THEORETICAL L-SHELL COSTER-KRONIG ENERGIES

$11 \leqslant Z \leqslant 103$*

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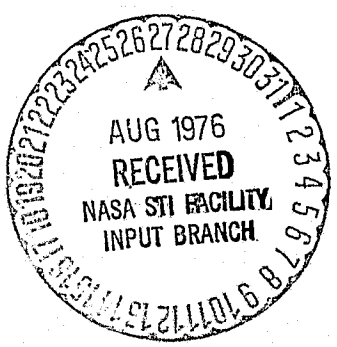

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Relativistic relaxed-orbital calculations of L-shell Coster-Kronig transition energies have been performed ab initio for all possible transitions in atoms with atomic numbers $11 \leq Z \leq 103$. Hartree-Fock-Slater wave functions served as zeroth-order 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.

CONTENTS

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

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

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 Lα 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 code[20] were used as zeroth-order eigenfunctions to compute the expectation of the total Hamiltonian,

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

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 exchange[21] 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

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

in atomic units, where the $\vec{\alpha}_i$ are Dirac matrices, α is the fine structure constant and $\omega = \alpha|\varepsilon_1-\varepsilon_2|$ 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 formulism of Grant[26] 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 $2p_{\frac{1}{2}}$ 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 $2p_{\frac{1}{2}}$ 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 $E_{n"\ell"}$

and $E_{n\ell}$ [cf. Eq. (1)] are taken from x-ray[34] or ESCA[35] 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]

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

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 Clausing[37] are based:

$$E_{\infty\ell_A}(Z) \cong E_{n''\ell''}(Z) - \tfrac{1}{2}[E_{n\ell}(Z) + E_{n\ell}(Z+1) + E_{n'\ell'}(Z) + E_{n'\ell'}(Z+1)] \tag{5}$$

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 Larkins[40] 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 calculations[42] 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]

References

1. D. Coster and R. de L. Kronig, Physica 2, 13 (1935)
2. O. Keski-Rahkonen and M. O. Krause, Atomic Data and Nuclear Data Tables 14, 139 (1974)
3. M. H. Chen, B. Crasemann, and V. O. Kostroun, Phys. Rev. A 4, 1 (1971)
4. B. Crasemann, M. H. Chen, and V. O. Kostroun, Phys. Rev. A 4, 2161 (1971)
5. W. Bambynek, B. Crasemann, R. W. Fink, H.-U. Freund, H. Mark, C. D. Swift, R. E. Price, and P. Venugopala Rao, Rev. Mod. Phys. 44, 716 (1972)
6. K. R. Baker, F. Tolea, R. W. Fink, and J. J. Pinajian, Z. Physik 270, 9 (1974)
7. D. W. Nix and R. W. Fink, Z. Physik A 273, 305 (1975)
8. L. A. McNelles, J. L. Campbell, J. S. Geiger, R. L. Graham, and J. S. Merrit, Can. J. Phys. 53, 1349 (1975)
9. P. Venugopala Rao, R. E. Woods, J. M. Palms, and R. W. Fink, Phys. Rev. 178, 1997 (1969)
10. M. R. Zalutsky and E. S. Macias, Phys. Rev. A 11, 71 (1975)
11. B. L. Doyle and S. M. Shafroth, in Abstracts of Contributed Papers, Second International Conference on Inner-Shell Ionization Phenomena (University of Freiburg, 1976), p. 211.
12. M. Aoyagi, M. H. Chen, B. Crasemann, K.-N. Huang, and H. Mark, in Abstracts, Fifth International Conference on Atomic Physics, edited by R. Marrus, M. H. Prior, and H. A. Shugart (University of California, Berkeley, 1976), p. 300.
13. L. I Yin, I. Adler, M. H. Chen, and B. Crasemann, Phys. Rev. A 7, 897 (1973)
14. L. I Yin, I. Adler, T. Tsang, M. H. Chen, D. A. Ringers, and B. Crasemann, Phys. Rev. A 9, 1070 (1974)

15. M. H. Chen, B. Crasemann, L. I Yin, T. Tsang, and I. Adler, Phys. Rev. A 13, 1435 (1976)

16. Computations of transition rates are under way in our group.

17. D. A. Shirley, Chem. Phys. Lett. 17, 312 (1972) and 15, 185 (1972)

18. S. P. Kowalczyk, R. A. Pollak, F. R. McFeely, L. Ley, and D. A. Shirley, Phys. Rev. B 8, 2387 (1973).

19. K.-N. Huang, M. Aoyagi, M. H. Chen, B. Crasemann, and H. Mark, Atomic Data and Nuclear Data Tables 18, 000 (1976)

20. D. A. Liberman, D. T. Cromer, and J. T. Waber, Comp. Phys. Commun. 2, 107 (1971)

21. W. Kohn and L. J. Sham, Phys. Rev. 140, A1133 (1965)

22. H. A. Bethe and E. E. Salpeter, Quantum Mechanics of One- and Two-Electron Atoms (Academic, New York, 1957), p. 199

23. A. I. Akhiezer and V. B. Berestetskii, Quantum Electrodynamics (Interscience, New York, 1965), p. 517

24. G. E. Brown, Phil. Mag. 43, 467 (1952)

25. J. B. Mann and W. R. Johnson, Phys. Rev. A 4, 41 (1971)

26. I. P. Grant, Proc. Roy. Soc. (London) A 262, 555 (1961); Adv. Phys. 19 747 (1970)

27. G. Breit, Phys. Rev. 34, 553 (1929); Phys. Rev. 36, 383 (1930); Phys. Rev. 39, 616 (1932)

28. Y.-K. Kim, Phys. Rev. 154, 17 (1967)

29. F. C. Smith and W. R. Johnson, Phys. Rev. 160, 136 (1967)

30. J. B. Mann and W. R. Johnson, Phys. Rev. A 4, 41 (1971)

31. K.-N. Huang, Phys. Rev. A 14, 000 (1976)

32. E. A. Uehling, Phys. Rev. 48, 55 (1935)

33. P. J. Mohr, Phys. Rev. Lett. 34, 1050 (1975)

34. J. A. Bearden and A. F. Burr, Rev. Mod. Phys. 39, 125 (1967)

35. K. Siegbahn, G. Nordling, A. Fahlman, R. Nordberg, K. Hamrin, H. Hedman, G. Johansson, T. Bergmark, S. Karlsson, I. Lindgren, and B. Lindberg, ESCA, Atomic, Molecular, and Solid State Structure Studied by Means of Electron Spectroscopy, Almqvist and Wiksells, Uppsala (1967)

36. M. F. Chung and L. H. Jenkins, Surface Science 22, 479 (1970)

37. W. A. Coghlan and R. E. Clausing, Atomic Data 5, 317 (1973)

38. J. C. Slater, Quantum Theory of Molecules and Solids. The Self-Consistent Field for Molecules and Solids. (McGraw-Hill, New York, 1974), Vol. IV

39. N. H. F. Beebe, Chem. Phys. Lett. 19, 290 (1973)

40. F. P. Larkins, J. Phys. B: Atom. Molec. Phys. 9, 47 (1976)

41. Ch. Briançon and J. P. Desclaux, Phys. Rev. A. 13, 2157 (1976).

42. M. H. Chen, unpublished results

43. W. Mehlhorn, Z. Physik 208, 1 (1968)

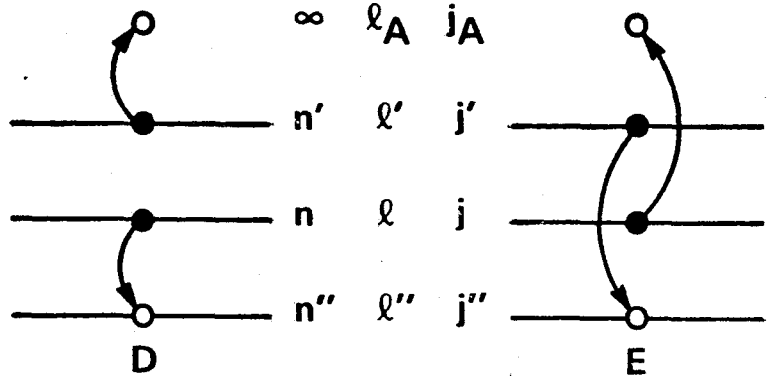

FIG. 1 Quantum numbers that label states involved in direct and exchange radiationless transitions

