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AUSTRALIAN ATOMIC ENERGY COMMISSION

RESEARCH ESTABLISHMENT

LUCAS HEIGHTS

AN EVALUATION OF THE GILBERT-CAMERON LEVEL DENSITY PARAMETERS

by

E.K. ROSE
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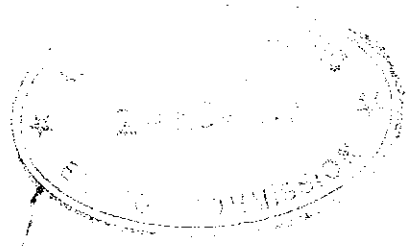

September 1977

ISBN 0 642 59617 4

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ABSTRACT

The level densities of 204 nuclides were fitted to the Gilbert-Cameron level density formula with satisfactory results. New shell and pairing corrections were obtained which led to most calculated level spacings being within the experimental error of the measured level spacings.

National Library of Australia card number and ISBN 0 642 59617 4

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S WAVES; ENERGY-LEVEL DENSITY; LEAST-SQUARES FIT; BINDING ENERGY; NEUTRONS; ISOTOPES

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1. INTRODUCTION

A knowledge of the average level spacing between resonances of compound nuclei has important applications in astrophysics, reactor physics and fission physics. The most suitable formula to date comes from the evaluation of Gilbert & Cameron [1965] shell and pairing corrections carried out by Cook, Ferguson & Musgrove [1967]. These authors gave a fit to 130 nuclide level densities ranging from ^{60}Ni to ^{243}Am. These calculations were based on an evaluation of neutron binding energies performed by the same authors. Wapstra & Gove [1971] have since published a thorough evaluation of neutron binding energies as a result of which many of the earlier values required updating. The earlier fit has been repeated using 204 nuclide level spacings, of which 74 are new values not available in 1967.

2. LEVEL SPACING FORMULA

The density of states of spin J at an energy E above the ground state was given by Gilbert & Cameron [1965] as

$$\rho(E,J) = \frac{\sqrt{\pi}}{12} \frac{\exp\{2(aU)^{\frac{1}{2}}\}}{a^{1/4}\, U^{5/4}} \frac{(2J+1)\exp\{-(J+1/2)^2/2\sigma^2\}}{2(2\pi)^{\frac{1}{2}}\sigma^3} \quad . \tag{1}$$

U is the effective excitation energy defined by

$$U = E - \Delta E \quad , \tag{2}$$

where ΔE is the nucleon pairing energy, which may be written

$$\Delta E = P(N) + P(Z) \quad . \tag{3}$$

The spin cutoff parameter σ was determined by Gilbert & Cameron [1965] to be given by

$$\sigma^2 = 0.0888(aU)^{1/2}A^{2/3} \quad . \tag{4}$$

The parameter a is the level density parameter which, for undeformed nuclei, can be written

$$a = (0.00917S + 0.142)A \quad , \tag{5}$$

while deformed nuclei obey the rule

$$a = (0.00917S + 0.120)A \quad . \tag{6}$$

For the ranges $54 \leq Z \leq 78$ and $86 \leq N \leq 122$, and $86 \leq Z \leq 122$ and $130 \leq N \leq 182$, nuclides were assumed to be deformed. The shell correction, S, is also split into proton and neutron contributions to give

$$S = S(Z) + S(N) \quad . \tag{7}$$

To obtain a fit of P(Z), P(N), S(Z) and S(N), there must be the restriction that the quantities

$$T(Z) = P(Z) + S(Z) \quad , \tag{8}$$

and $T(N) = P(N) + S(N)$

must remain fixed, as T(Z) and T(N) are terms in Cameron's [1958] semi-empirical mass formula.

A program was written which minimises the quantity

$$\chi^2_N = \frac{N(D^o_{exp} - D^o_{calc})^2}{1 \quad (\Delta D^o_{exp})^2} \quad , \tag{9}$$

where D^o_{exp} is the experimental s-wave level spacing and D^o_{calc} the same quantity determined from equation (1). ΔD^o_{exp} is the experimental error in D^o_{exp}. Thus, P(Z) and P(N) were varied in repeated passes until a χ^2_N value of 29.1 was obtained, which represents a good fit for 204 nuclides.

For neutron reactions, the proper excitation energy is given by

$$E = E_n + B \quad , \tag{10}$$

where E_n is kinetic energy of the neutron and B is the neutron binding energy. The kinetic energy was assumed to be half the last resolved resonance energy, and the binding energies were obtained from Wapstra & Gove [1971]. Since formula (1) applies to both parities, at low energies only one parity prevails, and so we write

$$\langle \rho_o \rangle = \frac{1}{2} \sum_{J=I-\frac{1}{2}}^{J=I+\frac{1}{2}} \rho(U,J) \tag{11}$$

for s-waves. The level spacing is then

$$\langle D_\ell \rangle = 1/\langle \rho_\ell \rangle \quad .$$

3. RESULTS

In Table 1 is a compilation of 204 s-wave level spacings obtained from Gyulassy & Perkins [1972] and Mughabghab & Garber [1973]. Also shown is the neutron binding energy S_n calculated by Wapstra & Gove [1971]. The least-squares fit to these data resulted in the P(Z) and P(N) values shown in Table 2(a), together with those of Gilbert & Cameron. Table 2(b) gives the corresponding S(Z), S(N) values. The values of T(Z) and T(N) were fixed at the Cook, Ferguson & Musgrove

[1967] results. In Table 3 are the specific results for shell and pairing corrections for the nuclides used, together with a comparison of experimental and calculated spacings. Also shown are the contribution to χ_N^2 and the ratio of calculated to experimental spacings. For the majority of nuclides, the fit is within the experimental error. The total χ_N^2 for this particular fit was found to be 29.1. Since a fit of 204 pieces of data with 178 parameters has just 26 degrees of freedom, this χ_N^2 value is quite acceptable, especially since almost 32 per cent is contributed by only four nuclides.

In order to test the sensitivity of the fitted P(Z), P(N) values to the initial level spacing data, new data for 49 nuclides recently compiled by Musgrove [1976] were included in the 204-nuclide library and a new set of P(Z), P(N) values was fitted. Table 4 lists these 49 new level spacings and their corresponding errors which, in general, are much smaller than the errors in the original data library. Tables 5(a) and 5(b) give the new P(Z), P(N) and S(Z), S(N) values which differ greatly from the first set. Table 6 is a repeat of Table 3 for the second 204-nuclide library. A total χ_N^2 of 50.7 was found for this fit; this is somewhat high and perhaps outside the acceptable limit imposed by the number of degrees of freedom. Again most (60 per cent) of the χ_N^2 is contributed by a few nuclides, at least half of which are the more recently compiled data with small errors on the level spacings.

4. REFERENCES

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TABLE 1

SPIN STATE, LEVEL SPACING AND NEUTRON SEPARATION ENERGY DATA FOR 204 NUCLIDES

Nuclide	I^{π}	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	S_n (keV)	Nuclide	I^{π}	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	S_n (keV)
20CA 40	0.0	44.5000	24.0000	8363.1	39 Y 89	0.5-	3.1500	3.7000	6860.0
20CA 42	0.0	28.7000	25.0000	7932.6	40ZR 90	0.0	5.6900	4.9000	7202.6
20CA 43	3.5-	3.1800	1.6000	11136.3	40ZR 91	2.5	0.3360	0.3700	8635.1
20CA 44	0.0	33.0000	20.0000	7414.4	40ZR 92	0.0	3.5600	3.1000	6758.0
21SC 45	3.5-	2.0200	1.4000	8766.9	40ZR 94	0.0	1.8100	1.3000	6475.0
22TI 46	0.0	29.3000	22.0000	8875.1	40ZR 96	0.0	0.6870	0.6900	5578.0
22TI 47	2.5-	2.3600	1.8000	11628.1	41NB 93	4.5	0.1050	0.0750	7228.9
22TI 48	0.0	21.0000	19.0000	8143.4	42MO 92	0.0	2.5600	1.4800	8072.7
22TI 49	3.5-	5.6500	5.8000	10948.0	42MO 95	2.5	0.0509	0.0540	9154.2
22TI 50	0.0	83.8000	96.8000	6377.0	42MO 96	0.0	0.4280	0.3400	6816.1
23 V 50	6.0	2.6100	1.3000	11052.4	42MO 97	2.5	0.0262	0.0230	8642.6
23 V 51	3.5-	5.1400	3.3000	7311.3	42MO 98	0.0	1.4300	1.1680	5917.0
24CR 50	0.0	20.1000	13.0000	9262.0	42MO100	0.0	0.2800	0.4000	5391.0
24CR 52	0.0	25.9000	21.0000	7940.5	43TC 99	4.5	0.0275	0.0160	6600.0
24CR 53	1.5-	7.3800	7.0000	9720.2	44RU 99	2.5	0.0411	0.0270	9673.5
24CR 54	0.0	24.6000	33.0000	6260.0	44RU101	2.5	0.0223	0.0150	9216.1
25MN 55	2.5-	2.2800	2.1000	7270.4	44RU102	0.0	0.3770	0.2100	6225.0
26FE 54	0.0	18.3000	15.0000	9298.4	44RU104	0.0	0.2070	0.1040	5908.0
26FE 56	0.0	20.0000	12.0000	7646.2	45RH103	0.5-	0.0338	0.0210	6999.3
26FE 57	0.5-	8.3600	9.6400	10043.0	46PD105	2.5	0.0127	0.0070	9561.0
27CO 59	3.5-	1.3100	0.8300	7491.6	46PD108	0.0	0.0294	0.0164	6151.0
28NI 58	0.0	19.7000	12.0000	8999.3	47AG107	0.5-	0.0277	0.0220	7269.0
28NI 60	0.0	21.2000	13.0000	7819.5	47AG109	0.5-	0.0190	0.0160	6805.7
28NI 61	1.5-	2.0100	1.5000	10596.6	48CD112	0.0	0.0532	0.0297	6539.8
28NI 62	0.0	28.5000	24.0000	6841.2	48CD113	0.5	0.0236	0.0092	9041.0
28NI 64	0.0	27.5000	17.0000	6095.7	49IN113	4.5	0.0265	0.0280	7313.0
29CU 63	1.5-	0.7200	0.5600	6320.0	49IN115	4.5	0.0108	0.0065	6779.0
29CU 65	1.5-	1.2300	0.8600	7066.7	50SN112	0.0	0.1270	0.1400	7741.0
30ZN 64	0.0	3.1900	3.2000	7979.2	50SN114	0.0	0.2840	0.1160	7534.0
30ZN 66	0.0	3.4000	2.7800	7053.9	50SN115	0.5	0.1440	0.0720	9566.0
30ZN 67	2.5-	0.5060	0.5060	10199.3	50SN116	0.0	0.4260	0.4900	6942.5
30ZN 68	0.0	9.1500	12.9400	6483.5	50SN117	0.5	0.0502	0.0300	9327.3
31GA 69	1.5-	0.3190	0.1800	7654.7	50SN118	0.0	0.4750	0.3900	6485.0
31GA 71	1.5-	0.3810	0.2000	6521.1	50SN119	0.5	0.0830	0.0650	9104.4
32GE 70	0.0	0.9740	0.4800	7415.2	50SN120	0.0	0.8910	0.9700	6180.1
32GE 72	0.0	2.3200	3.0000	6784.3	50SN122	0.0	0.9680	0.3660	5948.0
32GE 73	4.5	0.0718	0.0530	10200.9	51SB121	2.5	0.0107	0.0077	6807.3
32GE 74	0.0	5.8500	6.6000	6490.0	51SB123	3.5	0.0251	0.0170	6466.8
32GE 76	0.0	6.0200	2.1300	6020.0	52TE122	0.0	0.1890	0.0630	6929.9
33AS 75	1.5-	0.0744	0.0450	7328.2	52TE123	0.5	0.0292	0.0200	9423.8
34SE 76	0.0	0.9330	0.4700	7418.5	52TE124	0.0	0.2420	0.0910	6584.9
34SE 77	0.5-	0.1140	0.0570	10497.0	52TE125	0.5	0.0575	0.0340	9109.3
34SE 78	0.0	2.6000	2.5000	6978.0	52TE126	0.0	1.1600	1.6400	6295.6
34SE 80	0.0	4.1100	3.8000	6701.0	52TE130	0.0	5.6800	4.3000	5917.0
34SE 82	0.0	4.9900	2.5000	5925.0	53 I127	2.5	0.0137	0.0082	6825.4
35BR 79	1.5-	0.0512	0.0194	7883.0	53 I129	3.5	0.0162	0.0072	6456.0
35BR 81	1.5-	0.0347	0.0200	7601.0	54XE129	0.5	0.0352	0.0157	9258.0
37RB 85	2.5-	0.2010	0.1500	8650.4	54XE131	1.5	0.0672	0.0336	8936.1
37RB 87	1.5	2.5700	1.7100	6083.0	55CS133	3.5	0.0206	0.0130	6891.3
38SR 87	4.5	0.2740	0.2100	11113.0	56BA135	1.5	0.0663	0.0660	9107.1
38SR 88	0.0	41.0000	33.4000	6360.1	56BA136	0.0	2.6300	1.4700	6902.1

