.221	-27.1500	.2342	.7705	-.04026	-3.2643
2P3/2 5S1/2	1978.074	2007.115	-26.5727	.1658	.6664	-.03631	-3.2643
2P3/2 5P1/2	2024.895	2053.646	-26.3342	.1349	.7520	-.03933	-3.2643
2P3/2 5P3/2	2049.012	2078.016	-26.6017	.1399	.7618	-.03984	-3.2643
2F3/2 5D3/2	2116.910	2146.053	-26.7823	.1841	.7601	-.03983	-3.2643
2P3/2 5G5/2	2120.272	2149.471	-26.8438	.1892	.7598	-.03982	-3.2643
2P3/2 6S1/2	2134.952	2164.106	-26.7769	.1834	.7429	-.03917	-3.2643
2P3/2 6P1/2	2143.990	2173.115	-26.7562	.1804	.7547	-.03959	-3.2643
BISMUTH							
	6P3	Z=83 A=209	R=1.34576E-04	A.U.			
2P3/2 3D5/2	-406.826	-379.310	-24.5425	-.2539	.9168	-.04835	-3.5861
2P3/2 4S1/2	1289.167	1319.064	-26.6755	.0018	.3924	-.02792	-3.5861
2P3/2 4P1/2	1422.645	1450.648	-25.2912	-.0868	.8063	-.04275	-3.5861
2P3/2 4P3/2	1556.113	1585.894	-26.9825	-.0276	.8631	-.04571	-3.5861
2P3/2 4D3/2	1771.676	1801.652	-27.5135	.1083	.8631	-.04606	-3.5861
2P3/2 4D5/2	1797.700	1824.359	-28.0380	.1508	.8616	-.04602	-3.5861
2P3/2 4F5/2	2066.051	2117.098	-28.5162	.2491	.8562	-.04576	-3.5861
2P3/2 4F7/2	2091.902	2123.143	-28.7126	.2501	.8558	-.04577	-3.5861
2P3/2 5S1/2	2090.590	2121.404	-28.1033	.1776	.7408	-.04130	-3.5861

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
BISMUTH							
	6P3	Z=83 A=209	R=1.34576E-04 A.U.				
2P3/2 5P1/2	2139.453	2169.950	-27.8434	.1447	.8350	-.04469	-3.5881
2P3/2 5P3/2	2165.945	2196.717	-28.1348	.1500	.8462	-.04528	-3.5881
2P3/2 5D3/2	2237.530	2268.449	-28.3281	.1976	.8445	-.04528	-3.5881
2P3/2 5D5/2	2241.275	2272.258	-28.3974	.2034	.8442	-.04527	-3.5881
2P3/2 6S1/2	2259.283	2290.218	-28.3237	.1909	.8244	-.04449	-3.5881
2P3/2 6P1/2	2269.956	2300.855	-28.2980	.1933	.8364	-.04500	-3.5881
2P3/2 6P3/2	2272.533	2303.462	-28.3294	.1937	.8394	-.04506	-3.5881
POLONIUM							
	6P4	Z=84 A=209	R=1.34576E-04 A.U.				
2P3/2 3D5/2	-374.117	-344.911	-25.9627	-.2665	1.0151	-.05479	-3.9366
2P3/2 4S1/2	1373.248	1404.970	-28.2032	.0321	.4486	-.03223	-3.9366
2P3/2 4P1/2	1510.312	1540.234	-26.7443	-.0867	.6941	-.04850	-3.9366
2P3/2 4P3/2	1652.985	1684.585	-28.5462	-.0226	.9570	-.05190	-3.9366
2P3/2 4D3/2	1673.671	1905.875	-29.0502	.1173	.9579	-.05230	-3.9366
2P3/2 4D5/2	1901.637	1934.151	-29.6437	.1620	.9565	-.05224	-3.9366
2P3/2 4F5/2	2197.569	2230.489	-30.1480	.2654	.9507	-.05199	-3.9366
2P3/2 4F7/2	2203.917	2237.044	-30.3550	.2665	.9502	-.05197	-3.9366
2P3/2 5S1/2	2209.523	2242.205	-29.7120	.1897	.8233	-.04693	-3.9366
2P3/2 5P1/2	2260.474	2292.810	-29.4297	.1547	.9267	-.05073	-3.9366
2P3/2 5P3/2	2289.497	2322.132	-29.7467	.1604	.9397	-.05143	-3.9366
2P3/2 5L3/2	2364.776	2397.568	-29.9530	.2115	.9379	-.05143	-3.9366
2P3/2 5D5/2	2368.934	2401.797	-30.0305	.2179	.9375	-.05142	-3.9366
2P3/2 6S1/2	2390.308	2423.120	-29.9506	.2109	.9146	-.05050	-3.9366
2P3/2 6P1/2	2402.455	2435.225	-29.9205	.2068	.9311	-.05111	-3.9366
2P3/2 6P3/2	2405.686	2438.491	-29.9569	.2071	.9323	-.05118	-3.9366
ASTATINE							
	6P5	Z=85 A=210	R=1.34790E-04 A.U.				
2P3/2 3D5/2	-336.387	-305.430	-27.4578	-.2798	1.1236	-.06203	-4.3103
2P3/2 4S1/2	1462.845	1496.487	-29.8080	.0019	.5118	-.03714	-4.3103
2P3/2 4P1/2	1603.545	1635.279	-28.2732	-.0864	.9911	-.05498	-4.3103
2P3/2 4P3/2	1755.962	1789.476	-30.1903	-.0174	1.0624	-.05887	-4.3103
2P3/2 4D3/2	1982.220	2016.147	-30.7470	.1264	1.0627	-.05932	-4.3103
2P3/2 4D5/2	2011.816	2046.282	-31.3305	.1733	1.0612	-.05926	-4.3103
2P3/2 4F5/2	2315.341	2350.233	-31.8598	.2820	1.0550	-.05899	-4.3103
2P3/2 4F7/2	2322.214	2357.326	-32.0799	.2832	1.0545	-.05897	-4.3103
2P3/2 5S1/2	2334.599	2369.244	-31.4039	.2022	.9148	-.05330	-4.3103
2P3/2 5P1/2	2387.679	2421.952	-31.0980	.1652	1.0281	-.05754	-4.3103
2P3/2 5P3/2	2419.405	2454.002	-31.4424	.1712	1.0430	-.05836	-4.3103
2P3/2 5D3/2	2498.377	2533.140	-31.6622	.2260	1.0412	-.05837	-4.3103
2P3/2 5D5/2	2502.976	2537.819	-31.7482	.2332	1.0406	-.05835	-4.3103
2P3/2 6S1/2	2527.886	2562.676	-31.6617	.2255	1.0144	-.05727	-4.3103
2P3/2 6P1/2	2541.849	2576.549	-31.6257	.2208	1.0334	-.05799	-4.3103
2P3/2 6P3/2	2545.667	2580.448	-31.6691	.2212	1.0351	-.05809	-4.3103
RADON							
	6P6	Z=86 A=222	R=1.37310E-04 A.U.				