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, nℓj, n'ℓ'j' in Fig. 1. 2P1/2 = $2p_{\frac{1}{2}}$, 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	21.1077	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	.03158	-.00662	.00160	.000011	-.02255
2P3/2 3S1/2	26.0968	26.1197	.00367	-.00604	.00143	.000010	-.02200
2P3/2 3P1/2	32.0436	32.0651	.00571	-.00661	.00160	.000011	-.02200
SILICON	3P2	Z=14 A=28	R=6.88607E-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	.00621	-.00810	.00199	.000013	-.03053
2P3/2 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	.00269	.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	.07276	-.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	48.1695	48.2533	.04053	-.02327	.00684	.000037	-.08789
2P3/2 3P3/2	48.7812	48.8556	.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	.13629	-.02633	.00842	.000042	-.11103
2P3/2 3S1/2	21.9103	21.9960	.04044	-.02555	.00755	.000038	-.10819
2P3/2 3P1/2	44.7557	44.8284	.05567	-.02895	.00875	.000044	-.10819
2P3/2 3P3/2	45.5051	45.5922	.04107	-.02883	.00875	.000044	-.10819
2P3/2 4S1/2	74.7061	74.7966	.03354	-.02629	.00843	.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	37.6669	.22651	-.04383	.01363	.000058	-.16515
2P1/2 3D3/2	71.9152	71.9103	.19296	-.03656	.01352	.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	86.6965	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	36.1420	36.1004	.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	34.4914	34.4398	.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	.12628	-.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	-.06958	.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=8.62396E-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	.02888	.000075	-.33096
2P1/2 3D3/2	90.3758	90.3430	.40967	-.07469	.02870	.000075	-.33096
2P1/2 3D5/2	90.6635	90.6456	.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	.20361	-.08155	.02897	.000075	-.32278
2P3/2 3P3/2	51.2821	51.4995	.15674	-.08036	.02896	.000075	-.32276
2P3/2 3D3/2	102.0639	102.3167	.10991	-.06884	.02880	.000075	-.32276
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=8.67591E-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	.03426	.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	36.1561	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	43.2403	43.1661	.80936	-.14554	.05427	.000039	-.59395
2P1/2 3D3/2	121.9892	121.9459	.70379	-.12061	.05400	.000038	-.59395
2P1/2 3D5/2	121.4869	121.4522	.69984	-.12523	.05399	.000038	-.59395
2P1/2 4S1/2	131.0769	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	.23862	-.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	159.7694	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	.88767	-.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	.39809	-.15945	.06186	-.000019	-.74478
2P3/2 3P1/2	45.4433	45.7835	.51430	-.16279	.07305	-.000023	-.74478
2P3/2 3P3/2	50.4228	50.8568	.41912	-.16140	.07313	-.000023	-.74478
2P3/2 3D3/2	140.2660	140.6026	.31081	-.15538	.07280	-.000023	-.74478
2P3/2 3D5/2	141.4797	142.0331	.27060	-.15199	.07279	-.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	.08318	-.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	.06078	-.000067	-.85680
2P1/2 4P1/2	151.9162	151.8410	1.02634	-.17640	.06214	-.000068	-.85680
2P3/2 3S1/2	-20.0182	-19.5193	.44224	-.17674	.07073	-.000059	-.83910
2P3/2 3P1/2	35.8077	36.1677	.57676	-.20340	.08379	-.000070	-.83910
2P3/2 3P3/2	41.8809	42.3681	.46984	-.20173	.08369	-.000070	-.83910
2P3/2 3D3/2	138.0514	138.6310	.34833	-.17230	.08354	-.000070	-.83910
2P3/2 3D5/2	139.5561	140.1793	.30070	-.16823	.08353	-.000070	-.83910
2P3/2 4S1/2	173.5116	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	1.13766	-.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	.09563	-.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	.09545	-.000132	-.94250
2P3/2 4S1/2	181.0087	181.6669	.38344	-.19178	.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	.10869	-.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	188.7086	189.4425	.42667	-.21109	.10545	-.000204	-1.05477
2P3/2 4P1/2	202.7271	203.4486	.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	-.23604	.12082	-.000299	-1.19795
2P1/2 4P3/2	166.9810	166.8939	1.40102	-.23648	.12083	-.000299	-1.19795
2P3/2 3S1/2	-62.2960	-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	1.56115	-.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	2.8606	.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	206.4910	.51691	-.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	54.9258	1.68557	-.26195	.15555	-.000564	-1.47101
2P1/2 3D5/2	55.0831	54.9999	1.67802	-.27875	.15553	-.000564	-1.47101
2P1/2 4S1/2	149.8976	149.7942	1.70247	-.27751	.15003	-.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	.15391	-.000558	-1.47101
2P1/2 5S1/2	195.9808	195.8859	1.69227	-.27871	.15293	-.000554	-1.47101
2P3/2 3P3/2	-16.3441	-16.5435	.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	209.5802	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	1.85976	-.28541	.17494	-.000736	-1.62218
2P1/2 3D5/2	35.2384	35.1393	1.85158	-.30444	.17491	-.000738	-1.62218
2P1/2 4S1/2	146.7207	146.6055	1.87187	-.30207	.16831	-.000709	-1.62218
2P1/2 4P1/2	170.5430	170.7007	1.90022	-.30805	.17301	-.000729	-1.62218
2P1/2 4P3/2	171.9829	171.8646	1.87694	-.30882	.17305	-.000729	-1.62218
2P1/2 5S1/2	202.3843	202.2809	1.85762	-.30298	.17166	-.000724	-1.62218
2P3/2 3P3/2	-35.6290	-34.7652	.90537	-.35760	.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	.66061	-.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	270.6828	.61475	-.30110	.17380	-.000737	-1.59811
YTTRIUM 4D1	Z=39 A=89	R=1.01247E-04 A.U.					
2P1/2 3P3/2	-127.7536	-128.1546	2.39063	-.39693	.19629	-.000944	-1.78819
2P1/2 3D3/2	17.8935	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 4D1 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	2.03844	-.32982	.19216	-.000925	-1.78819
2P3/2 3P3/2	-50.8822	-49.9264	1.00035	-.39029	.19686	-.000963	-1.76379
2P3/2 3D3/2	91.7247	92.6669	.75164	-.32763	.19837	-.000962	-1.76379
2P3/2 3D5/2	95.3613	96.6127	.63180	-.31680	.19833	-.000962	-1.76379
2P3/2 4S1/2	222.8619	224.0740	.68784	-.32584	.19063	-.000924	-1.76379
2P3/2 4P1/2	247.7441	248.9199	.72652	-.33377	.19622	-.000951	-1.76379
2P3/2 4P3/2	250.6547	251.8642	.69219	-.33326	.19627	-.000951	-1.76379
2P3/2 4D3/2	280.8008	282.0365	.65630	-.32518	.19591	-.000950	-1.76379
2P3/2 5S1/2	285.0779	286.3051	.66923	-.32645	.19473	-.000944	-1.76379
ZIRCONIUM 4D2 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	2.25164	-.36420	.21858	-.001186	-1.96575
2P1/2 4S1/2	147.7114	147.5690	2.25827	-.35064	.20966	-.001137	-1.96575
2P1/2 4P1/2	173.8175	173.6367	2.29830	-.36684	.21622	-.001172	-1.96575
2P1/2 4P3/2	177.7853	177.6383	2.26516	-.36754	.21630	-.001173	-1.96575
2P1/2 4D3/2	211.1976	211.0884	2.21561	-.35564	.21592	-.001171	-1.96575
2P1/2 5S1/2	216.7434	216.6221	2.23199	-.35835	.21458	-.001164	-1.96575
2P3/2 3P3/2	-66.1407	-65.0959	1.10000	-.42435	.22220	-.001212	-1.94139
2P3/2 3D3/2	82.9921	84.2338	.62966	-.35566	.22169	-.001212	-1.94139
2P3/2 3D5/2	87.2793	88.6490	.69473	-.34342	.22165	-.001211	-1.94139
2P3/2 4S1/2	232.3975	233.7308	.74896	-.35248	.21274	-.001162	-1.94139
2P3/2 4P1/2	258.1698	259.4602	.79459	-.36174	.21929	-.001197	-1.94139
2P3/2 4P3/2	262.6302	263.9602	.75419	-.36099	.21937	-.001198	-1.94139
2P3/2 4D3/2	295.7099	297.0707	.71431	-.35148	.21900	-.001196	-1.94139
2P3/2 5S1/2	301.3769	302.7292	.72542	-.35279	.21766	-.001189	-1.94139
NIOBIUM 4D5 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 4P1/2	178.1437	177.9408	2.52366	-.40070	.24046	-.001452	-2.15905
2P1/2 4P3/2	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 4P1/2	272.5735	273.9921	.86484	-.39100	.24414	-.001485	-2.13512
2P3/2 4P3/2	279.7323	281.1964	.81813	-.38981	.24424	-.001486	-2.13512
2P3/2 4D3/2	314.9496	316.4476	.77386	-.37911	.24389	-.001484	-2.13512
2P3/2 5S1/2	319.3854	320.8763	.78334	-.38033	.24266	-.001476	-2.13512
MOLYBDENUM 4D5 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 4P1/2	181.1914	180.9671	2.75156	-.43220	.26720	-.001781	-2.36052
2P1/2 4P3/2	187.6877	187.5077	2.70782	-.43281	.26733	-.001782	-2.36052
2P1/2 4D3/2	227.0902	226.9594	2.64330	-.41717	.26696	-.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	.26556	-.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	76.4985	78.1275	.83766	-.40167	.27444	-.001845	-2.33759
2P3/2 4S1/2	258.9223	260.5257	.88350	-.41038	.26287	-.001766	-2.33759
2P3/2 4P1/2	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 4D5 5S1 Z=42 A=96 R=1.04551E-04 A.U.							
2P3/2 4P3/2	293.2298	294.8284	.89018	-.42111	.27171	-.001625	-2.33759
2P3/2 4D3/2	332.2450	333.8834	.63635	-.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	-.40982	.26997	-.001814	-2.33759
TECHNETIUM 4D6 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	.29628	-.002163	-2.57796
2P1/2 4P3/2	190.4524	190.2586	2.94316	-.46568	.29644	-.002164	-2.57796
2P1/2 4D3/2	233.8142	233.6770	2.86910	-.44781	.29605	-.002162	-2.57796
2P1/2 4D5/2	234.3861	234.2560	2.86503	-.45080	.29604	-.002162	-2.57796
2P1/2 5S1/2	240.3974	240.2503	2.88369	-.45097	.29452	-.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	.30464	-.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	.30148	-.002218	-2.55663
2P3/2 4P3/2	307.4686	309.2143	.96548	-.45393	.30164	-.002219	-2.55663
2P3/2 4D3/2	350.4172	352.2086	.90574	-.43971	.30125	-.002217	-2.55663
2P3/2 4D5/2	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 4D7 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 4D3/2	240.6218	240.4736	3.10737	-.47947	.32763	-.002604	-2.80476
2P1/2 4D5/2	241.1572	241.0167	3.10321	-.48294	.32762	-.002604	-2.80476
2P1/2 5S1/2	248.1582	248.0003	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 4D3/2	369.6081	371.5590	.97592	-.47213	.33378	-.002674	-2.78578
2P3/2 4D5/2	370.4689	372.4394	.95465	-.47048	.33377	-.002674	-2.78578
2P3/2 5S1/2	377.3205	379.2683	.98160	-.47305	.33208	-.002660	-2.78578
RHODIUM 4D8 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	.36229	-.003114	-3.04878
2P1/2 4D3/2	247.8095	247.6533	3.35832	-.51209	.36186	-.003111	-3.04878
2P1/2 4D5/2	248.3052	248.1570	3.35428	-.51607	.36185	-.003111	-3.04878
2P1/2 5S1/2	256.4557	256.2900	3.37370	-.51614	.35999	-.003095	-3.04878
2P3/2 3P3/2	-136.5959	-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	1.09500	-.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	.36964	-.003200	-3.03294
2P3/2 4P3/2	339.0416	341.1066	1.12582	-.52420	.36953	-.003203	-3.03294
2P3/2 4D3/2	390.1720	392.2961	1.04693	-.50600	.36911	-.003201	-3.03294
2P3/2 4D5/2	391.0203	393.1662	1.02524	-.50411	.36909	-.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	-106.8785	-107.1843	3.79156	-.57218	.40274	-.003731	-3.31258
2P1/2 4S1/2	162.6790	162.4522	3.71143	-.55245	.38392	-.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
2P3/2 3D3/2	44.3166	46.3354	1.43662	-.56234	.41134	-.003844	-3.30081
2P3/2 3D5/2	51.6313	53.6654	1.19949	-.54021	.41123	-.003843	-3.30081
2P3/2 4S1/2	319.5793	321.8326	1.20518	-.54648	.39242	-.003665	-3.30081
2P3/2 4P1/2	355.5824	357.7460	1.29836	-.56442	.40702	-.003799	-3.30081
2P3/2 4P3/2	360.5715	362.8143	1.21766	-.56315	.40731	-.003803	-3.30081
2P3/2 4D3/2	416.1384	418.4476	1.13145	-.54291	.40690	-.003800	-3.30081
2P3/2 4D5/2	416.8038	419.1348	1.10757	-.54088	.40688	-.003800	-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	262.1286	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	38.9030	41.3188	1.29873	-.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	.44853	-.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	-.57850	.44669	-.004474	-3.57716
CADMIUM 5S2 Z=48 A=114 R=1.09956E-04 A.U.							
2P1/2 3D5/2	-165.8031	-166.1662	4.42265	-.65252	.46810	-.005177	-3.87000
2P1/2 4S1/2	152.6433	152.5779	4.30248	-.62629	.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	.49962	-.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	382.6557	385.3938	1.46341	-.64104	.49456	-.005289	-3.86974
2P3/2 4P3/2	389.3919	392.0296	1.38185	-.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 R=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	145.3971	4.61653	-.66443	.50843	-.005732	-4.17707
2P1/2 4P1/2	188.7673	188.3691	4.73782	-.68631	.52970	-.005970	-4.17707
2P1/2 4P3/2	195.5832	195.2804	4.64436	-.68874	.53023	-.005979	-4.17707
2P1/2 4D3/2	264.4508	264.2593	4.49794	-.65308	.52969	-.005975	-4.17707
2P1/2 4D5/2	265.2494	265.0698	4.49309	-.66007	.52967	-.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	1.47165	-.65182	.54886	-.006258	-4.18451
2P3/2 4S1/2	353.3926	356.2759	1.44083	-.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	.53945	-.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	.56610	-.006652	-4.50130
2P1/2 4P1/2	183.5922	183.1636	5.08473	-.72790	.56066	-.006936	-4.50130
2P1/2 4P3/2	191.6111	191.2887	4.96046	-.73056	.56069	-.006947	-4.50130
2P1/2 4D3/2	264.6554	264.4959	4.81650	-.69085	.56015	-.006944	-4.50130
2P1/2 4D5/2	265.7836	265.5979	4.81274	-.69891	.56011	-.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	-1.8316	1.56427	-.69067	.60195	-.007286	-4.51796
2P3/2 4S1/2	365.6803	368.8088	1.51790	-.69327	.57173	-.006915	-4.51796
2P3/2 4P1/2	410.2868	413.2684	1.66859	-.72075	.59566	-.007200	-4.51796
2P3/2 4P3/2	419.1664	422.2919	1.54264	-.71873	.59632	-.007210	-4.51796
2P3/2 4D3/2	491.5991	494.8028	1.41358	-.68784	.59577	-.007207	-4.51796
2P3/2 4D5/2	493.2446	496.4901	1.36785	-.68387	.59573	-.007206	-4.51796
2P3/2 5S1/2	518.3940	521.6011	1.41512	-.68843	.59135	-.007153	-4.51796
2P3/2 5P1/2	526.7324	529.9268	1.42738	-.69103	.59437	-.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	.62920	-.007966	-4.84468
2P1/2 5P1/2	306.6562	306.4176	5.19926	-.74065	.63284	-.008012	-4.84468
2P1/2 5P3/2	306.8795	306.6536	5.18689	-.74122	.63291	-.008013	-4.84468
2P3/2 3D5/2	-20.4436	-17.1555	1.66380	-.73065	.65923	-.008447	-4.87220
2P3/2 4S1/2	378.5447	381.9308	1.60063	-.73197	.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	1.62629	-.76064	.65304	-.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	544.7832	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	171.7644	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	.69285	-.009259	-5.20650
2P1/2 4D5/2	265.2184	265.0151	5.50493	-.77866	.69281	-.009259	-5.20650
2P1/2 5S1/2	302.0247	301.7886	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(V-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	1.67031	-.80466	.71357	-.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	-.009566	-5.24675
2P3/2 5P1/2	584.2064	587.9419	1.57825	-.76930	.71169	-.009624	-5.24675
2P3/2 5P3/2	585.0153	588.7682	1.56065	-.76911	.71196	-.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	176.3565	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	307.2482	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	322.1448	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	458.8282	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	.77971	-.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	1.63138	-.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	.83165	-.012303	-5.98935
2P1/2 4S1/2	102.9795	102.6040	6.45932	-.86771	.78481	-.011591	-5.98935
2P1/2 4P1/2	157.7614	157.1604	6.66247	-.90248	.82247	-.012143	-5.98935
2P1/2 4P3/2	170.2441	169.6214	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	329.5665	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	158.6219	158.3596	6.94180	-.95467	.89675	-.013890	-6.40770
2P1/2 4D3/2	254.2080	253.9362	6.68567	-.89041	.85613	-.013889	-6.40770
2P1/2 4D5/2	256.2426	255.9975	6.67579	-.90522	.89607	-.013888	-6.40770
2P1/2 5S1/2	314.2691	313.9887	6.71883	-.90334	.88630	-.013732	-6.40770

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	-.89465	.88493	-.013901	-6.49955
2P3/2 4P1/2	491.2237	495.5619	2.18705	-.93799	.92685	-.014545	-6.49955
2P3/2 4P3/2	506.3666	510.9068	1.98052	-.93501	.92836	-.014579	-6.49955
2P3/2 4D3/2	600.8173	605.5069	1.78344	-.88663	.92775	-.014577	-6.49955
2P3/2 4D5/2	603.6605	608.4258	1.76046	-.87937	.92768	-.014576	-6.49955
2P3/2 5S1/2	661.3782	666.0697	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=138 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	70.4980	7.33749	-.95726	.92663	-.015016	-6.84828
2P1/2 4P1/2	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	-.96683	.96266	-.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	7.13486	-.94756	.96901	-.015713	-6.84828
2P3/2 3D5/2	-109.4882	-104.7792	2.19518	-.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	2.29812	-.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	1.00756	-.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	-.016538	-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	-.017875	-7.31572
2P1/2 4P3/2	136.8031	136.2545	7.87882	-1.05492	1.05837	-.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	-.017695	-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	7.61392	-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	-.018909	-7.45564
2P3/2 4D3/2	647.5242	652.9376	1.93352	-.97201	1.09906	-.018910	-7.45564
2P3/2 4D5/2	651.3192	656.8261	1.83171	-.96302	1.09896	-.018908	-7.45564
2P3/2 5S1/2	727.1426	732.5933	1.90740	-.96963	1.08584	-.018676	-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	778.5967	1.87783	-.96893	1.09549	-.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=58 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	8.07518	-1.03669	1.13353	-.020030	-7.81561
2P1/2 5P1/2	351.8603	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	-115.9731	2.45091	-1.04293	1.20538	-.021663	-7.98473
2P3/2 4S1/2	502.2980	507.9860	2.20999	-1.02901	1.13619	-.020402	-7.98473
2P3/2 4P1/2	564.7008	570.0664	2.53102	-1.08285	1.19234	-.021385	-7.98473
2P3/2 4P3/2	586.3310	591.9581	2.26252	-1.07825	1.19478	-.021445	-7.98473
2P3/2 4D3/2	689.9668	695.7743	2.02361	-1.01910	1.19413	-.021447	-7.98473
2P3/2 4D5/2	696.9251	702.8355	1.91025	-1.00850	1.19402	-.021445	-7.98473
2P3/2 4F5/2	809.4457	815.4222	1.83249	-.99519	1.19236	-.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	1.19084	-.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	-.022603	-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	8.53778	-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	1.29413	-.024193	-8.53671
2P3/2 4P3/2	621.1548	627.1949	2.35071	-1.12679	1.29695	-.024265	-8.53671
2P3/2 4D3/2	727.1165	733.3465	2.09891	-1.06425	1.29629	-.024269	-8.53671
2P3/2 4D5/2	736.1161	742.4593	1.97381	-1.05224	1.29618	-.024267	-8.53671
2P3/2 4F5/2	853.4722	859.8868	1.88908	-1.03719	1.29446	-.024233	-8.53671
2P3/2 5S1/2	815.4029	821.7072	2.03005	-1.05540	1.28174	-.023992	-8.53671
2P3/2 5P1/2	835.9662	842.2225	2.07538	-1.06355	1.29282	-.024195	-8.53671
2P3/2 5P3/2	839.7744	846.0741	2.03097	-1.06297	1.29320	-.024205	-8.53671
2P3/2 6S1/2	865.0502	871.3741	2.00142	-1.05460	1.29009	-.024146	-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	118.3138	9.71262	-1.20349	1.34240	-.025665	-8.87947
2P1/2 4P3/2	144.9492	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	-.025688	-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	2.69487	-1.14153	1.41872	-.027608	-9.11844
2P3/2 4S1/2	565.4939	572.0442	2.37625	-1.12025	1.33618	-.026035	-9.11844