TABLE 1 (Continued)

Nuclide	I^{π}	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	S_n (keV)	Nuclide	I^{π}	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	S_n (keV)
56BA137	1.5	0.3080	0.1720	8611.5	72HF176	0.0	0.0317	0.0170	6380.8
56BA138	0.0	11.2000	6.5000	4723.4	72HF177	3.5-	0.0032	0.0026	7626.1
57LA138	5.0-	0.0406	0.0210	8777.8	72HF178	0.0	0.0667	0.0470	6099.5
57LA139	3.5	0.2650	0.2400	5161.2	72HF179	4.5	0.0057	0.0033	7387.6
59PR141	2.5	0.0653	0.0520	5843.8	73TA181	3.5	0.0041	0.0028	6063.0
60ND142	0.0	1.1900	0.5300	6125.5	74 W180	0.0	0.0143	0.0064	6650.0
60ND143	3.5-	0.0330	0.0310	7817.4	74 W182	0.0	0.0604	0.0410	6191.4
60ND144	0.0	0.7630	0.4000	5760.4	74 W183	0.5-	0.0127	0.0093	7411.1
60ND145	3.5-	0.0177	0.0160	7565.4	74 W184	0.0	0.0670	0.0620	5749.7
60ND146	0.0	0.4740	0.3500	5302.3	74 W186	0.0	0.1140	0.0790	5466.1
60ND148	0.0	0.2580	0.2400	5068.0	75RE185	2.5	0.0032	0.0017	6179.0
60ND150	0.0	0.2470	0.1900	5309.0	75RE187	2.5	0.0044	0.0027	5873.4
61PM147	3.5	0.0050	0.0039	5900.0	76OS189	1.5-	0.0050	0.0033	7793.1
62SM147	3.5-	0.0076	0.0045	8140.7	77IR191	1.5	0.0030	0.0023	6198.7
62SM149	3.5-	0.0028	0.0017	7986.1	77IR193	1.5	0.0109	0.0099	6066.2
62SM150	0.0	0.0557	0.0190	5592.4	78PT192	0.0	0.0890	0.0363	6253.0
62SM151	3.5-	0.0013	0.0011	8266.8	78PT194	0.0	0.0806	0.0403	6124.0
62SM152	0.0	0.0555	0.0300	5867.0	78PT195	0.5-	0.0169	0.0150	7920.9
62SM154	0.0	0.1230	0.0820	5814.0	79AU197	1.5	0.0160	0.0100	6512.7
63EU151	2.5	0.0010	0.0006	6305.3	80HG198	0.0	0.0788	0.0352	6648.8
63EU153	2.5	0.0014	0.0007	6438.0	80HG199	0.5-	0.0940	0.0313	8028.7
64GD152	0.0	0.0149	0.0110	6487.0	80HG200	0.0	1.0800	0.4400	6225.4
64GD154	0.0	0.0130	0.0110	6446.0	80HG201	1.5-	0.0832	0.0295	7755.6
64GD155	1.5-	0.0020	0.0013	8531.2	81TL205	0.5	5.6800	5.0800	6503.9
64GD156	0.0	0.0493	0.0390	6368.2	82PB204	0.0	3.1000	2.0000	6734.2
64GD157	1.5-	0.0058	0.0038	7930.7	82PB206	0.0	20.5000	12.0000	6740.9
64GD158	0.0	0.1010	0.0500	5945.0	82PB207	0.5-	34.5000	29.0000	7368.2
64GD160	0.0	0.1700	0.0760	5633.0	83BI209	4.5-	4.0800	3.0000	4597.8
65TB159	1.5	0.0037	0.0020	6381.8	90TH229	2.5	0.0010	0.0008	6789.9
66DY161	2.5	0.0028	0.0016	8194.9	90TH230	0.0	0.0118	0.0050	5129.0
66DY162	0.0	0.0667	0.0300	6271.7	90TH232	0.0	0.0243	0.0150	4787.0
66DY163	2.5-	0.0080	0.0042	7654.7	91PA231	1.5-	0.0005	0.0004	5562.0
66DY164	0.0	0.1670	0.0630	5715.4	91PA233	1.5-	0.0008	0.0004	5197.0
67HO165	3.5-	0.0037	0.0025	6243.4	92 U232	0.0	0.0045	0.0055	5743.0
68ER162	0.0	0.0132	0.0110	6907.0	92 U233	2.5	0.0007	0.0003	6840.8
68ER164	0.0	0.0258	0.0280	6655.0	92 U234	0.0	0.0107	0.0074	5306.0
68ER166	0.0	0.0385	0.0200	6436.3	92 U235	3.5-	0.0006	0.0003	6545.1
68ER167	3.5	0.0047	0.0027	7771.4	92 U236	0.0	0.0129	0.0064	5124.5
68ER168	0.0	0.1060	0.0610	6003.1	92 U238	0.0	0.0220	0.0130	4803.2
68ER170	0.0	0.1590	0.1300	5681.0	93NP237	2.5	0.0007	0.0004	5480.0
69TM169	0.5	0.0084	0.0070	6594.2	94PU238	0.0	0.0076	0.0046	5656.0
70YB168	0.0	0.0587	0.0339	6867.2	94PU239	0.5	0.0024	0.0016	6533.5
70YB170	0.0	0.0386	0.0220	6617.2	94PU240	0.0	0.0163	0.0100	5240.6
70YB171	0.5-	0.0089	0.0045	8023.9	94PU241	2.5	0.0010	0.0008	6300.8
70YB172	0.0	0.0719	0.0430	6367.7	94PU242	0.0	0.0211	0.0140	5037.0
70YB173	2.5-	0.0074	0.0045	7469.1	95AM241	2.5-	0.0007	0.0005	5528.0
70YB174	0.0	0.1780	0.1100	5820.0	95AM242	1.0-	0.0051	0.0021	6377.0
70YB176	0.0	0.2160	0.1200	5562.0	95AM243	2.5-	0.0007	0.0005	5362.9
71LU175	3.5	0.0036	0.0023	6293.2	96CM243	2.5	0.0018	0.0015	6799.0
71LU176	7.0-	0.0024	0.0014	7072.1	96CM244	0.0	0.0146	0.0091	5519.9
72HF174	0.0	0.0219	0.0160	6854.0	96CM245	0.5	0.0031	0.0013	6450.7

TABLE 2(a)

COMPARISON OF P(Z), P(N) VALUES WITH GILBERT & CAMERON DATA

Z or N	P(Z) G&C	P(Z) this paper	P(N) G&C	P(N) this paper	Z or N	P(Z) G&C	P(Z) this paper	P(N) G&C	P(N) this paper	N	P(N) G&C	P(N) this paper
20	1.830	1.887	2.040		64	0.970	0.720	0.970	0.970	108	0.810	0.717
21	0.0	0.326	0.0	0.548	65	0.0	-0.111	0.080	-0.002	109	0.090	0.134
22	1.730	1.955	1.640		66	0.920	0.658	1.650	1.650	110	0.750	0.722
23	0.0	0.206	0.0	0.363	67	0.110	-0.048	-0.110	-0.364	111	0.170	-0.100
24	1.350	1.610	1.440	1.860	68	0.680	0.570	1.260	1.522	112	0.860	
25	0.0	0.288	0.0	0.309	69	0.050	0.068	-0.460	-0.077	113	0.140	-0.130
26	1.540	1.751	1.540	1.765	70	0.680	0.829	1.060	1.485	114	1.100	1.100
27	0.0	-0.056	0.0	0.055	71	-0.220	0.132	0.220	-0.028	115	-0.220	0.192
28	1.280	1.582	1.200	1.118	72	0.790	0.854	1.550	1.289	116	0.840	
29	0.260	-0.848	0.0	-0.128	73	0.090	-0.019	-0.070	-0.592	117	-0.470	-0.375
30	0.880	0.741	1.270	1.544	74	0.690	0.705	1.370	0.940	118	0.480	0.310
31	0.190	0.415	0.0	-0.353	75	0.010	0.155	0.100	-0.011	119	0.020	-0.137
32	1.350	0.920	1.290	1.574	76	0.720	0.657	1.200	1.150	120	0.880	1.120
33	-0.050	-0.348	0.080	-0.182	77	0.0	-0.373	-0.270	-0.525	121	0.240	0.230
34	1.520	1.081	1.410	1.315	78	0.400	0.590	0.920	0.917	122	0.520	0.520
35	-0.090	-0.219	-0.080	-0.124	79	0.160	0.358	-0.350	-0.708	123	0.270	0.138
36	1.170		1.500		80	0.730	0.717	1.190	1.483	124	0.410	
37	0.040	-0.053	-0.050	-0.047	81	0.0	-0.260	0.0	0.715	125	-0.050	-0.065
38	1.240	1.565	2.240	2.240	82	0.460	0.375	1.050	1.269	126	0.380	0.635
39	0.290	0.074	-0.470	-0.057	83	0.170	-0.138	-0.250	0.140	127	0.150	0.240
40	1.090	0.876	1.430		84	0.890		1.610	1.513	128	0.670	
41	0.260	-0.371	-0.150	-0.483	85	0.0		-0.210	0.621	129	0.0	
42	1.170	0.546	1.440	1.828	86	0.790		0.900	0.885	130	0.610	
43	0.230	0.188	0.060	0.255	87	0.0		-0.210	-0.239	131	0.0	
44	1.150	1.200	1.560	1.861	88	0.890		0.740	0.913	132	0.780	
45	-0.080	0.402	0.250	0.339	89	0.0		-0.380	-0.426	133	0.0	
46	1.350	0.774	1.570		90	0.810	0.732	0.720	0.961	134	0.670	
47	0.340	0.900	-0.160	-0.416	91	-0.060	0.069	-0.340	-0.279	135	0.0	
48	1.050	0.725	1.460		92	0.690	0.648	0.920	1.214	136	0.670	
49	0.280	0.776	0.0	-0.632	93	-0.200	0.131	-0.260	-0.139	137	0.0	
50	1.270	1.360	0.930	1.164	94	0.710	0.515	0.940	0.994	138	0.790	
51	0.0	0.215	0.010	0.540	95	-0.120	0.055	0.010	0.011	139	0.0	
52	1.050	1.462	0.620	0.936	96	0.720	0.672	0.650	1.032	140	0.600	0.978
53	0.0	0.096	-0.500	0.286	97			-0.360	-0.095	141	0.040	-0.091
54	1.000	1.508	1.420	1.235	98			0.830	1.002	142	0.640	0.772
55	0.090	0.618	0.130	0.068	99			0.110	0.027	143	-0.060	-0.101
56	1.200	1.020	1.520	1.208	100			0.670	0.987	144	0.450	0.594
57	0.200	0.070	-0.650	-0.520	101			0.050	0.112	145	0.050	-0.133
58	1.400		0.800	1.017	102			1.000	0.877	146	0.260	0.521
59	0.930	0.270	-0.080	-0.459	103			0.510	0.064	147	-0.220	-0.113
60	1.000	1.032	1.290	1.900	104			1.040	0.679	148	0.390	0.692
61	-0.200	0.009	-0.470	-0.603	105			0.330	-0.031	149	0.0	-0.160
62	1.190	1.026	1.250		106			0.680	0.500	150	0.390	0.270
63	0.090	0.236	-0.440	-0.783	107			-0.270	-0.113			

TABLE 2(b)

