P.J. Masson and J. Janecke Masses

† Nuclide is unstable to one-particle emission
‡ Nuclide is unstable to two-particle, but not one particle emission

Isotope	Mass Excess
^{17}O	-0.810
^{18}O	-0.780
^{19}O	3.410
^{20}O	3.210
^{21}O	8.440
^{22}O	9.660
^{23}O	16.410
^{24}O	20.830
^{25}O	29.810 †
^{26}O	36.140
^{27}O	46.650 †
^{28}O	54.810 †
^{17}F	2.050
^{19}F	-1.570 ‡
^{20}F	0.200
^{21}F	-0.480
^{22}F	3.000
^{23}F	3.770
^{24}F	8.840
^{25}F	13.060
^{26}F	20.290
^{27}F	25.610
^{28}F	34.370 †
^{29}F	41.980 ‡
^{18}Ne	5.440
^{19}Ne	1.780
^{20}Ne	-6.690
^{21}Ne	-5.670
^{22}Ne	-8.330
^{23}Ne	-5.470
^{24}Ne	-6.510
^{25}Ne	-1.740
^{26}Ne	0.690
^{27}Ne	6.910
^{28}Ne	10.500
^{29}Ne	18.770 †
^{30}Ne	24.380
^{31}Ne	35.000 †
^{32}Ne	40.940 ‡
^{33}Ne	49.990 †
^{34}Ne	55.040
^{35}Ne	63.410 †
^{36}Ne	68.590
^{37}Ne	76.820 †
^{38}Ne	81.650
^{19}Na	13.270 †
^{20}Na	7.170
^{21}Na	-2.070
^{23}Na	-9.340
^{24}Na	-8.440
^{25}Na	-9.870
^{26}Na	-6.950
^{27}Na	-5.580
^{28}Na	-1.090
^{29}Na	2.050
^{30}Na	8.380
^{31}Na	13.260
^{32}Na	21.620 †
^{33}Na	26.690
^{34}Na	34.170
^{35}Na	39.090
^{36}Na	46.420
^{37}Na	51.500
^{38}Na	58.770
^{39}Na	63.630
^{40}Na	72.760 †
^{41}Na	80.810 ‡
^{42}Na	90.810 †
^{20}Mg	17.190
^{21}Mg	10.570
^{22}Mg	-0.650
^{23}Mg	-5.290
^{24}Mg	-13.360
^{25}Mg	-12.970
^{26}Mg	-16.350
^{27}Mg	-14.530
^{28}Mg	-14.900
^{29}Mg	-10.850
^{30}Mg	-9.620
^{31}Mg	-3.950
^{32}Mg	-0.830
^{33}Mg	6.540
^{34}Mg	9.940
^{35}Mg	17.180
^{36}Mg	20.960
^{37}Mg	28.100
^{38}Mg	32.120
^{39}Mg	39.340
^{40}Mg	43.140
^{41}Mg	52.330 †
^{42}Mg	59.180
^{43}Mg	69.020 †
^{44}Mg	75.740 ‡
^{45}Mg	85.960 †
^{46}Mg	93.100 ‡
^{21}Al	26.790 †
^{22}Al	18.390 †
^{23}Al	6.510
^{24}Al	-0.090
^{25}Al	-8.680
^{27}Al	-17.270
^{28}Al	-17.230
^{29}Al	-18.050
^{30}Al	-15.880
^{31}Al	-15.250
^{32}Al	-11.270
^{33}Al	-8.930
^{34}Al	-3.320
^{35}Al	-0.250
^{36}Al	5.760
^{37}Al	9.250
^{38}Al	15.240
^{39}Al	19.120
^{40}Al	25.200
^{41}Al	29.050
^{42}Al	37.010
^{43}Al	43.670
^{44}Al	51.850 †
^{45}Al	58.540
^{46}Al	67.490 †
^{47}Al	74.480
^{48}Al	84.330 †
^{49}Al	91.910 ‡
^{22}Si	32.830 ‡
^{23}Si	23.940
^{24}Si	10.230
^{25}Si	3.220
^{26}Si	-7.330
^{27}Si	-12.550
^{28}Si	-21.250
^{29}Si	-21.670
^{30}Si	-24.360
^{31}Si	-22.760
^{32}Si	-23.770
^{33}Si	-20.480
^{34}Si	-19.910
^{35}Si	-14.710
^{36}Si	-12.950
^{37}Si	-7.310
^{38}Si	-5.040
^{39}Si	0.730
^{40}Si	3.390
^{41}Si	9.440
^{42}Si	12.080
^{43}Si	19.820
^{44}Si	24.790
^{45}Si	32.920 †
^{46}Si	38.310
^{47}Si	47.080 †
^{48}Si	53.270
^{49}Si	62.780 †
^{50}Si	69.560 ‡
^{51}Si	79.970 †
^{52}Si	87.320 ‡
^{53}Si	98.120 †
^{23}P	44.630 †
^{24}P	34.040 †
^{25}P	20.020 †
^{26}P	11.120 †
^{27}P	-0.540
^{28}P	-7.550
^{29}P	-16.720
^{31}P	-24.530
^{32}P	-24.520
^{33}P	-26.150
^{34}P	-24.540
^{35}P	-24.490
^{36}P	-20.660
^{37}P	-19.350
^{38}P	-15.010
^{39}P	-13.040
^{40}P	-8.560
^{41}P	-5.990
^{42}P	-1.230
^{43}P	1.240
^{44}P	7.260
^{45}P	12.150
^{46}P	18.960
^{47}P	24.150
^{48}P	32.110
^{49}P	37.940
^{50}P	46.630 †
^{51}P	53.360
^{52}P	62.710 †
^{53}P	69.830 ‡
^{54}P	79.730 †
^{55}P	87.760 ‡
^{56}P	98.560 †
^{57}P	107.450 †
^{24}S	54.540 †
^{25}S	43.720 †
^{26}S	27.880 †
^{27}S	17.920 ‡
^{28}S	4.490
^{29}S	-2.980
^{30}S	-14.030
^{31}S	-19.170
^{32}S	-26.230
^{33}S	-26.780
^{34}S	-30.000
^{35}S	-28.810
^{36}S	-30.300
^{37}S	-26.990
^{38}S	-27.040
^{39}S	-23.050
^{40}S	-22.430
^{41}S	-18.120
^{42}S	-16.910
^{43}S	-12.380
^{44}S	-11.560
^{45}S	-5.640
^{46}S	-2.090
^{47}S	4.500
^{48}S	8.860
^{49}S	16.440
^{50}S	21.430
^{51}S	30.060 †
^{52}S	35.720
^{53}S	44.810 †
^{54}S	51.020
^{55}S	60.630 †
^{56}S	67.780 ‡
^{57}S	78.510 †
^{58}S	86.260 ‡
^{59}S	97.240 †
^{60}S	105.270 ‡
^{61}S	116.690 †
^{27}Cl	39.770 †
^{28}Cl	28.070 †
^{29}Cl	14.180 †
^{30}Cl	4.810 †
^{31}Cl	-6.820
^{32}Cl	-13.550
^{33}Cl	-21.180
^{35}Cl	-29.110
^{36}Cl	-29.350
^{37}Cl	-31.490
^{38}Cl	-29.590
^{39}Cl	-30.050
^{40}Cl	-27.480
^{41}Cl	-27.080
^{42}Cl	-24.180
^{43}Cl	-23.270
^{44}Cl	-20.450
^{45}Cl	-19.640
^{46}Cl	-15.080
^{47}Cl	-11.770
^{48}Cl	-6.030
^{49}Cl	-2.070
^{50}Cl	4.660
^{51}Cl	9.580
^{52}Cl	17.120
^{53}Cl	22.510
^{54}Cl	30.680 †
^{55}Cl	36.600
^{56}Cl	45.320 †
^{57}Cl	52.390
^{58}Cl	61.970 †
^{59}Cl	69.440 ‡
^{60}Cl	79.360 †
^{61}Cl	87.130 ‡
^{62}Cl	97.480 †
^{63}Cl	105.990 †
^{64}Cl	116.910 †
^{28}Ar	49.460 †
^{29}Ar	37.280 †
^{30}Ar	21.470 †
^{31}Ar	11.470
^{32}Ar	-1.810
^{33}Ar	-9.180
^{34}Ar	-18.410
^{35}Ar	-23.120
^{36}Ar	-30.360
^{37}Ar	-31.130
^{38}Ar	-34.750
^{39}Ar	-33.300
^{40}Ar	-35.230
^{41}Ar	-32.930
^{42}Ar	-34.000
^{43}Ar	-31.450
^{44}Ar	-32.300
^{45}Ar	-29.550
^{46}Ar	-30.000
^{47}Ar	-25.700
^{48}Ar	-23.250
^{49}Ar	-17.920
^{50}Ar	-14.820
^{51}Ar	-8.190
^{52}Ar	-4.370
^{53}Ar	2.900
^{54}Ar	7.350
^{55}Ar	15.220
^{56}Ar	20.240
^{57}Ar	28.870 †
^{58}Ar	34.790
^{59}Ar	44.080 †
^{60}Ar	50.480
^{61}Ar	60.140 †
^{62}Ar	66.840 ‡
^{63}Ar	77.080 †
^{64}Ar	84.440 ‡
^{65}Ar	95.540 †
^{66}Ar	103.710 †
^{67}Ar	115.480 †
^{31}K	33.430 †
^{32}K	21.720 †
^{33}K	7.720 †
^{34}K	-1.340 †
^{35}K	-11.000 †
^{36}K	-17.160
^{37}K	-24.930
^{39}K	-33.500
^{40}K	-33.550
^{41}K	-35.790
^{42}K	-35.000
^{43}K	-36.470
^{44}K	-35.720
^{45}K	-36.700
^{46}K	-35.260
^{47}K	-35.870
^{48}K	-32.440
^{49}K	-30.420
^{50}K	-25.970
^{51}K	-22.970
^{52}K	-17.440
^{53}K	-13.910
^{54}K	-7.590
^{55}K	-3.440
^{56}K	3.520
^{57}K	8.440
^{58}K	15.910
^{59}K	21.540
^{60}K	29.760 †
^{61}K	35.890
^{62}K	44.470 †
^{63}K	51.070
^{64}K	60.160 †
^{65}K	67.690 ‡
^{66}K	77.600 †
^{67}K	85.900 †
^{68}K	96.820 †
^{32}Ca	43.230 †
^{33}Ca	30.720 †
^{34}Ca	14.940 ‡
^{35}Ca	5.330
^{36}Ca	-5.900
^{37}Ca	-12.710
^{38}Ca	-21.980
^{39}Ca	-26.930
^{40}Ca	-34.760
^{41}Ca	-35.160
^{42}Ca	-38.940
^{43}Ca	-38.580
^{44}Ca	-41.900
^{45}Ca	-41.320
^{46}Ca	-43.660
^{47}Ca	-42.420
^{48}Ca	-43.800
^{49}Ca	-40.810
^{50}Ca	-39.670
^{51}Ca	-35.330
^{52}Ca	-33.450
^{53}Ca	-28.220
^{54}Ca	-25.640
^{55}Ca	-19.630
^{56}Ca	-16.400
^{57}Ca	-9.540
^{58}Ca	-5.790
^{59}Ca	1.390
^{60}Ca	5.930
^{61}Ca	13.890
^{62}Ca	18.940
^{63}Ca	27.420 †
^{64}Ca	32.860
^{65}Ca	42.120 †
^{66}Ca	48.470
^{67}Ca	58.500 †
^{68}Ca	65.960 ‡
^{69}Ca	76.930 †
^{70}Ca	85.400 †
^{34}Sc	42.990 †
^{35}Sc	26.780 †
^{36}Sc	15.770 †
^{37}Sc	4.010 †
^{38}Sc	-4.240 †
^{39}Sc	-13.980 †
^{40}Sc	-20.460
^{41}Sc	-28.660
^{42}Sc	-32.680
^{43}Sc	-36.410
^{44}Sc	-37.610
^{45}Sc	-40.980
^{46}Sc	-41.820
^{47}Sc	-44.580
^{48}Sc	-44.520
^{49}Sc	-46.120
^{50}Sc	-44.140
^{51}Sc	-43.170
^{52}Sc	-39.940
^{53}Sc	-38.300
^{54}Sc	-33.920
^{55}Sc	-31.530
^{56}Sc	-26.280
^{57}Sc	-23.000
^{58}Sc	-17.150
^{59}Sc	-13.550
^{60}Sc	-7.330
^{61}Sc	-2.950
^{62}Sc	3.990
^{63}Sc	8.980
^{64}Sc	16.280
^{65}Sc	21.830
^{66}Sc	29.800
^{67}Sc	36.090
^{68}Sc	45.040 †
^{69}Sc	52.240 ‡
^{70}Sc	61.910 †
^{71}Sc	70.140 †
^{72}Sc	81.190 †
^{73}Sc	91.620 †
^{74}Sc	104.270 †
^{35}Ti	53.130 †
^{36}Ti	35.570 †
^{37}Ti	24.080 †