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=1.18861E-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	2.16965	-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	1.40402	-.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	1.40226	-.027319	-9.11844
2P3/2 5P3/2	886.3276	893.0928	2.08355	-1.10568	1.40271	-.027331	-9.11844
2P3/2 6S1/2	912.1791	918.9705	2.05162	-1.09672	1.39942	-.027268	-9.11844
PROMETHIUM 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	47.2665	9.94176	-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	1.43763	-.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	-128.1368	-121.5335	2.81143	-1.19098	1.53728	-.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	2.65412	-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	808.5070	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	930.8198	938.0280	2.18155	-1.14897	1.51979	-.030782	-9.72983
2P3/2 5P3/2	935.4790	942.7369	2.13069	-1.14522	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	-.030659	-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	-1.31268	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	10.16764	-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	10.21650	-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	2.58756	-1.27266	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	2.13196	-1.18291	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	967.8797	2.17685	-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	987.2983	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 4P1/2	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	419.4491	419.2313	10.52286	-1.24327	1.69441	-.036234	-10.67399
2P1/2 5S1/2	374.2242	373.7758	10.74496	-1.26380	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	-117.8723	3.05737	-1.29337	1.80066	-.039326	-11.05190
2P3/2 4S1/2	677.1131	685.1648	2.59931	-1.25624	1.69410	-.036965	-11.05190
2P3/2 4P1/2	749.0066	756.5898	3.05622	-1.32970	1.78103	-.038804	-11.05190
2P3/2 4P3/2	784.0161	791.9821	2.65980	-1.32092	1.78094	-.038950	-11.05190
2P3/2 4D3/2	901.2778	909.4751	2.35164	-1.24334	1.78525	-.038964	-11.05190
2P3/2 4D5/2	916.4481	924.8022	2.17744	-1.22576	1.78508	-.038961	-11.05190
2P3/2 4F5/2	1055.4050	1063.8533	2.06244	-1.20290	1.78300	-.038912	-11.05190
2P3/2 4F7/2	1058.5670	1067.0873	1.99050	-1.20293	1.78292	-.038910	-11.05190
2P3/2 5S1/2	1013.3909	1021.7283	2.21124	-1.22385	1.78565	-.038530	-11.05190
2P3/2 5P1/2	1036.2697	1044.5474	2.26539	-1.23321	1.78066	-.038652	-11.05190
2P3/2 5P3/2	1041.5286	1049.8626	2.25760	-1.23227	1.78149	-.038672	-11.05190
2P3/2 6S1/2	1068.8271	1077.1944	2.16733	-1.22144	1.77755	-.038788	-11.05190
CACCLINIUM 4F7 5D1	Z=64 A=156	R=1.22595E-04 A.U.					
2P1/2 3D5/2	-821.4237	-823.0143	12.58912	-1.48106	1.84684	-.040425	-11.32335
2P1/2 4S1/2	22.7598	21.9069	11.78907	-1.34495	1.73037	-.038251	-11.32335
2P1/2 4P1/2	96.0173	95.7588	12.20629	-1.41254	1.82536	-.040384	-11.32335
2P1/2 4P3/2	134.6697	133.7705	11.84989	-1.41769	1.83101	-.040504	-11.32335
2P1/2 4D3/2	257.0963	256.5233	11.41076	-1.30419	1.83034	-.040423	-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	11.10087	-1.28619	1.82801	-.040466	-11.32335
2P1/2 4F7/2	421.9351	421.6592	11.09656	-1.28681	1.82799	-.040466	-11.32335
2P1/2 5S1/2	378.8246	378.3403	11.34949	-1.31006	1.83023	-.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	-.041388	-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	2.38609	-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	1.98663	-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	1088.8522	1097.7040	2.29885	-1.27427	1.92544	-.043526	-11.75832
2P3/2 5P3/2	1095.5621	1104.4772	2.23371	-1.27316	1.92621	-.043551	-11.75832
2P3/2 5D3/2	1122.2892	1131.2457	2.18026	-1.26027	1.92534	-.043535	-11.75832
2P3/2 6S1/2	1125.9770	1134.9280	2.19019	-1.26129	1.92186	-.043455	-11.75832
TERBIUM 4F9	Z=65 A=156	R=1.22595E-04 A.U.					
2P1/2 3D5/2	-855.9021	-857.6549	13.36913	-1.54848	1.99046	-.045607	-12.01272
2P1/2 4S1/2	26.6662	25.8059	12.44422	-1.39312	1.86464	-.042616	-12.01272
2P1/2 4P1/2	105.0741	103.7207	12.90703	-1.46332	1.96730	-.044936	-12.01272
2P1/2 4P3/2	142.7777	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=158 R=1.22595E-04 A.U.							
2P1/2 4F7/2	439.7544	439.4308	11.74159	-1.33065	1.97052	-.045103	-12.01272
2P1/2 5S1/2	391.6746	391.3636	11.97076	-1.35268	1.95040	-.044622	-12.01272
2P1/2 5P1/2	416.4938	415.9234	12.02107	-1.36103	1.96809	-.045030	-12.01272
2P1/2 5P3/2	421.8970	421.3618	11.96022	-1.36219	1.96892	-.045057	-12.01272
2P1/2 6S1/2	450.3936	449.9212	11.91469	-1.34529	1.96456	-.044957	-12.01272
2P3/2 3D5/2	-116.2966	-107.7534	3.31417	-1.40002	2.10336	-.049270	-12.51142
2P3/2 4S1/2	763.3166	772.5149	2.72687	-1.34512	1.97761	-.046281	-12.51142
2P3/2 4P1/2	840.7162	849.3813	3.24422	-1.42653	2.08021	-.048602	-12.51142
2P3/2 4P3/2	879.9396	889.0401	2.78987	-1.41674	2.08061	-.048607	-12.51142
2P3/2 4D3/2	1006.5080	1015.8677	2.44412	-1.32945	2.08591	-.048829	-12.51142
2P3/2 4D5/2	1020.3859	1029.9192	2.25188	-1.31067	2.08570	-.048824	-12.51142
2P3/2 4F5/2	1173.3714	1183.0223	2.10852	-1.28262	2.08339	-.048766	-12.51142
2P3/2 4F7/2	1176.1050	1185.8302	2.03434	-1.28266	2.08333	-.048764	-12.51142
2P3/2 5S1/2	1128.3276	1137.8663	2.26290	-1.30514	2.08325	-.048289	-12.51142
2P3/2 5P1/2	1152.7995	1162.2726	2.32117	-1.31512	2.08092	-.048691	-12.51142
2P3/2 5P3/2	1158.4090	1167.9461	2.25519	-1.31385	2.08174	-.048718	-12.51142
2P3/2 6S1/2	1186.6188	1196.3957	2.20744	-1.30168	2.07733	-.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	-.050744	-12.73073
2P1/2 4S1/2	20.9178	19.9963	13.13301	-1.44063	2.00729	-.047389	-12.73073
2P1/2 4P1/2	102.1916	100.7427	13.62527	-1.51430	2.11863	-.049990	-12.73073
2P1/2 4P3/2	142.1717	141.1311	13.21624	-1.52060	2.12593	-.050231	-12.73073
2P1/2 4D3/2	274.8728	274.1984	12.72330	-1.39319	2.12526	-.050259	-12.73073
2P1/2 4D5/2	286.9491	286.3462	12.68111	-1.42231	2.12504	-.050254	-12.73073
2P1/2 4F5/2	447.7924	447.3640	12.45920	-1.37250	2.12261	-.050191	-12.73073
2P1/2 4F7/2	450.2719	449.9165	12.38707	-1.37329	2.12258	-.050190	-12.73073
2P1/2 5S1/2	401.0047	400.4604	12.61990	-1.39615	2.10093	-.049660	-12.73073
2P1/2 5P1/2	426.4434	425.8371	12.67189	-1.40474	2.11998	-.050106	-12.73073
2P1/2 5P3/2	431.9756	431.4279	12.61358	-1.40587	2.12090	-.050139	-12.73073
2P1/2 6S1/2	461.0128	460.5106	12.55903	-1.39234	2.11623	-.050030	-12.73073
2P3/2 3D5/2	-108.6191	-99.5180	3.43636	-1.45350	2.27095	-.055014	-13.29993
2P3/2 4S1/2	810.5232	820.3500	2.77879	-1.38850	2.13455	-.051661	-13.29993
2P3/2 4P1/2	890.7667	900.0208	3.32833	-1.47402	2.24563	-.054261	-13.29993
2P3/2 4P3/2	932.2992	942.0215	2.84270	-1.46367	2.25310	-.054501	-13.29993
2P3/2 4D3/2	1063.6502	1073.6463	2.47722	-1.37126	2.25240	-.054528	-13.29993
2P3/2 4D5/2	1076.8353	1087.0137	2.27562	-1.35191	2.25217	-.054522	-13.29993
2P3/2 4F5/2	1237.0531	1247.3614	2.11736	-1.32107	2.24974	-.054459	-13.29993
2P3/2 4F7/2	1239.5544	1249.9372	2.04298	-1.32110	2.24967	-.054457	-13.29993
2P3/2 5S1/2	1190.3944	1200.5905	2.27396	-1.34426	2.22807	-.053929	-13.29993
2P3/2 5P1/2	1215.6179	1225.7452	2.33445	-1.35455	2.24709	-.054376	-13.29993
2P3/2 5P3/2	1221.4241	1231.6185	2.26520	-1.35327	2.24801	-.054407	-13.29993
2P3/2 6S1/2	1250.3712	1260.6083	2.21424	-1.34047	2.24336	-.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	-.056369	-13.47466
2P1/2 4S1/2	15.0071	14.0132	13.84930	-1.48768	2.15960	-.052612	-13.47466
2P1/2 4P1/2	99.2054	97.6493	14.37068	-1.56464	2.28024	-.055519	-13.47466
2P1/2 4P3/2	141.6134	140.4933	13.93342	-1.57140	2.28854	-.055802	-13.47466
2P1/2 4D3/2	279.2191	278.4858	13.41246	-1.43654	2.28767	-.055836	-13.47466
2P1/2 4D5/2	290.5532	289.8934	13.37075	-1.46607	2.28763	-.055830	-13.47466
2P1/2 4F5/2	458.7960	458.3259	13.12977	-1.41429	2.28507	-.055761	-13.47466
2P1/2 4F7/2	461.0330	460.6357	13.05771	-1.41503	2.28504	-.055760	-13.47466
2P1/2 5S1/2	410.2039	409.7164	13.29440	-1.43880	2.28172	-.055172	-13.47466
2P1/2 5P1/2	436.5669	435.9145	13.34810	-1.44754	2.28221	-.055668	-13.47466
2P1/2 5P3/2	442.3735	441.7835	13.28568	-1.44864	2.28329	-.055706	-13.47466
2P1/2 6S1/2	471.8799	471.3386	13.22763	-1.43442	2.27835	-.055586	-13.47466
2P3/2 3D5/2	-98.6970	-89.0108	3.55279	-1.50679	2.45066	-.061336	-14.12148
2P3/2 4S1/2	860.6097	871.0953	2.82162	-1.43094	2.30280	-.057581	-14.12148
2P3/2 4P1/2	943.7538	953.6284	3.40466	-1.52064	2.42338	-.060467	-14.12148
2P3/2 4P3/2	987.7488	998.1236	2.88546	-1.50961	2.43164	-.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	-.060602	-14.12148
2P3/2 4D5/2	1136.4335	1147.2685	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	-.060136	-14.12148
2P3/2 5P1/2	1281.7805	1292.5923	2.33791	-1.39289	2.42530	-.060634	-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	-994.5546	-996.7731	15.80080	-1.74003	2.48226	-.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	-.061936	-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	13.62467	-1.45484	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	2.48298	-.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	1199.1118	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	1388.0429	2.02734	-1.39402	2.61910	-.067617	-14.99498
2P3/2 5S1/2	1324.1799	1335.8016	2.26513	-1.41901	2.59414	-.066967	-14.99498
2P3/2 5P1/2	1351.1284	1362.6746	2.32995	-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	456.2070	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	-1.48907	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	1408.4569	2.24163	-1.45395	2.79079	-.074469	-15.91046
2P3/2 5P1/2	1423.8567	1436.1798	2.30912	-1.46511	2.82044	-.075078	-15.91046
2P3/2 5P3/2	1430.3462	1442.7466	2.22661	-1.46341	2.82176	-.075128	-15.91046
2P3/2 6S1/2	1460.9359	1473.3869	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	16.77969	-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	-.075672	-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	2.81098	-.074974	-15.94138
2P1/2 5P1/2	467.4199	466.6368	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	504.3807	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	1186.0054	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	2.03107	-1.46054	3.04242	-.083504	-16.87362
2P3/2 4F7/2	1526.9902	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	2.18967	-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	128.0640	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	497.1975	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	16.32764	-1.60854	3.04581	-.083546	-16.81986
2P1/2 5P3/2	481.4683	480.6686	16.24513	-1.60958	3.04762	-.083617	-16.81986
2P1/2 5D3/2	514.2562	513.5490	16.15239	-1.58807	3.04631	-.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	-.087678	-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	1597.7842	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	2.13356	-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	17.63494	-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	280.7625	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	16.85959	-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	1466.2986	1483.2193	2.12298	-1.56132	3.53120	-.102737	-18.91086
2P3/2 4F5/2	1673.5797	1688.7099	1.86666	-1.51121	3.52706	-.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	2.06328	-1.55656	3.52489	-.102523	-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=1.28276E-04 A.U.					
2P1/2 4S1/2	-58.5078	-59.9791	18.72706	-1.74735	3.30575	-.095540	-18.71858
2P1/2 4P1/2	43.4712	41.1689	19.47010	-1.84760	3.49941	-.101067	-18.71858
2P1/2 4P3/2	107.7780	106.1187	18.81990	-1.85715	3.51669	-.101780	-18.71858
2P1/2 4D3/2	274.3322	273.1950	18.11164	-1.67031	3.51630	-.101872	-18.71858
2P1/2 4D5/2	286.4586	285.4182	18.06293	-1.71773	3.51583	-.101858	-18.71858
2P1/2 4F5/2	499.8769	499.1263	17.69401	-1.63544	3.51237	-.101746	-18.71858
2P1/2 4F7/2	502.4391	501.7790	17.60472	-1.63664	3.51230	-.101743	-18.71858
2P1/2 5S1/2	453.7568	452.8467	17.93056	-1.67266	3.47130	-.100503	-18.71858
2P1/2 5P1/2	484.9139	483.6937	18.01949	-1.68562	3.50645	-.101512	-18.71858
2P1/2 5P3/2	497.3345	496.4150	17.91728	-1.68654	3.50893	-.101616	-18.71858
2P1/2 5D3/2	534.9825	534.1470	17.80860	-1.66049	3.50756	-.101588	-18.71858
2P1/2 6S1/2	538.6718	537.8238	17.83146	-1.66465	3.50112	-.101392	-18.71858
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	2.77466	-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	1542.5870	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	-1.58565	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	1.88729	-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	18.81787	-1.70795	3.72039	-.110542	-19.71567
2P1/2 5P1/2	490.5194	489.3913	18.91841	-1.72239	3.75945	-.111693	-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	18.71663	-1.69896	3.75387	-.111569	-19.71567
2P3/2 3D5/2	-2.7012	12.3004	4.00323	-1.62682	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	4.06869	-.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=1.28981E-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
2P3/2 4F5/2	1835.9526	1853.0794	1.63616	-1.55134	4.08385	-.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
2P3/2 5D3/2	1880.0828	1897.1082	1.77459	-1.58326	4.07854	-.125402	-21.16989
2P3/2 6S1/2	1884.9879	1902.0080	1.78836	-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	-1.82081	3.79300	-.115353	-20.77409
2P1/2 4P1/2	9.2725	8.6301	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	463.7947	462.7130	19.72837	-1.73669	3.98555	-.121445	-20.77409
2P1/2 5P1/2	497.4147	496.1958	19.63902	-1.75213	4.02885	-.122753	-20.77409
2P1/2 5P3/2	512.8140	511.7171	19.71485	-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	-1.72685	4.03070	-.122873	-20.77409
2P1/2 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	4.43083	-.140060	-22.39184
2P3/2 3D5/2	16.5480	32.4938	4.02246	-1.86480	4.42840	-.139983	-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	1505.4739	1522.7107	2.70499	-1.80759	4.39636	-.138734	-22.39184
2P3/2 4D3/2	1679.9019	1697.5556	2.14127	-1.66007	4.39575	-.138653	-22.39184
2P3/2 4D5/2	1695.5457	1713.4995	1.81203	-1.63035	4.39516	-.138635	-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	-1.63198	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
2P1/2 4D5/2	267.8593	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
2P1/2 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	4.30958	-.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	-1.71909	4.45618	-.144452	-23.65340
2P3/2 4P1/2	1500.9756	1518.3869	3.54844	-1.85496	4.70055	-.151968	-23.65340
2P3/2 4P3/2	1583.2284	1601.5266	2.61647	-1.83576	4.72557	-.153075	-23.65340
2P3/2 4D3/2	1762.6283	1781.3617	2.02901	-1.66077	4.72560	-.153213	-23.65340
2P3/2 4D5/2	1779.2924	1798.3439	1.67997	-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)
OSMIUM	5D6	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
2P3/2 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	5D9	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	4.62197	-.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	4.04791	-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	1584.8381	1603.3299	3.52786	-1.88651	5.04561	-.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	5.07276	-.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	5.00609	-.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	5D9 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	509.2786	508.0865	22.32769	-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	521.1967	22.80252	-1.82023	4.94411	-.161845	-24.18237
2P1/2 5P3/2	539.1454	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	-.187572	-26.38249
2P3/2 3D5/2	97.2839	116.3205	4.00916	-1.96771	5.49166	-.187464	-26.38249
2P3/2 4S1/2	1544.6966	1565.5335	2.34413	-1.75978	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	2.39993	-1.88603	5.45290	-.185601	-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	1.48352	-1.68357	5.43586	-.185277	-26.38249
2P3/2 5P3/2	2244.8760	2266.3865	1.29606	-1.67982	5.44125	-.185531	-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 4D3/2	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	5.30281	-.177738	-25.42376
2P1/2 5S1/2	468.9908	467.4745	23.70476	-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	-1.79484	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	23.53486	-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	1847.6301	1869.4862	2.25144	-1.90473	5.85041	-.204493	-27.85472
2P3/2 4D3/2	2042.3584	2064.7066	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	-.204486	-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	2350.4303	2361.2430	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	R=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	5.68061	-.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	533.2973	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	5.98699	-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	2.08061	-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	1.66296	-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	6.28433	-.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	-1.66902	6.19905	-.221903	-29.36964
2P3/2 5P1/2	2454.2812	2478.2292	1.07106	-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	.69165	-1.65323	6.26309	-.224194	-29.36964
THALLIUM 6P1		Z=81 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	203.1538	200.9428	26.20601	-1.82763	6.07441	-.212770	-28.03101
2P1/2 4D5/2	224.4063	222.3708	26.10678	-1.90085	6.07335	-.212732	-28.03101
2P1/2 4F5/2	498.7692	497.1870	25.52611	-1.76682	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	489.4657	487.6843	25.91152	-1.83389	5.97376	-.209019	-28.03101
2P1/2 5P1/2	534.7990	532.7447	26.10218	-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	619.1876	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	635.4981	633.7981	25.71618	-1.81744	6.04340	-.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	2262.5927	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	.56406	-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	-1.64085	6.73606	-.246883	-30.99333
2P3/2 6S1/2	2672.8968	2698.6616	.39915	-1.64603	6.72176	-.246346	-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	6.49278	-.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	6.48727	-.232052	-29.41693
2P1/2 5S1/2	489.2120	487.2382	27.07131	-1.83539	6.38290	-.228086	-29.41693
2P1/2 5P1/2	536.3376	534.0972	27.27968	-1.85981	6.46861	-.231112	-29.41693
2P1/2 5P3/2	560.0282	558.0113	27.05029	-1.86324	6.47839	-.231618	-29.41693
2P1/2 5D3/2	626.2708	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	26.86029	-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	259.9100	3.65311	-2.05799	7.29814	-.273989	-32.68128
2P3/2 4S1/2	1880.9835	1907.2972	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	-1.64843	7.24771	-.271578	-32.68128
2P3/2 4D3/2	2345.9994	2372.5877	.83379	-1.71651	7.24759	-.271697	-32.68128
2P3/2 4D5/2	2370.3677	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	7.13065	-.267657	-32.68128
2P3/2 5P1/2	2695.6522	2724.5491	.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	-48.1861	-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	191.5942	28.49509	-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	-.248677	-30.85625
2P1/2 5P1/2	536.8189	534.3662	28.50530	-1.85680	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 5D5/2	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	28.04604	-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	7.83680	-.300910	-34.44436
2P3/2 3D5/2	276.1251	303.6078	3.49482	-2.06441	7.83200	-.300726	-34.44436
2P3/2 4S1/2	1974.1178	2001.9818	1.36181	-1.80866	7.30754	-.280296	-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	-.298088	-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	-.298391	-34.44436
2P3/2 4F5/2	2771.0025	2800.0158	-.48083	-1.56135	7.77137	-.298157	-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	-.293672	-34.44436
2P3/2 5P1/2	2624.4044	2852.8675	.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 5D5/2	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	7.75359	-.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	29.52021	-1.82051	7.28183	-.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	7.39826	-.275415	-32.35882
2P1/2 5D3/2	641.7652	639.5487	29.23950	-1.78531	7.39657	-.275424	-32.35882
2P1/2 5D5/2	645.6898	643.4985	29.22856	-1.79919	7.39618	-.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 3D5/2	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	2209.7056	2237.4032	2.92352	-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	8.33969	-.327090	-36.29543
2P3/2 4F7/2	2903.3104	2934.2129	-1.08719	-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	-.44420	-1.60884	8.21237	-.322031	-36.29543
2P3/2 5P1/2	2959.8682	2989.9794	-.16186	-1.64382	8.31574	-.325827	-36.29543
2P3/2 5P3/2	2988.8907	3019.3010	-.47689	-1.63817	8.32869	-.326526	-36.29543
2P3/2 5D3/2	3064.1701	3094.7374	-.68523	-1.58703	8.32694	-.326531	-36.29543
2P3/2 5D5/2	3068.3278	3098.9665	-.76267	-1.58059	8.32655	-.326515	-36.29543
2P3/2 6S1/2	3089.7016	3120.2894	-.68278	-1.58763	8.30366	-.325598	-36.29543
2P3/2 6P1/2	3101.8489	3132.3948	-.65266	-1.59173	8.32011	-.326209	-36.29543
2P3/2 6P3/2	3105.0793	3135.6601	-.68907	-1.59140	8.32137	-.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	-.300482	-33.91146
2P1/2 4D3/2	132.9205	129.8107	31.19347	-1.79396	7.92266	-.300944	-33.91146
2P1/2 4D5/2	160.9092	158.0217	31.06290	-1.88423	7.92116	-.300886	-33.91146
2P1/2 4F5/2	465.7328	463.3980	30.35356	-1.72184	7.91517	-.300625	-33.91146
2P1/2 4F7/2	472.5494	470.4286	30.14209	-1.72399	7.91461	-.300608	-33.91146
2P1/2 5S1/2	484.4477	481.8608	30.82221	-1.80353	7.77462	-.294916	-33.91146
2P1/2 5P1/2	537.8758	534.9411	31.08958	-1.83227	7.88802	-.299159	-33.91146
2P1/2 5P3/2	569.1107	566.4624	30.79373	-1.83702	7.90298	-.299982	-33.91146
2P1/2 5D3/2	648.5032	646.0669	30.51143	-1.76492	7.90125	-.299999	-33.91146
2P1/2 5D5/2	652.8562	650.4483	30.49878	-1.78028	7.90085	-.299982	-33.91146
2P1/2 6S1/2	677.8403	675.3964	30.55943	-1.77963	7.87441	-.298899	-33.91146
2P1/2 6P1/2	691.8519	689.3627	30.59010	-1.78325	7.89343	-.299618	-33.91146
2P1/2 6P3/2	695.6049	693.1516	30.55367	-1.78436	7.89516	-.299717	-33.91146
2P3/2 3P3/2	-248.2079	-222.9955	7.11407	-2.75716	9.01220	-.359758	-38.22179
2P3/2 3D3/2	247.6691	273.8086	5.70770	-2.28601	9.02255	-.361902	-38.22179
2P3/2 3D5/2	377.6569	406.2003	3.08313	-2.05966	9.01663	-.361668	-38.22179
2P3/2 4S1/2	2176.8884	2208.0872	.73295	-1.77797	8.40483	-.336773	-38.22179
2P3/2 4P1/2	2317.5885	2346.8794	2.26770	-1.86632	8.88416	-.354613	-38.22179
2P3/2 4P3/2	2470.0056	2501.0770	.35065	-1.79727	8.95552	-.358507	-38.22179
2P3/2 4D3/2	2696.2635	2727.7480	-.20605	-1.65349	8.95577	-.358953	-38.22179
2P3/2 4D5/2	2725.8594	2757.8821	-.78961	-1.60662	8.95424	-.358893	-38.22179
2P3/2 4F5/2	3029.3846	3061.8336	-1.31886	-1.49787	8.94810	-.358624	-38.22179
2P3/2 4F7/2	3036.2579	3068.9263	-1.53897	-1.49668	8.94760	-.358602	-38.22179
2P3/2 5S1/2	3048.6420	3080.8496	-.86304	-1.57766	8.80767	-.352931	-38.22179
2P3/2 5P1/2	3101.7225	3133.5521	-.55711	-1.61471	8.92120	-.357172	-38.22179
2P3/2 5P3/2	3133.4489	3165.6028	-.90153	-1.60871	8.93610	-.357992	-38.22179
2P3/2 5D3/2	3212.4201	3244.7408	-1.12134	-1.55393	8.93432	-.358006	-38.22179
2P3/2 5D5/2	3217.0196	3249.4195	-1.20728	-1.54672	8.93388	-.357987	-38.22179
2P3/2 6S1/2	3241.9298	3274.2761	-1.12076	-1.55437	8.90751	-.356907	-38.22179
2P3/2 6P1/2	3255.8929	3288.1898	-1.08484	-1.55913	8.92652	-.357626	-38.22179
2P3/2 6P3/2	3259.7103	3292.0485	-1.12819	-1.55869	8.92822	-.357724	-38.22179
RADON	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	-.326965	-35.50667
2P1/2 4D3/2	112.9471	109.5384	32.55540	-1.76904	8.45650	-.327485	-35.50667
2P1/2 4D5/2	142.8367	139.6631	32.41683	-1.86401	8.45485	-.327420	-35.50667
2P1/2 4F5/2	455.3100	452.7159	31.67274	-1.69343	8.44859	-.327142	-35.50667
2P1/2 4F7/2	462.6804	460.3128	31.44902	-1.69579	8.44817	-.327122	-35.50667
2P1/2 5S1/2	481.7977	478.9476	32.16313	-1.77962	8.29402	-.320727	-35.50667
2P1/2 5P1/2	537.4001	534.1715	32.45239	-1.80980	8.41811	-.325457	-35.50667
2P1/2 5P3/2	571.7340	568.8144	32.13266	-1.81531	8.43529	-.326421	-35.50667
2P1/2 5D3/2	654.8272	652.1343	31.83002	-1.73753	8.43348	-.326446	-35.50667
2P1/2 5D5/2	659.6338	656.9315	31.81703	-1.75470	8.43308	-.326429	-35.50667
2P1/2 6S1/2	688.2025	685.5042	31.88097	-1.75363	8.40277	-.325160	-35.50667
2P1/2 6P1/2	703.9541	701.2035	31.91629	-1.75765	8.42465	-.326002	-35.50667
2P1/2 6P3/2	708.6276	705.9182	31.87437	-1.75899	8.42681	-.326128	-35.50667
2P3/2 3P3/2	-207.4966	-180.7706	6.98455	-2.76208	9.66269	-.394102	-40.21704
2P3/2 3D3/2	297.5567	325.2107	5.57081	-2.28331	9.67399	-.396476	-40.21704
2P3/2 3D5/2	434.5189	464.6857	2.82646	-2.04761	9.66760	-.396219	-40.21704
2P3/2 4S1/2	2266.0898	2319.0570	.36392	-1.75270	9.00739	-.368772	-40.21704
2P3/2 4P1/2	2430.4663	2461.4099	1.97971	-1.84060	9.52259	-.388311	-40.21704