COMPARISON OF S(Z), S(N) VALUES WITH GILBERT & CAMERON DATA

Z or N	S(Z) G&C	S(Z) this paper	S(N) G&C	S(N) this paper	Z or N	S(Z) G&C	S(Z) this paper	S(N) G&C	S(N) this paper	N	S(N) G&C	S(N) this paper
20	-12.070	-12.127	11.390		64	-10.410	-10.160	20.080	20.080	108	6.750	6.842
21	-12.550	-12.876	12.540	11.991	65	-10.210	-10.099	19.980	20.062	109	6.600	6.556
22	-13.240	-13.465	13.680		66	-9.850	-9.588	19.830	19.830	110	6.380	6.407
23	-13.930	-14.136	14.340	13.977	67	-9.470	-9.312	20.200	20.454	111	6.360	6.630
24	-14.710	-14.970	14.190	13.770	68	-9.030	-8.920	19.720	19.458	112	6.490	
25	-15.530	-15.818	13.830	13.521	69	-8.610	-8.627	19.870	19.487	113	6.250	6.520
26	-16.370	-16.581	13.500	13.275	70	-8.130	-8.279	19.240	18.815	114	5.850	5.850
27	-17.360	-17.303	13.000	12.944	71	-7.460	-7.812	18.440	18.687	115	5.480	5.068
28	-18.600	-18.902	12.130	12.212	72	-7.480	-7.544	17.610	17.870	116	4.530	
29	-18.700	-17.592	12.600	12.728	73	-7.200	-7.090	17.100	17.622	117	4.300	4.205
30	-18.010	-17.871	13.260	12.986	74	-7.130	-7.145	16.160	16.589	118	3.390	3.560
31	-17.870	-18.095	14.130	14.483	75	-7.060	-7.205	15.900	16.010	119	2.350	2.507
32	-17.080	-16.650	14.920	14.635	76	-6.780	-6.717	15.330	15.380	120	1.660	1.420
33	-16.600	-16.301	15.520	15.782	77	-6.560	-6.186	14.760	15.015	121	0.810	0.820
34	-16.750	-16.311	16.380	16.474	78	-6.640	-6.830	13.540	13.543	122	0.460	0.460
35	-16.500	-16.371	17.160	17.204	79	-7.680	-7.878	12.630	12.988	123	-0.960	-0.828
36	-16.350		17.550		80	-7.890	-7.877	10.650	10.357	124	-1.690	
37	-16.220	-16.127	18.030	18.027	81	-8.410	-8.150	10.100	9.385	125	-2.530	-2.515
38	-16.410	-16.735	17.590	17.590	82	-8.490	-8.405	8.890	8.671	126	-3.160	-3.415
39	-16.890	-16.674	19.030	18.617	83	-7.880	-7.572	10.250	9.860	127	-1.870	-1.960
40	-16.430	-16.216	18.710		84	-6.380		9.790	9.887	128	-0.410	
41	-16.680	-16.049	18.800	19.133	85	-5.470		11.390	10.558	129	0.710	
42	-16.730	-16.106	18.990	18.602	86	-4.780		11.720	11.735	130	1.660	
43	-17.450	-17.408	18.460	18.264	87	-4.370		12.430	12.459	131	2.620	
44	-17.290	-17.340	18.250	17.948	88	-4.170		12.960	12.786	132	3.220	
45	-17.440	-17.922	17.760	17.671	89	-4.120		13.430	13.476	133	3.760	
46	-17.820	-17.244	17.380		90	-4.320	-4.242	13.370	13.128	134	4.100	
47	-18.530	-19.090	16.720	16.976	91	-4.550	-4.679	12.960	12.899	135	4.460	
48	-18.270	-17.945	15.620		92	-5.040	-4.998	12.110	11.816	136	4.830	
49	-19.390	-19.886	14.380	15.012	93	-5.280	-5.611	11.920	11.799	137	5.090	
50	-19.910	-20.000	12.880	12.646	94	-6.060	-5.865	11.000	10.945	138	5.180	
51	-19.140	-19.355	13.230	12.699	95	-6.280	-6.455	10.800	10.799	139	5.170	
52	-18.260	-18.672	13.810	13.493	96	-6.870	-6.822	10.430	10.048	140	5.100	4.722
53	-17.400	-17.496	14.900	14.114	97			10.390	10.125	141	5.010	5.141
54	-16.420	-16.928	14.860	15.045	98			9.690	9.518	142	4.970	4.838
55	-15.770	-16.298	15.760	15.822	99			9.270	9.352	143	5.090	5.131
56	-14.370	-14.190	16.200	16.511	100			8.930	8.613	144	5.030	4.886
57	-13.910	-13.780	17.620	17.490	101			8.570	8.507	145	4.930	5.113
58	-13.100		17.730	17.513	102			8.020	8.142	146	5.280	5.018
59	-13.110	-12.450	18.160	18.539	103			7.590	8.035	147	5.490	5.383
60	-11.430	-11.462	18.670	18.060	104			7.330	7.691	148	5.500	5.197
61	-10.890	-11.099	19.690	19.823	105			7.230	7.591	149	5.370	5.530
62	-10.750	-10.586	19.510		106			7.050	7.229	150	5.300	5.420
63	-10.620	-10.766	20.170	20.513	107			7.420	7.263			

TABLE 3

SUMMARY OF PARAMETERS FOR 204 NUCLIDES

Nuclide	N+1	P(Z)	P(N+1)	S(Z)	S(N+1)	T(Z)	T(N+1)	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	$\bar{D}_{o\ calc}$ (keV)	χ^2	Ratio
20CA 40	21	1.887	0.548	-12.127	11.991	-10.240	12.540	44.5000	24.0000	44.4237	0.000	0.998
20CA 42	23	1.887	0.363	-12.127	13.977	-10.240	14.340	28.7000	25.0000	28.6061	0.000	0.997
20CA 43	24	1.887	1.860	-12.127	13.770	-10.240	15.630	3.1800	1.6000	3.1874	0.000	1.002
20CA 44	25	1.887	0.309	-12.127	13.521	-10.240	13.830	33.0000	20.0000	38.3053	0.070	1.161
21SC 45	25	0.326	0.309	-12.876	13.521	-12.550	13.830	2.0200	1.4000	2.0219	0.000	1.001
22TI 46	25	1.955	0.309	-13.465	13.521	-11.510	13.830	29.3000	22.0000	19.0712	0.216	0.651
22TI 47	26	1.955	1.765	-13.465	13.275	-11.510	15.040	2.3600	1.8000	2.3575	0.000	0.999
22TI 48	27	1.955	0.055	-13.465	12.944	-11.510	13.000	21.0000	19.0000	27.5094	0.117	1.310
22TI 49	28	1.955	1.118	-13.465	12.212	-11.510	13.330	5.6500	5.8000	3.1806	0.181	0.563
22TI 50	29	1.955	-0.128	-13.465	12.728	-11.510	12.600	83.7999	96.7999	84.7995	0.000	1.012
23 V 50	28	0.206	1.118	-14.136	12.212	-13.930	13.330	2.6100	1.3000	2.7879	0.019	1.068
23 V 51	29	0.206	-0.128	-14.136	12.728	-13.930	12.600	5.1400	3.3000	4.3333	0.060	0.843
24CR 50	27	1.610	0.055	-14.970	12.944	-13.360	13.000	20.1000	13.0000	14.3790	0.194	0.715
24CR 52	29	1.610	-0.128	-14.970	12.728	-13.360	12.600	25.9000	21.0000	25.0606	0.002	0.968
24CR 53	30	1.610	1.544	-14.970	12.986	-13.360	14.530	7.3800	7.0000	7.4161	0.000	1.005
24CR 54	31	1.610	-0.353	-14.970	14.483	-13.360	14.130	24.6000	33.0000	38.3679	0.174	1.560
25MN 55	31	0.288	-0.353	-15.818	14.483	-15.530	14.130	2.2800	2.1000	2.2783	0.000	0.999
26FE 54	29	1.751	-0.128	-16.581	12.728	-14.830	12.600	18.3000	15.0000	22.9789	0.097	1.256
26FE 56	31	1.751	-0.353	-16.581	14.483	-14.830	14.130	20.0000	12.0000	15.7872	0.123	0.789
26FE 57	32	1.751	1.574	-16.581	14.635	-14.830	16.210	8.3600	9.6400	8.3611	0.000	1.000
27CO 59	33	-0.056	-0.182	-17.303	15.782	-17.360	15.600	1.3100	0.8300	1.3035	0.000	0.995
28NI 58	31	1.582	-0.353	-18.902	14.483	-17.320	14.130	19.7000	12.0000	19.9856	0.001	1.015
28NI 60	33	1.582	-0.182	-18.902	15.782	-17.320	15.600	21.2000	13.0000	21.6736	0.001	1.022
28NI 61	34	1.582	1.315	-18.902	16.474	-17.320	17.790	2.0100	1.5000	2.0073	0.000	0.999
28NI 62	35	1.582	-0.124	-18.902	17.204	-17.320	17.080	28.5000	24.0000	21.9874	0.074	0.771
28NI 64	37	1.582	-0.047	-18.902	18.027	-17.320	17.980	27.5000	17.0000	28.5213	0.004	1.037
29CU 63	35	-0.848	-0.124	-17.592	17.204	-18.440	17.080	0.7200	0.5600	0.8504	0.054	1.181
29CU 65	37	-0.848	-0.047	-17.592	18.027	-18.440	17.980	1.2300	0.8600	0.2618	1.268	0.213
30ZN 64	35	0.741	-0.124	-17.871	17.204	-17.130	17.080	3.1900	3.2000	2.8746	0.010	0.901
30ZN 66	37	0.741	-0.047	-17.871	18.027	-17.130	17.980	3.4000	2.7800	3.9032	0.033	1.148
30ZN 67	38	0.741	2.240	-17.871	17.590	-17.130	19.830	0.5060	0.5060	0.4849	0.002	0.958
30ZN 68	39	0.741	-0.057	-17.871	18.617	-17.130	18.560	9.1500	12.9400	4.3878	0.135	0.480
31GA 69	39	0.415	-0.057	-18.095	18.617	-17.680	18.560	0.3190	0.1800	0.3093	0.003	0.970
31GA 71	41	0.415	-0.483	-18.095	19.133	-17.680	18.650	0.3810	0.2000	0.3951	0.005	1.037
32GE 70	39	0.920	-0.057	-16.650	18.617	-15.730	18.560	0.9740	0.4800	1.0147	0.007	1.042
32GE 72	41	0.920	-0.483	-16.650	19.133	-15.730	18.650	2.3200	3.0000	0.8303	0.247	0.358
32GE 73	42	0.920	1.828	-16.650	18.602	-15.730	20.430	0.0718	0.0530	0.0717	0.000	0.999
32GE 74	43	0.920	0.255	-16.650	18.264	-15.730	18.520	5.8500	6.6000	3.0588	0.179	0.523
32GE 76	45	0.920	0.339	-16.650	17.671	-15.730	18.010	6.0200	2.1300	6.2739	0.014	1.042
33AS 75	43	-0.348	0.255	-16.301	18.264	-16.650	18.520	0.0744	0.0450	0.0744	0.000	1.001
34SE 76	43	1.081	0.255	-16.311	18.264	-15.230	18.520	0.9330	0.4700	0.9865	0.013	1.057
34SE 77	44	1.081	1.861	-16.311	17.948	-15.230	19.810	0.1140	0.0570	0.1141	0.000	1.001
34SE 78	45	1.081	0.339	-16.311	17.671	-15.230	18.010	2.6000	2.5000	1.9061	0.077	0.733
34SE 80	47	1.081	-0.416	-16.311	16.976	-15.230	16.560	4.1100	3.8000	1.3049	0.545	0.317
34SE 82	49	1.081	-0.632	-16.311	15.012	-15.230	14.380	4.9900	2.5000	5.1819	0.006	1.038
35BR 79	45	-0.219	0.339	-16.371	17.671	-16.590	18.010	0.0512	0.0194	0.0496	0.007	0.969
35BR 81	47	-0.219	-0.416	-16.371	16.976	-16.590	16.560	0.0347	0.0200	0.0371	0.014	1.069
37RB 85	49	-0.053	-0.632	-16.127	15.012	-16.180	14.380	0.2010	0.1500	0.0193	1.468	0.096
37RB 87	51	-0.053	0.540	-16.127	12.699	-16.180	13.240	2.5700	1.7100	2.7810	0.015	1.082
38SR 87	50	1.565	1.164	-16.735	12.646	-15.170	13.810	0.2740	0.2100	0.2743	0.000	1.001
38SR 88	51	1.565	0.540	-16.735	12.699	-15.170	13.240	41.0000	33.4000	41.3862	0.000	1.009
39 Y 89	51	0.074	0.540	-16.674	12.699	-16.600	13.240	3.1500	3.7000	3.1436	0.000	0.998

TABLE 3 (Continued)