2P3/2 3D5/2	-294.037	-261.172	-29.0338	-.2934	1.2430	-.07018	-4.7104
2P3/2 4S1/2	1557.534	1593.199	-31.4963	.0015	.5826	-.04273	-4.7104
2P3/2 4P1/2	1701.910	1735.552	-29.8805	-.0864	1.0980	-.06227	-4.7104
2P3/2 4P3/2	1864.624	1900.156	-31.9213	-.0117	1.1776	-.06672	-4.7104
2P3/2 4D3/2	2096.302	2132.256	-32.4905	.1360	1.1783	-.06723	-4.7104
2P3/2 4D5/2	2127.821	2164.342	-33.1053	.1852	1.1766	-.06716	-4.7104
2P3/2 4F5/2	2436.949	2475.917	-33.6601	.2994	1.1701	-.06687	-4.7104
2P3/2 4F7/2	2446.377	2483.578	-33.9439	.3007	1.1696	-.06685	-4.7104
2P3/2 5S1/2	2466.019	2502.742	-33.1832	.2152	1.0159	-.06047	-4.7104
2P3/2 5P1/2	2521.492	2557.803	-32.8514	.1759	1.1599	-.06520	-4.7104
2P3/2 5P3/2	2556.104	2592.766	-33.2246	.1623	1.1570	-.06516	-4.7104
2P3/2 5L3/2	2638.748	2675.537	-33.4588	.2409	1.1552	-.06618	-4.7104
2P3/2 5D5/2	2643.819	2690.746	-33.5537	.2489	1.1547	-.06616	-4.7104
2P3/2 6S1/2	2672.309	2709.179	-33.4603	.2466	1.1245	-.06490	-4.7104

FINAL STATE	E (TOT)	E (DHFS)	E (MAG)	E (RET)	E (V-P)	E (H-VP)	E (SELF)
RADDN 6P6 Z=86 A=222 R=1.37310E-04 A.U.							
2P3/2 6P1/2	2688.007	2724.820	-33.4187	.2353	1.1464	-.06574	-4.7104
2P3/2 6P3/2	2692.751	2729.612	-33.4667	.2357	1.1485	-.06586	-4.7104
FRANCIUM 7S1 Z=87 A=223 R=1.37516E-04 A.U.							
2P3/2 3L5/2	-250.400	-215.556	-30.6898	-.3090	1.3770	-.07942	-5.1426
2P3/2 4S1/2	1653.935	1691.730	-33.2656	-.0010	.6644	-.04917	-5.1426
2P3/2 4P1/2	1802.064	1837.713	-31.5660	-.0879	1.2182	-.07056	-5.1426
2P3/2 4P3/2	1975.716	2013.374	-33.7380	-.0070	1.3076	-.07564	-5.1426
2P3/2 4D3/2	2212.821	2250.906	-34.3193	.1445	1.3082	-.07621	-5.1426
2P3/2 4D5/2	2246.375	2285.059	-34.9669	.1960	1.3064	-.07613	-5.1426
2P3/2 4F5/2	2565.106	2634.256	-35.5475	.3158	1.2996	-.07582	-5.1426
2P3/2 4F7/2	2573.124	2612.527	-35.7955	.3173	1.2990	-.07580	-5.1426
2P3/2 5S1/2	2600.376	2639.279	-35.0466	.2271	1.1300	-.06864	-5.1426
2P3/2 5P1/2	2657.786	2696.242	-34.6517	.1859	1.2657	-.07391	-5.1426
2P3/2 5P3/2	2695.612	2734.448	-35.0963	.1926	1.2653	-.07503	-5.1426
2P3/2 5D3/2	2781.924	2820.953	-35.3449	.2553	1.2634	-.07506	-5.1426
2P3/2 5D5/2	2767.585	2826.705	-35.4495	.2641	1.2829	-.07504	-5.1426
2P3/2 6S1/2	2920.936	2859.999	-35.3493	.2555	1.2477	-.07354	-5.1426
2P3/2 6P1/2	2838.263	2877.257	-35.2996	.2494	1.2732	-.07454	-5.1426
2P3/2 6P3/2	2844.183	2883.233	-35.3587	.2498	1.2758	-.07469	-5.1426
2P3/2 7S1/2	2859.198	2898.265	-35.3740	.2557	1.2690	-.07441	-5.1426
RADIUM 7S2 Z=88 A=226 R=1.38130E-04 A.U.							
2P3/2 3D5/2	-201.525	-164.591	-32.4365	-.3250	1.5251	-.08981	-5.6082
2P3/2 4S1/2	1755.975	1796.015	-35.1280	-.0037	.7559	-.05650	-5.6082
2P3/2 4P1/2	1907.906	1945.672	-33.3393	-.0895	1.3510	-.07988	-5.6082
2P3/2 4P3/2	2093.133	2133.029	-35.6512	-.0019	1.4511	-.08569	-5.6082
2P3/2 4D3/2	2335.699	2376.032	-36.2441	.1534	1.4519	-.08532	-5.6082
2P3/2 4D5/2	2371.392	2412.355	-36.9257	.2074	1.4496	-.08623	-5.6082
2P3/2 4F5/2	2697.733	2739.184	-37.5329	.3329	1.4427	-.08590	-5.6082
2P3/2 4F7/2	2706.386	2746.099	-37.7956	.3345	1.4421	-.08587	-5.6082
2P3/2 5S1/2	2741.489	2782.691	-37.0116	.2395	1.2564	-.07789	-5.6082
2P3/2 5P1/2	2801.107	2841.826	-36.6273	.1962	1.4047	-.08371	-5.6082
2P3/2 5P3/2	2842.374	2883.503	-37.0653	.2034	1.4271	-.08501	-5.6082
2P3/2 5D3/2	2932.344	2973.670	-37.3290	.2703	1.4252	-.08506	-5.6082
2P3/2 5D5/2	2938.619	2980.051	-37.4433	.2799	1.4245	-.08503	-5.6082
2P3/2 6S1/2	2977.149	3018.523	-37.3371	.2710	1.3834	-.08326	-5.6082
2P3/2 6P1/2	2996.084	3037.377	-37.2785	.2642	1.4134	-.08444	-5.6082
2P3/2 6P3/2	3003.114	3044.473	-37.3481	.2646	1.4167	-.08464	-5.6082
2P3/2 7S1/2	3022.019	3063.401	-37.3690	.2723	1.4074	-.08425	-5.6082
ACTINIUM 6D1 Z=89 A=227 R=1.38334E-04 A.U.							