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
RADON	6P6	Z=86 A=222	R=1.37310E-04 A.U.				
2P3/2 4P3/2	2593.1799	2626.0142	-.06104	-1.76589	9.60248	-.392762	-40.21704
2P3/2 4D3/2	2824.8578	2858.1137	-.63025	-1.61820	9.60289	-.393265	-40.21704
2P3/2 4D5/2	2856.3772	2890.2004	-1.24509	-1.56906	9.60120	-.393198	-40.21704
2P3/2 4F5/2	3167.5050	3201.7749	-1.79983	-1.45465	9.59476	-.392909	-40.21704
2P3/2 4F7/2	3174.9335	3209.4364	-2.03371	-1.45351	9.59422	-.392885	-40.21704
2P3/2 5S1/2	3194.5752	3228.6002	-1.32299	-1.53899	9.44054	-.386512	-40.21704
2P3/2 5P1/2	3250.0481	3283.6613	-.99117	-1.57829	9.56452	-.391238	-40.21704
2P3/2 5P3/2	3284.6600	3318.6242	-1.36460	-1.57195	9.58162	-.392199	-40.21704
2P3/2 5D3/2	3367.3037	3401.4450	-1.59858	-1.51329	9.57982	-.392222	-40.21704
2P3/2 5D5/2	3372.3751	3406.6038	-1.69343	-1.50535	9.57933	-.392202	-40.21704
2P3/2 6S1/2	3400.8648	3435.0373	-1.60002	-1.51363	9.54914	-.390936	-40.21704
2P3/2 6P1/2	3416.5630	3450.6783	-1.55651	-1.51896	9.57100	-.391780	-40.21704
2P3/2 6P3/2	3421.3069	3455.4697	-1.60842	-1.51852	9.57312	-.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	-.355690	-37.17142
2P1/2 4D3/2	88.5006	84.7625	33.97305	-1.73850	9.03125	-.356275	-37.17142
2P1/2 4D5/2	120.4055	116.9162	33.82584	-1.83831	9.02943	-.356202	-37.17142
2P1/2 4F5/2	440.5294	437.6469	33.04022	-1.65931	9.02288	-.355905	-37.17142
2P1/2 4F7/2	448.4861	445.8446	32.80804	-1.66165	9.02245	-.355883	-37.17142
2P1/2 5S1/2	475.1814	472.0398	33.55907	-1.75018	8.85287	-.348701	-37.17142
2P1/2 5P1/2	532.9712	529.4185	33.87117	-1.78172	8.98862	-.353969	-37.17142
2P1/2 5P3/2	570.2626	567.0452	33.52306	-1.78747	9.00830	-.355096	-37.17142
2P1/2 5D3/2	657.0545	654.0789	33.19956	-1.70388	9.00652	-.355134	-37.17142
2P1/2 5D5/2	662.4307	659.4891	33.18479	-1.72268	9.00603	-.355114	-37.17142
2P1/2 6S1/2	695.8641	692.8867	33.25283	-1.72111	8.97074	-.353606	-37.17142
2P1/2 6P1/2	713.2527	710.2126	33.29549	-1.72565	8.99625	-.354605	-37.17142
2P1/2 6P3/2	719.0913	716.0999	33.24603	-1.72741	8.99897	-.354766	-37.17142
2P1/2 7S1/2	734.1361	731.1630	33.22769	-1.72076	8.99204	-.354482	-37.17142
2P3/2 3P3/2	-165.4719	-137.1532	6.82111	-2.76082	10.36673	-.431684	-42.31400
2P3/2 3D3/2	348.8116	378.0532	5.40260	-2.27499	10.37909	-.434311	-42.31400
2P3/2 3D5/2	493.2333	525.1041	2.53486	-2.02978	10.37212	-.434026	-42.31400
2P3/2 4S1/2	2397.5684	2432.3896	-.04107	-1.72173	9.65942	-.403777	-42.31400
2P3/2 4P1/2	2545.6975	2578.3734	1.65868	-1.80873	10.21330	-.425164	-42.31400
2P3/2 4P3/2	2719.3509	2754.0336	-.51332	-1.72781	10.30271	-.430249	-42.31400
2P3/2 4D3/2	2956.4536	2991.5660	-1.09462	-1.57629	10.30330	-.430814	-42.31400
2P3/2 4D5/2	2990.0084	3025.7186	-1.74217	-1.52478	10.30144	-.430739	-42.31400
2P3/2 4F5/2	3308.7386	3344.9161	-2.32281	-1.40498	10.29469	-.430430	-42.31400
2P3/2 4F7/2	3316.7624	3353.1871	-2.57064	-1.40352	10.29409	-.430402	-42.31400
2P3/2 5S1/2	3344.0090	3379.9387	-1.82386	-1.49370	10.12508	-.423246	-42.31400
2P3/2 5P1/2	3401.4185	3436.9022	-1.46700	-1.53491	10.26075	-.428512	-42.31400
2P3/2 5P3/2	3439.2453	3475.1084	-1.87162	-1.52817	10.28033	-.429634	-42.31400
2P3/2 5D3/2	3525.5624	3561.6132	-2.12016	-1.46547	10.27850	-.429669	-42.31400
2P3/2 5D5/2	3531.2177	3567.3649	-2.22463	-1.45670	10.27795	-.429645	-42.31400
2P3/2 6S1/2	3564.5695	3600.6588	-2.12465	-1.46531	10.24276	-.428142	-42.31400
2P3/2 6P1/2	3581.8962	3617.9174	-2.07490	-1.47139	10.26826	-.429141	-42.31400
2P3/2 6P3/2	3587.8160	3623.8934	-2.13403	-1.47099	10.27091	-.429299	-42.31400
2P3/2 7S1/2	3602.8313	3638.9246	-2.14927	-1.46504	10.26407	-.429018	-42.31400
RADIUM	7S2	Z=88 A=226	R=1.38130E-04 A.U.				
2P1/2 4P3/2	-182.2537	-157.0948	36.45306	-1.97088	9.64078	-.386654	-38.89522
2P1/2 4D3/2	62.7908	58.6695	35.44155	-1.69970	9.64195	-.387311	-38.89522
2P1/2 4D5/2	96.8144	92.9764	35.28500	-1.80450	9.63995	-.387229	-38.89522
2P1/2 4F5/2	424.5982	421.3948	34.46930	-1.61688	9.63308	-.386910	-38.89522
2P1/2 4F7/2	433.1805	430.2314	34.21808	-1.61943	9.63251	-.386883	-38.89522
2P1/2 5S1/2	467.6948	464.2300	35.00513	-1.71261	9.44632	-.378834	-38.89522
2P1/2 5P1/2	527.7087	523.7981	35.34137	-1.74548	9.56464	-.384691	-38.89522
2P1/2 5P3/2	568.4190	564.8705	34.96432	-1.75175	9.61715	-.386005	-38.89522
2P1/2 5D3/2	658.8913	655.6003	34.61891	-1.66201	9.61535	-.386057	-38.89522
2P1/2 5D5/2	664.8781	661.6239	34.60334	-1.68271	9.61480	-.386033	-38.89522
2P1/2 6S1/2	703.4877	700.1995	34.67400	-1.68034	9.57399	-.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	722.4917	719.1298	34.72446	-1.68541	9.60346	-.385429	-38.89522
2P1/2 6P3/2	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
2P3/2 3P3/2	-118.4462	-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
2P3/2 4S1/2	2514.8242	2551.5851	-.48978	-1.68279	10.39698	-.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	2888.5987	-1.01307	-1.68092	11.05216	-.471077	-44.50347
2P3/2 4D3/2	3094.5482	3131.6020	-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
2P3/2 4F5/2	3456.5824	3494.7542	-2.69472	-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	3538.2603	-2.37366	-1.43954	10.85749	-.463241	-44.50347
2P3/2 5P1/2	3559.9566	3597.3955	-1.98917	-1.48286	11.00573	-.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	3697.4684	3735.6209	-2.80510	-1.39914	11.02558	-.470422	-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	3792.9470	-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	10.25091	-.420693	-40.69481
2P1/2 4D5/2	74.7559	70.5401	36.80791	-1.76539	10.26870	-.420602	-40.69481
2P1/2 4F5/2	410.1633	406.6306	35.95518	-1.56890	10.26151	-.420262	-40.69481
2P1/2 4F7/2	419.4574	416.1745	35.68644	-1.57149	10.26097	-.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	568.6245	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	669.3921	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 6D3/2	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	11.74279	-.508865	-46.80751
2P3/2 4P3/2	2994.1699	3032.8451	-1.56170	-1.62521	11.85473	-.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	11.80340	-.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	3967.5606	4007.7988	-3.36465	-1.33953	11.80760	-.513908	-46.80751