Nuclide	N+1	P(Z)	P(N+1)	S(Z)	S(N+1)	T(Z)	T(N+1)	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	$\bar{D}_{o\ calc}$ (keV)	χ^2	Ratio
40ZR 90	51	0.876	0.540	-16.216	12.699	-15.340	13.240	5.6900	4.9000	6.8482	0.056	1.204
40ZR 91	52	0.876	0.936	-16.216	13.493	-15.340	14.430	0.3360	0.3700	0.3364	0.000	1.001
40ZR 92	53	0.876	0.286	-16.216	14.114	-15.340	14.400	3.5600	3.1000	3.4397	0.002	0.966
40ZR 94	55	0.876	0.068	-16.216	15.822	-15.340	15.890	1.8100	1.3000	1.3531	0.124	0.748
40ZR 96	57	0.876	-0.520	-16.216	17.490	-15.340	16.970	0.6870	0.6900	0.7631	0.012	1.111
41NB 93	53	-0.371	0.286	-16.049	14.114	-16.420	14.400	0.1050	0.0750	0.1042	0.000	0.992
42MO 92	51	0.546	0.540	-16.106	12.699	-15.560	13.240	2.5600	1.4800	1.8305	0.243	0.715
42MO 95	54	0.546	1.235	-16.106	15.045	-15.560	16.280	0.0509	0.0540	0.0510	0.000	1.003
42MO 96	55	0.546	0.068	-16.106	15.822	-15.560	15.890	0.4280	0.3400	0.5159	0.067	1.205
42MO 97	56	0.546	1.208	-16.106	16.511	-15.560	17.720	0.0262	0.0230	0.0312	0.047	1.190
42MO 98	57	0.546	-0.520	-16.106	17.490	-15.560	16.970	1.4300	1.1680	0.2716	0.984	0.190
42MO100	59	0.546	-0.459	-16.106	18.539	-15.560	18.080	0.2800	0.4000	0.3079	0.005	1.100
43TC 99	57	0.188	-0.520	-17.408	17.490	-17.220	16.970	0.0275	0.0160	0.0275	0.000	1.000
44RU 99	56	1.200	1.208	-17.340	16.511	-16.140	17.720	0.0411	0.0270	0.0358	0.039	0.871
44RU101	58	1.200	1.017	-17.340	17.513	-16.140	18.530	0.0223	0.0150	0.0225	0.000	1.008
44RU102	59	1.200	-0.459	-17.340	18.539	-16.140	18.080	0.3770	0.2100	0.3792	0.000	1.006
44RU104	61	1.200	-0.603	-17.340	19.823	-16.140	19.220	0.2070	0.1040	0.2227	0.023	1.076
45RH103	59	0.402	-0.459	-17.922	18.539	-17.520	18.080	0.0338	0.0210	0.0338	0.000	1.001
46PD105	60	0.774	1.900	-17.244	18.060	-16.470	19.960	0.0127	0.0070	0.0127	0.000	1.000
46PD108	63	0.774	-0.783	-17.244	20.513	-16.470	19.730	0.0294	0.0164	0.0330	0.049	1.124
47AG107	61	0.900	-0.603	-19.090	19.823	-18.190	19.220	0.0277	0.0220	0.0253	0.012	0.914
47AG109	63	0.900	-0.783	-19.090	20.513	-18.190	19.730	0.0190	0.0160	0.0207	0.011	1.088
48CD112	65	0.725	-0.002	-17.945	20.062	-17.220	20.060	0.0532	0.0297	0.0725	0.421	1.362
48CD113	66	0.725	1.650	-17.945	19.830	-17.220	21.480	0.0236	0.0092	0.0119	1.612	0.505
49IN113	65	0.776	-0.002	-19.886	20.062	-19.110	20.060	0.0265	0.0280	0.0133	0.222	0.502
49IN115	67	0.776	-0.364	-19.886	20.454	-19.110	20.090	0.0108	0.0065	0.0113	0.005	1.044
50SN112	63	1.360	-0.783	-20.000	20.513	-18.640	19.730	0.1270	0.1400	0.0302	0.479	0.237
50SN114	65	1.360	-0.002	-20.000	20.062	-18.640	20.060	0.2840	0.1160	0.1201	1.996	0.423
50SN115	66	1.360	1.650	-20.000	19.830	-18.640	21.480	0.1440	0.0720	0.0400	2.085	0.278
50SN116	67	1.360	-0.364	-20.000	20.454	-18.640	20.090	0.4260	0.4900	0.1129	0.408	0.265
50SN117	68	1.360	1.522	-20.000	19.458	-18.640	20.980	0.0502	0.0300	0.0502	0.000	1.000
50SN118	69	1.360	-0.077	-20.000	19.487	-18.640	19.410	0.4750	0.3900	0.4747	0.000	0.999
50SN119	70	1.360	1.485	-20.000	18.815	-18.640	20.300	0.0830	0.0650	0.0829	0.000	0.998
50SN120	71	1.360	-0.028	-20.000	18.687	-18.640	18.660	0.8910	0.9700	1.0658	0.032	1.196
50SN122	73	1.360	-0.592	-20.000	17.622	-18.640	17.030	0.9680	0.3660	1.1210	0.175	1.158
51SB121	71	0.215	-0.028	-19.355	18.687	-19.140	18.660	0.0107	0.0077	0.0130	0.092	1.218
51SB123	73	0.215	-0.592	-19.355	17.622	-19.140	17.030	0.0251	0.0170	0.0151	0.345	0.602
52TE122	71	1.462	-0.028	-18.672	18.687	-17.210	18.660	0.1890	0.0630	0.1828	0.010	0.967
52TE123	72	1.462	1.289	-18.672	17.870	-17.210	19.160	0.0292	0.0200	0.0292	0.000	1.000
52TE124	73	1.462	-0.592	-18.672	17.622	-17.210	17.030	0.2420	0.0910	0.2219	0.049	0.917
52TE125	74	1.462	0.940	-18.672	16.589	-17.210	17.530	0.0575	0.0340	0.0575	0.000	1.000
52TE126	75	1.462	-0.011	-18.672	16.010	-17.210	16.000	1.1600	1.6400	1.6789	0.100	1.447
52TE130	79	1.462	-0.708	-18.672	12.988	-17.210	12.280	5.6800	4.3000	6.0073	0.006	1.058
53 I127	75	0.096	-0.011	-17.496	16.010	-17.400	16.000	0.0137	0.0082	0.0126	0.017	0.923
53 I129	77	0.096	-0.525	-17.496	15.015	-17.400	14.490	0.0162	0.0072	0.0162	0.000	1.000
54XE129	76	1.508	1.150	-16.928	15.380	-15.420	16.530	0.0352	0.0157	0.0352	0.000	0.999
54XE131	78	1.508	0.917	-16.928	13.543	-15.420	14.460	0.0672	0.0336	0.0673	0.000	1.002
55CS133	79	0.618	-0.708	-16.298	12.988	-15.680	12.280	0.0206	0.0130	0.0206	0.000	1.000
56BA135	80	1.020	1.483	-14.190	10.357	-13.170	11.840	0.0663	0.0660	0.0664	0.000	1.001
56BA136	81	1.020	0.715	-14.190	9.385	-13.170	10.100	2.6300	1.4700	2.6357	0.000	1.002
56BA137	82	1.020	1.269	-14.190	8.671	-13.170	9.940	0.3080	0.1720	0.3058	0.000	0.993
56BA138	83	1.020	0.140	-14.190	9.860	-13.170	10.000	11.2000	6.5000	13.2680	0.101	1.185
57LA138	82	0.070	1.269	-13.780	8.671	-13.710	9.940	0.0406	0.0210	0.0386	0.009	0.950

TABLE 3 (Continued)

Nuclide	N+1	P(Z)	P(N+1)	S(Z)	S(N+1)	T(Z)	T(N+1)	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	$\bar{D}_{o\ calc}$ (keV)	χ^2	Ratio
57LA149	83	0.070	0.140	-13.780	9.860	-13.710	10.000	0.2650	0.2400	0.2981	0.019	1.125
59PR141	83	0.270	0.140	-12.450	9.860	-12.180	10.000	0.0653	0.0520	0.0651	0.000	0.997
60ND142	83	1.032	0.140	-11.462	9.860	-10.430	10.000	1.1900	0.5300	0.3281	2.645	0.276
60ND143	84	1.032	1.513	-11.462	9.887	-10.430	11.400	0.0330	0.0310	0.0330	0.000	0.999
60ND144	85	1.032	0.621	-11.462	10.558	-10.430	11.180	0.7630	0.4000	0.7647	0.000	1.002
60ND145	86	1.032	0.885	-11.462	11.735	-10.430	12.620	0.0177	0.0160	0.0243	0.171	1.374
60ND146	87	1.032	-0.239	-11.462	12.459	-10.430	12.220	0.4740	0.3500	0.4759	0.000	1.004
60ND148	89	1.032	-0.426	-11.462	13.476	-10.430	13.050	0.2580	0.2400	0.2580	0.000	1.000
60ND150	91	1.032	-0.279	-11.462	12.899	-10.430	12.620	0.2470	0.1900	0.2796	0.029	1.132
61PM147	87	0.009	-0.239	-11.099	12.459	-11.090	12.220	0.0050	0.0039	0.0050	0.000	1.000
62SM147	86	1.026	0.885	-10.586	11.735	-9.560	12.620	0.0076	0.0045	0.0050	0.329	0.660
62SM149	88	1.026	0.913	-10.586	12.786	-9.560	13.700	0.0028	0.0017	0.0028	0.000	0.998
62SM150	89	1.026	-0.426	-10.586	13.476	-9.560	13.050	0.0557	0.0190	0.0567	0.003	1.017
62SM151	90	1.026	0.961	-10.586	13.128	-9.560	14.090	0.0013	0.0011	0.0013	0.000	0.999
62SM152	91	1.026	-0.279	-10.586	12.899	-9.560	12.620	0.0555	0.0300	0.0579	0.006	1.043
62SM154	93	1.026	-0.139	-10.586	11.799	-9.560	11.660	0.1230	0.0820	0.1418	0.053	1.153
63EU151	89	0.236	-0.426	-10.766	13.476	-10.530	13.050	0.0010	0.0006	0.0010	0.012	1.065
63EU153	91	0.236	-0.279	-10.766	12.899	-10.530	12.620	0.0014	0.0007	0.0014	0.014	0.946
64GD152	89	0.720	-0.426	-10.160	13.476	-9.440	13.050	0.0149	0.0110	0.0053	0.767	0.354
64GD154	91	0.720	-0.279	-10.160	12.899	-9.440	12.620	0.0130	0.0110	0.0092	0.117	0.711
64GD155	92	0.720	1.214	-10.160	11.816	-9.440	13.030	0.0020	0.0013	0.0020	0.000	1.000
64GD156	93	0.720	-0.139	-10.160	11.799	-9.440	11.660	0.0493	0.0390	0.0244	0.409	0.494
64GD157	94	0.720	0.994	-10.160	10.945	-9.440	11.940	0.0058	0.0038	0.0059	0.000	1.000
64GD158	95	0.720	0.011	-10.160	10.799	-9.440	10.810	0.1010	0.0500	0.1061	0.011	1.051
64GD160	97	0.720	-0.095	-10.160	10.125	-9.440	10.030	0.1700	0.0760	0.2087	0.259	1.228
65TB159	95	-0.111	0.011	-10.099	10.799	-10.210	10.810	0.0037	0.0020	0.0037	0.000	0.998
66DY161	96	0.658	1.032	-9.588	10.048	-8.930	11.080	0.0028	0.0016	0.0028	0.000	0.999
66DY162	97	0.658	-0.095	-9.588	10.125	-8.930	10.030	0.0667	0.0300	0.0426	0.645	0.639
66DY163	98	0.658	1.002	-9.588	9.518	-8.930	10.520	0.0080	0.0042	0.0080	0.000	0.999
66DY164	99	0.658	0.027	-9.588	9.352	-8.930	9.380	0.1670	0.0630	0.1909	0.143	1.143
67HO165	99	-0.048	0.027	-9.312	9.352	-9.360	9.380	0.0037	0.0025	0.0037	0.000	1.001
68ER162	95	0.570	0.011	-8.920	10.799	-8.350	10.810	0.0132	0.0110	0.0062	0.406	0.469
68ER164	97	0.570	-0.095	-8.920	10.125	-8.350	10.030	0.0258	0.0280	0.0113	0.268	0.438
68ER166	99	0.570	0.027	-8.920	9.352	-8.350	9.380	0.0385	0.0200	0.0302	0.174	0.783
68ER167	100	0.570	0.987	-8.920	8.613	-8.350	9.600	0.0047	0.0027	0.0047	0.000	0.989
68ER168	101	0.570	0.112	-8.920	8.507	-8.350	8.620	0.1060	0.0610	0.1122	0.010	1.058
68ER170	103	0.570	0.064	-8.920	8.035	-8.350	8.100	0.1590	0.1300	0.2184	0.209	1.374
69TM169	101	0.068	0.112	-8.627	8.507	-8.560	8.620	0.0084	0.0070	0.0084	0.000	1.002
70YB168	99	0.829	0.027	-8.279	9.352	-7.450	9.380	0.0587	0.0339	0.0130	1.821	0.221
70YB170	101	0.829	0.112	-8.279	8.507	-7.450	8.620	0.0386	0.0220	0.0368	0.006	0.954
70YB171	102	0.829	0.877	-8.279	8.142	-7.450	9.020	0.0089	0.0045	0.0088	0.000	0.990
70YB172	103	0.829	0.064	-8.279	8.035	-7.450	8.100	0.0719	0.0430	0.0644	0.031	0.895
70YB173	104	0.829	0.679	-8.279	7.691	-7.450	8.370	0.0074	0.0045	0.0073	0.000	0.989
70YB174	105	0.829	-0.031	-8.279	7.591	-7.450	7.560	0.1780	0.1100	0.1643	0.016	0.923
70YB176	107	0.829	-0.113	-8.279	7.263	-7.450	7.150	0.2160	0.1200	0.2524	0.092	1.169
71LU175	105	0.132	-0.031	-7.812	7.591	-7.680	7.560	0.0036	0.0023	0.0029	0.096	0.803
71LU176	106	0.132	0.500	-7.812	7.229	-7.680	7.730	0.0024	0.0014	0.0025	0.015	1.072
72HF174	103	0.854	0.064	-7.544	8.035	-6.690	8.100	0.0219	0.0160	0.0163	0.124	0.742
72HF176	105	0.854	-0.031	-7.544	7.591	-6.690	7.560	0.0317	0.0170	0.0374	0.111	1.179
72HF177	106	0.854	0.500	-7.544	7.229	-6.690	7.730	0.0032	0.0026	0.0025	0.069	0.784
72HF178	107	0.854	-0.113	-7.544	7.263	-6.690	7.150	0.0667	0.0470	0.0597	0.022	0.894
72HF179	108	0.854	0.717	-7.544	6.842	-6.690	7.560	0.0057	0.0033	0.0057	0.000	0.999
73TA181	109	-0.019	0.134	-7.090	6.556	-7.110	6.690	0.0041	0.0028	0.0040	0.002	0.967