Isotope	Mass Excess
^{38}Ti	10.940 ‡
^{39}Ti	2.260 ‡
^{40}Ti	-8.960
^{41}Ti	-15.780
^{42}Ti	-25.560
^{43}Ti	-29.540
^{44}Ti	-37.370
^{45}Ti	-38.640
^{46}Ti	-43.450
^{47}Ti	-44.720
^{48}Ti	-48.650
^{49}Ti	-48.790
^{50}Ti	-51.220
^{51}Ti	-49.490
^{52}Ti	-49.710
^{53}Ti	-46.780
^{54}Ti	-46.050
^{55}Ti	-41.920
^{56}Ti	-40.340
^{57}Ti	-35.100
^{58}Ti	-32.860
^{59}Ti	-27.200
^{60}Ti	-24.570
^{61}Ti	-18.530
^{62}Ti	-15.170
^{63}Ti	-8.300
^{64}Ti	-4.480
^{65}Ti	2.950
^{66}Ti	7.220
^{67}Ti	15.150
^{68}Ti	20.390
^{69}Ti	29.120 †
^{70}Ti	35.050
^{71}Ti	44.530 †
^{72}Ti	51.450 ‡
^{38}V	35.670 †
^{39}V	22.150 †
^{40}V	12.020 †
^{41}V	0.500 †
^{42}V	-7.860 †
^{43}V	-18.090 †
^{44}V	-23.660
^{45}V	-31.570
^{46}V	-36.590
^{47}V	-41.840
^{48}V	-44.290
^{49}V	-48.420
^{50}V	-49.400
^{51}V	-51.910
^{52}V	-51.440
^{53}V	-52.010
^{54}V	-50.060
^{55}V	-49.630
^{56}V	-46.360
^{57}V	-44.830
^{58}V	-40.670
^{59}V	-38.650
^{60}V	-33.980
^{61}V	-31.560
^{62}V	-26.550
^{63}V	-23.270
^{64}V	-17.570
^{65}V	-13.630
^{66}V	-7.470
^{67}V	-3.220
^{68}V	3.680
^{69}V	8.720
^{70}V	16.210
^{71}V	21.990
^{72}V	30.200 †
^{73}V	36.860
^{74}V	46.420 †
^{75}V	55.320 †
^{39}Cr	45.320 †

Isotope	Mass Excess
^{40}Cr	30.390 †
^{41}Cr	20.010 †
^{42}Cr	6.980 ‡
^{43}Cr	-1.800
^{44}Cr	-13.920
^{45}Cr	-19.550
^{46}Cr	-28.920
^{47}Cr	-34.390
^{48}Cr	-42.910
^{49}Cr	-45.590
^{50}Cr	-50.570
^{51}Cr	-51.630
^{52}Cr	-55.280
^{53}Cr	-55.220
^{54}Cr	-56.830
^{55}Cr	-55.230
^{56}Cr	-55.710
^{57}Cr	-52.520
^{58}Cr	-52.110
^{59}Cr	-48.190
^{60}Cr	-47.200
^{61}Cr	-42.760
^{62}Cr	-41.390
^{63}Cr	-36.470
^{64}Cr	-34.370
^{65}Cr	-28.550
^{66}Cr	-25.880
^{67}Cr	-19.730
^{68}Cr	-16.500
^{69}Cr	-9.790
^{70}Cr	-5.950
^{71}Cr	1.410
^{72}Cr	5.960
^{73}Cr	13.940
^{74}Cr	19.370
^{75}Cr	28.740 †
^{76}Cr	36.540 ‡
^{77}Cr	47.730 †
^{78}Cr	57.540 †
^{41}Mn	42.580 †
^{42}Mn	30.740 †
^{43}Mn	17.320 †
^{44}Mn	6.690 †
^{45}Mn	-5.630 †
^{46}Mn	-12.690
^{47}Mn	-22.490
^{48}Mn	-29.160
^{49}Mn	-37.910
^{50}Mn	-43.340
^{51}Mn	-48.410
^{52}Mn	-50.620
^{53}Mn	-54.650
^{54}Mn	-55.680
^{55}Mn	-57.690
^{56}Mn	-57.040
^{57}Mn	-57.630
^{58}Mn	-55.590
^{59}Mn	-55.460
^{60}Mn	-52.590
^{61}Mn	-51.840
^{62}Mn	-48.480
^{63}Mn	-47.210
^{64}Mn	-43.480
^{65}Mn	-41.270
^{66}Mn	-36.720
^{67}Mn	-34.050
^{68}Mn	-28.920
^{69}Mn	-25.860
^{70}Mn	-20.340
^{71}Mn	-16.600
^{72}Mn	-10.440
^{73}Mn	-6.090
^{74}Mn	0.710
^{75}Mn	5.960
^{76}Mn	14.280 †