2P3/2 3D5/2	-144.360	-105.212	-34.2811	-.3401	1.6864	-.10139	-6.1127
2P3/2 4S1/2	1866.642	1909.059	-37.0897	-.0056	.8564	-.06472	-6.1127
2P3/2 4P1/2	2022.367	2062.343	-35.2091	-.0898	1.4457	-.09027	-6.1127
2P3/2 4P3/2	2219.860	2262.146	-37.6684	.0051	1.6076	-.09689	-6.1127
2P3/2 4D3/2	2467.885	2510.594	-38.2717	.1640	1.6086	-.09760	-6.1127
2P3/2 4D5/2	2505.876	2549.249	-38.9891	.2205	1.6063	-.09750	-6.1127
2P3/2 4F5/2	2839.810	2883.692	-39.6230	.3519	1.5989	-.09715	-6.1127
2P3/2 4F7/2	2845.149	2893.308	-39.9014	.3537	1.5962	-.09711	-6.1127
2P3/2 5S1/2	2892.343	2935.475	-39.0796	.2537	1.3945	-.08814	-6.1127
2P3/2 5P1/2	2954.069	2997.178	-38.6863	.2082	1.5563	-.09463	-6.1127
2P3/2 5P3/2	2999.117	3042.668	-39.1399	.2160	1.5819	-.09616	-6.1127
2P3/2 5D3/2	3092.586	3136.347	-39.4190	.2872	1.5800	-.09622	-6.1127
2P3/2 5D5/2	3099.662	3143.538	-39.5446	.2978	1.5793	-.09619	-6.1127
2P3/2 6S1/2	3143.230	3187.047	-39.4314	.2887	1.5529	-.09413	-6.1127
2P3/2 6P1/2	3163.113	3205.638	-39.3646	.2810	1.5867	-.09550	-6.1127
2P3/2 6P3/2	3171.778	3215.580	-39.4452	.2817	1.5708	-.09575	-6.1127
2P3/2 6D3/2	3191.806	3235.638	-39.4651	.2924	1.5686	-.09567	-6.1127

FINAL STATE	E(TCT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
ACTINIUM 6D1 Z=89 A=227 R=1.38334E-04 A.U.							
2P3/2 7S1/2	3193.271	3237.099	-39.4714	.2908	1.5605	-.09531	-6.1127
THORIUM 6D2 Z=90 A=232 R=1.39342E-04 A.U.							
2P3/2 3D5/2	-80.328	-38.837	-36.2305	-.3545	1.8643	-.11439	-6.6558
2P3/2 4S1/2	1984.506	2029.432	-39.1577	-.0067	.9691	-.07405	-6.6558
2P3/2 4P1/2	2144.105	2186.478	-37.1813	-.0889	1.6553	-.10195	-6.6558
2P3/2 4P3/2	2354.558	2399.326	-39.7966	.0138	1.7804	-.10949	-6.6558
2P3/2 4C3/2	2608.025	2653.243	-40.4045	.1761	1.7816	-.11028	-6.6558
2P3/2 4D5/2	2648.438	2694.353	-41.1643	.2353	1.7792	-.11017	-6.6558
2P3/2 4F5/2	2989.967	3036.414	-41.8254	.3727	1.7713	-.10979	-6.6558
2P3/2 4F7/2	3000.031	3046.772	-42.1200	.3745	1.7705	-.10975	-6.6558
2P3/2 5S1/2	5051.400	5097.597	-41.2586	.2695	1.5473	-.09972	-6.6558
2P3/2 5P1/2	3115.243	3160.875	-40.8152	.2219	1.7237	-.10692	-6.6558
2P3/2 5P3/2	3164.333	3210.441	-41.3269	.2302	1.7528	-.10869	-6.6558
2P3/2 5D3/2	3261.275	3307.605	-41.6216	.3059	1.7509	-.10877	-6.6558
2P3/2 5D5/2	3269.209	3315.865	-41.7586	.3175	1.7502	-.10874	-6.6558
2P3/2 6S1/2	3318.007	3364.402	-41.6397	.3082	1.6977	-.10836	-6.6558
2P3/2 6P1/2	3358.539	3384.831	-41.5634	.2997	1.7360	-.10794	-6.6558
2P3/2 6P3/2	3348.982	3395.360	-41.6557	.3007	1.7410	-.10825	-6.6558
2P3/2 6D3/2	3370.927	3417.341	-41.7019	.3129	1.7368	-.10817	-6.6558
2P3/2 7S1/2	3372.997	3419.407	-41.6870	.3112	1.7296	-.10776	-6.6558
PROTACTINIUM 5F2 6D1 Z=91 A=231 R=1.39141E-04 A.U.							
2P3/2 3D3/2	-174.080	-133.292	-34.8083	-.6727	2.0699	-.12937	-7.2480
2P3/2 3D5/2	3.668	47.805	-38.2411	-.3791	2.0600	-.12894	-7.2480
2P3/2 4S1/2	2122.543	2170.090	-41.2916	-.0174	1.0945	-.08460	-7.2480
2P3/2 4P1/2	2286.034	2330.879	-39.2161	-.0971	1.8311	-.11502	-7.2480
2P3/2 4P3/2	2510.106	2557.491	-41.9967	.0141	1.9708	-.12360	-7.2480
2P3/2 4C3/2	2769.048	2816.885	-42.6156	.1792	1.9722	-.12446	-7.2480
2P3/2 4D5/2	2811.991	2860.563	-43.4112	.2413	1.9695	-.12436	-7.2480
2P3/2 4F5/2	3160.716	3209.836	-44.0944	.3844	1.9613	-.12396	-7.2480
2P3/2 4F7/2	3172.048	3221.483	-44.4103	.3869	1.9604	-.12391	-7.2480
2P3/2 5S1/2	3231.247	3280.127	-43.5135	.2773	1.7172	-.11277	-7.2480
2P3/2 5P1/2	3296.564	3344.838	-43.0418	.2277	1.9085	-.12071	-7.2480
2P3/2 5P3/2	3350.037	3398.824	-43.5957	.2376	1.9416	-.12275	-7.2480
2P3/2 5D3/2	3447.657	3496.875	-43.9037	.3167	1.9398	-.12285	-7.2480
2P3/2 5D5/2	3458.454	3507.609	-44.0535	.3300	1.9390	-.12282	-7.2480
2P3/2 5F5/2	3555.663	3604.904	-44.1297	.3468	1.9327	-.12250	-7.2480
2P3/2 6S1/2	3508.609	3557.715	-43.9443	.3227	1.8838	-.12027	-7.2480
2P3/2 6P1/2	3529.515	3578.515	-43.8699	.3149	1.9243	-.12197	-7.2480
2P3/2 6P3/2	3540.058	3589.150	-43.9673	.3162	1.9297	-.12231	-7.2480
2P3/2 6D3/2	3561.304	3610.434	-44.0169	.3290	1.9274	-.12223	-7.2480
2P3/2 7S1/2	3562.617	3612.045	-44.0041	.3275	1.9182	-.12181	-7.2480
URANIUM 5F3 6D1 Z=92 A=238 R=1.40533E-04 A.U.							