TABLE 3 (Continued)

Nuclide	N+1	P(Z)	P(N+1)	S(Z)	S(N+1)	T(Z)	T(N+1)	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	$\bar{D}_{o\ calc}$ (keV)	χ^2	Ratio
74 W180	107	0.705	-0.113	-7.145	7.263	-6.440	7.150	0.0143	0.0064	0.0130	0.040	0.911
74 W182	109	0.705	0.134	-7.145	6.556	-6.440	6.690	0.0604	0.0410	0.0624	0.002	1.033
74 W183	110	0.705	0.722	-7.145	6.407	-6.440	7.130	0.0127	0.0093	0.0126	0.000	0.990
74 W184	111	0.705	-0.100	-7.145	6.630	-6.440	6.530	0.0670	0.0620	0.0751	0.017	1.121
74 W186	113	0.705	-0.130	-7.145	6.520	-6.440	6.390	0.1140	0.0790	0.1135	0.000	0.996
75RE185	111	0.155	-0.100	-7.205	6.630	-7.050	6.530	0.0032	0.0017	0.0030	0.006	0.957
75RE187	113	0.155	-0.130	-7.205	6.520	-7.050	6.390	0.0044	0.0027	0.0046	0.006	1.046
76OS189	114	0.657	1.100	-6.717	5.850	-6.060	6.950	0.0050	0.0033	0.0051	0.000	1.002
77IR191	115	-0.373	0.192	-6.186	5.068	-6.560	5.260	0.0030	0.0023	0.0034	0.031	1.137
77IR193	117	-0.373	-0.375	-6.186	4.205	-6.560	3.830	0.0109	0.0099	0.0036	0.547	0.328
78PT192	115	0.590	0.192	-6.830	5.068	-6.240	5.260	0.0890	0.0363	0.0848	0.013	0.953
78PT194	117	0.590	-0.375	-6.830	4.205	-6.240	3.830	0.0806	0.0403	0.0857	0.016	1.064
78PT195	118	0.590	0.310	-6.830	3.560	-6.240	3.870	0.0169	0.0150	0.0169	0.000	1.000
79AU197	119	0.358	-0.137	-7.878	2.507	-7.520	2.370	0.0160	0.0100	0.0160	0.000	0.999
80HG198	119	0.717	-0.137	-7.877	2.507	-7.160	2.370	0.0788	0.0352	0.0791	0.000	1.004
80HG199	120	0.717	1.120	-7.877	1.420	-7.160	2.540	0.0940	0.0313	0.0940	0.000	1.000
80HG200	121	0.717	0.230	-7.877	0.820	-7.160	1.050	1.0800	0.4400	1.0793	0.000	0.999
80HG201	122	0.717	0.520	-7.877	0.460	-7.160	0.980	0.0832	0.0295	0.0832	0.000	1.000
81TL205	125	-0.260	-0.065	-8.150	-2.515	-8.410	-2.580	5.6800	5.0800	5.6828	0.000	1.000
82PB204	123	0.375	0.138	-8.405	-0.828	-8.030	-0.690	3.1000	2.0000	3.0933	0.000	0.998
82PB206	125	0.375	-0.065	-8.405	-2.515	-8.030	-2.580	20.5000	12.0000	20.5368	0.000	1.002
82PB207	126	0.375	0.635	-8.405	-3.415	-8.030	-2.780	34.5000	29.0000	34.5031	0.000	1.000
83BI209	127	-0.138	0.240	-7.572	-1.960	-7.710	-1.720	4.0800	3.0000	4.0799	0.000	1.000
90TH229	140	0.732	0.978	-4.242	4.722	-3.510	5.700	0.0010	0.0008	0.0010	0.000	1.001
90TH230	141	0.732	-0.091	-4.242	5.141	-3.510	5.050	0.0118	0.0050	0.0121	0.004	1.025
90TH232	143	0.732	-0.101	-4.242	5.131	-3.510	5.030	0.0243	0.0150	0.0230	0.008	0.945
91PA231	141	0.069	-0.091	-4.679	5.141	-4.610	5.050	0.0005	0.0004	0.0005	0.030	0.870
91PA233	143	0.069	-0.101	-4.679	5.131	-4.610	5.030	0.0008	0.0004	0.0009	0.008	1.044
92 U232	141	0.648	-0.091	-4.998	5.141	-4.350	5.050	0.0045	0.0055	0.0049	0.006	1.095
92 U233	142	0.648	0.772	-4.998	4.838	-4.350	5.610	0.0007	0.0003	0.0007	0.000	1.000
92 U234	143	0.648	-0.101	-4.998	5.131	-4.350	5.030	0.0107	0.0074	0.0106	0.000	0.992
92 U235	144	0.648	0.594	-4.998	4.886	-4.350	5.480	0.0006	0.0003	0.0006	0.000	1.000
92 U236	145	0.648	-0.133	-4.998	5.113	-4.350	4.980	0.0129	0.0064	0.0135	0.008	1.043
92 U238	147	0.648	-0.113	-4.998	5.383	-4.350	5.270	0.0220	0.0130	0.0207	0.011	0.939
93NP237	145	0.131	-0.133	-5.611	5.113	-5.480	4.980	0.0007	0.0004	0.0007	0.000	0.999
94PU238	145	0.515	-0.133	-5.865	5.113	-5.350	4.980	0.0076	0.0046	0.0069	0.019	0.917
94PU239	146	0.515	0.521	-5.865	5.018	-5.350	5.540	0.0024	0.0016	0.0024	0.000	1.003
94PU240	147	0.515	-0.113	-5.865	5.383	-5.350	5.270	0.0163	0.0100	0.0117	0.208	0.720
94PU241	148	0.515	0.692	-5.865	5.197	-5.350	5.890	0.0010	0.0008	0.0015	0.442	1.510
94PU242	149	0.515	-0.160	-5.865	5.530	-5.350	5.370	0.0211	0.0140	0.0132	0.321	0.624
95AM241	147	0.055	-0.113	-6.455	5.383	-6.400	5.270	0.0007	0.0005	0.0008	0.161	1.285
95AM242	148	0.055	0.692	-6.455	5.197	-6.400	5.890	0.0051	0.0021	0.0017	2.765	0.322
95AM243	149	0.055	-0.160	-6.455	5.530	-6.400	5.370	0.0007	0.0005	0.0008	0.097	1.209
96CM243	148	0.672	0.692	-6.822	5.197	-6.150	5.890	0.0018	0.0015	0.0017	0.000	0.986
96CM244	149	0.672	-0.160	-6.822	5.530	-6.150	5.370	0.0146	0.0091	0.0146	0.000	1.000
96CM245	150	0.672	0.279	-6.822	5.420	-6.150	5.690	0.0031	0.0013	0.0031	0.000	1.001

TABLE 4

SPIN STATE, LEVEL SPACING AND NEUTRON SEPARATION ENERGY

DATA FOR 49 UPDATED NUCLIDES

Nuclide	I^{π}	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	S_n (keV)	Nuclide	I^{π}	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	S_n (keV)
20CA 40	0.0	37.0000	4.0000	8363.1	60ND142	0.0	0.6800	0.1700	6125.5
20CA 42	0.0	8.6000	1.0000	7932.6	60ND143	3.5	0.0350	0.0040	7817.4
20CA 43	3.5	1.4800	0.2000	11136.3	60ND144	0.0	0.4500	0.1000	5760.4
20CA 44	0.0	16.0000	2.0000	7414.4	60ND145	3.5	0.0190	0.0020	7565.4
39 Y 89	0.5	2.2000	0.4000	6860.0	60ND146	0.0	0.3350	0.0800	5302.3
40ZR 90	0.0	8.6000	1.6000	7202.6	60ND148	0.0	0.1700	0.0450	5068.0
40ZR 91	2.5	0.6400	0.1200	8635.1	62SM150	0.0	0.0680	0.0100	5592.4
40ZR 92	0.0	4.0000	1.0000	6758.0	62SM152	0.0	0.0518	0.0010	5867.0
40ZR 94	0.0	4.5000	1.0000	6475.0	62SM154	0.0	0.1150	0.0070	5814.0
42MO 92	0.0	2.4000	0.6500	8072.7	63EU151	2.5	0.0007	0.0001	6305.3
42MO 95	2.5	0.0800	0.0250	9154.2	63EU153	2.5	0.0011	0.0001	6438.0
42MO 96	0.0	0.9500	0.2200	6816.1	68ER166	0.0	0.0384	0.0008	6436.3
42MO 97	2.5	0.0420	0.0150	8642.6	68ER167	3.5	0.0041	0.0024	7771.4
42MO 98	0.0	0.9500	0.1500	5917.0	68ER168	0.0	0.0953	0.0050	6003.1
42MO100	0.0	0.4200	0.1000	5391.0	68ER170	0.0	0.1550	0.0090	5681.0
44RU 99	2.5	0.0200	0.0080	9673.5	70YB171	0.5	0.0058	0.0014	8023.9
45RH103	0.5	0.0200	0.0100	6999.3	70YB172	0.0	0.0703	0.0030	6367.7
48CD112	0.0	0.1370	0.0080	6539.8	70YB173	2.5	0.0078	0.0009	7469.1
48CD113	0.5	0.0221	0.0004	9041.0	70YB174	0.0	0.1620	0.0170	5820.0
56BA135	1.5	0.0395	0.0040	9107.1	70YB176	0.0	0.1850	0.0190	5562.0
56BA136	0.0	1.0000	0.2500	6902.1	73TA181	3.5	0.0046	0.0002	6063.0
56BA137	1.5	0.3800	0.0500	8611.5	74 W182	0.0	0.0663	0.0035	6191.4
56BA138	0.0	7.5000	1.5000	4723.4	74 W183	0.5	0.0132	0.0007	7411.1
57LA139	3.5	0.2080	0.0100	5161.2	74 W184	0.0	0.0813	0.0050	5749.7

TABLE 5(a)