FINAL STATE	E(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	-242.4909	-248.2098	39.63822	-1.89224	10.97712	-.455787	-42.54840
2P1/2 4D3/2	13.5870	8.6504	38.56551	-1.60266	10.97880	-.456608	-42.54840
2P1/2 4D5/2	52.2930	47.6516	38.38768	-1.71777	10.97639	-.456506	-42.54840
2P1/2 4F5/2	395.3683	391.4187	37.49753	-1.51222	10.96885	-.456143	-42.54840
2P1/2 4F7/2	405.3683	401.7048	37.21463	-1.51481	10.96823	-.456111	-42.54840
2P1/2 5S1/2	456.0570	451.6447	38.08054	-1.61803	10.74427	-.446039	-42.54840
2P1/2 5P1/2	520.3290	515.5953	38.46821	-1.65356	10.92069	-.453242	-42.54840
2P1/2 5P3/2	568.8194	564.5067	38.02679	-1.66069	10.95003	-.455020	-42.54840
2P1/2 5D3/2	666.3190	662.2963	37.63604	-1.55807	10.94821	-.455106	-42.54840
2P1/2 5D5/2	673.9312	669.9529	37.61674	-1.58249	10.94755	-.455076	-42.54840
2P1/2 6S1/2	722.8238	718.8161	37.69205	-1.57821	10.85494	-.452694	-42.54840
2P1/2 6P1/2	743.4416	739.3380	37.75728	-1.58422	10.93325	-.454271	-42.54840
2P1/2 6P3/2	753.7694	749.7416	37.67680	-1.58630	10.93831	-.454585	-42.54840
2P1/2 6D3/2	775.8015	771.8193	37.61940	-1.57038	10.93612	-.454511	-42.54840
2P1/2 7S1/2	777.8411	773.8491	37.64207	-1.57443	10.92686	-.454092	-42.54840
2P3/2 3P3/2	-1.6276	31.4790	6.08052	-2.70665	12.78937	-.565570	-49.20424
2P3/2 3D3/2	540.6574	575.1606	4.66806	-2.20327	12.80529	-.569100	-49.20424
2P3/2 3D5/2	709.4669	746.9697	1.40167	-1.92775	12.79628	-.568710	-49.20424
2P3/2 4S1/2	2774.2012	2815.2383	-1.52557	-1.57996	11.90102	-.528370	-49.20424
2P3/2 4P1/2	2933.9002	2972.2647	.45087	-1.66216	12.58727	-.556262	-49.20424
2P3/2 4P3/2	3144.3527	3185.1323	-2.16450	-1.55939	12.71236	-.563603	-49.20424
2P3/2 4D3/2	3397.8196	3439.0494	-2.77740	-1.39713	12.71357	-.564593	-49.20424
2P3/2 4D5/2	3438.2325	3480.1602	-3.53215	-1.33794	12.71111	-.564488	-49.20424
2P3/2 4F5/2	3779.7623	3822.2212	-4.19326	-1.20057	12.70330	-.564109	-49.20424
2P3/2 4F7/2	3789.8263	3832.5786	-4.48787	-1.19858	12.70249	-.564069	-49.20424
2P3/2 5S1/2	3841.1945	3883.4037	-3.62651	-1.30373	12.47930	-.554035	-49.20424
2P3/2 5P1/2	3905.0378	3946.6821	-3.18304	-1.35135	12.65561	-.561237	-49.20424
2P3/2 5P3/2	3954.1278	3996.2480	-3.69479	-1.34300	12.66460	-.563005	-49.20424
2P3/2 5D3/2	4051.0703	4093.4115	-3.98951	-1.26728	12.66291	-.563087	-49.20424
2P3/2 5D5/2	4059.0039	4101.4713	-4.12646	-1.25577	12.66215	-.563052	-49.20424
2P3/2 6S1/2	4107.8020	4150.2098	-4.00755	-1.26505	12.62968	-.560676	-49.20424
2P3/2 6P1/2	4128.3341	4170.6374	-3.93126	-1.27348	12.66797	-.562253	-49.20424
2P3/2 6P3/2	4138.7770	4181.1670	-4.02261	-1.27256	12.67298	-.562565	-49.20424
2P3/2 6D3/2	4160.7218	4203.1478	-4.06974	-1.26030	12.67078	-.562490	-49.20424
2P3/2 7S1/2	4162.7922	4205.2139	-4.05490	-1.26203	12.66156	-.562074	-49.20424
PROTACTINIUM 5F2 6D1 Z=91 A=231 R=1.39141E-04 A.U.							
2P1/2 4P3/2	-260.8027	-267.0056	41.32180	-1.83702	11.71257	-.494412	-44.50005
2P1/2 4D3/2	.8138	-4.5889	40.22243	-1.53881	11.71448	-.495325	-44.50005
2P1/2 4D5/2	42.0354	36.9474	40.03041	-1.65902	11.71186	-.495213	-44.50005
2P1/2 4F5/2	392.3577	387.9849	39.10644	-1.44470	11.70391	-.494822	-44.50005
2P1/2 4F7/2	403.6144	399.5478	38.80535	-1.44709	11.70319	-.494785	-44.50005
2P1/2 5S1/2	462.1042	457.4774	39.70593	-1.55461	11.45916	-.483600	-44.50005
2P1/2 5P1/2	527.8659	522.6803	40.11788	-1.59128	11.65061	-.491544	-44.50005
2P1/2 5P3/2	580.7222	575.9909	39.63886	-1.59779	11.66392	-.493599	-44.50005
2P1/2 5D3/2	679.1282	674.7007	39.22532	-1.49023	11.66214	-.493706	-44.50005
2P1/2 5D5/2	689.3977	685.0218	39.20300	-1.51477	11.66144	-.493674	-44.50005
2P1/2 5F5/2	786.8614	782.5838	39.07946	-1.46363	11.67515	-.493357	-44.50005
2P1/2 6S1/2	739.6543	735.2600	39.26742	-1.50806	11.62608	-.491120	-44.50005
2P1/2 6P1/2	760.6487	756.1582	39.33019	-1.51339	11.66662	-.492819	-44.50005
2P1/2 6P3/2	771.0933	766.6828	39.24671	-1.51516	11.67215	-.493169	-44.50005
2P1/2 6D3/2	792.4145	788.0514	39.18540	-1.49907	11.66987	-.493090	-44.50005
2P1/2 7S1/2	794.0014	789.6307	39.20566	-1.50275	11.66054	-.492661	-44.50005
2P3/2 3P1/2	-771.2564	-745.2051	16.04460	-2.96139	13.20001	-.566429	-51.74805
2P3/2 3P3/2	80.1254	115.6841	5.76358	-2.67414	13.71826	-.618378	-51.74805
2P3/2 3D3/2	631.5094	667.9313	4.38715	-2.17421	13.73546	-.622262	-51.74805
2P3/2 3D5/2	809.4578	849.0283	.95441	-1.88066	13.72564	-.621829	-51.74805
2P3/2 4S1/2	2928.1326	2971.3130	-2.09608	-1.51897	12.76014	-.577488	-51.74805
2P3/2 4P1/2	3091.6235	3132.1021	-.02059	-1.59870	13.49665	-.607909	-51.74805
2P3/2 4P3/2	3315.6976	3358.7144	-2.80119	-1.48742	13.63639	-.616406	-51.74805
2P3/2 4D3/2	3574.6381	3618.1084	-3.42035	-1.32233	13.63781	-.617367	-51.74805
2P3/2 4D5/2	3617.5804	3661.7865	-4.21568	-1.26026	13.63512	-.617250	-51.74805
2P3/2 4F5/2	3966.3052	4011.0593	-4.89892	-1.11716	13.62690	-.616843	-51.74805