Isotope	Mass Excess
^{77}Mn	22.110
^{78}Mn	32.430 †
^{79}Mn	42.090 †
^{80}Mn	53.770 †
^{81}Mn	63.940 †
^{42}Fe	52.070 †
^{43}Fe	39.880 †
^{44}Fe	24.660 †
^{45}Fe	13.860 ‡
^{46}Fe	0.140
^{47}Fe	-7.350
^{48}Fe	-18.320
^{49}Fe	-25.200
^{50}Fe	-34.810
^{51}Fe	-40.340
^{52}Fe	-48.310
^{53}Fe	-50.900
^{54}Fe	-56.050
^{55}Fe	-57.530
^{56}Fe	-60.530
^{57}Fe	-60.030
^{58}Fe	-61.820
^{59}Fe	-60.090
^{60}Fe	-61.030
^{61}Fe	-58.430
^{62}Fe	-58.770
^{63}Fe	-55.520
^{64}Fe	-55.450
^{65}Fe	-51.610
^{66}Fe	-50.670
^{67}Fe	-46.130
^{68}Fe	-44.470
^{69}Fe	-39.490
^{70}Fe	-37.610
^{71}Fe	-32.170
^{72}Fe	-29.610
^{73}Fe	-23.610
^{74}Fe	-20.400
^{75}Fe	-13.750
^{76}Fe	-9.500
^{77}Fe	-1.120 †
^{78}Fe	5.890
^{79}Fe	16.110 †
^{80}Fe	24.090 ‡
^{81}Fe	34.780 †
^{82}Fe	43.270 †
^{83}Fe	54.710 †
^{84}Fe	64.030 †
^{44}Co	51.170 †
^{45}Co	35.820 †
^{46}Co	23.660 †
^{47}Co	9.690 †
^{48}Co	1.050 †
^{49}Co	-10.120 †
^{50}Co	-17.840 †
^{51}Co	-27.540
^{52}Co	-34.240
^{53}Co	-42.600
^{54}Co	-47.890
^{55}Co	-53.610
^{56}Co	-56.130
^{57}Co	-59.330
^{58}Co	-60.060
^{59}Co	-62.180
^{60}Co	-61.560
^{61}Co	-62.790
^{62}Co	-61.300
^{63}Co	-61.770
^{64}Co	-59.730
^{65}Co	-59.550
^{66}Co	-56.990
^{67}Co	-56.050
^{68}Co	-52.500
^{69}Co	-50.990

Isotope	Mass Excess
^{70}Co	-47.170
^{71}Co	-45.350
^{72}Co	-41.060
^{73}Co	-38.640
^{74}Co	-33.750
^{75}Co	-30.650
^{76}Co	-24.950
^{77}Co	-20.570
^{78}Co	-12.980
^{79}Co	-6.030
^{80}Co	2.560 †
^{81}Co	9.600
^{82}Co	18.670 †
^{83}Co	26.160 ‡
^{84}Co	35.860 †
^{85}Co	44.280 †
^{86}Co	54.840 †
^{46}Ni	44.170 †
^{47}Ni	31.800 †
^{48}Ni	17.010 †
^{49}Ni	8.180 ‡
^{50}Ni	-3.810
^{51}Ni	-11.610
^{52}Ni	-22.470
^{53}Ni	-29.560
^{54}Ni	-39.050
^{55}Ni	-44.920
^{56}Ni	-53.330
^{57}Ni	-56.090
^{58}Ni	-60.560
^{59}Ni	-61.670
^{60}Ni	-64.930
^{61}Ni	-64.610
^{62}Ni	-66.970
^{63}Ni	-65.630
^{64}Ni	-67.330
^{65}Ni	-65.190
^{66}Ni	-66.290
^{67}Ni	-63.720
^{68}Ni	-63.770
^{69}Ni	-60.360
^{70}Ni	-59.990
^{71}Ni	-56.210
^{72}Ni	-55.520
^{73}Ni	-51.330
^{74}Ni	-49.990
^{75}Ni	-45.170
^{76}Ni	-42.990
^{77}Ni	-37.130
^{78}Ni	-33.430
^{79}Ni	-25.850
^{80}Ni	-20.500
^{81}Ni	-12.810
^{82}Ni	-7.340
^{83}Ni	0.780 †
^{84}Ni	6.590
^{85}Ni	15.440 †
^{86}Ni	22.140
^{87}Ni	32.020 †
^{88}Ni	39.840 ‡
^{89}Ni	51.120 †
^{48}Cu	43.870 †
^{49}Cu	28.650 †
^{50}Cu	18.780 †
^{51}Cu	6.550 †
^{52}Cu	-2.490 †
^{53}Cu	-13.750 †
^{54}Cu	-21.900 †
^{55}Cu	-31.810
^{56}Cu	-38.700
^{57}Cu	-47.330
^{58}Cu	-51.930
^{59}Cu	-56.480
^{60}Cu	-58.580

Isotope	Mass Excess
^{61}Cu	-62.110
^{62}Cu	-62.950
^{63}Cu	-65.520
^{64}Cu	-65.450
^{65}Cu	-67.090
^{66}Cu	-66.240
^{67}Cu	-67.330
^{68}Cu	-65.710
^{69}Cu	-65.810
^{70}Cu	-63.440
^{71}Cu	-63.010
^{72}Cu	-60.260
^{73}Cu	-59.590
^{74}Cu	-56.450
^{75}Cu	-55.220
^{76}Cu	-51.460
^{77}Cu	-49.360
^{78}Cu	-44.590
^{79}Cu	-41.280
^{80}Cu	-34.370
^{81}Cu	-28.930
^{82}Cu	-21.840
^{83}Cu	-16.350
^{84}Cu	-8.980
^{85}Cu	-3.160
^{86}Cu	4.760
^{87}Cu	11.460
^{88}Cu	20.440 †
^{89}Cu	28.050 ‡
^{90}Cu	38.340 †
^{91}Cu	47.520 †
^{92}Cu	59.560 †
^{50}Zn	38.660 †
^{51}Zn	28.610 †
^{52}Zn	15.180 †
^{53}Zn	5.790 †
^{54}Zn	-6.480 ‡
^{55}Zn	-14.990
^{56}Zn	-25.860
^{57}Zn	-32.920
^{58}Zn	-42.790
^{59}Zn	-47.480
^{60}Zn	-54.140
^{61}Zn	-56.410
^{62}Zn	-61.030
^{63}Zn	-62.050
^{64}Zn	-65.880
^{65}Zn	-65.780
^{66}Zn	-68.750
^{67}Zn	-67.930
^{68}Zn	-70.020
^{69}Zn	-68.510
^{70}Zn	-69.720
^{71}Zn	-67.330
^{72}Zn	-67.970
^{73}Zn	-65.280
^{74}Zn	-65.670
^{75}Zn	-62.640
^{76}Zn	-62.440
^{77}Zn	-58.720
^{78}Zn	-57.660
^{79}Zn	-53.160
^{80}Zn	-51.050
^{81}Zn	-44.230
^{82}Zn	-39.550
^{83}Zn	-32.550
^{84}Zn	-27.920
^{85}Zn	-20.610
^{86}Zn	-15.760
^{87}Zn	-7.860
^{88}Zn	-2.030
^{89}Zn	6.810 †
^{90}Zn	13.520
^{91}Zn	23.460 †
^{92}Zn	31.540 †

Isotope	Mass Excess
^{93}Zn	42.850 †
^{94}Zn	52.540 †
^{95}Zn	65.550 †
^{54}Ga	16.820 †
^{55}Ga	4.230 †
^{56}Ga	-5.200 †
^{57}Ga	-16.190 †
^{58}Ga	-24.450 †
^{59}Ga	-34.660 †
^{60}Ga	-40.350
^{61}Ga	-47.190
^{62}Ga	-51.840
^{63}Ga	-56.540
^{64}Ga	-58.760
^{65}Ga	-62.520
^{66}Ga	-63.740
^{67}Ga	-66.740
^{68}Ga	-66.940
^{69}Ga	-69.170
^{70}Ga	-68.800
^{71}Ga	-70.030
^{72}Ga	-68.750
^{73}Ga	-69.470
^{74}Ga	-67.870
^{75}Ga	-68.370
^{76}Ga	-66.370
^{77}Ga	-66.180
^{78}Ga	-63.430
^{79}Ga	-62.570
^{80}Ga	-59.180
^{81}Ga	-57.460
^{82}Ga	-51.510
^{83}Ga	-47.050
^{84}Ga	-41.020
^{85}Ga	-36.530
^{86}Ga	-30.250
^{87}Ga	-25.440
^{88}Ga	-18.410
^{89}Ga	-12.700
^{90}Ga	-4.700
^{91}Ga	1.750
^{92}Ga	10.710 †
^{93}Ga	18.210 ‡
^{94}Ga	28.370 †
^{95}Ga	37.170 †
^{96}Ga	48.790 †
^{97}Ga	59.180 †
^{55}Ge	26.560 †
^{56}Ge	13.080 †
^{57}Ge	3.570 †
^{58}Ge	-8.580 †
^{59}Ge	-17.140 †
^{60}Ge	-28.460
^{61}Ge	-34.440
^{62}Ge	-42.370
^{63}Ge	-47.100
^{64}Ge	-54.450
^{65}Ge	-56.500
^{66}Ge	-61.510
^{67}Ge	-62.730
^{68}Ge	-66.730
^{69}Ge	-67.080
^{70}Ge	-70.450
^{71}Ge	-70.120
^{72}Ge	-72.470
^{73}Ge	-71.290
^{74}Ge	-73.110
^{75}Ge	-71.630
^{76}Ge	-73.150
^{77}Ge	-71.140
^{78}Ge	-71.890
^{79}Ge	-69.300
^{80}Ge	-69.460
^{81}Ge	-66.360