COMPARISON OF P(Z), P(N) VALUES WITH GILBERT & CAMERON DATA

USING MUSGROVE'S [1976] NUCLIDE DATA

Z or N	P(Z) G&C	P(Z) this paper	P(N) G&C	P(N) this paper	Z or N	P(Z) G&C	P(Z) this paper	P(N) G&C	P(N) this paper	N	P(N) G&C	P(N) this paper
20	1.830	1.478	2.040		64	0.970	0.864	0.970	0.970	108	0.810	0.837
21	0.0	0.713	0.0	0.770	65	0.0	0.032	0.080	0.005	109	0.090	0.190
22	1.730	1.945	1.640		66	0.920	0.220	1.650	1.650	110	0.750	0.775
23	0.0	0.161	0.0	-0.358	67	0.110	-0.466	-0.110	-0.212	111	0.170	-0.035
24	1.350	1.573	1.440	1.602	68	0.680	0.258	1.260	1.695	112	0.860	
25	0.0	0.263	0.0	-0.080	69	0.050	-0.172	-0.460	0.101	113	0.140	-0.192
26	1.540	1.721	1.540	1.775	70	0.680	0.689	1.060	1.663	114	1.100	1.100
27	0.0	-0.094	0.0	0.071	71	-0.220	0.028	0.220	0.127	115	-0.220	0.192
28	1.280	1.560	1.200	1.166	72	0.790	0.736	1.550	1.434	116	0.840	
29	0.260	-0.858	0.0	-0.098	73	0.090	-0.013	-0.070	-0.424	117	-0.470	-0.375
30	0.880	0.724	1.270	1.575	74	0.690	0.673	1.370	1.085	118	0.480	0.310
31	0.190	0.433	0.0	-0.326	75	0.010	0.140	0.100	0.081	119	0.020	-0.137
32	1.350	0.935	1.290	1.604	76	0.720	0.657	1.200	1.150	120	0.880	1.120
33	-0.050	-0.372	0.080	-0.157	77	0.0	-0.371	-0.270	-0.450	121	0.240	0.230
34	1.520	1.059	1.410	1.340	78	0.400	0.590	0.920	0.917	122	0.520	0.520
35	-0.090	-0.204	-0.080	-0.112	79	0.160	0.358	-0.350	-0.560	123	0.270	0.138
36	1.170		1.500		80	0.730	0.717	1.190	1.173	124	0.410	
37	0.040	0.043	-0.050	-0.025	81	0.0	-0.260	0.0	0.168	125	-0.050	-0.065
38	1.240	1.657	2.240	2.240	82	0.460	0.375	1.050	1.324	126	0.380	0.635
39	0.290	-0.066	-0.470	-0.082	83	0.170	-0.138	-0.250	-0.146	127	0.150	0.240
40	1.090	1.107	1.430		84	0.890		1.610	1.612	128	0.670	
41	0.260	-0.231	-0.150	-0.501	85	0.0		-0.210	0.454	129	0.0	
42	1.170	0.839	1.440	1.815	86	0.790		0.900	0.844	130	0.610	
43	0.230	-0.122	0.060	0.279	87	0.0		-0.210	-0.328	131	0.0	
44	1.150	1.092	1.560	1.883	88	0.890		0.740	0.850	132	0.780	
45	-0.080	0.214	0.250	0.324	89	0.0		-0.380	-0.531	133	0.0	
46	1.350	0.775	1.570		90	0.810	0.732	0.720	0.898	134	0.670	
47	0.340	0.884	-0.160	-0.444	91	-0.060	0.069	-0.340	-0.390	135	0.0	
48	1.050	1.045	1.460		92	0.690	0.648	0.920	1.073	136	0.670	
49	0.280	0.624	0.0	-0.602	93	-0.200	0.134	-0.260	-0.295	137	0.0	
50	1.270	1.182	0.930	1.073	94	0.710	0.518	0.940	0.849	138	0.790	
51	0.0	0.060	0.010	0.443	95	-0.120	0.055	0.010	-0.132	139	0.0	
52	1.050	1.313	0.020	1.111	96	0.720	0.672	0.650	1.470	140	0.600	0.978
53	0.0	0.020	-0.500	0.150	97			-0.360	-0.272	141	0.040	-0.091
54	1.000	1.508	1.420	1.212	98			0.830	1.440	142	0.640	0.772
55	0.090	0.470	0.130	0.252	99			0.110	0.444	143	-0.060	-0.101
56	1.200	1.064	1.520	1.034	100			0.670	1.237	144	0.450	0.594
57	0.200	0.178	-0.650	-0.210	101			0.050	0.352	145	0.050	-0.136
58	1.400		0.800	1.120	102			1.000	0.834	146	0.260	0.519
59	0.930	0.558	-0.080	-0.566	103			0.510	0.239	147	-0.220	-0.113
60	1.000	0.961	1.290	1.900	104			1.040	0.847	148	0.390	0.690
61	-0.200	0.098	-0.470	-0.532	105			0.330	0.102	149	0.0	-0.160
62	1.190	1.090	1.250		106			0.680	0.608	150	0.390	0.270
63	0.090	0.212	-0.440	-0.824	107			-0.270	-0.103			

TABLE 5(b)

COMPARISON OF S(Z), S(N) VALUES WITH GILBERT & CAMERON DATA

USING MUSGROVE'S [1976] NUCLIDE DATA

Z or N	S(Z) G&C	S(Z) this paper	S(N) G&C	S(N) this paper	Z or N	S(Z) G&C	S(Z) this paper	S(N) G&C	S(N) this paper	N	S(N) G&C	S(N) this paper
20	-12.070	-11.718	11.390		64	-10.410	-10.304	20.080	20.080	108	6.750	6.723
21	-12.550	-13.263	12.540	11.770	65	-10.210	-10.242	19.980	20.055	109	6.600	6.500
22	-13.240	-13.455	13.680		66	-9.850	-9.150	19.830	19.830	110	6.380	6.355
23	-13.930	-14.091	14.340	14.698	67	-9.470	-8.894	20.200	20.302	111	6.360	6.565
24	-14.710	-14.933	14.190	14.028	68	-9.030	-8.608	19.720	19.285	112	6.490	
25	-15.530	-15.793	13.830	13.910	69	-8.610	-8.388	19.870	19.309	113	6.250	6.582
26	-16.370	-16.551	13.500	13.265	70	-8.130	-8.139	19.240	18.637	114	5.850	5.850
27	-17.360	-17.266	13.000	12.929	71	-7.460	-7.708	18.440	18.533	115	5.480	5.068
28	-18.600	-18.880	12.130	12.164	72	-7.480	-7.426	17.610	17.726	116	4.530	
29	-18.700	-17.582	12.600	12.698	73	-7.200	-7.097	17.100	17.454	117	4.300	4.205
30	-18.010	-17.854	13.260	12.955	74	-7.130	-7.113	16.160	16.445	118	3.390	3.560
31	-17.870	-18.113	14.130	14.456	75	-7.060	-7.190	15.900	15.919	119	2.350	2.507
32	-17.080	-16.665	14.920	14.606	76	-6.780	-6.717	15.330	15.380	120	1.660	1.420
33	-16.600	-16.278	15.520	15.757	77	-6.560	-6.189	14.760	14.940	121	0.810	0.820
34	-16.750	-16.289	16.380	16.450	78	-6.640	-6.330	13.540	13.543	122	0.460	0.460
35	-16.500	-16.386	17.160	17.192	79	-7.680	-7.878	12.630	12.840	123	-0.960	-0.828
36	-16.350		17.550		80	-7.890	-7.877	10.650	10.667	124	-1.690	
37	-16.220	-16.223	18.030	18.005	81	-8.410	-8.150	10.100	9.932	125	-2.530	-2.515
38	-16.410	-16.827	17.590	17.590	82	-8.490	-8.405	8.890	8.616	126	-3.160	-3.415
39	-16.890	-16.534	19.030	18.642	83	-7.880	-7.572	10.250	10.146	127	-1.870	-1.960
40	-16.430	-16.447	18.710		84	-6.380		9.790	9.788	128	-0.410	
41	-16.680	-16.189	18.800	19.151	85	-5.470		11.390	10.726	129	0.710	
42	-16.730	-16.399	18.990	18.615	86	-4.780		11.720	11.776	130	1.660	
43	-17.450	-17.098	18.460	18.241	87	-4.370		12.430	12.548	131	2.620	
44	-17.290	-17.232	18.250	17.927	88	-4.170		12.960	12.850	132	3.220	
45	-17.440	-17.734	17.760	17.686	89	-4.120		13.430	13.581	133	3.760	
46	-17.820	-17.245	17.380		90	-4.320	-4.242	13.370	13.192	134	4.100	
47	-18.530	-19.074	16.720	17.004	91	-4.550	-4.679	12.960	13.010	135	4.460	
48	-18.270	-18.265	15.620		92	-5.040	-4.998	12.110	11.957	136	4.830	
49	-19.390	-19.734	14.380	14.982	93	-5.280	-5.614	11.920	11.955	137	5.090	
50	-19.910	-19.822	12.880	12.737	94	-6.060	-5.868	11.000	11.091	138	5.180	
51	-19.140	-19.200	13.230	12.797	95	-6.280	-6.455	10.800	10.942	139	5.170	
52	-18.260	-18.523	13.810	13.319	96	-6.870	-6.822	10.430	9.610	140	5.100	4.722
53	-17.400	-17.420	14.900	14.250	97			10.390	10.302	141	5.010	5.141
54	-16.420	-16.928	14.860	15.068	98			9.690	9.080	142	4.970	4.838
55	-15.770	-16.150	15.760	15.638	99			9.270	8.936	143	5.090	5.131
56	-14.370	-14.234	16.200	16.686	100			8.930	8.363	144	5.030	4.886
57	-13.910	-13.888	17.620	17.180	101			8.570	8.268	145	4.930	5.116
58	-13.100		17.730	17.410	102			8.020	8.186	146	5.280	5.021
59	-13.110	-12.738	18.160	18.646	103			7.590	7.861	147	5.490	5.383
60	-11.430	-11.391	18.670	18.060	104			7.330	7.523	148	5.500	5.200
61	-10.890	-11.186	19.690	19.752	105			7.230	7.458	149	5.370	5.530
62	-10.750	-10.650	19.510		106			7.050	7.122	150	5.300	5.420
63	-10.620	-10.742	20.170	20.554	107			7.420	7.253			

TABLE 6

SUMMARY OF PARAMETERS FOR 204 NUCLIDES INCLUDING 49 UPDATED NUCLIDES

Nuclide	I^{π}	P(Z)	P(N+1)	S(Z)	S(N+1)	T(Z)	T(N+1)	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	$\bar{D}_{o\ calc}$ (keV)	χ^2	Ratio
20CA 40	21	1.478	0.770	-11.718	11.770	-10.240	12.540	37.0000	4.0000	36.9706	0.000	0.999
20CA 42	23	1.478	-0.358	-11.718	14.698	-10.240	14.340	8.6000	1.0000	8.5999	0.000	1.000
20CA 43	24	1.478	1.602	-11.718	14.028	-10.240	15.630	1.4800	0.2000	1.4789	0.000	0.999
20CA 44	25	1.478	-0.080	-11.718	13.910	-10.240	13.830	16.0000	2.0000	16.1095	0.003	1.007
21SC 45	25	0.713	-0.080	-13.263	13.910	-12.550	13.830	2.0200	1.4000	2.0160	0.000	0.998
22TI 46	25	1.945	-0.080	-13.455	13.910	-11.510	13.830	29.3000	22.0000	12.3973	0.590	0.423
22TI 47	26	1.945	1.775	-13.455	13.265	-11.510	15.040	2.3600	1.8000	2.3575	0.000	0.999
22TI 48	27	1.945	0.071	-13.455	12.929	-11.510	13.000	21.0000	19.0000	27.6750	0.123	1.318
22TI 49	28	1.945	1.166	-13.455	12.164	-11.510	13.330	5.6500	5.8000	3.3244	0.161	0.588
22TI 50	29	1.945	-0.098	-13.455	12.698	-11.510	12.600	83.7999	96.7999	86.7099	0.001	1.035
23 V 50	28	0.161	1.166	-14.091	12.164	-13.930	13.330	2.6100	1.3000	2.7969	0.021	1.072
23 V 51	29	0.161	-0.098	-14.091	12.698	-13.930	12.600	5.1400	3.3000	4.2556	0.072	0.828
24CR 50	27	1.573	0.071	-14.933	12.929	-13.360	13.000	20.1000	13.0000	14.0367	0.218	0.698
24CR 52	29	1.573	-0.098	-14.933	12.698	-13.360	12.600	25.9000	21.0000	24.8528	0.002	0.960
24CR 53	30	1.573	1.575	-14.933	12.955	-13.360	14.530	7.3800	7.0000	7.3566	0.000	0.997
24CR 54	31	1.573	-0.326	-14.933	14.456	-13.360	14.130	24.6000	33.0000	37.9174	0.163	1.541
25MN 55	31	0.263	-0.326	-15.793	14.456	-15.530	14.130	2.2800	2.1000	2.2852	0.000	1.002
26FE 54	29	1.721	-0.098	-16.551	12.698	-14.830	12.600	18.3000	15.0000	22.9789	0.097	1.256
26FE 56	31	1.721	-0.326	-16.551	14.456	-14.830	14.130	20.0000	12.0000	15.7412	0.126	0.787
26FE 57	32	1.721	1.604	-16.551	14.606	-14.830	16.210	8.3600	9.6400	8.3562	0.000	1.000
27CO 59	33	-0.094	-0.157	-17.266	15.757	-17.360	15.600	1.3100	0.8300	1.2826	0.001	0.979
28NI 58	31	1.560	-0.326	-18.880	14.456	-17.320	14.130	19.7000	12.0000	20.1016	0.001	1.020
28NI 60	33	1.560	-0.157	-18.880	15.757	-17.320	15.600	21.2000	13.0000	21.7383	0.002	1.025
28NI 61	34	1.560	1.340	-18.880	16.450	-17.320	17.790	2.0100	1.5000	2.0123	0.000	1.001
28NI 62	35	1.560	-0.112	-18.880	17.192	-17.320	17.080	28.5000	24.0000	21.7133	0.080	0.762
28NI 64	37	1.560	-0.025	-18.880	18.005	-17.320	17.980	27.5000	17.0000	28.5212	0.004	1.037
29CU 63	35	-0.858	-0.112	-17.582	17.192	-18.440	17.080	0.7200	0.5600	0.8532	0.057	1.185
29CU 65	37	-0.858	-0.025	-17.582	18.005	-18.440	17.980	1.2300	0.8600	0.2662	1.256	0.216
30ZN 64	35	0.724	-0.112	-17.854	17.192	-17.130	17.080	3.1900	3.2000	2.8560	0.011	0.895
30ZN 66	37	0.724	-0.025	-17.854	18.005	-17.130	17.980	3.4000	2.7800	3.9298	0.036	1.156
30ZN 67	38	0.724	2.240	-17.854	17.590	-17.130	19.830	0.5060	0.5060	0.4732	0.004	0.935
30ZN 68	39	0.724	-0.082	-17.854	18.642	-17.130	18.560	9.1500	12.9400	4.1335	0.150	0.452
31GA 69	39	0.433	-0.082	-18.113	18.642	-17.680	18.560	0.3190	0.1800	0.3061	0.005	0.960
31GA 71	41	0.433	-0.501	-18.113	19.151	-17.680	18.650	0.3810	0.2000	0.3951	0.005	1.037
32GE 70	39	0.935	-0.082	-16.665	18.642	-15.730	18.560	0.9740	0.4800	1.0001	0.003	1.027
32GE 72	41	0.935	-0.501	-16.665	19.151	-15.730	18.650	2.3200	3.0000	0.8272	0.248	0.357
32GE 73	42	0.935	1.815	-16.665	18.615	-15.730	20.430	0.0718	0.0530	0.0720	0.000	1.002
32GE 74	43	0.935	0.279	-16.665	18.241	-15.730	18.520	5.8500	6.6000	3.2431	0.156	0.554
32GE 76	45	0.935	0.324	-16.665	17.686	-15.730	18.010	6.0200	2.1300	6.2739	0.014	1.042
33AS 75	43	-0.372	0.279	-16.278	18.241	-16.650	18.520	0.0744	0.0450	0.0744	0.000	1.001
34SE 76	43	1.059	0.279	-16.289	18.241	-15.230	18.520	0.9330	0.4700	0.9888	0.014	1.060
34SE 77	44	1.059	1.883	-16.289	17.927	-15.230	19.810	0.1140	0.0570	0.1140	0.000	1.000
34SE 78	45	1.059	0.324	-16.289	17.686	-15.230	18.010	2.6000	2.5000	1.7995	0.103	0.692
34SE 80	47	1.059	-0.444	-16.289	17.004	-15.230	16.560	4.1100	3.8000	1.2087	0.583	0.294
34SE 82	49	1.059	-0.602	-16.289	14.982	-15.230	14.380	4.9900	2.5000	5.2451	0.010	1.051
35BR 79	45	-0.204	0.324	-16.386	17.686	-16.590	18.010	0.0512	0.0194	0.0496	0.007	0.969
35BR 81	47	-0.204	-0.444	-16.386	17.004	-16.590	16.560	0.0347	0.0200	0.0364	0.007	1.049
37RB 85	49	0.043	-0.602	-16.223	14.982	-16.180	14.380	0.2010	0.1500	0.0234	1.402	0.117
37RB 87	51	0.043	0.443	-16.223	12.797	-16.180	13.240	2.5700	1.7100	2.7727	0.014	1.079
38SR 87	50	1.657	1.073	-16.327	12.737	-15.170	13.810	0.2740	0.2100	0.2743	0.000	1.001
38SR 88	51	1.657	0.443	-16.327	12.797	-15.170	13.240	41.0000	33.4000	41.0199	0.000	1.000
39 Y 89	51	-0.066	0.443	-16.534	12.797	-16.530	13.240	2.2000	0.4000	2.1959	0.000	0.998