2P3/2 3D3/2	-97.693	-54.451	-36.7934	-.7081	2.2870	-.14578	-7.8820
2P3/2 3D5/2	89.624	136.163	-40.3891	-.3989	2.2765	-.14530	-7.8820
2P3/2 4S1/2	2262.454	2312.784	-43.5625	-.0237	1.2357	-.09659	-7.8820
2P3/2 4P1/2	2429.870	2477.340	-41.3827	-.1005	2.0255	-.12973	-7.8820
2P3/2 4P3/2	2668.347	2718.506	-44.3389	.0200	2.1815	-.13949	-7.8820
2P3/2 4C3/2	2932.805	2983.421	-44.9643	.1879	2.1832	-.14047	-7.8820
2P3/2 4D5/2	2978.398	3029.788	-45.8012	.2529	2.1802	-.14034	-7.8820
2P3/2 4F5/2	3334.509	3386.466	-46.5087	.4019	2.1716	-.13940	-7.8820
2P3/2 4F7/2	3346.938	3399.224	-46.8449	.4048	2.1706	-.13985	-7.8820
2P3/2 5S1/2	3414.313	3466.035	-45.9088	.2901	1.9553	-.12746	-7.8820
2P3/2 5P1/2	3481.294	3532.467	-45.4061	.2385	2.1129	-.13622	-7.8820
2P3/2 5P3/2	3534.465	3591.084	-46.0039	.2498	2.1005	-.13658	-7.8820
2P3/2 5D3/2	3639.294	3691.159	-46.3260	.3327	2.1486	-.13870	-7.8820
2P3/2 5D5/2	3651.842	3705.856	-46.4889	.3476	2.1478	-.13866	-7.8820

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
URANIUM 5F3 6D1 Z=92 A=236 R=1.40533E-04 A.U.							
2P3/2 5F5/2	3752.987	3805.076	-46.5768	.3668	2.1413	-.13833	-7.8820
2P3/2 6S1/2	3705.141	3757.110	-46.3808	.3411	2.0877	-.13584	-7.8820
2P3/2 6P1/2	3726.586	3778.444	-46.3031	.3333	2.1318	-.13772	-7.8820
2P3/2 6P3/2	3738.270	3790.227	-46.4092	.3349	2.1380	-.13812	-7.8820
2P3/2 6D3/2	3759.774	3811.772	-46.4628	.3487	2.1557	-.13804	-7.8820
2P3/2 7S1/2	3761.573	3813.569	-46.4497	.3472	2.1258	-.13757	-7.8820
NEPTUNIUM 5F4 6D1 Z=93 A=237 R=1.40336E-04 A.U.							
2P3/2 3D3/2	-13.127	32.721	-38.8909	-.7452	2.5260	-.16421	-8.5751
2P3/2 3D5/2	183.652	233.251	-42.6570	-.4191	2.5165	-.16369	-8.5751
2P3/2 4S1/2	2411.041	2464.317	-45.9549	-.0307	1.3941	-.11019	-8.5751
2P3/2 4P1/2	2582.456	2632.706	-43.6659	-.1041	2.2412	-.14627	-8.5751
2P3/2 4P3/2	2836.144	2889.243	-46.8089	.0265	2.4154	-.15736	-8.5751
2P3/2 4D3/2	3106.150	3159.708	-47.4393	.1970	2.4173	-.15845	-8.5751
2P3/2 4D5/2	3154.516	3208.890	-48.3196	.2651	2.4141	-.15830	-8.5751
2P3/2 4F5/2	3518.010	3572.970	-49.0518	.4203	2.4050	-.15784	-8.5751
2P3/2 4F7/2	3531.549	3586.914	-49.4095	.4236	2.4039	-.15778	-8.5751
2P3/2 5S1/2	3606.940	3661.673	-48.4323	.3036	2.1146	-.14402	-8.5751
2P3/2 5P1/2	3675.784	3729.821	-47.8975	.2499	2.3398	-.15366	-8.5751
2P3/2 5P3/2	3738.723	3793.351	-48.5419	.2626	2.3824	-.15638	-8.5751
2P3/2 5D3/2	3840.465	3895.344	-48.8779	.3495	2.3805	-.15653	-8.5751
2P3/2 5D5/2	3855.083	3910.124	-49.0545	.3660	2.3796	-.15648	-8.5751
2P3/2 5F5/2	3960.069	4015.194	-49.1539	.3877	2.3729	-.15614	-8.5751
2P3/2 6S1/2	3911.432	3966.433	-46.9468	.3602	2.3143	-.15336	-8.5751
2P3/2 6P1/2	3933.410	3988.291	-48.8649	.3523	2.3623	-.15544	-8.5751
2P3/2 6P3/2	3946.250	4001.237	-48.9797	.3543	2.3694	-.15590	-8.5751
2P3/2 6D3/2	3968.214	4023.247	-49.0371	.3689	2.3669	-.15582	-8.5751
2P3/2 7S1/2	3970.133	4025.164	-49.0242	.3674	2.3663	-.15532	-8.5751
PLUTONIUM 5F6 Z=94 A=244 R=1.41704E-04 A.U.							
2P3/2 3P3/2	-492.654	-444.629	-39.8178	-1.2800	2.7712	-.17971	-9.3190
2P3/2 3D3/2	86.650	135.228	-41.0744	-.7921	2.7929	-.18486	-9.3190
2P3/2 3D5/2	254.015	346.211	-45.0281	-.4450	2.7802	-.18427	-9.3190
2P3/2 4S1/2	2575.420	2631.787	-48.4500	-.0432	1.5706	-.12954	-9.3190
2P3/2 4P1/2	2750.839	2804.007	-46.0494	-.1125	2.4784	-.16480	-9.3190
2P3/2 4P3/2	3020.532	3076.715	-49.3889	.0288	2.6727	-.17739	-9.3190
2P3/2 4D3/2	3256.114	3352.756	-50.0218	.2014	2.6750	-.17859	-9.3190
2P3/2 4D5/2	3347.372	3404.873	-50.9482	.2728	2.6714	-.17843	-9.3190
2P3/2 4F5/2	3718.096	3776.194	-51.7022	.4339	2.6618	-.17793	-9.3190
2P3/2 4F7/2	3733.110	3791.593	-52.0846	.4379	2.6607	-.17787	-9.3190
2P3/2 5S1/2	3816.239	3874.128	-51.0666	.3127	2.3461	-.16263	-9.3190
2P3/2 5P1/2	3886.543	3943.688	-50.4996	.2571	2.5896	-.17322	-9.3190
2P3/2 5P3/2	3954.642	4012.422	-51.1944	.2719	2.6376	-.17635	-9.3190
2P3/2 5D3/2	4057.058	4115.099	-51.5430	.3620	2.6360	-.17652	-9.3190
2P3/2 5D5/2	4074.651	4132.666	-51.7346	.3808	2.6349	-.17647	-9.3190
2P3/2 5F5/2	4162.196	4240.501	-51.8421	.4046	2.6281	-.17611	-9.3190
2P3/2 6S1/2	4131.954	4190.138	-51.6352	.3769	2.5665	-.17314	-9.3190
2P3/2 6P1/2	4154.213	4212.276	-51.5557	.3698	2.6189	-.17536	-9.3190
2P3/2 6P3/2	4167.149	4225.324	-51.6763	.3722	2.6247	-.17588	-9.3190
2P3/2 7S1/2	4189.523	4247.744	-51.7245	.3859	2.6115	-.17527	-9.3190
AMERICIUM 5F7 Z=95 A=243 R=1.41510E-04 A.U.							