Isotope	Mass Excess
^{82}Ge	-65.660
^{83}Ge	-60.030
^{84}Ge	-56.610
^{85}Ge	-50.790
^{86}Ge	-47.390
^{87}Ge	-41.200
^{88}Ge	-37.290
^{89}Ge	-30.370
^{90}Ge	-25.470
^{91}Ge	-17.670
^{92}Ge	-12.120
^{93}Ge	-3.630 †
^{94}Ge	2.860
^{95}Ge	12.290 †
^{96}Ge	19.910 ‡
^{97}Ge	30.570 †
^{98}Ge	39.620 †
^{99}Ge	51.820 †
^{100}Ge	62.130 †
^{59}As	2.780 †
^{60}As	-6.850 †
^{61}As	-18.460 †
^{62}As	-25.600 †
^{63}As	-33.710 †
^{64}As	-39.650 †
^{65}As	-46.840 †
^{66}As	-51.730
^{67}As	-56.660
^{68}As	-58.810
^{69}As	-62.910
^{70}As	-64.380
^{71}As	-67.780
^{72}As	-68.580
^{73}As	-71.030
^{74}As	-70.970
^{75}As	-72.910
^{76}As	-72.440
^{77}As	-73.950
^{78}As	-72.860
^{79}As	-73.720
^{80}As	-72.100
^{81}As	-72.470
^{82}As	-70.290
^{83}As	-69.930
^{84}As	-65.420
^{85}As	-62.280
^{86}As	-57.610
^{87}As	-54.330
^{88}As	-49.060
^{89}As	-45.270
^{90}As	-39.160
^{91}As	-34.430
^{92}As	-27.470
^{93}As	-22.310
^{94}As	-14.730
^{95}As	-8.840
^{96}As	-0.440 †
^{97}As	6.390
^{98}As	15.910 †
^{99}As	24.100 †
^{100}As	34.630 †
^{101}As	43.970 †
^{102}As	55.660 †
^{103}As	66.160 †
^{59}Se	25.140 †
^{60}Se	11.690 †
^{61}Se	1.810 †
^{62}Se	-10.900 †
^{63}Se	-18.250 †
^{64}Se	-27.650 ‡
^{65}Se	-33.530
^{66}Se	-41.970
^{67}Se	-46.780
^{68}Se	-54.340
^{69}Se	-56.510
^{70}Se	-61.690
^{71}Se	-63.150
^{72}Se	-67.660
^{73}Se	-68.540
^{74}Se	-72.110
^{75}Se	-72.160
^{76}Se	-75.120
^{77}Se	-74.630
^{78}Se	-77.040
^{79}Se	-76.040
^{80}Se	-77.830
^{81}Se	-76.360
^{82}Se	-77.590
^{83}Se	-75.660
^{84}Se	-76.390
^{85}Se	-72.180
^{86}Se	-70.230
^{87}Se	-65.710
^{88}Se	-63.380
^{89}Se	-58.250
^{90}Se	-55.260
^{91}Se	-49.300
^{92}Se	-45.380
^{93}Se	-38.770
^{94}Se	-34.450
^{95}Se	-27.370
^{96}Se	-22.400
^{97}Se	-14.660
^{98}Se	-8.800
^{99}Se	0.030 †
^{100}Se	6.750
^{101}Se	16.530 †
^{102}Se	24.330 ‡
^{103}Se	34.980 †
^{104}Se	43.940 †
^{105}Se	55.810 †
^{106}Se	65.920 †
^{62}Br	13.410 †
^{63}Br	0.590 †
^{64}Br	-8.060 †
^{65}Br	-17.430 †
^{66}Br	-24.640 †
^{67}Br	-33.090 †
^{68}Br	-38.840 †
^{69}Br	-46.420 †
^{70}Br	-51.450
^{71}Br	-56.540
^{72}Br	-59.060
^{73}Br	-63.630
^{74}Br	-65.610
^{75}Br	-69.280
^{76}Br	-70.340
^{77}Br	-73.270
^{78}Br	-73.680
^{79}Br	-76.170
^{80}Br	-76.070
^{81}Br	-77.990
^{82}Br	-77.320
^{83}Br	-78.730
^{84}Br	-77.800
^{85}Br	-78.760
^{86}Br	-75.760
^{87}Br	-73.980
^{88}Br	-70.430
^{89}Br	-68.250
^{90}Br	-63.920
^{91}Br	-61.080
^{92}Br	-55.910
^{93}Br	-52.290
^{94}Br	-46.470
^{95}Br	-42.580
^{96}Br	-36.350
^{97}Br	-31.930
^{98}Br	-25.040
^{99}Br	-19.730
^{100}Br	-12.210
^{101}Br	-6.070
^{102}Br	2.370 †
^{103}Br	9.320
^{104}Br	18.650 †
^{105}Br	26.700 ‡
^{106}Br	37.070 †
^{107}Br	46.050 †
^{108}Br	57.220 †
^{109}Br	66.920 †
^{63}Kr	23.280 †
^{64}Kr	9.270 †
^{65}Kr	0.660 †
^{66}Kr	-10.050 †
^{67}Kr	-17.310 †
^{68}Kr	-26.770 ‡
^{69}Kr	-32.630
^{70}Kr	-41.290
^{71}Kr	-46.240
^{72}Kr	-54.220
^{73}Kr	-56.750
^{74}Kr	-62.370
^{75}Kr	-64.430
^{76}Kr	-69.100
^{77}Kr	-70.120
^{78}Kr	-73.940
^{79}Kr	-74.420
^{80}Kr	-77.800
^{81}Kr	-77.810
^{82}Kr	-80.500
^{83}Kr	-79.980
^{84}Kr	-82.320
^{85}Kr	-81.550
^{86}Kr	-83.620
^{87}Kr	-80.800
^{88}Kr	-79.980
^{89}Kr	-76.580
^{90}Kr	-75.210
^{91}Kr	-71.020
^{92}Kr	-68.950
^{93}Kr	-64.060
^{94}Kr	-61.200
^{95}Kr	-55.770
^{96}Kr	-52.660
^{97}Kr	-46.890
^{98}Kr	-43.240
^{99}Kr	-36.790
^{100}Kr	-32.670
^{101}Kr	-25.590
^{102}Kr	-20.640
^{103}Kr	-12.880
^{104}Kr	-7.060
^{105}Kr	1.540 †
^{106}Kr	8.290
^{107}Kr	17.740 †
^{108}Kr	25.430 ‡
^{109}Kr	35.700 †
^{110}Kr	43.710 ‡
^{111}Kr	54.430 †
^{112}Kr	62.850 †
^{66}Rb	12.090 †
^{67}Rb	1.330 †
^{68}Rb	-6.960 †
^{69}Rb	-16.570 †
^{70}Rb	-23.560 †
^{71}Rb	-32.220 †
^{72}Rb	-38.230 †
^{73}Rb	-46.230 †
^{74}Rb	-51.640
^{75}Rb	-57.300
^{76}Rb	-60.330
^{77}Rb	-64.950
^{78}Rb	-66.860
^{79}Rb	-70.740
^{80}Rb	-72.110
^{81}Rb	-75.590
^{82}Rb	-76.360
^{83}Rb	-79.170
^{84}Rb	-79.550
^{85}Rb	-82.010
^{86}Rb	-82.280
^{87}Rb	-84.440
^{88}Rb	-82.560
^{89}Rb	-81.890
^{90}Rb	-79.290
^{91}Rb	-78.040
^{92}Rb	-74.610
^{93}Rb	-72.810
^{94}Rb	-68.650
^{95}Rb	-66.140
^{96}Rb	-61.440
^{97}Rb	-58.740
^{98}Rb	-53.670
^{99}Rb	-50.370
^{100}Rb	-45.020
^{101}Rb	-41.230
^{102}Rb	-35.220
^{103}Rb	-30.820
^{104}Rb	-24.050
^{105}Rb	-18.800
^{106}Rb	-11.320
^{107}Rb	-5.320
^{108}Rb	3.010 †
^{109}Rb	9.980
^{110}Rb	18.750 †
^{111}Rb	26.140 ‡
^{112}Rb	35.360 †
^{113}Rb	42.930 ‡
^{114}Rb	52.420 †
^{115}Rb	59.890 ‡
^{68}Sr	10.040 †
^{69}Sr	1.590 †
^{70}Sr	-9.180 †
^{71}Sr	-16.200 †
^{72}Sr	-25.970 ‡
^{73}Sr	-32.060
^{74}Sr	-41.100
^{75}Sr	-46.560
^{76}Sr	-54.990
^{77}Sr	-57.940
^{78}Sr	-63.440
^{79}Sr	-65.410
^{80}Sr	-70.190
^{81}Sr	-71.660
^{82}Sr	-75.900
^{83}Sr	-76.790
^{84}Sr	-80.500
^{85}Sr	-80.970
^{86}Sr	-84.440
^{87}Sr	-84.740
^{88}Sr	-87.760
^{89}Sr	-86.000
^{90}Sr	-86.100
^{91}Sr	-83.610
^{92}Sr	-83.120
^{93}Sr	-79.930
^{94}Sr	-78.840
^{95}Sr	-75.000
^{96}Sr	-73.190
^{97}Sr	-68.850
^{98}Sr	-66.790
^{99}Sr	-62.010
^{100}Sr	-59.740
^{101}Sr	-54.630
^{102}Sr	-51.820
^{103}Sr	-46.240
^{104}Sr	-42.710
^{105}Sr	-36.390
^{106}Sr	-32.130
^{107}Sr	-25.260
^{108}Sr	-20.230
^{109}Sr	-12.470
^{110}Sr	-6.840
^{111}Sr	1.460 †
^{112}Sr	7.510
^{113}Sr	16.040 †
^{114}Sr	22.440
^{115}Sr	31.100 †
^{116}Sr	37.520
^{117}Sr	45.810 †
^{118}Sr	51.510
^{70}Y	12.970 †
^{71}Y	2.150 †
^{72}Y	-6.010 †
^{73}Y	-15.880 †
^{74}Y	-23.060 †
^{75}Y	-32.190 †
^{76}Y	-38.630 †
^{77}Y	-46.980 †
^{78}Y	-52.510
^{79}Y	-58.050
^{80}Y	-60.920
^{81}Y	-65.820
^{82}Y	-68.060
^{83}Y	-72.440
^{84}Y	-74.240
^{85}Y	-78.040
^{86}Y	-79.520
^{87}Y	-83.000
^{88}Y	-84.130
^{89}Y	-87.200
^{90}Y	-86.180
^{91}Y	-86.370
^{92}Y	-84.610
^{93}Y	-84.330
^{94}Y	-81.830
^{95}Y	-81.040
^{96}Y	-77.870
^{97}Y	-76.390
^{98}Y	-72.660
^{99}Y	-70.840
^{100}Y	-67.030
^{101}Y	-64.930
^{102}Y	-60.720
^{103}Y	-58.270
^{104}Y	-53.470
^{105}Y	-50.280
^{106}Y	-44.840
^{107}Y	-41.080
^{108}Y	-35.060
^{109}Y	-30.470
^{110}Y	-23.910
^{111}Y	-18.620
^{112}Y	-11.530
^{113}Y	-6.050
^{114}Y	1.430
^{115}Y	7.130
^{116}Y	14.840
^{117}Y	20.760
^{118}Y	28.030
^{119}Y	33.330
^{120}Y	39.690
^{121}Y	43.910
^{72}Zr	11.020 †
^{73}Zr	2.740 †
^{74}Zr	-8.240 †
^{75}Zr	-15.530 †
^{76}Zr	-25.670 ‡
^{77}Zr	-32.060
^{78}Zr	-41.290
^{79}Zr	-46.870
^{80}Zr	-54.850
^{81}Zr	-57.850
^{82}Zr	-63.540
^{83}Zr	-65.950
^{84}Zr	-71.260
^{85}Zr	-73.170
^{86}Zr	-78.000
^{87}Zr	-79.510
^{88}Zr	-83.820
^{89}Zr	-84.990
^{90}Zr	-88.750
^{91}Zr	-87.790
^{92}Zr	-88.670
^{93}Zr	-87.110
^{94}Zr	-87.490
^{95}Zr	-85.280
^{96}Zr	-85.130
^{97}Zr	-82.270
^{98}Zr	-81.360
^{99}Zr	-77.830
^{100}Zr	-76.940
^{101}Zr	-73.250
^{102}Zr	-72.000
^{103}Zr	-68.080
^{104}Zr	-66.330
^{105}Zr	-61.790
^{106}Zr	-59.400
^{107}Zr	-54.360
^{108}Zr	-51.340
^{109}Zr	-45.660
^{110}Zr	-42.170
^{111}Zr	-35.840
^{112}Zr	-31.660
^{113}Zr	-25.030
^{114}Zr	-20.490
^{115}Zr	-13.610
^{116}Zr	-8.770
^{117}Zr	-1.480
^{118}Zr	3.480
^{119}Zr	10.400
^{120}Zr	14.870
^{121}Zr	20.920
^{122}Zr	24.580
^{123}Zr	30.830
^{124}Zr	36.800
^{74}Nb	14.250 †
^{75}Nb	3.140 †
^{76}Nb	-5.170 †
^{77}Nb	-15.280 †
^{78}Nb	-22.560 †
^{79}Nb	-31.850 †
^{80}Nb	-38.340 †
^{81}Nb	-46.450 †
^{82}Nb	-51.540
^{83}Nb	-57.430
^{84}Nb	-60.810
^{85}Nb	-66.280
^{86}Nb	-69.260
^{87}Nb	-74.160
^{88}Nb	-76.530
^{89}Nb	-80.900
^{90}Nb	-82.770
^{91}Nb	-86.570
^{92}Nb	-86.270
^{93}Nb	-87.330
^{94}Nb	-86.400
^{95}Nb	-87.050
^{96}Nb	-85.450
^{97}Nb	-85.590
^{98}Nb	-83.280
^{99}Nb	-82.550
^{100}Nb	-79.920
^{101}Nb	-79.120
^{102}Nb	-76.230
^{103}Nb	-75.220
^{104}Nb	-71.940