TABLE 6 (Continued)

Nuclide	N+1	P(Z)	P(N+1)	S(Z)	S(N+1)	T(Z)	T(N+1)	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	$\bar{D}_{o\ calc}$ (keV)	χ^2	Ratio
40ZR 90	51	1.107	0.443	-16.447	12.797	-15.340	13.240	3.6000	1.6000	3.3849	0.018	0.975
40ZR 91	52	1.107	1.111	-16.447	13.319	-15.340	14.430	0.6400	0.1200	0.6396	0.000	0.999
40ZR 92	53	1.107	0.150	-16.447	14.250	-15.340	14.400	4.0000	1.0000	3.9997	0.000	1.000
40ZR 94	55	1.107	0.252	-16.447	15.638	-15.340	15.890	4.5000	1.0000	2.7167	3.180	0.604
40ZR 96	57	1.107	-0.210	-16.447	17.180	-15.340	16.970	0.6870	0.6900	1.9931	3.583	2.901
41NB 93	53	-0.231	0.150	-16.189	14.250	-16.420	14.400	0.1050	0.0750	0.1049	0.000	0.999
42MO 92	51	0.839	0.443	-16.399	12.797	-15.560	13.240	2.4000	0.6500	2.4774	0.014	1.032
42MO 95	54	0.839	1.212	-16.399	15.068	-15.560	16.280	0.0800	0.0250	0.0800	0.000	1.000
42MO 96	55	0.839	0.252	-16.399	15.638	-15.560	15.890	0.9500	0.2200	1.1565	0.881	1.217
42MO 97	56	0.839	1.034	-16.399	16.686	-15.560	17.720	0.0420	0.0150	0.0383	0.060	0.912
42MO 98	57	0.839	-0.210	-16.399	17.180	-15.560	16.970	0.9500	0.1500	0.7939	1.083	0.836
42MO100	59	0.839	-0.566	-16.399	18.646	-15.560	18.080	0.4200	0.1000	0.4354	0.024	1.037
43TC 99	57	-0.122	-0.210	-17.098	17.180	-17.220	16.970	0.0275	0.0160	0.0275	0.000	1.000
44RU 99	56	1.092	1.034	-17.232	16.686	-16.140	17.720	0.0200	0.0080	0.0220	0.064	1.101
44RU101	58	1.092	1.120	-17.232	17.410	-16.140	18.530	0.0223	0.0150	0.0223	0.000	1.000
44RU102	59	1.092	-0.566	-17.232	18.646	-16.140	18.080	0.3770	0.2100	0.2558	0.333	0.679
44RU104	61	1.092	-0.532	-17.232	19.752	-16.140	19.220	0.2070	0.1040	0.2077	0.000	1.003
45RH103	59	0.214	-0.566	-17.734	18.646	-17.520	18.080	0.0200	0.0100	0.0200	0.000	1.000
46PD105	60	0.775	1.900	-17.245	18.060	-16.470	19.960	0.0127	0.0070	0.0127	0.000	1.001
46PD108	63	0.775	-0.824	-17.245	20.554	-16.470	19.730	0.0294	0.0164	0.0306	0.005	1.040
47AG107	61	0.884	-0.532	-19.074	19.752	-18.190	19.220	0.0277	0.0220	0.0280	0.000	1.011
47AG109	63	0.884	-0.824	-19.074	20.554	-18.190	19.730	0.0190	0.0160	0.0186	0.001	0.979
48CD112	65	1.045	0.005	-18.265	20.055	-17.220	20.060	0.1370	0.0080	0.1375	0.004	1.004
48CD113	66	1.045	1.650	-18.265	19.830	-17.220	21.480	0.0221	0.0004	0.0221	0.000	1.000
49IN113	65	0.624	0.005	-19.734	20.055	-19.110	20.060	0.0265	0.0280	0.0100	0.346	0.379
49IN115	67	0.624	-0.212	-19.734	20.302	-19.110	20.090	0.0108	0.0065	0.0113	0.005	1.043
50SN112	63	1.182	-0.824	-19.822	20.554	-18.640	19.730	0.1270	0.1400	0.0201	0.583	0.158
50SN114	65	1.182	0.005	-19.822	20.055	-18.640	20.060	0.2840	0.1160	0.0869	2.887	0.306
50SN115	66	1.182	1.650	-19.822	19.830	-18.640	21.480	0.1440	0.0720	0.0296	2.568	0.199
50SN116	67	1.182	-0.212	-19.822	20.302	-18.640	20.090	0.4260	0.4900	0.1074	0.423	0.252
50SN117	68	1.182	1.695	-19.822	19.285	-18.640	20.980	0.0502	0.0300	0.0497	0.000	0.991
50SN118	69	1.182	0.101	-19.822	19.309	-18.640	19.410	0.4750	0.3900	0.4747	0.000	0.999
50SN119	70	1.182	1.663	-19.822	18.637	-18.640	20.300	0.0830	0.0650	0.0829	0.000	0.998
50SN120	71	1.182	0.127	-19.822	18.533	-18.640	18.660	0.8910	0.9700	1.0184	0.017	1.143
50SN122	73	1.182	-0.424	-19.822	17.454	-18.640	17.030	0.9680	0.3660	1.1010	0.132	1.137
51SB121	71	0.060	0.127	-19.200	18.533	-19.140	18.660	0.0107	0.0077	0.0130	0.090	1.216
51SB123	73	0.060	-0.424	-19.200	17.454	-19.140	17.030	0.0251	0.0170	0.0155	0.319	0.617
52TE122	71	1.313	0.127	-18.523	18.533	-17.210	18.660	0.1890	0.0630	0.1846	0.005	0.977
52TE123	72	1.313	1.434	-18.523	17.726	-17.210	19.160	0.0292	0.0200	0.0289	0.000	0.991
52TE124	73	1.313	-0.424	-18.523	17.454	-17.210	17.030	0.2420	0.0910	0.2303	0.017	0.952
52TE125	74	1.313	1.085	-18.523	16.445	-17.210	17.530	0.0575	0.0340	0.0570	0.000	0.991
52TE126	75	1.313	0.081	-18.523	15.919	-17.210	16.000	1.1600	1.6400	1.5009	0.043	1.294
52TE130	79	1.313	-0.560	-18.523	12.840	-17.210	12.280	5.6800	4.3000	5.9964	0.005	1.056
53 I127	75	0.020	0.081	-17.420	15.919	-17.400	16.000	0.0137	0.0082	0.0130	0.007	0.951
53 I129	77	0.020	-0.450	-17.420	14.940	-17.400	14.490	0.0162	0.0072	0.0162	0.000	0.999
54XE129	76	1.508	1.150	-16.928	15.380	-15.420	16.530	0.0352	0.0157	0.0352	0.000	0.999
54XE131	78	1.508	0.917	-16.928	13.543	-15.420	14.460	0.0672	0.0336	0.0673	0.000	1.002
55CS133	79	0.470	-0.560	-15.150	12.840	-15.680	12.280	0.0206	0.0130	0.0206	0.000	1.000
56BA135	80	1.064	1.173	-14.234	10.667	-13.170	11.840	0.0395	0.0040	0.0395	0.000	1.000
56BA136	81	1.064	0.168	-14.234	9.932	-13.170	10.100	1.0000	0.2500	1.0015	0.000	1.001
56BA137	82	1.064	1.324	-14.234	8.616	-13.170	9.940	0.3800	0.0500	0.3692	0.046	0.972
56BA138	83	1.064	-0.146	-14.234	10.146	-13.170	10.000	7.5000	1.5000	8.2037	0.220	1.094
57LA138	82	0.178	1.324	-13.838	8.616	-13.710	9.940	0.0406	0.0210	0.0533	0.368	1.314

TABLE 6 (Continued)