2P3/2 3P3/2	-400.366	-349.584	-42.1989	-1.3158	3.0642	-.20245	-10.1292
2P3/2 3D3/2	189.706	240.210	-43.4264	-.8278	3.0877	-.20809	-10.1292
2P3/2 3D5/2	406.233	461.502	-47.5363	-.4706	3.0738	-.20744	-10.1292
2P3/2 4S1/2	2742.231	2801.878	-51.0915	-.0525	1.7695	-.14299	-10.1292
2P3/2 4P1/2	2921.824	2978.088	-48.5750	-.1170	2.7426	-.18568	-10.1292
2P3/2 4P3/2	3208.341	3268.796	-52.1211	.0357	2.9595	-.19996	-10.1292
2P3/2 4D3/2	3489.649	3549.566	-52.7590	.2107	2.9620	-.20129	-10.1292

FINAL STATE	E(TGT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
AMERICIUM							
	5F7	Z=95 A=243	R=1.41510E-04 A.U.				
2P3/2 4D5/2	3543.789	3604.635	-53.7287	.2848	2.9581	-.20111	-10.1292
2P3/2 4F5/2	3922.282	3983.723	-54.5121	.4527	2.5480	-.20058	-10.1292
2P3/2 4F7/2	3938.026	3999.864	-54.9119	.4569	2.9467	-.20051	-10.1292
2P3/2 5S1/2	4029.492	4090.728	-53.8541	.3260	2.6042	-.18362	-10.1292
2P3/2 5P1/2	4102.078	4162.519	-53.2534	.2689	2.8678	-.19525	-10.1292
2P3/2 5P3/2	4174.804	4235.924	-53.9955	.2848	2.9222	-.19884	-10.1292
2P3/2 5D3/2	4280.633	4342.026	-54.3652	.3797	2.9204	-.19904	-10.1292
2P3/2 5D5/2	4298.316	4359.893	-54.5679	.3993	2.5193	-.19899	-10.1292
2P3/2 5F5/2	4410.932	4472.613	-54.8909	.4260	2.5122	-.19860	-10.1292
2P3/2 5F7/2	4413.961	4475.690	-54.7388	.4257	2.9119	-.19859	-10.1292
2P3/2 6S1/2	4359.583	4421.139	-54.4731	.3966	2.8449	-.19531	-10.1292
2P3/2 6P1/2	4382.753	4444.181	-54.3904	.3895	2.8997	-.19776	-10.1292
2P3/2 6P3/2	4396.292	4457.840	-54.5208	.3923	2.9084	-.19835	-10.1292
2P3/2 7S1/2	4419.279	4460.878	-54.5734	.4068	2.8945	-.19769	-10.1292
CURIUM							
	5F7 6D1	Z=96 A=247	R=1.42282E-04 A.U.				
2P3/2 3P3/2	-305.129	-251.191	-44.7526	-1.3454	3.3868	-.22803	-11.0001
2P3/2 3D3/2	243.648	348.267	-45.9386	-.8606	3.4140	-.23420	-11.0001
2P3/2 3D5/2	521.964	560.514	-50.2272	-.4880	3.3989	-.23348	-11.0001
2P3/2 4S1/2	2912.473	2975.606	-53.9062	-.0574	1.9929	-.16278	-11.0001
2P3/2 4P1/2	3096.214	3155.773	-51.2681	-.1164	3.0353	-.20915	-11.0001
2P3/2 4P3/2	3400.574	3463.508	-55.0351	.0489	3.2771	-.22534	-11.0001
2P3/2 4D3/2	3687.556	3750.951	-55.6740	.2256	3.2801	-.22602	-11.0001
2P3/2 4D5/2	3744.844	3809.183	-56.6914	.3031	3.2758	-.22662	-11.0001
2P3/2 4F5/2	4130.923	4195.909	-57.5023	.4776	3.2652	-.22605	-11.0001
2P3/2 4F7/2	4147.767	4213.172	-57.9243	.4822	3.2638	-.22597	-11.0001
2P3/2 5S1/2	4247.588	4312.379	-56.8167	.3448	2.8905	-.20724	-11.0001
2P3/2 5P1/2	4322.251	4388.190	-56.1805	.2858	3.1758	-.22000	-11.0001
2P3/2 5P3/2	4400.650	4465.315	-56.9813	.3031	3.2373	-.22413	-11.0001
2P3/2 5D3/2	4509.444	4574.393	-57.3822	.4027	3.2354	-.22437	-11.0001
2P3/2 5D5/2	4528.589	4593.735	-57.5795	.4237	3.2342	-.22430	-11.0001
2P3/2 5F5/2	4646.202	4711.461	-57.7155	.4531	3.2266	-.22390	-11.0001
2P3/2 5F7/2	4649.788	4715.103	-57.7711	.4528	3.2265	-.22388	-11.0001
2P3/2 6S1/2	4594.758	4654.633	-57.4758	.4204	3.1510	-.22011	-11.0001
2P3/2 6P1/2	4618.706	4683.667	-57.3824	.4126	3.2119	-.22287	-11.0001
2P3/2 6P3/2	4634.295	4699.408	-57.5267	.4157	3.2222	-.22358	-11.0001
2P3/2 6D3/2	4658.000	4723.167	-57.5951	.4328	3.2193	-.22346	-11.0001
2P3/2 7S1/2	4659.502	4724.668	-57.5809	.4311	3.2066	-.22284	-11.0001
BERKELIUM							
	5F9	Z=97 A=247	R=1.42282E-04 A.U.				