Isotope	Mass Excess
^{105}Nb	-70.390
^{106}Nb	-66.590
^{107}Nb	-64.520
^{108}Nb	-60.140
^{109}Nb	-57.370
^{110}Nb	-52.700
^{111}Nb	-49.360
^{112}Nb	-44.040
^{113}Nb	-40.230
^{114}Nb	-34.450
^{115}Nb	-30.440
^{116}Nb	-24.340
^{117}Nb	-19.860
^{118}Nb	-13.470
^{119}Nb	-8.810
^{120}Nb	-2.700
^{121}Nb	1.450
^{122}Nb	6.930
^{123}Nb	10.460
^{124}Nb	17.310
^{125}Nb	23.950
^{126}Nb	32.850 †
^{127}Nb	40.960 †
^{77}Mo	3.560 †
^{78}Mo	-7.450 †
^{79}Mo	-14.800 †
^{80}Mo	-25.000 ‡
^{81}Mo	-31.600 ‡
^{82}Mo	-40.510
^{83}Mo	-45.800
^{84}Mo	-53.640
^{85}Mo	-57.240
^{86}Mo	-63.850
^{87}Mo	-66.960
^{88}Mo	-72.770
^{89}Mo	-75.250
^{90}Mo	-80.380
^{91}Mo	-82.330
^{92}Mo	-86.820
^{93}Mo	-86.650
^{94}Mo	-88.330
^{95}Mo	-87.640
^{96}Mo	-88.890
^{97}Mo	-87.570
^{98}Mo	-88.240
^{99}Mo	-86.090
^{100}Mo	-86.240
^{101}Mo	-83.670
^{102}Mo	-83.640
^{103}Mo	-80.950
^{104}Mo	-80.540
^{105}Mo	-77.420
^{106}Mo	-76.550
^{107}Mo	-73.000
^{108}Mo	-71.540
^{109}Mo	-67.340
^{110}Mo	-65.520
^{111}Mo	-60.920
^{112}Mo	-58.510
^{113}Mo	-53.490
^{114}Mo	-50.450
^{115}Mo	-45.130
^{116}Mo	-41.830
^{117}Mo	-36.040
^{118}Mo	-32.410
^{119}Mo	-26.290
^{120}Mo	-22.420
^{121}Mo	-16.620
^{122}Mo	-13.050
^{123}Mo	-7.750
^{124}Mo	-4.640
^{125}Mo	2.890
^{126}Mo	9.370
^{127}Mo	18.360 †
^{128}Mo	25.870 ‡