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
PROTOACTINIUM 5F2 6D1	Z=91 A=231	R=1.39141E-04 A.U.					
2P3/2 4F7/2	3977.6379	4022.7062	-5.21476	-1.11470	13.626G1	-.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	-.615640	-51.74805
2P3/2 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
2P3/2 6P1/2	4335.1041	4379.7383	-4.67445	-1.18668	13.56986	-.614556	-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	376.0817	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	12.44527	-.534500	-46.48277
2P1/2 6D3/2	807.6624	802.8393	40.81547	-1.41898	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	-.675776	-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	.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	-1.16299	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	387.4594	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 5D5/2	710.2551	704.9277	42.54469	-1.34854	13.28764	-.579826	-48.57660
2P1/2 5F5/2	815.5074	810.3021	42.39083	-1.31050	13.28103	-.579479	-48.57660
2P1/2 6S1/2	766.7228	761.3907	42.60168	-1.33844	13.22219	-.576694	-48.57660
2P1/2 6P1/2	788.7925	783.3508	42.67041	-1.34352	13.27020	-.578773	-48.57660
2P1/2 6P3/2	801.5192	796.1714	42.57132	-1.34507	13.27741	-.579244	-48.57660
2P1/2 6D3/2	823.5841	818.2909	42.50083	-1.32680	13.27493	-.579159	-48.57660
2P1/2 7S1/2	825.4755	820.1755	42.52164	-1.33066	13.26432	-.578653	-48.57660
2P3/2 3P1/2	-698.9837	-669.7892	16.42345	-2.90754	15.13896	-.697590	-57.15173
2P3/2 3P3/2	254.2255	293.9791	4.92867	-2.57031	15.77825	-.736460	-57.15173
2P3/2 3D3/2	824.2736	864.8259	3.61881	-2.07448	15.79820	-.743141	-57.15173
2P3/2 3D5/2	1021.3520	1065.3561	-.14809	-1.74839	15.78672	-.742619	-57.15173
2P3/2 4S1/2	3248.4409	3296.4226	-3.44521	-1.35994	14.66433	-.689115	-57.15173
2P3/2 4P1/2	3419.8561	3464.8112	-1.15620	-1.43336	15.51143	-.725202	-57.15173
2P3/2 4P3/2	3673.5440	3721.3483	-4.29919	-1.30276	15.68564	-.736288	-57.15173
2P3/2 4D3/2	3943.5499	3991.8134	-4.92966	-1.13228	15.66758	-.737376	-57.15173
2P3/2 4D5/2	3991.9162	4040.9949	-5.80996	-1.06417	15.66435	-.737231	-57.15173
2P3/2 4F5/2	4355.4105	4405.0749	-6.54212	-.90900	15.67525	-.736764	-57.15173
2P3/2 4F7/2	4368.9994	4419.0191	-6.89979	-.90567	15.67418	-.736707	-57.15173
2P3/2 5S1/2	4444.3405	4493.7786	-5.92264	-1.02567	15.38486	-.722948	-57.15173
2P3/2 5P1/2	4513.1844	4561.9258	-5.38780	-1.07932	15.61001	-.732590	-57.15173
2P3/2 5P3/2	4576.1230	4625.4563	-6.03222	-1.06662	15.65260	-.735310	-57.15173
2P3/2 5D3/2	4677.8651	4727.4496	-6.36828	-.97978	15.65076	-.735458	-57.15173
2P3/2 5D5/2	4692.4835	4742.2289	-6.54487	-.96321	15.64980	-.735412	-57.15173
2P3/2 5F5/2	4797.4693	4847.2987	-6.64425	-.94157	15.64319	-.735065	-57.15173
2P3/2 6S1/2	4748.8323	4798.5379	-6.43714	-.96902	15.58456	-.732291	-57.15173
2P3/2 6P1/2	4770.8106	4820.3964	-6.35528	-.97692	15.63250	-.734368	-57.15173
2P3/2 6P3/2	4783.6500	4833.3420	-6.47003	-.97499	15.63960	-.734833	-57.15173
2P3/2 6D3/2	4805.6146	4855.3516	-6.52748	-.96037	15.63714	-.734748	-57.15173
2P3/2 7S1/2	4807.5331	4857.2688	-6.51451	-.96182	15.62658	-.734244	-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	-.629671	-50.70892
2P1/2 4F5/2	370.7517	364.7947	44.27895	-1.17481	14.19093	-.629192	-50.70892
2P1/2 4F7/2	385.6876	380.1001	43.91221	-1.17657	14.18989	-.629135	-50.70892
2P1/2 5S1/2	467.9729	461.7875	44.93325	-1.29938	13.87434	-.613846	-50.70892
2P1/2 5P1/2	538.7733	531.8996	45.42842	-1.33930	14.11793	-.624432	-50.70892
2P1/2 5P3/2	606.2048	599.8951	44.82423	-1.34436	14.16634	-.627576	-50.70892
2P1/2 5D3/2	709.2884	703.3270	44.35331	-1.21993	14.16471	-.627763	-50.70892
2P1/2 5D5/2	726.5165	720.6255	44.31051	-1.24665	14.16377	-.627718	-50.70892
2P1/2 5F5/2	834.3430	828.5820	44.14601	-1.20568	14.15693	-.627353	-50.70892
2P1/2 6S1/2	783.9518	778.0679	44.35592	-1.23386	14.09512	-.624375	-50.70892
2P1/2 6P1/2	806.3004	800.3061	44.42232	-1.23816	14.14566	-.626601	-50.70892
2P1/2 6P3/2	819.1408	813.2443	44.31848	-1.23939	14.15350	-.627122	-50.70892
2P1/2 7S1/2	841.5825	835.7365	44.26588	-1.22472	14.14032	-.626516	-50.70892
2P3/2 3P1/2	-647.6799	-616.8194	16.58967	-2.86944	16.20746	-.760316	-60.02790
2P3/2 3P3/2	360.4912	402.4766	4.43502	-2.50320	16.91722	-.806499	-60.02790
2P3/2 3D3/2	939.7960	982.5335	3.17836	-2.01529	16.93897	-.811646	-60.02790
2P3/2 3D5/2	1147.1609	1193.5171	-.77529	-1.66822	16.92623	-.811056	-60.02790
2P3/2 4S1/2	3428.5655	3479.0927	-4.19724	-1.26637	15.71666	-.752333	-60.02790
2P3/2 4P1/2	3603.9849	3651.3123	-1.79666	-1.33567	16.62441	-.791589	-60.02790
2P3/2 4P3/2	3873.6772	3924.0210	-5.13611	-1.19440	16.81878	-.804174	-60.02790
2P3/2 4D3/2	4149.2591	4200.0622	-5.76899	-1.02182	16.82102	-.805381	-60.02790
2P3/2 4D5/2	4200.5173	4252.1788	-6.69546	-.95042	16.81748	-.805221	-60.02790
2P3/2 4F5/2	4571.2414	4623.5048	-7.44940	-.78928	16.80789	-.804718	-60.02790
2P3/2 4F7/2	4586.2559	4638.8988	-7.83178	-.78529	16.80672	-.804655	-60.02790
2P3/2 5S1/2	4669.3844	4721.4338	-6.81382	-.91048	16.49218	-.789422	-60.02790
2P3/2 5P1/2	4739.6885	4790.9937	-6.24686	-.96606	16.73568	-.800008	-60.02790
2P3/2 5P3/2	4807.7875	4859.7277	-6.94162	-.95132	16.76381	-.803136	-60.02790
2P3/2 5D3/2	4910.2039	4962.4045	-7.29021	-.86116	16.78202	-.803310	-60.02790
2P3/2 5D5/2	4927.7970	4980.1714	-7.48183	-.84239	16.78099	-.803262	-60.02790
2P3/2 5F5/2	5035.3417	5087.8063	-7.58933	-.81861	16.77416	-.802896	-60.02790
2P3/2 6S1/2	4985.0999	5037.4439	-7.38238	-.84631	16.71251	-.799926	-60.02790
2P3/2 6P1/2	5007.3587	5059.5821	-7.30293	-.85346	16.76299	-.802152	-60.02790

FINAL STATE	E(TOT)	E(DHFS)	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
AMERICIUM 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	361.6338	355.0539	46.12658	-1.05825	15.13479	-.681090	-52.94221
2P1/2 4F7/2	377.2922	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	-.675645	-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	736.8562	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 6P1/2	821.5243	814.9344	46.24499	-1.12078	15.08610	-.676185	-52.94221
2P1/2 6P3/2	834.9603	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	-1.47563	-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	4412.7064	-6.69852	-.89401	18.04907	-.879718	-63.07140
2P3/2 4D5/2	4413.4321	4467.8259	-7.66820	-.81982	18.04521	-.879540	-63.07140
2P3/2 4F5/2	4791.9245	4846.9433	-8.45158	-.65195	18.03509	-.879001	-63.07140
2P3/2 4F7/2	4807.6687	4863.0844	-8.65141	-.64776	18.03361	-.878930	-63.07140
2P3/2 5S1/2	4899.1345	4953.9490	-7.79365	-.77865	17.69124	-.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	5338.9108	-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	16.10329	-.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	-545.3926	-510.8778	16.75870	-2.74482	18.59571	-.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	1407.8456	1459.3489	-2.28286	-1.46234	19.48064	-.967227	-66.22152

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	19.36161	-.960570	-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	5033.6969	5092.0067	-9.97998	-.49213	19.34552	-.959716	-66.22152
2P3/2 5S1/2	5133.5195	5191.2137	-8.87436	-.62955	19.97225	-.940991	-66.22152
2P3/2 5P1/2	5208.1829	5265.0254	-8.23625	-.68852	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	5480.6895	5538.7175	-9.53147	-.55393	19.23279	-.953859	-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	19.28839	-.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	-.796969	-57.61577
2P1/2 4F5/2	342.2399	334.2043	50.02857	-.78167	17.20081	-.796383	-57.61577
2P1/2 4F7/2	359.4181	351.8042	49.61015	-.78357	17.19935	-.796299	-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	-.794252	-57.61577
2P1/2 5D3/2	739.8750	731.8960	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	-.80484	17.15998	-.794048	-57.61577
2P1/2 5F7/2	883.3724	875.7060	49.72220	-.80564	17.15962	-.794027	-57.61577
2P1/2 6S1/2	826.4243	818.5690	50.01955	-.83846	17.08001	-.789986	-57.61577
2P1/2 6P1/2	851.5291	843.5420	50.09363	-.84202	17.14420	-.792944	-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	-.792966	-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	1563.1986	1617.3631	-3.09707	-1.34969	20.90423	-1.055936	-69.56604
2P3/2 4S1/2	4008.4009	4067.3778	-6.92246	-.89854	19.36858	-.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	-1.046514	-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	5664.8627	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	5869.6905	-11.01928	-.35406	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	695.8009	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	-.856686	-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	1.08626	-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	5586.1488	-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	5799.0824	-10.52627	-.35438	22.16684	-1.136035	-73.04796
2P3/2 5P3/2	5824.3035	5888.0271	-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	321.6561	311.8680	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	453.8863	55.00872	-.59624	19.05156	-.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	1059.7623	.78867	-1.94023	24.05625	-1.250593	-76.68174
2P3/2 3D3/2	1632.6836	1688.2786	-.28298	-1.45907	24.06742	-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	23.56604	-1.223724	-76.68174
2P3/2 4P3/2	5008.9350	5073.9739	-10.62015	-.41096	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	-1.248969	-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	6082.0537	-11.82217	-.16037	23.76526	-1.239575	-76.68174
2P3/2 5P3/2	6109.7413	6176.7396	-12.80502	-.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	6351.0459	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	-.28168	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	56.29421	-.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	24.49142	-1.269348	-80.47378
2P3/2 3P3/2	1165.2397	1223.2407	-.20485	-1.77758	25.81979	-1.364581	-80.47378
2P3/2 3D3/2	1804.3813	1862.9024	-1.22696	-1.30014	25.85317	-1.373366	-80.47378
2P3/2 3D5/2	2078.5768	2141.6551	-6.16617	-.89798	25.83194	-1.372287	-80.47378
2P3/2 4S1/2	4686.7446	4755.3515	-10.40052	-.39649	25.93416	-1.270280	-80.47378
2P3/2 4P1/2	4887.8182	4951.9819	-7.23167	-.42586	25.30219	-1.334363	-80.47378
2P3/2 4P3/2	5273.1863	5341.5527	-12.00519	-.20231	25.67584	-1.360982	-80.47378
2P3/2 4D3/2	5583.7710	5652.5996	-12.65371	-.01837	25.68041	-1.363167	-80.47378
2P3/2 4D5/2	5654.2238	5724.1712	-13.85413	.06906	25.67435	-1.362865	-80.47378
2P3/2 4F5/2	6072.1123	6142.8108	-14.79746	.27372	25.66116	-1.362102	-80.47378
2P3/2 4F7/2	6091.8326	6163.0183	-15.28782	.27876	25.65912	-1.361979	-80.47378
2P3/2 5S1/2	6224.4178	6294.9804	-14.00857	.11495	25.13892	-1.334086	-80.47378
2P3/2 5P1/2	6309.0162	6378.4846	-13.22007	.05217	25.52563	-1.352308	-80.47378
2P3/2 5P3/2	6408.8313	6479.2359	-14.27118	.07508	25.62466	-1.359376	-80.47378
2P3/2 5D3/2	6532.4573	6603.1993	-14.72722	.19597	25.62283	-1.359770	-80.47378
2P3/2 5D5/2	6550.0403	6621.0209	-14.98747	.21920	25.62110	-1.359681	-80.47378
2P3/2 5F5/2	6688.7447	6759.8935	-15.18956	.26131	25.61236	-1.359164	-80.47378
2P3/2 5F7/2	6691.4773	6762.6885	-15.25129	.26114	25.61184	-1.359132	-80.47378
2P3/2 6S1/2	6630.7142	6701.7217	-14.91283	.22261	25.51024	-1.353712	-80.47378
2P3/2 6P1/2	6658.5310	6729.3677	-14.81240	.21625	25.59079	-1.357583	-80.47378
2P3/2 6P3/2	6675.6379	6746.6420	-14.99948	.22126	25.60666	-1.358742	-80.47378
2P3/2 7S1/2	6700.8118	6771.8858	-15.06926	.23912	25.58771	-1.357783	-80.47378
MENDELEVIUM 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	21.61564	-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	-1.078954	-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	942.4168	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
2P1/2 7S1/2	955.0326	943.5498	58.43702	-.05824	22.10618	-1.077278	-67.92486
2P3/2 3P1/2	-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	2050.6360	-2.27554	-1.12211	27.76488	-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	6368.3172	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
2P3/2 5S1/2	6529.4402	6603.6115	-15.56273	.34837	26.99271	-1.455564	-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	-15.85562	.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	6998.9080	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	288.5046	275.4451	61.13153	.21690	23.64795	-1.166930	-70.76995
2P1/2 4F7/2	309.9180	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	808.3073	795.5322	60.97360	.13382	23.60163	-1.164031	-70.76995
2P1/2 5F5/2	956.2527	943.7331	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	15.6180	16.27151	-2.03981	26.15180	-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	2252.1682	-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	5278.3020	-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	-15.12594	.27748	29.62000	-1.620879	-88.74810
2P3/2 4D3/2	6167.8983	6243.9511	-15.77652	.46349	29.63161	-1.623517	-88.74810
2P3/2 4D5/2	6245.6358	6323.1035	-17.07666	.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	-1.588161	-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	7261.3915	-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	7428.7556	-18.57729	.77105	29.55419	-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	-18.27374	.72817	29.43368	-1.612191	-88.74810
2P3/2 6P1/2	7318.7159	7396.9965	-18.16557	.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	-68.74810
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	25.18718	-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	24.99505	-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	986.3574	972.4365	63.22331	.44623	25.09782	-1.251793	-73.59467
2P3/2 3S1/2	-380.1297	-310.0049	1.83558	-1.83228	24.28652	-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	1788.8485	-3.87461	-1.16273	31.99414	-1.772913	-93.06379
2P3/2 3D3/2	2391.0433	2459.2706	-4.70939	-.70481	32.03474	-1.784241	-93.06379
2P3/2 3D5/2	2704.5616	2777.8838	-10.20826	-.27466	32.00730	-1.782787	-93.06379
2P3/2 4S1/2	5472.8565	5552.5042	-14.83495	.27199	29.62790	-1.648608	-93.06379
2P3/2 4P1/2	5687.3588	5761.7841	-11.20690	.27403	31.30130	-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	6474.5046	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	-1.769729	-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	-1.766889	-93.06379
2P3/2 5D5/2	7543.0339	7625.3283	-20.22564	1.00957	31.75219	-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	.0006
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	-26.514	-26.445	-.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	-18.859	-18.705	-.1590	.0009	.0003	.00000	.0042
2P3/2 4S1/2	-8.582	-8.438	-.1460	-.0003	-.0001	-.00000	.0042