2P3/2 3P3/2	-187.092	-129.856	-47.3873	-1.3884	3.7469	-.25666	-11.9503
2P3/2 3D3/2	421.745	479.632	-48.5450	-.9022	3.7740	-.26342	-11.9503
2P3/2 3D5/2	660.745	722.703	-52.4771	-.5258	3.7575	-.26262	-11.9503
2P3/2 4S1/2	3105.948	3172.718	-56.8025	-.0747	2.2419	-.18510	-11.9503
2P3/2 4P1/2	3293.994	3356.990	-54.0407	-.1274	3.3583	-.23543	-11.9503
2P3/2 4P3/2	3616.969	3683.532	-56.0377	.0509	3.6200	-.25378	-11.9503
2P3/2 4D3/2	3909.858	3976.884	-58.6810	.2297	3.6313	-.25542	-11.9503
2P3/2 4D5/2	3970.131	4038.140	-59.7405	.3094	3.6267	-.25520	-11.9503
2P3/2 4F5/2	4364.269	4432.952	-60.5852	.4914	3.6154	-.25458	-11.9503
2P3/2 4F7/2	4381.531	4450.646	-61.0207	.4960	3.6139	-.25449	-11.9503
2P3/2 5S1/2	4489.624	4558.126	-59.8792	.3528	3.2084	-.23300	-11.9503
2P3/2 5P1/2	4566.894	4634.491	-59.2075	.2930	3.5164	-.24776	-11.9503
2P3/2 5P3/2	4649.609	4717.979	-60.0651	.3114	3.5856	-.25249	-11.9503
2P3/2 5D3/2	4782.409	4831.078	-60.4661	.4163	3.5839	-.25276	-11.9503
2P3/2 5D5/2	4780.146	4849.020	-60.6913	.4374	3.5826	-.25270	-11.9503
2P3/2 5F5/2	4903.039	4972.042	-60.8454	.4700	3.5750	-.25226	-11.9503
2P3/2 5F7/2	4905.973	4975.031	-60.8993	.4698	3.5746	-.25224	-11.9503
2P3/2 6S1/2	4849.191	4918.062	-60.6049	.4370	3.4952	-.24822	-11.9503
2P3/2 6P1/2	4874.193	4942.920	-60.5156	.4301	3.5594	-.25117	-11.9503
2P3/2 6P3/2	4889.040	4957.905	-60.6671	.4338	3.5705	-.25195	-11.9503
2P3/2 7S1/2	4912.967	4981.841	-60.7271	.4497	3.5547	-.25114	-11.9503

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
CALIFORNIUM 5F10 Z=98 A=251 R=1.43046E-04 A.U.							
2P3/2 3P3/2	-64.778	-4.021	-50.2122	-1.4252	4.1436	-.28886	-12.9747
2P3/2 3D3/2	554.072	615.440	-51.3293	-.9411	4.1729	-.29624	-12.9747
2P3/2 3E5/2	804.395	869.993	-55.9269	-.5557	4.1550	-.29536	-12.9747
2P3/2 4S1/2	3304.099	3374.739	-59.8887	-.0878	2.5215	-.21039	-12.9747
2P3/2 4P1/2	3496.436	3563.089	-56.9966	-.1335	3.7165	-.26496	-12.9747
2P3/2 4P3/2	3839.128	3409.550	-61.2378	.0587	4.0171	-.28576	-12.9747
2P3/2 4D3/2	4137.673	4208.758	-61.8834	.2394	4.0204	-.28757	-12.9747
2P3/2 4D5/2	4201.404	4273.318	-62.9895	.3219	4.0156	-.28732	-12.9747
2P3/2 4F5/2	4603.420	4676.033	-63.8660	.5112	4.0034	-.28666	-12.9747
2P3/2 4F7/2	4621.475	4694.538	-64.3146	.5159	4.0022	-.28656	-12.9747
2P3/2 5S1/2	4737.616	4810.260	-63.1340	.3662	3.5615	-.26369	-12.9747
2P3/2 5P1/2	4817.487	4888.966	-62.4248	.3052	3.8940	-.27897	-12.9747
2P3/2 5P3/2	4905.606	4977.911	-63.3430	.3251	3.9721	-.28436	-12.9747
2P3/2 5D3/2	5021.891	5094.507	-63.7620	.4351	3.9703	-.28468	-12.9747
2P3/2 5L5/2	5039.603	5112.435	-63.9986	.4565	3.9688	-.28461	-12.9747
2P3/2 5F5/2	5167.707	5240.681	-64.1685	.4926	3.9604	-.28415	-12.9747
2P3/2 5F7/2	5170.581	5243.612	-64.2252	.4924	3.9604	-.28413	-12.9747
2P3/2 6S1/2	5112.529	5185.368	-63.9165	.4578	3.8742	-.27968	-12.9747
2P3/2 6P1/2	5138.457	5211.144	-63.8236	.4511	3.9434	-.28252	-12.9747
2P3/2 6P3/2	5154.015	5226.849	-63.9864	.4551	3.9560	-.28381	-12.9747
2P3/2 7S1/2	5178.385	5251.282	-64.0497	.4717	3.9392	-.28298	-12.9747
EINSTEINIUM 5F11 Z=99 A=254 R=1.43614E-04 A.U.							
2P3/2 3P1/2	-1257.925	-1207.771	-37.2342	-1.9867	3.3871	-.24055	-14.0801
2P3/2 3P3/2	68.725	133.212	-53.2032	-1.4625	4.5838	-.32505	-14.0801
2P3/2 3D3/2	697.674	762.729	-54.2749	-.9814	4.6150	-.33310	-14.0801
2P3/2 3D5/2	959.727	1029.173	-59.0414	-.5874	4.5954	-.33212	-14.0801
2P3/2 4S1/2	3513.771	3588.497	-63.1394	-.1027	2.8346	-.23901	-14.0801
2P3/2 4P1/2	3710.451	3700.968	-60.1124	-.1406	4.1136	-.29818	-14.0801
2P3/2 4P3/2	4073.926	4148.424	-64.6121	.0668	4.4488	-.32171	-14.0801
2P3/2 4D3/2	4378.569	4453.529	-65.2583	.2489	4.4529	-.32369	-14.0801
2P3/2 4D5/2	4445.490	4521.525	-66.4123	.3341	4.4474	-.32342	-14.0801
2P3/2 4F5/2	4855.424	4932.182	-67.3218	.5310	4.4349	-.32271	-14.0801
2P3/2 4F7/2	4874.297	4951.525	-67.7936	.5359	4.4330	-.32260	-14.0801
2P3/2 5S1/2	4998.811	5075.417	-66.5622	.3793	3.9541	-.29734	-14.0801
2P3/2 5P1/2	5080.926	5156.504	-65.8141	.3173	4.3128	-.31403	-14.0801
2P3/2 5P3/2	5174.732	5251.190	-66.7969	.3387	4.4008	-.32022	-14.0801
2P3/2 5D3/2	5254.701	5371.483	-67.2343	.4541	4.3990	-.32057	-14.0801
2P3/2 5D5/2	5312.360	5389.369	-67.4827	.4766	4.3974	-.32049	-14.0801
2P3/2 5F5/2	5445.739	5522.903	-67.6683	.5154	4.3890	-.32000	-14.0801
2P3/2 5F7/2	5448.545	5525.769	-67.7276	.5152	4.3885	-.31997	-14.0801
2P3/2 6S1/2	5389.169	5466.195	-67.4042	.4787	4.2949	-.31506	-14.0801
2P3/2 6P1/2	5416.036	5492.901	-67.3076	.4721	4.3896	-.31860	-14.0801
2P3/2 6P3/2	5432.347	5509.368	-67.4822	.4767	4.3938	-.31962	-14.0801
2P3/2 7S1/2	5457.142	5534.230	-67.5490	.4939	4.3659	-.31872	-14.0801
FERMIUM 5F12 Z=100 A=257 R=1.44177E-04 A.U.							