Isotope	Mass Excess
^{129}Mo	35.540 †
^{130}Mo	43.200 ‡
^{79}Tc	3.950 †
^{80}Tc	-4.290 †
^{81}Tc	-14.610 †
^{82}Tc	-21.990 †
^{83}Tc	-31.060 †
^{84}Tc	-37.330 †
^{85}Tc	-45.400 †
^{86}Tc	-50.690
^{87}Tc	-57.510
^{88}Tc	-61.630
^{89}Tc	-67.630
^{90}Tc	-70.940
^{91}Tc	-76.210
^{92}Tc	-78.920
^{93}Tc	-83.650
^{94}Tc	-84.070
^{95}Tc	-85.960
^{96}Tc	-85.860
^{97}Tc	-87.380
^{98}Tc	-86.580
^{99}Tc	-87.410
^{100}Tc	-86.110
^{101}Tc	-86.310
^{102}Tc	-84.490
^{103}Tc	-84.640
^{104}Tc	-82.530
^{105}Tc	-82.240
^{106}Tc	-79.760
^{107}Tc	-79.100
^{108}Tc	-76.110
^{109}Tc	-74.770
^{110}Tc	-71.460
^{111}Tc	-69.650
^{112}Tc	-65.920
^{113}Tc	-63.740
^{114}Tc	-59.440
^{115}Tc	-56.800
^{116}Tc	-52.140
^{117}Tc	-49.100
^{118}Tc	-44.110
^{119}Tc	-40.720
^{120}Tc	-35.370
^{121}Tc	-31.810
^{122}Tc	-26.610
^{123}Tc	-23.250
^{124}Tc	-18.430
^{125}Tc	-15.290
^{126}Tc	-7.900
^{127}Tc	-1.310
^{128}Tc	7.080 †
^{129}Tc	14.240
^{130}Tc	23.050 †
^{131}Tc	30.060
^{132}Tc	38.650 †
^{133}Tc	45.660
^{134}Tc	54.920 †
^{135}Tc	62.900 ‡
^{81}Ru	4.320 †
^{82}Ru	-6.770 †
^{83}Ru	-14.290 †
^{84}Ru	-24.300 ‡
^{85}Ru	-30.740 ‡
^{86}Ru	-39.940
^{87}Ru	-45.450
^{88}Ru	-53.320
^{89}Ru	-57.740
^{90}Ru	-64.680
^{91}Ru	-68.240
^{92}Ru	-74.360
^{93}Ru	-77.390
^{94}Ru	-82.890
^{95}Ru	-83.510

Isotope	Mass Excess
^{96}Ru	-85.990
^{97}Ru	-86.150
^{98}Ru	-88.190
^{99}Ru	-87.540
^{100}Ru	-89.220
^{101}Ru	-87.970
^{102}Ru	-88.910
^{103}Ru	-87.260
^{104}Ru	-87.970
^{105}Ru	-85.960
^{106}Ru	-86.290
^{107}Ru	-83.990
^{108}Ru	-83.850
^{109}Ru	-80.950
^{110}Ru	-80.450
^{111}Ru	-77.100
^{112}Ru	-76.110
^{113}Ru	-72.560
^{114}Ru	-71.050
^{115}Ru	-67.090
^{116}Ru	-65.070
^{117}Ru	-60.610
^{118}Ru	-58.340
^{119}Ru	-53.570
^{120}Ru	-50.930
^{121}Ru	-45.880
^{122}Ru	-42.930
^{123}Ru	-37.970
^{124}Ru	-35.140
^{125}Ru	-30.350
^{126}Ru	-27.690
^{127}Ru	-20.190
^{128}Ru	-14.180
^{129}Ru	-6.130
^{130}Ru	0.190
^{131}Ru	8.360 †
^{132}Ru	14.360
^{133}Ru	22.630 †
^{134}Ru	29.340
^{135}Ru	38.370 †
^{136}Ru	45.960 ‡
^{137}Ru	55.760 †
^{138}Ru	64.050 †
^{83}Rh	4.660 †
^{84}Rh	-3.770 †
^{85}Rh	-13.920 †
^{86}Rh	-21.430 †
^{87}Rh	-30.760 †
^{88}Rh	-37.280 †
^{89}Rh	-45.450 †
^{90}Rh	-50.220 †
^{91}Rh	-57.550
^{92}Rh	-62.100
^{93}Rh	-68.670
^{94}Rh	-72.590
^{95}Rh	-78.590
^{96}Rh	-79.790
^{97}Rh	-82.520
^{98}Rh	-83.210
^{99}Rh	-85.400
^{100}Rh	-85.620
^{101}Rh	-87.350
^{102}Rh	-86.860
^{103}Rh	-87.970
^{104}Rh	-86.880
^{105}Rh	-87.680
^{106}Rh	-86.280
^{107}Rh	-86.770
^{108}Rh	-84.970
^{109}Rh	-84.890
^{110}Rh	-82.790
^{111}Rh	-82.230
^{112}Rh	-79.660
^{113}Rh	-78.810
^{114}Rh	-75.880

Isotope	Mass Excess
^{115}Rh	-74.670
^{116}Rh	-71.280
^{117}Rh	-69.430
^{118}Rh	-65.710
^{119}Rh	-63.620
^{120}Rh	-59.590
^{121}Rh	-57.240
^{122}Rh	-52.800
^{123}Rh	-50.110
^{124}Rh	-45.710
^{125}Rh	-42.980
^{126}Rh	-38.750
^{127}Rh	-36.050
^{128}Rh	-29.130
^{129}Rh	-23.450
^{130}Rh	-16.220
^{131}Rh	-10.530
^{132}Rh	-3.360
^{133}Rh	2.330
^{134}Rh	10.330
^{135}Rh	16.830
^{136}Rh	25.480 †
^{137}Rh	32.670
^{138}Rh	41.770 †
^{139}Rh	49.670 ‡
^{85}Pd	4.950 †
^{86}Pd	-6.220 †
^{87}Pd	-13.810 †
^{88}Pd	-24.070 ‡
^{89}Pd	-30.780 ‡
^{90}Pd	-39.900
^{91}Pd	-45.050
^{92}Pd	-52.030
^{93}Pd	-57.190
^{94}Pd	-64.810
^{95}Pd	-69.380
^{96}Pd	-76.400
^{97}Pd	-77.870
^{98}Pd	-81.140
^{99}Pd	-82.010
^{100}Pd	-85.090
^{101}Pd	-85.380
^{102}Pd	-87.880
^{103}Pd	-87.580
^{104}Pd	-89.260
^{105}Pd	-88.270
^{106}Pd	-89.680
^{107}Pd	-88.440
^{108}Pd	-89.420
^{109}Pd	-87.660
^{110}Pd	-88.380
^{111}Pd	-86.190
^{112}Pd	-86.370
^{113}Pd	-83.910
^{114}Pd	-83.650
^{115}Pd	-80.990
^{116}Pd	-80.310
^{117}Pd	-77.060
^{118}Pd	-75.910
^{119}Pd	-72.350
^{120}Pd	-70.980
^{121}Pd	-67.220
^{122}Pd	-65.490
^{123}Pd	-61.320
^{124}Pd	-59.210
^{125}Pd	-54.960
^{126}Pd	-52.850
^{127}Pd	-48.680
^{128}Pd	-46.440
^{129}Pd	-39.830
^{130}Pd	-34.970
^{131}Pd	-28.360
^{132}Pd	-23.660
^{133}Pd	-16.780
^{134}Pd	-11.350

Isotope	Mass Excess
^{135}Pd	-3.550
^{136}Pd	2.590
^{137}Pd	10.870 †
^{138}Pd	17.370
^{139}Pd	26.090 †
^{140}Pd	33.170
^{141}Pd	42.440 †
^{142}Pd	50.020 ‡
^{87}Ag	5.010 †
^{88}Ag	-3.440 †
^{89}Ag	-13.820 †
^{90}Ag	-21.370 †
^{91}Ag	-30.740 †
^{92}Ag	-36.880 †
^{93}Ag	-44.470 †
^{94}Ag	-48.440 †
^{95}Ag	-56.910 †
^{96}Ag	-62.690
^{97}Ag	-70.620
^{98}Ag	-72.660
^{99}Ag	-76.140
^{100}Ag	-77.930
^{101}Ag	-81.120
^{102}Ag	-82.210
^{103}Ag	-84.940
^{104}Ag	-85.230
^{105}Ag	-87.040
^{106}Ag	-86.670
^{107}Ag	-88.260
^{108}Ag	-87.510
^{109}Ag	-88.540
^{110}Ag	-87.570
^{111}Ag	-88.180
^{112}Ag	-86.720
^{113}Ag	-86.990
^{114}Ag	-85.100
^{115}Ag	-85.070
^{116}Ag	-82.920
^{117}Ag	-82.350
^{118}Ag	-79.770
^{119}Ag	-78.750
^{120}Ag	-75.890
^{121}Ag	-74.780
^{122}Ag	-71.620
^{123}Ag	-70.160
^{124}Ag	-66.600
^{125}Ag	-64.670
^{126}Ag	-61.080
^{127}Ag	-59.100
^{128}Ag	-55.480
^{129}Ag	-53.300
^{130}Ag	-47.510
^{131}Ag	-43.250
^{132}Ag	-37.620
^{133}Ag	-33.200
^{134}Ag	-26.570
^{135}Ag	-21.320
^{136}Ag	-13.870
^{137}Ag	-8.090
^{138}Ag	-0.490
^{139}Ag	5.660
^{140}Ag	13.580
^{141}Ag	20.440
^{142}Ag	28.860 †
^{143}Ag	36.280
^{144}Ag	45.520 †
^{145}Ag	53.900 †
^{90}Cd	-6.000 †
^{91}Cd	-13.700 †
^{92}Cd	-23.930 ‡
^{93}Cd	-30.530
^{94}Cd	-39.170
^{95}Cd	-43.980
^{96}Cd	-50.370