FINAL STATE	E(TOT)	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	-55.885	-55.727	-.1579	-.0051	.0005	.00000	.0051
2P3/2 3D3/2	-18.677	-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	-18.298	-.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	-9.976	-.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	-.852	-.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	.848	1.256	-.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	-.0080	-.0003	-.00000	.0135
ZINC	4S2	Z=30 A=64	R=9.07080E-05 A.U.				
2P3/2 3D3/2	-12.663	-12.170	-.4999	-.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(TOT)	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	4.796	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	-.0193	.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	26.961	-.9206	-.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	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
YTTRIUM 4D1	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	-1.1993	-.0435	.0035	-.00002	.0244
2P3/2 4P3/2	28.751	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 4D2	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 4D5 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	-1.4927	-.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
MOLYBDENUM 4D5 5S1	Z=42 A=98	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 4D6 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	-1.7664	-.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	-1.7791	-.0569	.0042	-.00005	.0213
RUTHENIUM 4D7 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	.0190
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	107.396	109.366	-1.9300	-.0650	.0068	-.00008	.0190
2P3/2 4D5/2	108.257	110.246	-1.9512	-.0633	.0067	-.00006	.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)
RHODIUM 4D8 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	.0081	-.00009	.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	126.354	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	81.308	83.541	-2.1436	-.1101	.0091	-.00012	.0118
2P3/2 4D3/2	136.875	139.175	-2.2298	-.0898	.0087	-.00011	.0118
2P3/2 4D5/2	137.541	139.862	-2.2537	-.0878	.0087	-.00011	.0118
SILVER 5S1	Z=47 A=107	R=1.07656E-04 A.U.					
2P3/2 3D5/2	-249.614	-246.615	-2.3213	-.0991	.0159	-.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	.0101	-.00015	.0066
2P3/2 4P3/2	86.721	89.138	-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=1.09956E-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	98.068	100.694	-2.6816	-.1525	.0157	-.00024	-.0074
2P3/2 4D3/2	166.315	169.231	-2.7986	-.1246	.0152	-.00023	-.0074
2P3/2 4D5/2	167.621	170.572	-2.8382	-.1211	.0151	-.00023	-.0074
2P3/2 5S1/2	187.716	190.639	-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=118	R=1.11228E-04 A.U.					
2P3/2 3D5/2	-319.314	-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	.0181	-.00029	-.0167
2P3/2 4D3/2	177.167	180.317	-3.0133	-.1379	.0175	-.00029	-.0167
2P3/2 4D5/2	178.812	182.004	-3.0590	-.1339	.0175	-.00029	-.0167
2P3/2 5S1/2	203.961	207.115	-3.0118	-.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)
ANTIMONY 5P3	Z=51 A=121	R=1.12162E-04 A.U.					
2P3/2 3D5/2	-343.956	-340.739	-3.0591	-.1572	.0269	-.00044	-.0275
2P3/2 4S1/2	55.032	58.347	-3.1223	-.1586	-.0070	-.00000	-.0275
2P3/2 4P1/2	101.942	105.093	-2.9542	-.1888	.0200	-.00034	-.0275
2P3/2 4P3/2	111.873	115.161	-3.0946	-.1866	.0207	-.00035	-.0275
2P3/2 4D3/2	188.676	192.072	-3.2354	-.1526	.0202	-.00035	-.0275
2P3/2 4D5/2	190.596	193.949	-3.2876	-.1481	.0201	-.00035	-.0275
2P3/2 5S1/2	221.271	224.672	-3.2353	-.1532	.0149	-.00028	-.0275
2P3/2 5P1/2	231.166	234.572	-3.2197	-.1564	.0186	-.00033	-.0275
2P3/2 5P3/2	231.507	234.907	-3.2348	-.1562	.0186	-.00033	-.0275
TELLURIUM 5P4	Z=52 A=130	R=1.14877E-04 A.U.					
2P3/2 3D5/2	-368.604	-365.354	-3.2643	-.1756	.0304	-.00053	-.0402
2P3/2 4S1/2	59.651	63.220	-3.3458	-.1755	-.0073	-.00001	-.0402
2P3/2 4P1/2	108.932	112.316	-3.1592	-.2087	.0228	-.00041	-.0402
2P3/2 4P3/2	119.979	123.517	-3.3144	-.2063	.0238	-.00043	-.0402
2P3/2 4D3/2	201.188	204.842	-3.4682	-.1690	.0232	-.00042	-.0402
2P3/2 4D5/2	203.221	206.930	-3.5274	-.1639	.0231	-.00042	-.0402
2P3/2 5S1/2	239.771	243.434	-3.4698	-.1696	.0170	-.00034	-.0402
2P3/2 5P1/2	251.503	255.147	-3.4512	-.1733	.0214	-.00040	-.0402
2P3/2 5P3/2	252.312	255.973	-3.4686	-.1732	.0214	-.00040	-.0402
IODINE 5P5	Z=53 A=127	R=1.13987E-04 A.U.					
2P3/2 3D5/2	-393.801	-390.104	-3.4805	-.1955	.0344	-.00063	-.0551
2P3/2 4S1/2	65.148	68.987	-3.5820	-.1938	-.0077	-.00002	-.0551
2P3/2 4P1/2	116.792	120.427	-3.3756	-.2302	.0261	-.00049	-.0551
2P3/2 4P3/2	129.047	132.850	-3.5467	-.2276	.0272	-.00052	-.0551
2P3/2 4D3/2	214.677	218.607	-3.7142	-.1868	.0266	-.00051	-.0551
2P3/2 4D5/2	216.935	220.926	-3.7608	-.1810	.0265	-.00051	-.0551
2P3/2 5S1/2	259.795	263.737	-3.7189	-.1871	.0194	-.00041	-.0551
2P3/2 5P1/2	273.267	277.186	-3.6963	-.1917	.0245	-.00048	-.0551
2P3/2 5P3/2	274.462	278.421	-3.7170	-.1914	.0246	-.00048	-.0551
XENON 5P6	Z=54 A=132	R=1.15463E-04 A.U.					
2P3/2 3D5/2	-419.060	-415.101	-3.7076	-.2172	.0389	-.00075	-.0722
2P3/2 4S1/2	71.385	75.510	-3.8310	-.2137	-.0079	-.00004	-.0722
2P3/2 4P1/2	125.454	129.354	-3.6034	-.2534	.0297	-.00059	-.0722
2P3/2 4P3/2	139.018	143.101	-3.7914	-.2506	.0310	-.00062	-.0722
2P3/2 4D3/2	229.089	233.311	-3.9734	-.2062	.0304	-.00062	-.0722
2P3/2 4D5/2	231.594	235.884	-4.0477	-.1997	.0303	-.00062	-.0722
2P3/2 5S1/2	281.016	285.254	-3.9808	-.2064	.0221	-.00049	-.0722
2P3/2 5P1/2	296.364	300.595	-3.9543	-.2116	.0281	-.00058	-.0722
2P3/2 5P3/2	297.989	302.223	-3.9788	-.2113	.0282	-.00058	-.0722
CESIUM 6S1	Z=55 A=134	R=1.16043E-04 A.U.					
2P3/2 3D5/2	-449.416	-445.184	-3.9420	-.2419	.0444	-.00090	-.0919
2P3/2 4S1/2	73.672	78.097	-4.0887	-.2366	-.0076	-.00007	-.0919
2P3/2 4P1/2	130.183	134.360	-3.8363	-.2798	.0343	-.00072	-.0919
2P3/2 4P3/2	145.326	149.704	-4.0446	-.2768	.0359	-.00075	-.0919
2P3/2 4D3/2	239.777	244.305	-4.2419	-.2284	.0352	-.00075	-.0919
2P3/2 4D5/2	242.620	247.223	-4.3248	-.2211	.0352	-.00075	-.0919
2P3/2 5S1/2	300.338	304.887	-4.2546	-.2279	.0254	-.00059	-.0919
2P3/2 5P1/2	317.462	321.978	-4.2221	-.2341	.0326	-.00070	-.0919
2P3/2 5P3/2	319.591	324.136	-4.2514	-.2338	.0326	-.00071	-.0919
2P3/2 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=138	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	339.994	344.834	-4.5052	-.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	-4.5568	-.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	88.919	-4.6520	-.2863	-.0076	-.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	.0466	-.00107	-.1399
2P3/2 4D3/2	267.042	272.241	-4.8277	-.2767	.0461	-.00107	-.1399
2P3/2 4D5/2	270.837	276.129	-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	.0426	-.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	305.508	-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	-.3368	.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	-.4393	.0664	-.00175	-.2390
2P3/2 4D3/2	356.854	363.198	-5.7964	-.3733	.0663	-.00175	-.2390
2P3/2 4D5/2	366.003	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=1.18861E-04 A.U.					
2P3/2 4F5/2	490.240	496.784	-6.0250	-.3430	.0644	-.00171	-.2390
2P3/2 5S1/2	451.366	457.800	-5.8824	-.3618	.0506	-.00144	-.2390
2P3/2 5P1/2	472.379	478.762	-5.8349	-.3702	.0626	-.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
PROMETHIUM 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	-.00050	-.2802
2P3/2 4P1/2	248.274	254.513	-5.5434	-.4855	.0717	-.00195	-.2802
2P3/2 4P3/2	276.248	284.819	-5.8855	-.4782	.0754	-.00205	-.2802
2P3/2 4D3/2	388.755	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	.0066	-.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	436.775	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	-6.6644	-.4303	.0659	-.00202	-.3264
2P3/2 5P1/2	552.320	559.620	-6.6122	-.4394	.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	343.843	351.336	-6.6442	-.5644	.0955	-.00281	-.3779
2P3/2 4D3/2	461.104	468.829	-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	616.393	626.442	-7.3135	-.4484	.0925	-.00277	-.3779
2P3/2 5S1/2	573.217	581.083	-7.0928	-.4673	.0752	-.00239	-.3779
2P3/2 5P1/2	596.096	603.902	-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	258.625	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	-7.5684	-.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	.1016	-.00316	-.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	-.5908	.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	-7.9280	-.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	469.585	-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	-.7841	.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	-9.1677	-.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	.1898	-.00657	-.7330
2P3/2 4S1/2	419.673	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	716.325	-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	-.7089	.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 5P3/2	863.755	874.627	-9.5899	-.7073	.1640	-.00584	-.7330
2P3/2 6S1/2	893.757	904.677	-9.6473	-.6932	.1586	-.00571	-.7330
THULIUM 4F13 Z=69 A=169 R=1.25376E-04 A.U.							
2P3/2 3D5/2	-576.717	-566.549	-8.6323	-.9120	.2114	-.00757	-.8278
2P3/2 4S1/2	464.787	475.916	-9.5246	-.8115	.0360	-.00288	-.8278
2P3/2 4P1/2	553.913	564.348	-9.8702	-.9098	.1792	-.00649	-.8278
2P3/2 4P3/2	603.326	614.329	-9.4599	-.8976	.1898	-.00686	-.8278
2P3/2 4D3/2	749.545	760.868	-9.8885	-.7887	.1891	-.00692	-.8278
2P3/2 4D5/2	760.499	772.031	-10.1180	-.7677	.1888	-.00691	-.8278
2P3/2 4F5/2	943.283	954.985	-10.3254	-.7277	.1859	-.00683	-.8278
2P3/2 4F7/2	945.026	956.799	-10.3968	-.7277	.1858	-.00683	-.8278
2P3/2 5S1/2	891.278	902.862	-10.1562	-.7536	.1540	-.00611	-.8278
2P3/2 5P1/2	919.080	930.585	-10.0887	-.7647	.1827	-.00672	-.8278
2P3/2 5P3/2	925.567	937.152	-10.1710	-.7630	.1840	-.00677	-.8278
2P3/2 6S1/2	956.157	967.792	-10.2309	-.7483	.1784	-.00662	-.8278
YTTERBIUM 4F14 Z=70 A=174 R=1.26600E-04 A.U.							
2P3/2 3D5/2	-570.682	-559.877	-9.1068	-.9901	.2351	-.00870	-.9322
2P3/2 4S1/2	512.832	524.683	-10.0874	-.8758	.0476	-.00347	-.9322
2P3/2 4P1/2	605.040	616.153	-9.3952	-.9785	.2001	-.00749	-.9322
2P3/2 4P3/2	657.428	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
2P3/2 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
2P3/2 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	-.8849	.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	1090.967	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
2P3/2 4D3/2	916.613	930.492	-11.7879	-.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
2P3/2 5P1/2	1115.559	1129.445	-12.0130	-.9490	.2960	-.01031	-1.1691