2P3/2 3P1/2	-1186.453	-1133.081	-39.5093	-2.0632	3.7431	-.27045	-15.2721
2P3/2 3P3/2	213.998	282.435	-56.3698	-1.5004	5.0715	-.36568	-15.2721
2P3/2 3D3/2	853.140	922.097	-57.3919	-1.0230	5.1046	-.37446	-15.2721
2P3/2 3D5/2	1127.336	1200.849	-62.3311	-.6203	5.0836	-.37339	-15.2721
2P3/2 4S1/2	3735.503	3814.546	-66.5655	-.1193	3.1858	-.27138	-15.2721
2P3/2 4P1/2	3936.577	4011.176	-63.3966	-.1487	4.5539	-.33546	-15.2721
2P3/2 4P3/2	4321.945	4400.747	-68.1702	.0743	4.5275	-.36208	-15.2721
2P3/2 4D3/2	4632.530	4711.794	-66.8187	.2568	4.9321	-.36427	-15.2721
2P3/2 4D5/2	4702.963	4783.365	-70.0191	.3462	4.9260	-.36396	-15.2721
2P3/2 4F5/2	5120.871	5202.005	-70.9624	.5509	4.9128	-.36320	-15.2721
2P3/2 4F7/2	5140.591	5222.213	-71.4528	.5559	4.9108	-.36306	-15.2721
2P3/2 6S1/2	5272.177	5354.175	-70.1735	.3921	4.3906	-.33519	-15.2721
2P3/2 5F1/2	5357.775	5437.679	-69.3850	.3293	4.7773	-.35341	-15.2721
2P3/2 5P3/2	5457.590	5538.430	-70.4361	.3522	4.8763	-.36047	-15.2721

FINAL STATE	E(TOT)	E(OHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
FERMIUM 5F12 Z=100 A=257 R=1.44177E-04 A.U.							
2P3/2 5D3/2	5581.216	5662.394	-70.8922	.4731	4.8745	-.36087	-15.2721
2P3/2 5L5/2	5598.799	5650.215	-71.1524	.4964	4.6726	-.36076	-15.2721
2P3/2 5F5/2	5737.503	5814.088	-71.3545	.5385	4.6641	-.36026	-15.2721
2P3/2 5F7/2	5740.236	5821.883	-71.4163	.5383	4.6635	-.36023	-15.2721
2P3/2 6S1/2	5679.473	5750.916	-71.0778	.4998	4.7619	-.35481	-15.2721
2P3/2 6P1/2	5707.290	5788.562	-70.9774	.4934	4.8425	-.35868	-15.2721
2P3/2 6P3/2	5724.397	5805.636	-71.1644	.4984	4.6583	-.35484	-15.2721
2P3/2 7S1/2	5749.570	5831.080	-71.2342	.5163	4.8394	-.35888	-15.2721
MENDELEVIUM 5F13 Z=101 A=256 R=1.43990E-04 A.U.							
2P3/2 3P1/2	-1106.315	-1049.513	-41.9242	-2.1429	4.1388	-.30406	-16.5692
2P3/2 3P3/2	371.769	444.400	-59.7258	-1.5389	5.6139	-.41138	-16.5692
2P3/2 3D3/2	1021.182	1094.232	-60.6936	-1.0660	5.6496	-.42095	-16.5692
2P3/2 3D5/2	1307.959	1385.785	-65.8080	-.6562	5.6264	-.41975	-16.5692
2P3/2 4S1/2	3769.914	4053.528	-70.1783	-.1360	3.5800	-.30802	-16.5692
2P3/2 4P1/2	4175.451	4254.375	-66.8634	-.1578	5.0437	-.37736	-16.5692
2P3/2 4F3/2	4583.913	4667.271	-71.9251	.0830	5.4002	-.40749	-16.5692
2P3/2 4L3/2	4900.483	4984.302	-72.5736	.2681	5.4654	-.40989	-16.5692
2P3/2 4D5/2	4974.606	5059.591	-73.8232	.3561	5.4587	-.40956	-16.5692
2P3/2 4F5/2	5400.489	5486.252	-74.8012	.5708	5.4448	-.40874	-16.5692
2P3/2 4F7/2	5421.065	5507.355	-75.3102	.5759	5.4425	-.40860	-16.5692
2P3/2 5S1/2	5561.612	5647.258	-73.9810	.4045	4.8774	-.37782	-16.5692
2P3/2 5P1/2	5646.744	5733.226	-73.1507	.3411	5.2942	-.39769	-16.5692
2P3/2 5P3/2	5754.905	5840.383	-74.2741	.3657	5.4057	-.40576	-16.5692
2P3/2 5D3/2	5882.227	5968.066	-74.7491	.4922	5.4036	-.40620	-16.5692
2P3/2 5D5/2	5899.723	5985.802	-75.0214	.5161	5.4019	-.40611	-16.5692
2P3/2 5F5/2	6043.811	6130.071	-75.2400	.5616	5.3928	-.40555	-16.5692
2P3/2 5F7/2	6046.464	6132.789	-75.3040	.5614	5.3922	-.40552	-16.5692
2P3/2 6S1/2	5984.240	6070.356	-74.9500	.5200	5.2819	-.39454	-16.5692
2P3/2 6P1/2	6013.022	6098.958	-74.8460	.5148	5.3688	-.40377	-16.5692
2P3/2 6P3/2	6031.080	6117.193	-75.0460	.5202	5.3866	-.40509	-16.5692
2P3/2 7S1/2	6056.549	6142.736	-75.1190	.5388	5.3664	-.40405	-16.5692
NOBELIUM 5F14 Z=102 A=254 R=1.43614E-04 A.U.							