Isotope	Mass Excess
^{97}Cd	-57.280
^{98}Cd	-66.690
^{99}Cd	-68.980
^{100}Cd	-73.440
^{101}Cd	-75.390
^{102}Cd	-79.430
^{103}Cd	-80.790
^{104}Cd	-84.160
^{105}Cd	-84.620
^{106}Cd	-87.090
^{107}Cd	-86.930
^{108}Cd	-89.040
^{109}Cd	-88.360
^{110}Cd	-90.180
^{111}Cd	-89.110
^{112}Cd	-90.450
^{113}Cd	-89.070
^{114}Cd	-89.890
^{115}Cd	-88.220
^{116}Cd	-88.670
^{117}Cd	-86.600
^{118}Cd	-86.680
^{119}Cd	-84.210
^{120}Cd	-83.860
^{121}Cd	-81.240
^{122}Cd	-80.720
^{123}Cd	-77.830
^{124}Cd	-76.980
^{125}Cd	-73.610
^{126}Cd	-72.380
^{127}Cd	-68.960
^{128}Cd	-67.600
^{129}Cd	-64.130
^{130}Cd	-62.430
^{131}Cd	-57.230
^{132}Cd	-53.950
^{133}Cd	-48.590
^{134}Cd	-44.400
^{135}Cd	-37.940
^{136}Cd	-33.030
^{137}Cd	-25.920
^{138}Cd	-20.800
^{139}Cd	-13.540
^{140}Cd	-8.180
^{141}Cd	-0.460
^{142}Cd	5.560
^{143}Cd	13.840 †
^{144}Cd	20.600
^{145}Cd	29.750 †
^{146}Cd	37.630 ‡
^{92}In	-3.250 †
^{93}In	-13.810 †
^{94}In	-21.310 †
^{95}In	-30.610 †
^{96}In	-36.630 †
^{97}In	-44.150
^{98}In	-48.020 †
^{99}In	-58.900 †
^{100}In	-62.240
^{101}In	-66.930
^{102}In	-69.810
^{103}In	-74.190
^{104}In	-76.270
^{105}In	-79.870
^{106}In	-81.050
^{107}In	-83.770
^{108}In	-84.180
^{109}In	-86.390
^{110}In	-86.530
^{111}In	-88.270
^{112}In	-87.940
^{113}In	-89.360
^{114}In	-88.530
^{115}In	-89.560
^{116}In	-88.360

Isotope	Mass Excess
^{117}In	-88.880
^{118}In	-87.430
^{119}In	-87.590
^{120}In	-85.770
^{121}In	-85.640
^{122}In	-83.590
^{123}In	-83.330
^{124}In	-81.040
^{125}In	-80.380
^{126}In	-77.730
^{127}In	-76.700
^{128}In	-73.950
^{129}In	-72.800
^{130}In	-69.900
^{131}In	-68.420
^{132}In	-64.190
^{133}In	-61.160
^{134}In	-56.020
^{135}In	-51.990
^{136}In	-45.860
^{137}In	-41.280
^{138}In	-34.820
^{139}In	-30.030
^{140}In	-23.540
^{141}In	-18.370
^{142}In	-11.470
^{143}In	-5.570
^{144}In	2.070
^{145}In	8.760
^{146}In	17.430 †
^{147}In	25.100 ‡
^{148}In	34.850 †
^{149}In	43.920 †
^{94}Sn	-5.960 †
^{95}Sn	-13.960 †
^{96}Sn	-24.290 ‡
^{97}Sn	-31.230
^{98}Sn	-40.220
^{99}Sn	-45.570
^{100}Sn	-52.910
^{101}Sn	-56.580
^{102}Sn	-62.290
^{103}Sn	-65.600
^{104}Sn	-70.790
^{105}Sn	-73.190
^{106}Sn	-77.580
^{107}Sn	-79.090
^{108}Sn	-82.450
^{109}Sn	-83.010
^{110}Sn	-86.090
^{111}Sn	-86.180
^{112}Sn	-88.700
^{113}Sn	-88.470
^{114}Sn	-90.450
^{115}Sn	-89.840
^{116}Sn	-91.330
^{117}Sn	-90.180
^{118}Sn	-91.310
^{119}Sn	-89.930
^{120}Sn	-90.720
^{121}Sn	-89.090
^{122}Sn	-89.520
^{123}Sn	-87.700
^{124}Sn	-88.020
^{125}Sn	-85.920
^{126}Sn	-85.980
^{127}Sn	-83.540
^{128}Sn	-83.200
^{129}Sn	-80.710
^{130}Sn	-80.190
^{131}Sn	-77.590
^{132}Sn	-76.700
^{133}Sn	-72.700
^{134}Sn	-69.900
^{135}Sn	-64.910

Isotope	Mass Excess
^{136}Sn	-61.200
^{137}Sn	-55.380
^{138}Sn	-51.440
^{139}Sn	-45.290
^{140}Sn	-41.260
^{141}Sn	-34.940
^{142}Sn	-30.570
^{143}Sn	-23.780
^{144}Sn	-18.510
^{145}Sn	-10.930
^{146}Sn	-4.700
^{147}Sn	3.780 †
^{148}Sn	11.060
^{149}Sn	20.860 †
^{150}Sn	29.310 †
^{151}Sn	40.350 †
^{152}Sn	50.230 †
^{97}Sb	-12.130 †
^{98}Sb	-19.630 †
^{99}Sb	-28.870 †
^{100}Sb	-35.250 †
^{101}Sb	-42.910 †
^{102}Sb	-47.570 †
^{103}Sb	-53.680 †
^{104}Sb	-57.710 †
^{105}Sb	-63.110 †
^{106}Sb	-66.180
^{107}Sb	-70.800
^{108}Sb	-72.850
^{109}Sb	-76.300
^{110}Sb	-77.700
^{111}Sb	-80.730
^{112}Sb	-81.630
^{113}Sb	-84.300
^{114}Sb	-84.700
^{115}Sb	-86.980
^{116}Sb	-86.920
^{117}Sb	-88.560
^{118}Sb	-88.100
^{119}Sb	-89.360
^{120}Sb	-88.640
^{121}Sb	-89.640
^{122}Sb	-88.540
^{123}Sb	-89.140
^{124}Sb	-87.820
^{125}Sb	-88.200
^{126}Sb	-86.650
^{127}Sb	-86.720
^{128}Sb	-84.750
^{129}Sb	-84.440
^{130}Sb	-82.350
^{131}Sb	-81.920
^{132}Sb	-79.720
^{133}Sb	-78.810
^{134}Sb	-74.680
^{135}Sb	-71.680
^{136}Sb	-66.680
^{137}Sb	-62.990
^{138}Sb	-57.530
^{139}Sb	-53.640
^{140}Sb	-48.030
^{141}Sb	-43.990
^{142}Sb	-38.330
^{143}Sb	-33.960
^{144}Sb	-27.740
^{145}Sb	-22.510
^{146}Sb	-15.440
^{147}Sb	-9.500
^{148}Sb	-1.570
^{149}Sb	5.540
^{150}Sb	14.420 †
^{151}Sb	22.560 †
^{152}Sb	32.600 †
^{153}Sb	42.120 †
^{154}Sb	53.450 †

Isotope	Mass Excess
^{155}Sb	64.470 †
^{100}Te	-19.480 †
^{101}Te	-26.090 †
^{102}Te	-34.760 †
^{103}Te	-39.820 †
^{104}Te	-46.830 ‡
^{105}Te	-51.050
^{106}Te	-57.120
^{107}Te	-60.410
^{108}Te	-65.570
^{109}Te	-67.720
^{110}Te	-72.010
^{111}Te	-73.370
^{112}Te	-77.200
^{113}Te	-78.260
^{114}Te	-81.550
^{115}Te	-82.260
^{116}Te	-85.090
^{117}Te	-85.170
^{118}Te	-87.500
^{119}Te	-87.170
^{120}Te	-89.090
^{121}Te	-88.580
^{122}Te	-90.110
^{123}Te	-89.200
^{124}Te	-90.290
^{125}Te	-89.030
^{126}Te	-89.960
^{127}Te	-88.440
^{128}Te	-89.000
^{129}Te	-87.070
^{130}Te	-87.170
^{131}Te	-85.180
^{132}Te	-85.160
^{133}Te	-82.970
^{134}Te	-82.490
^{135}Te	-78.210
^{136}Te	-75.230
^{137}Te	-70.290
^{138}Te	-66.980
^{139}Te	-61.600
^{140}Te	-58.280
^{141}Te	-52.680
^{142}Te	-49.310
^{143}Te	-43.660
^{144}Te	-39.850
^{145}Te	-33.670
^{146}Te	-28.940
^{147}Te	-22.140
^{148}Te	-16.730
^{149}Te	-8.930
^{150}Te	-2.700
^{151}Te	5.930 †
^{152}Te	13.130
^{153}Te	22.870 †
^{154}Te	31.390 †
^{155}Te	42.250 †
^{156}Te	52.240 †
^{102}I	-14.910 †
^{103}I	-24.010 †
^{104}I	-29.800 †
^{105}I	-37.000 †
^{106}I	-42.290 †
^{107}I	-48.580 †
^{108}I	-52.410 †
^{109}I	-57.670 †
^{110}I	-60.650
^{111}I	-64.900
^{112}I	-67.060
^{113}I	-71.050
^{114}I	-72.730
^{115}I	-76.330
^{116}I	-77.590
^{117}I	-80.570