Nuclide	N+1	P(Z)	P(N+1)	S(Z)	S(N+1)	T(Z)	T(N+1)	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	$\bar{D}_{o\ calc}$ (keV)	χ^2	Ratio
57LA139	83	0.178	-0.146	-13.888	10.146	-13.710	10.000	0.2080	0.0100	0.2073	0.005	0.997
59PR141	83	0.558	-0.146	-12.738	10.146	-12.180	10.000	0.0653	0.0520	0.0654	0.000	1.001
60ND142	83	0.961	-0.146	-11.391	10.146	-10.430	10.000	0.6800	0.1700	0.1536	9.589	0.226
60ND143	84	0.961	1.612	-11.391	9.788	-10.430	11.400	0.0350	0.0040	0.0350	0.000	1.001
60ND144	85	0.961	0.454	-11.391	10.726	-10.430	11.180	0.4500	0.1000	0.4492	0.000	0.998
60ND145	86	0.961	0.844	-11.391	11.776	-10.430	12.620	0.0190	0.0020	0.0191	0.004	1.006
60ND146	87	0.961	-0.328	-11.391	12.548	-10.430	12.220	0.3350	0.0800	0.3352	0.000	1.001
60ND148	89	0.961	-0.531	-11.391	13.581	-10.430	13.050	0.1700	0.0450	0.1731	0.005	1.018
60ND150	91	0.961	-0.390	-11.391	13.010	-10.430	12.620	0.2470	0.1900	0.1855	0.105	0.751
61PM147	87	0.098	-0.328	-11.188	12.548	-11.090	12.220	0.0050	0.0039	0.0050	0.000	1.000
62SM147	86	1.090	0.844	-10.650	11.776	-9.560	12.620	0.0076	0.0045	0.0052	0.268	0.693
62SM149	88	1.090	0.850	-10.650	12.850	-9.560	13.700	0.0028	0.0017	0.0028	0.000	0.998
62SM150	89	1.090	-0.531	-10.650	13.581	-9.560	13.050	0.0680	0.0100	0.0516	2.701	0.758
62SM151	90	1.090	0.898	-10.650	13.192	-9.560	14.090	0.0013	0.0011	0.0013	0.000	0.999
62SM152	91	1.090	-0.390	-10.650	13.010	-9.560	12.620	0.0518	0.0010	0.0519	0.016	1.002
62SM154	93	1.090	-0.295	-10.650	11.955	-9.560	11.660	0.1150	0.0070	0.1152	0.001	1.002
63EU151	89	0.212	-0.531	-10.742	13.581	-10.530	13.050	0.0007	0.0001	0.0008	0.769	1.088
63EU153	91	0.212	-0.390	-10.742	13.010	-10.530	12.620	0.0011	0.0001	0.0010	0.761	0.921
64GD152	89	0.864	-0.531	-10.304	13.581	-9.440	13.050	0.0149	0.0110	0.0058	0.691	0.386
64GD154	91	0.864	-0.390	-10.304	13.010	-9.440	12.620	0.0130	0.0110	0.0100	0.077	0.765
64GD155	92	0.864	1.073	-10.304	11.957	-9.440	13.030	0.0020	0.0013	0.0020	0.000	1.004
64GD156	93	0.864	-0.295	-10.304	11.955	-9.440	11.660	0.0493	0.0390	0.0237	0.430	0.481
64GD157	94	0.864	0.849	-10.304	11.091	-9.440	11.940	0.0058	0.0038	0.0058	0.000	0.996
64GD158	95	0.864	-0.132	-10.304	10.942	-9.440	10.810	0.1010	0.0500	0.1062	0.011	1.052
64GD160	97	0.864	-0.272	-10.304	10.302	-9.440	10.030	0.1700	0.0760	0.1938	0.098	1.140
65TB159	95	0.032	-0.132	-10.242	10.942	-10.210	10.810	0.0037	0.0020	0.0037	0.000	0.998
66DY161	96	0.220	1.470	-9.150	9.610	-8.930	11.080	0.0028	0.0016	0.0028	0.000	0.999
66DY162	97	0.220	-0.272	-9.150	10.302	-8.930	10.030	0.0667	0.0300	0.0106	3.495	0.159
66DY163	98	0.220	1.440	-9.150	9.080	-8.930	10.520	0.0080	0.0042	0.0080	0.000	0.999
66DY164	99	0.220	0.444	-9.150	8.936	-8.930	9.380	0.1670	0.0630	0.1818	0.055	1.089
67HO165	99	-0.466	0.444	-8.894	8.936	-9.360	9.380	0.0037	0.0025	0.0037	0.000	0.996
68ER162	95	0.258	-0.132	-8.608	10.942	-8.350	10.810	0.0132	0.0110	0.0022	1.004	0.165
68ER164	97	0.258	-0.272	-8.608	10.302	-8.350	10.030	0.0258	0.0280	0.0037	0.623	0.143
68ER166	99	0.258	0.444	-8.608	8.936	-8.350	9.380	0.0384	0.0008	0.0383	0.028	0.997
68ER167	100	0.258	1.237	-8.608	8.363	-8.350	9.600	0.0041	0.0024	0.0041	0.000	0.999
68ER168	101	0.258	0.352	-8.608	8.268	-8.350	8.620	0.0953	0.0050	0.0951	0.001	0.998
68ER170	103	0.258	0.239	-8.608	7.861	-8.350	8.100	0.1550	0.0090	0.1597	0.270	1.030
69TM169	101	-0.172	0.352	-8.388	8.268	-8.560	8.620	0.0084	0.0070	0.0084	0.000	1.002
70YB168	99	0.689	0.444	-8.139	8.936	-7.450	9.380	0.0587	0.0339	0.0246	1.014	0.419
70YB170	101	0.689	0.352	-8.139	8.268	-7.450	8.620	0.0386	0.0220	0.0463	0.122	1.199
70YB171	102	0.689	0.834	-8.139	8.186	-7.450	9.020	0.0058	0.0014	0.0058	0.000	0.998
70YB172	103	0.689	0.239	-8.139	7.861	-7.450	8.100	0.0703	0.0030	0.0696	0.050	0.990
70YB173	104	0.689	0.847	-8.139	7.523	-7.450	8.370	0.0078	0.0009	0.0078	0.000	1.001
70YB174	105	0.689	0.102	-8.139	7.458	-7.450	7.560	0.1620	0.0170	0.1616	0.000	0.998
70YB176	107	0.689	-0.103	-8.139	7.253	-7.450	7.150	0.1850	0.0190	0.1866	0.007	1.008
71LU175	105	0.028	0.102	-7.708	7.458	-7.680	7.560	0.0036	0.0023	0.0031	0.049	0.859
71LU176	106	0.028	0.608	-7.708	7.122	-7.680	7.730	0.0024	0.0014	0.0026	0.018	1.080
72HF174	103	0.736	0.239	-7.426	7.861	-6.690	8.100	0.0219	0.0160	0.0185	0.044	0.847
72HF176	105	0.736	0.102	-7.426	7.458	-6.690	7.560	0.0317	0.0170	0.0387	0.170	1.221
72HF177	106	0.736	0.608	-7.426	7.122	-6.690	7.730	0.0032	0.0026	0.0024	0.083	0.764
72HF178	107	0.736	-0.103	-7.426	7.253	-6.690	7.150	0.0667	0.0470	0.0462	0.190	0.693
72HF179	108	0.736	0.837	-7.426	6.723	-6.690	7.560	0.0057	0.0033	0.0057	0.000	1.001
73TA181	109	-0.013	0.190	-7.097	6.500	-7.110	6.690	0.0046	0.0002	0.0046	0.002	0.998

TABLE 6 (Continued)

Nuclide	N+1	P(Z)	P(N+1)	S(Z)	S(N+1)	T(Z)	T(N+1)	$\bar{D}_o$ (keV)	$\Delta\bar{D}_o$ (keV)	$\bar{D}_{o\ calc}$ (keV)	χ^2	Ratio
74 W180	107	0.673	-0.103	-7.113	7.253	-6.440	7.150	0.0143	0.0064	0.0124	0.092	0.865
74 W182	109	0.673	0.190	-7.113	6.500	-6.440	6.690	0.0663	0.0035	0.0660	0.009	0.995
74 W183	110	0.673	0.775	-7.113	6.355	-6.440	7.130	0.0132	0.0007	0.0132	0.001	0.999
74 W184	111	0.673	-0.035	-7.113	6.565	-6.440	6.530	0.0813	0.0050	0.0812	0.000	0.999
74 W186	113	0.673	-0.192	-7.113	6.582	-6.440	6.390	0.0900	0.0070	0.0904	0.003	1.004
75RE185	111	0.140	-0.035	-7.190	6.565	-7.050	6.530	0.0032	0.0017	0.0034	0.021	1.079
75RE187	113	0.140	-0.192	-7.190	6.582	-7.050	6.390	0.0044	0.0027	0.0038	0.046	0.870
76OS189	114	0.657	1.100	-6.717	5.850	-6.060	6.950	0.0050	0.0033	0.0051	0.000	1.002
77IR191	115	-0.371	0.192	-6.189	5.068	-6.560	5.260	0.0030	0.0023	0.0034	0.034	1.143
77IR193	117	-0.371	-0.375	-6.189	4.205	-6.560	3.830	0.0109	0.0099	0.0036	0.544	0.330
78PT192	115	0.590	0.192	-6.830	5.068	-6.240	5.260	0.0890	0.0363	0.0848	0.013	0.953
78PT194	117	0.590	-0.375	-6.830	4.205	-6.240	3.830	0.0806	0.0403	0.0857	0.016	1.064
78PT195	118	0.590	0.310	-6.830	3.560	-6.240	3.870	0.0169	0.0150	0.0169	0.000	1.000
79AU197	119	0.358	-0.137	-7.878	2.507	-7.520	2.370	0.0160	0.0100	0.0160	0.000	0.999
80HG198	119	0.717	-0.137	-7.877	2.507	-7.160	2.370	0.0788	0.0352	0.0791	0.000	1.004
80HG199	120	0.717	1.120	-7.877	1.420	-7.160	2.540	0.0940	0.0313	0.0940	0.000	1.000
80HG200	121	0.717	0.230	-7.877	0.820	-7.160	1.050	1.0800	0.4400	1.0793	0.000	0.999
80HG201	122	0.717	0.520	-7.877	0.460	-7.160	0.980	0.0832	0.0295	0.0832	0.000	1.000
81TL205	125	-0.260	-0.065	-8.150	-2.515	-8.410	-2.580	5.6800	5.0800	5.6828	0.000	1.000
82PB204	123	0.375	0.139	-8.405	-0.828	-8.030	-0.690	3.1000	2.0000	3.0933	0.000	0.998
82PB206	125	0.375	-0.065	-8.405	-2.515	-8.030	-2.580	20.5000	12.0000	20.5368	0.000	1.002
82PB207	126	0.375	0.635	-8.405	-3.415	-8.030	-2.780	34.5000	29.0000	34.5031	0.000	1.000
83BI209	127	-0.138	0.240	-7.572	-1.960	-7.710	-1.720	4.0800	3.0000	4.0799	0.000	1.000
90TH229	140	0.732	0.978	-4.242	4.722	-3.510	5.700	0.0010	0.0008	0.0010	0.000	1.001
90TH230	141	0.732	-0.091	-4.242	5.141	-3.510	5.050	0.0118	0.0050	0.0121	0.004	1.025
90TH232	143	0.732	-0.101	-4.242	5.131	-3.510	5.030	0.0243	0.0150	0.0230	0.008	0.945
91PA231	141	0.069	-0.091	-4.679	5.141	-4.610	5.050	0.0005	0.0004	0.0005	0.030	0.870
91PA233	143	0.069	-0.101	-4.679	5.131	-4.610	5.030	0.0008	0.0004	0.0009	0.008	1.044
92 U232	141	0.648	-0.091	-4.998	5.141	-4.350	5.050	0.0045	0.0055	0.0049	0.006	1.095
92 U233	142	0.648	0.772	-4.998	4.838	-4.350	5.610	0.0007	0.0003	0.0007	0.000	1.000
92 U234	143	0.648	-0.101	-4.998	5.131	-4.350	5.030	0.0107	0.0074	0.0106	0.000	0.992
92 U235	144	0.648	0.594	-4.998	4.886	-4.350	5.480	0.0006	0.0003	0.0006	0.000	1.000
92 U236	145	0.648	-0.136	-4.998	5.116	-4.350	4.980	0.0129	0.0064	0.0134	0.005	1.036
92 U238	147	0.648	-0.113	-4.998	5.383	-4.350	5.270	0.0220	0.0130	0.0207	0.011	0.939
93NP237	145	0.134	-0.136	-5.614	5.116	-5.480	4.980	0.0007	0.0004	0.0007	0.000	0.999
94PU238	145	0.518	-0.136	-5.868	5.116	-5.350	4.980	0.0076	0.0046	0.0069	0.019	0.917
94PU239	146	0.518	0.519	-5.868	5.021	-5.350	5.540	0.0024	0.0016	0.0024	0.000	1.003
94PU240	147	0.518	-0.113	-5.868	5.383	-5.350	5.270	0.0163	0.0100	0.0118	0.201	0.725
94PU241	148	0.518	0.690	-5.868	5.200	-5.350	5.890	0.0010	0.0008	0.0015	0.442	1.510
94PU242	149	0.518	-0.160	-5.868	5.530	-5.350	5.370	0.0211	0.0140	0.0133	0.314	0.628
95AM241	147	0.055	-0.113	-6.455	5.383	-6.400	5.270	0.0007	0.0005	0.0008	0.161	1.285
95AM242	148	0.055	0.690	-6.455	5.200	-6.400	5.890	0.0051	0.0021	0.0016	2.784	0.320
95AM243	149	0.055	-0.160	-6.455	5.530	-6.400	5.370	0.0007	0.0005	0.0008	0.097	1.209
96CM243	148	0.672	0.690	-5.822	5.200	-6.150	5.890	0.0018	0.0015	0.0017	0.001	0.979
96CM244	149	0.672	-0.160	-5.822	5.530	-6.150	5.370	0.0146	0.0091	0.0146	0.000	1.000
96CM245	150	0.672	0.270	-5.822	5.420	-6.150	5.690	0.0031	0.0013	0.0031	0.000	1.001