2P3/2 3P1/2	-1016.661	-956.207	-44.4855	-2.2265	4.5782	-.34184	-17.9781
2P3/2 3P3/2	543.087	620.170	-63.2802	-1.5782	6.2165	-.46274	-17.9781
2P3/2 3D3/2	1202.846	1280.343	-64.1892	-1.1109	6.2547	-.47316	-17.9781
2P3/2 3D5/2	1502.854	1585.051	-69.4823	-.6940	6.2254	-.47184	-17.9781
2P3/2 4S1/2	4218.029	4306.480	-73.9868	-.1593	4.0223	-.34946	-17.9781
2P3/2 4P1/2	4428.073	4511.575	-70.5196	-.1685	5.5880	-.42450	-17.9781
2P3/2 4P3/2	4860.850	4949.070	-75.8870	.0908	6.0524	-.45854	-17.9781
2P3/2 4D3/2	5183.488	5272.126	-76.5334	.2768	6.0381	-.46118	-17.9781
2P3/2 4D5/2	5261.426	5351.278	-77.8337	.3693	6.0507	-.46080	-17.9781
2P3/2 4F5/2	5695.342	5786.001	-78.8474	.5902	6.0360	-.45492	-17.9781
2P3/2 4F7/2	5716.846	5808.030	-79.3751	.5955	6.0336	-.45977	-17.9781
2P3/2 5S1/2	5865.157	5955.719	-77.9935	.4160	5.4157	-.42582	-17.9781
2P3/2 5P1/2	5954.866	6044.191	-77.1198	.3522	5.6666	-.44747	-17.9781
2P3/2 5P3/2	6067.733	6158.115	-78.3199	.3786	5.9441	-.45667	-17.9781
2P3/2 5D3/2	6196.820	6269.566	-78.8143	.5109	5.4923	-.45717	-17.9781
2P3/2 5D5/2	6216.193	6307.201	-79.0987	.5354	5.9902	-.45706	-17.9781
2P3/2 5F5/2	6365.727	6456.931	-79.3343	.5844	5.9806	-.45647	-17.9781
2P3/2 5F7/2	6368.296	6459.567	-79.4003	.5843	5.9800	-.45643	-17.9781
2P3/2 6S1/2	6304.541	6395.598	-79.0308	.5415	5.6603	-.44485	-17.9781
2P3/2 6P1/2	6334.306	6425.171	-78.9226	.5357	5.9539	-.45446	-17.9781
2P3/2 6P3/2	6353.154	6444.209	-79.1367	.5418	5.9739	-.45597	-17.9781
2P3/2 7S1/2	6374.052	6470.184	-79.2125	.5610	5.9525	-.45485	-17.9781

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
LAWRENCIUM	6D1	Z=103 A=257	R=1.44177E-04 A.U.				
2P3/2 3P1/2	-924.852	-860.526	-47.2291	-2.3092	5.0656	-.38433	-19.4691
2P3/2 3P3/2	720.807	802.600	-67.0764	-1.6116	6.6847	-.52046	-19.4691
2P3/2 3D3/2	1390.882	1473.022	-67.9112	-1.1537	6.9253	-.53181	-19.4691
2F3/2 3D5/2	1704.400	1791.635	-73.4100	-.7235	6.8479	-.53030	-19.4691
2P3/2 4S1/2	4472.695	4566.256	-78.0367	-.1769	4.5185	-.39638	-19.4691
2P3/2 4P1/2	4687.197	4775.536	-74.4087	-.1749	6.1919	-.47746	-19.4691
2F3/2 4P3/2	5145.764	5239.037	-80.1019	.1046	6.7096	-.51594	-19.4691
2P3/2 4D3/2	5474.348	5566.069	-80.7395	.2907	6.7155	-.51881	-19.4691
2P3/2 4C5/2	5556.384	5651.375	-82.0979	.3864	6.7076	-.51641	-19.4691
2P3/2 4F5/2	5998.167	6093.991	-83.1450	.6155	6.6921	-.51747	-19.4691
2P3/2 4F7/2	6020.936	6117.309	-83.6968	.6212	6.6854	-.51730	-19.4691
2P3/2 5S1/2	6176.925	6272.672	-82.2541	.4327	6.6226	-.47984	-19.4691
2P3/2 5P1/2	6269.006	6363.436	-81.3325	.3682	6.5061	-.50341	-19.4691
2P3/2 5P3/2	6389.804	6485.359	-82.6148	.3967	6.6470	-.51390	-19.4691
2P3/2 5D3/2	6524.210	6620.140	-83.1266	.5347	6.6451	-.51446	-19.4691
2P3/2 5D5/2	6542.872	6639.080	-83.4274	.5607	6.6428	-.51433	-19.4691
2F3/2 5F5/2	6697.690	6794.104	-83.6771	.6128	6.6326	-.51370	-19.4691
2P3/2 5F7/2	6700.758	6757.246	-83.7503	.6127	6.6319	-.51366	-19.4691
2P3/2 6S1/2	6636.204	6732.463	-83.3483	.5661	6.4964	-.50614	-19.4691
2P3/2 6P1/2	6666.861	6762.907	-83.2264	.5598	6.6015	-.51133	-19.4691
2P3/2 6P3/2	6688.401	6784.653	-83.4608	.5663	6.6248	-.51310	-19.4691
2P3/2 6D3/2	6717.244	6813.572	-83.5553	.5887	6.6204	-.51293	-19.4691
2P3/2 7S1/2	6716.656	6813.227	-83.5375	.5864	6.6068	-.51183	-19.4691

TABLE III. Comparison of Coster-Kronig energies (in eV)

Element	Transition	Transition- State (Ref. 42)	Z+1 Rule [Eq. (4)]	Modified Z+1 Rule [Eq. (5)]	Present Work
^{18}Ar	$L_1-L_2M_1$		39	19	26^a
	$L_1-L_3M_1$		41	21	28^a
	$L_1-L_2M_{23}$		55	33	46^b
	$L_1-L_3M_{23}$		57	36	49^b
^{20}Ca	$L_1-L_3M_1$	18	37	15	15
	$L_1-L_2M_{23}$	34	56	31	37
^{26}Fe	$L_1-L_3M_1$	17	35	4	9
	$L_1-L_2M_{23}$	36	63	30	36
	$L_1-L_2M_{45}$	90	120	83	96
^{28}Ni	$L_1-L_3M_1$	16	15	-1	7
	$L_1-L_2M_{23}$	36	62	26	35
	$L_1-L_2M_{45}$	100	134	94	107
^{30}Zn	$L_1-L_3M_1$	18	15	-22	5
	$L_1-L_2M_{23}$	37	45	5	33
	$L_1-L_2M_{45}$	111	132	87	119
^{32}Ge	$L_1-L_2M_3$	17	23	-23	9
	$L_1-L_2M_{45}$	100	123	74	107
	$L_1-L_3M_{45}$	132	155	108	139
^{91}Pa	$L_2-L_3M_5$		29	-134	4
^{94}Pu	$L_2-L_3M_4$		117	-47	87

^aThe statistical average of the measured $L_1-L_2M_1$ and $L_1-L_3M_1$ Ar Coster-Kronig energies is 30.1 eV (Ref. 43)

^bThe statistical average of the measured $L_1-L_2M_{23}$ and $L_1-L_3M_{23}$ Ar Coster-Kronig energies is 45.4 eV (Ref. 43)