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.					
2P3/2 5P3/2	1126.081	1140.069	-12.1200	-.9466	.2581	-.01040	-1.1691
2P3/2 5D3/2	1161.058	1175.112	-12.2040	-.9273	.2567	-.01037	-1.1691
2P3/2 6S1/2	1163.807	1177.855	-12.1911	-.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	.0855	-.00589	-1.3060
2P3/2 4P1/2	744.876	758.320	-11.2136	-1.1928	.2791	-.01142	-1.3060
2P3/2 4P3/2	810.882	825.060	-11.9800	-1.1770	.2965	-.01213	-1.3060
2P3/2 4D3/2	975.804	990.365	-12.4959	-1.0434	.2956	-.01222	-1.3060
2P3/2 4D5/2	989.207	1004.033	-12.7867	-1.0172	.2953	-.01220	-1.3060
2P3/2 4F5/2	1201.612	1216.661	-13.0591	-.9636	.2918	-.01209	-1.3060
2P3/2 4F7/2	1204.405	1219.547	-13.1524	-.9634	.2917	-.01208	-1.3060
2P3/2 5S1/2	1155.899	1170.792	-12.8271	-1.0005	.2508	-.01085	-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	1251.955	-12.9325	-.9927	.2870	-.01193	-1.3060
2P3/2 6S1/2	1240.743	1255.694	-12.9197	-.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
2P3/2 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	883.706	-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	1066.575	-13.5519	-1.0864	.3297	-.01401	-1.4542
2P3/2 4F5/2	1272.713	1288.726	-13.6414	-1.0291	.3260	-.01389	-1.4542
2P3/2 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	.2802	-.01246	-1.4542
2P3/2 5P1/2	1261.880	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	1423.957	-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
2P3/2 4P1/2	912.906	929.068	-13.2798	-1.4561	.3860	-.01717	-1.7948
2P3/2 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 5D6 Z=76 A=190 R=1.303688E-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	-.01825	-1.7948
2P3/2 5S1/2	1391.846	1409.730	-15.1889	-1.2322	.3489	-.01639	-1.7948
2P3/2 5P1/2	1427.117	1444.834	-15.0460	-1.2529	.3968	-.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	.3993	-.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	.3967	-.01774	-1.7948
IRIDIUM 5D9 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	.1617	-.01119	-1.9906
2P3/2 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	-.02093	-1.9906
2P3/2 4D5/2	1274.228	1293.106	-15.9711	-1.3480	.4525	-.02091	-1.9908
2P3/2 4F5/2	1517.218	1536.381	-16.3213	-1.2784	.4483	-.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	.4364	-.02032	-1.9908
2P3/2 5P3/2	1539.154	1556.108	-16.0384	-1.3469	.4430	-.02053	-1.9908
2P3/2 5D3/2	1586.543	1606.593	-16.1635	-1.3176	.4416	-.02052	-1.9908
2P3/2 5D5/2	1590.794	1609.874	-16.1952	-1.3150	.4417	-.02051	-1.9906
PLATINUM 5D9 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	-15.6513	-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	-16.8654	-1.4405	.5059	-.02396	-2.2001
2P3/2 4F5/2	1600.689	1621.234	-17.2564	-1.3665	.5015	-.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
2P3/2 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	.4852	-.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	-18.0848	-1.5047	.5500	-.02684	-2.4310
2P3/2 6S1/2	1796.777	1818.249	-18.0466	-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 6S2	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	1167.297	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	1495.925	1521.139	-23.2153	.0823	.6291	-.03126	-2.6795
2P3/2 4D5/2	1517.169	1542.791	-23.6588	.1187	.6282	-.03124	-2.6795
2P3/2 4F5/2	1782.877	1808.833	-24.0706	.2024	.6233	-.03105	-2.6795
2P3/2 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
2P3/2 5P1/2	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
2P3/2 5D3/2	1891.705	1917.541	-23.8972	.1577	.6143	-.03070	-2.6795
2P3/2 5D5/2	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.					
2P3/2 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
2P3/2 4P1/2	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	1582.971	1609.756	-24.5791	.0907	.6995	-.03563	-2.9623
2P3/2 4D5/2	1605.733	1632.952	-25.0466	.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
2P3/2 5P3/2	1936.799	1964.115	-25.1339	.1296	.6851	-.03500	-2.9623
2P3/2 5D3/2	2001.290	2028.736	-25.3030	.1705	.6835	-.03498	-2.9623
2P3/2 5D5/2	2004.049	2031.545	-25.3570	.1751	.6832	-.03497	-2.9623
2P3/2 6S1/2	2016.037	2043.494	-25.2989	.1699	.6689	-.03444	-2.9623
2P3/2 6P1/2	2022.917	2050.352	-25.2834	.1675	.6789	-.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
2P3/2 4P3/2	1464.952	1493.004	-25.4967	-.0323	.7774	-.04023	-3.2643
2P3/2 4D3/2	1675.242	1703.684	-26.0144	.0997	.7773	-.04054	-3.2643
2P3/2 4D5/2	1699.610	1728.510	-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
2P3/2 5D3/2	2116.910	2146.053	-26.7823	.1841	.7601	-.03983	-3.2643
2P3/2 5D5/2	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	1827.359	-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	.1969	.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	.0021	.8486	-.03223	-3.9366
2P3/2 4P1/2	1510.312	1540.234	-26.7443	-.0867	.8941	-.04850	-3.9366
2P3/2 4P3/2	1652.985	1684.585	-28.5462	-.0226	.9570	-.05190	-3.9366
2P3/2 4D3/2	1873.871	1905.875	-29.0902	.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 5D3/2	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	-305.400	-27.4578	-.2798	1.1236	-.06203	-4.3103
2P3/2 4S1/2	1462.845	1496.487	-29.8080	.0019	.9118	-.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	-.05867	-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	2369.249	-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	1.0408	-.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	2576.589	-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	.9828	-.04273	-4.7104
2P3/2 4P1/2	1701.910	1735.552	-29.8605	-.0864	1.0980	-.06227	-4.7104
2P3/2 4P3/2	1864.624	1900.156	-31.9213	-.0117	1.1778	-.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	-33.9939	.3007	1.1696	-.06685	-4.7104
2P3/2 5S1/2	2466.019	2502.742	-33.1632	.2152	1.0159	-.06047	-4.7104
2P3/2 5P1/2	2521.492	2557.803	-32.8514	.1759	1.1399	-.06520	-4.7104
2P3/2 5P3/2	2556.104	2592.766	-33.2248	.1823	1.1570	-.06616	-4.7104
2P3/2 5D3/2	2638.748	2675.587	-33.4986	.2409	1.1552	-.06618	-4.7104
2P3/2 5D5/2	2643.819	2680.746	-33.5537	.2489	1.1547	-.06616	-4.7104
2P3/2 6S1/2	2672.309	2709.179	-33.4603	.2406	1.1245	-.06490	-4.7104

FINAL STATE	E(TOT)	E(DHFS)	E(MAG)	E(RET)	E(V-P)	E(H-VP)	E(SELF)
RADON 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 3D5/2	-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	1975.718	2013.374	-33.7380	-.0070	1.3076	-.07564	-5.1426
2P3/2 4D3/2	2212.821	2250.906	-34.3193	.1445	1.3062	-.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	2604.256	-35.5475	.3158	1.2996	-.07582	-5.1426
2P3/2 4F7/2	2573.129	2612.527	-35.7955	.3173	1.2990	-.07580	-5.1426
2P3/2 5S1/2	2600.376	2639.279	-35.0486	.2271	1.1300	-.06864	-5.1426
2P3/2 5P1/2	2657.786	2696.242	-34.6917	.1859	1.2657	-.07391	-5.1426
2P3/2 5P3/2	2695.612	2734.448	-35.0963	.1926	1.2853	-.07503	-5.1426
2P3/2 5D3/2	2761.929	2820.953	-35.3449	.2553	1.2834	-.07506	-5.1426
2P3/2 5D5/2	2787.585	2826.705	-35.4495	.2641	1.2829	-.07504	-5.1426
2P3/2 6S1/2	2820.936	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	1.2756	-.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	-35.6912	-.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	-.07785	-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	-37.4435	.2799	1.4245	-.08503	-5.6082
2P3/2 6S1/2	2977.149	3018.523	-37.3371	.2710	1.3034	-.08326	-5.6082
2P3/2 6P1/2	2996.084	3037.377	-37.2765	.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	2022.387	2062.393	-35.2091	-.0898	1.4457	-.09027	-6.1127
2P3/2 4P3/2	2219.880	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	2849.149	2893.308	-39.9014	.3537	1.5982	-.09711	-6.1127
2P3/2 5S1/2	2892.343	2935.475	-39.0796	.2537	1.3945	-.08614	-6.1127
2P3/2 5P1/2	2954.069	2997.178	-38.6663	.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	3206.838	-39.3646	.2810	1.5667	-.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(TOT)	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	-6.6556
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	-6.6556
2P3/2 4D3/2	2608.025	2653.243	-40.4045	.1761	1.7816	-.11028	-6.6558
2P3/2 4D5/2	2646.438	2694.353	-41.1643	.2353	1.7792	-.11017	-6.6556
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	.3746	1.7705	-.10975	-6.6556
2P3/2 5S1/2	3051.400	3097.597	-41.2586	.2695	1.5473	-.09972	-6.6556
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	-6.6556
2P3/2 5D3/2	3261.275	3307.605	-41.6216	.3059	1.7509	-.10877	-6.6558
2P3/2 5D5/2	3269.209	3315.665	-41.7586	.3175	1.7502	-.10874	-6.6558
2P3/2 6S1/2	3318.007	3364.403	-41.6397	.3082	1.6977	-.10636	-6.6558
2P3/2 6P1/2	3338.539	3384.831	-41.5634	.2997	1.7360	-.10794	-6.6556
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	-.10617	-6.6558
2P3/2 7S1/2	3372.997	3419.407	-41.6870	.3112	1.7296	-.10776	-6.6556
PROTUACTINIUM 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	3.868	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	1.8811	-.11502	-7.2480
2P3/2 4P3/2	2510.108	2557.491	-41.9967	.0141	1.9708	-.12360	-7.2480
2P3/2 4D3/2	2769.048	2816.885	-42.6158	.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	3447.857	3496.875	-43.9037	.3167	1.9398	-.12285	-7.2480
2P3/2 5D5/2	3456.454	3507.609	-44.0535	.3300	1.9390	-.12282	-7.2480
2P3/2 6S1/2	3505.683	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	3562.917	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	2666.347	2718.506	-44.3369	.0200	2.1815	-.13949	-7.8820
2P3/2 4D3/2	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	-46.5067	.4019	2.1716	-.13990	-7.8820
2P3/2 4F7/2	3346.938	3399.229	-46.8449	.4048	2.1706	-.13985	-7.8820
2P3/2 5S1/2	3414.313	3466.035	-45.9088	.2901	1.9353	-.12746	-7.8820
2P3/2 5P1/2	3481.394	3532.467	-45.4061	.2385	2.1129	-.13622	-7.8820
2P3/2 5P3/2	3539.465	3591.084	-46.0039	.2498	2.1305	-.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	3703.856	-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	-46.3608	.3411	2.0877	-.13564	-7.8820
2P3/2 6P1/2	3726.596	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	2.1357	-.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	2.5280	-.16421	-8.5751
2P3/2 3D5/2	183.952	233.251	-42.6576	-.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	3572.470	-49.0518	.4203	2.4050	-.15784	-8.5751
2P3/2 4F7/2	3531.599	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	2.3624	-.15636	-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	-48.9468	.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	294.015	346.211	-45.0281	-.4450	2.7802	-.18427	-9.3190
2P3/2 4S1/2	2575.420	2631.767	-48.4500	-.0432	1.5706	-.12554	-9.3190
2P3/2 4P1/2	2750.839	2804.007	-46.0494	-.1125	2.4784	-.16460	-9.3190
2P3/2 4P3/2	3020.532	3076.715	-49.3889	.0288	2.6727	-.17739	-9.3190
2P3/2 4D3/2	3296.114	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	3776.199	-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	2.6169	-.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	-.20609	-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	-.14295	-10.1292
2P3/2 4P1/2	2921.824	2978.088	-48.5750	-.1170	2.7426	-.18568	-10.1292
2P3/2 4P3/2	3208.341	3267.796	-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(TOT)	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	3604.605	-53.7287	.2848	2.9581	-.20111	-10.1292
2P3/2 4F5/2	3922.282	3983.723	-54.5121	.4527	2.9480	-.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	.2669	2.6676	-.19525	-10.1292
2P3/2 5P3/2	4174.804	4235.924	-53.9995	.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	2.9193	-.19899	-10.1292
2P3/2 5F5/2	4410.932	4472.613	-54.6909	.4260	2.9122	-.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	2.6449	-.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	4480.878	-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	293.648	348.267	-45.9386	-.8606	3.4140	-.23420	-11.0001
2P3/2 3D5/2	521.964	580.514	-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	-.22682	-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	3.2636	-.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	4386.190	-56.1605	.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	-57.3622	.4027	3.2354	-.22437	-11.0001
2P3/2 5D5/2	4526.589	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	4659.683	-57.4758	.4204	3.1510	-.22011	-11.0001
2P3/2 6P1/2	4618.706	4683.687	-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	-58.0377	.0509	3.6260	-.25378	-11.9503
2P3/2 4D3/2	3909.658	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	4469.624	4550.126	-59.8792	.3528	3.2064	-.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	4762.409	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	4981.891	-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	4.1438	-.28886	-12.9747
2P3/2 3D3/2	554.072	615.440	-51.3293	-.9411	4.1729	-.29624	-12.9747
2P3/2 3D5/2	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	3909.550	-61.2378	.0587	4.0171	-.28576	-12.9747
2P3/2 4D3/2	4137.873	4208.758	-61.8834	.2394	4.0208	-.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 5D5/2	5039.603	5112.435	-63.9986	.4569	3.9686	-.28461	-12.9747
2P3/2 5F5/2	5167.707	5240.681	-64.1685	.4926	3.9609	-.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	-.28292	-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	-63.1396	-.1027	2.8348	-.23901	-14.0801
2P3/2 4P1/2	3710.451	3780.968	-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	4376.569	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	-67.7938	.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	4.4006	-.32022	-14.0801
2P3/2 5D3/2	5294.701	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	4.3696	-.31860	-14.0801
2P3/2 6P3/2	5432.347	5509.368	-67.4822	.4767	4.3838	-.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	-.6208	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	-63.3968	-.1487	4.5529	-.33546	-15.2721
2P3/2 4P3/2	4321.945	4400.747	-68.1702	.0748	4.9275	-.36208	-15.2721
2P3/2 4D3/2	4632.530	4711.794	-66.8187	.2568	4.9321	-.36427	-15.2721
2P3/2 4D5/2	4702.983	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	-71.4526	.5559	4.9108	-.36306	-15.2721
2P3/2 6S1/2	5272.177	5354.175	-70.1735	.3921	4.3906	-.33519	-15.2721
2P3/2 6P1/2	5357.775	5437.679	-69.3850	.3293	4.7773	-.35341	-15.2721
2P3/2 6P3/2	5457.590	5538.430	-70.4361	.3522	4.8763	-.36047	-15.2721

FINAL STATE	E(TOT)	E(DHFS)	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 5D5/2	5598.799	5680.215	-71.1524	.4964	4.8726	-.36076	-15.2721
2P3/2 5F5/2	5737.503	5819.088	-71.3545	.5385	4.8641	-.36026	-15.2721
2P3/2 5F7/2	5740.236	5821.883	-71.4163	.5383	4.8635	-.36023	-15.2721
2P3/2 6S1/2	5679.473	5760.916	-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	4.8583	-.35984	-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	-59.7256	-1.5389	5.6139	-.41138	-16.5692
2P3/2 3D3/2	1021.182	1094.282	-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	3969.914	4053.528	-70.1783	-.1380	3.5800	-.30802	-16.5692
2P3/2 4P1/2	4175.451	4254.375	-66.8634	-.1578	5.0437	-.37736	-16.5692
2P3/2 4P3/2	4563.913	4667.271	-71.9251	.0830	5.4602	-.40749	-16.5692
2P3/2 4D3/2	4900.483	4984.302	-72.5736	.2681	5.4654	-.40989	-16.5692
2P3/2 4D5/2	4974.606	5059.591	-73.8232	.3581	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	5882.237	5966.066	-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	.5208	5.2819	-.39954	-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	5.3864	-.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	4.5762	-.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	-64.1692	-1.1109	6.2547	-.47316	-17.9781
2P3/2 3D5/2	1502.654	1585.051	-69.4823	-.6940	6.2294	-.47184	-17.9781
2P3/2 4S1/2	4218.029	4306.480	-73.9866	-.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	4860.690	4949.070	-75.8870	.0908	6.0524	-.45854	-17.9781
2P3/2 4D3/2	5183.488	5272.126	-76.5334	.2768	6.0561	-.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	-.45992	-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	5.4197	-.42582	-17.9781
2P3/2 5P1/2	5954.866	6044.191	-77.1198	.3522	5.8666	-.44747	-17.9781
2P3/2 5P3/2	6067.733	6158.115	-78.3199	.3786	5.9941	-.45667	-17.9781
2P3/2 5D3/2	6196.820	6289.566	-78.8143	.5109	5.9923	-.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	5.8603	-.44985	-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	6379.052	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	-924.652	-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
2P3/2 3D5/2	1704.400	1791.636	-73.4100	-.7235	6.8979	-.53036	-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
2P3/2 4P3/2	5145.764	5239.037	-80.1019	.1046	6.7096	-.51594	-19.4691
2P3/2 4D3/2	5474.348	5568.069	-80.7395	.2907	6.7155	-.51881	-19.4691
2P3/2 4D5/2	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	6.6894	-.51730	-19.4691
2P3/2 5S1/2	6176.925	6272.672	-82.2541	.4327	6.0226	-.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
2P3/2 5F5/2	6697.690	6794.104	-83.6771	.6128	6.6326	-.51370	-19.4691
2P3/2 5F7/2	6700.758	6797.246	-83.7503	.6127	6.6319	-.51366	-19.4691
2P3/2 6S1/2	6636.204	6732.463	-83.3483	.5661	6.4984	-.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	6716.896	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

[a]The 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)

[b]The 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)