Isotope	Mass Excess
^{118}I	-81.340
^{119}I	-83.800
^{120}I	-84.130
^{121}I	-86.260
^{122}I	-86.290
^{123}I	-88.000
^{124}I	-87.590
^{125}I	-88.750
^{126}I	-88.040
^{127}I	-89.010
^{128}I	-87.970
^{129}I	-88.580
^{130}I	-87.080
^{131}I	-87.290
^{132}I	-85.740
^{133}I	-85.750
^{134}I	-84.000
^{135}I	-83.710
^{136}I	-79.490
^{137}I	-76.600
^{138}I	-72.070
^{139}I	-68.880
^{140}I	-64.090
^{141}I	-60.800
^{142}I	-55.880
^{143}I	-52.520
^{144}I	-47.440
^{145}I	-43.680
^{146}I	-37.980
^{147}I	-33.510
^{148}I	-27.210
^{149}I	-21.910
^{150}I	-14.960
^{151}I	-8.950
^{152}I	-1.210
^{153}I	5.750
^{154}I	14.550 †
^{155}I	22.670 †
^{156}I	32.570 †
^{157}I	41.990 †
^{158}I	53.240 †
^{159}I	64.120 †
^{105}Xe	-20.950 †
^{106}Xe	-28.830 †
^{107}Xe	-34.340 †
^{108}Xe	-41.750 ‡
^{109}Xe	-45.670 ‡
^{110}Xe	-51.760
^{111}Xe	-54.700
^{112}Xe	-59.740
^{113}Xe	-62.060
^{114}Xe	-66.680
^{115}Xe	-68.670
^{116}Xe	-72.820
^{117}Xe	-74.230
^{118}Xe	-77.890
^{119}Xe	-78.800
^{120}Xe	-81.930
^{121}Xe	-82.470
^{122}Xe	-85.140
^{123}Xe	-85.350
^{124}Xe	-87.570
^{125}Xe	-87.220
^{126}Xe	-88.950
^{127}Xe	-88.280
^{128}Xe	-89.750
^{129}Xe	-88.770
^{130}Xe	-89.820
^{131}Xe	-88.440
^{132}Xe	-89.100
^{133}Xe	-87.590
^{134}Xe	-88.060
^{135}Xe	-86.530
^{136}Xe	-86.480
^{137}Xe	-82.370

Isotope	Mass Excess
^{138}Xe	-79.920
^{139}Xe	-75.530
^{140}Xe	-72.940
^{141}Xe	-68.200
^{142}Xe	-65.600
^{143}Xe	-60.710
^{144}Xe	-57.930
^{145}Xe	-52.890
^{146}Xe	-49.620
^{147}Xe	-44.170
^{148}Xe	-40.190
^{149}Xe	-33.980
^{150}Xe	-29.490
^{151}Xe	-22.730
^{152}Xe	-17.570
^{153}Xe	-10.030
^{154}Xe	-3.950
^{155}Xe	4.510 †
^{156}Xe	11.730
^{157}Xe	21.140 †
^{158}Xe	29.740 †
^{159}Xe	40.400 †
^{160}Xe	50.290 †
^{161}Xe	62.140 †
^{162}Xe	73.150 †
^{108}Cs	-23.750 †
^{109}Cs	-31.250 †
^{110}Cs	-36.740 †
^{111}Cs	-42.780 †
^{112}Cs	-46.510 †
^{113}Cs	-51.710 †
^{114}Cs	-54.650 †
^{115}Cs	-59.580
^{116}Cs	-62.120
^{117}Cs	-66.420
^{118}Cs	-68.520
^{119}Cs	-72.320
^{120}Cs	-73.890
^{121}Cs	-77.230
^{122}Cs	-78.320
^{123}Cs	-81.180
^{124}Cs	-81.900
^{125}Cs	-84.190
^{126}Cs	-84.420
^{127}Cs	-86.190
^{128}Cs	-86.030
^{129}Cs	-87.560
^{130}Cs	-87.030
^{131}Cs	-88.210
^{132}Cs	-87.300
^{133}Cs	-88.020
^{134}Cs	-86.990
^{135}Cs	-87.690
^{136}Cs	-86.420
^{137}Cs	-86.520
^{138}Cs	-82.870
^{139}Cs	-80.580
^{140}Cs	-76.820
^{141}Cs	-74.290
^{142}Cs	-70.260
^{143}Cs	-67.700
^{144}Cs	-63.400
^{145}Cs	-60.660
^{146}Cs	-56.110
^{147}Cs	-53.080
^{148}Cs	-48.110
^{149}Cs	-44.200
^{150}Cs	-38.790
^{151}Cs	-34.460
^{152}Cs	-28.520
^{153}Cs	-23.520
^{154}Cs	-16.820
^{155}Cs	-11.040
^{156}Cs	-3.410
^{157}Cs	3.380

Isotope	Mass Excess
^{158}Cs	12.040 †
^{159}Cs	20.130 †
^{160}Cs	29.900 †
^{161}Cs	39.140 †
^{162}Cs	49.890 †
^{163}Cs	60.310 †
^{111}Ba	-28.170 †
^{112}Ba	-35.860 ‡
^{113}Ba	-39.740 ‡
^{114}Ba	-45.560
^{115}Ba	-48.800
^{116}Ba	-54.280
^{117}Ba	-56.970
^{118}Ba	-61.960
^{119}Ba	-64.190
^{120}Ba	-68.660
^{121}Ba	-70.460
^{122}Ba	-74.340
^{123}Ba	-75.620
^{124}Ba	-78.990
^{125}Ba	-79.800
^{126}Ba	-82.660
^{127}Ba	-82.940
^{128}Ba	-85.230
^{129}Ba	-85.150
^{130}Ba	-87.140
^{131}Ba	-86.760
^{132}Ba	-88.420
^{133}Ba	-87.570
^{134}Ba	-88.790
^{135}Ba	-88.000
^{136}Ba	-88.980
^{137}Ba	-87.880
^{138}Ba	-88.400
^{139}Ba	-84.920
^{140}Ba	-83.270
^{141}Ba	-79.580
^{142}Ba	-77.770
^{143}Ba	-73.800
^{144}Ba	-71.830
^{145}Ba	-67.570
^{146}Ba	-65.320
^{147}Ba	-61.010
^{148}Ba	-58.450
^{149}Ba	-53.550
^{150}Ba	-50.420
^{151}Ba	-45.140
^{152}Ba	-41.610
^{153}Ba	-35.800
^{154}Ba	-31.600
^{155}Ba	-25.150
^{156}Ba	-20.150
^{157}Ba	-12.910
^{158}Ba	-6.800
^{159}Ba	1.410 †
^{160}Ba	8.680
^{161}Ba	17.880 †
^{162}Ba	26.110 †
^{163}Ba	36.360 †
^{164}Ba	45.760 †
^{165}Ba	57.400 †
^{166}Ba	68.100 †
^{113}La	-24.960 †
^{114}La	-30.390 †
^{115}La	-36.500 †
^{116}La	-40.290 †
^{117}La	-45.910 †
^{118}La	-49.290 †
^{119}La	-54.410 †
^{120}La	-57.320
^{121}La	-62.010
^{122}La	-64.350
^{123}La	-68.430
^{124}La	-70.230

Isotope	Mass Excess	
^{125}La	-73.690	
^{126}La	-75.070	
^{127}La	-78.000	
^{128}La	-78.810	
^{129}La	-81.180	
^{130}La	-81.560	
^{131}La	-83.710	
^{132}La	-83.820	
^{133}La	-85.560	
^{134}La	-85.220	
^{135}La	-86.700	
^{136}La	-86.210	
^{137}La	-87.390	
^{138}La	-86.720	
^{139}La	-87.300	
^{140}La	-84.470	
^{141}La	-82.910	
^{142}La	-79.940	
^{143}La	-78.190	
^{144}La	-74.810	
^{145}La	-72.900	
^{146}La	-69.130	
^{147}La	-67.110	
^{148}La	-63.270	
^{149}La	-60.760	
^{150}La	-56.630	
^{151}La	-53.620	
^{152}La	-49.120	
^{153}La	-45.690	
^{154}La	-40.650	
^{155}La	-36.670	
^{156}La	-30.960	
^{157}La	-26.300	
^{158}La	-19.690	
^{159}La	-13.960	
^{160}La	-6.510	
^{161}La	0.260	
^{162}La	8.520	†
^{163}La	16.330	
^{164}La	25.650	†
^{165}La	34.420	†
^{166}La	44.970	†
^{167}La	54.980	†
^{168}La	66.730	†
^{169}La	77.720	†
^{116}Ce	-29.160	†
^{117}Ce	-33.080	‡
^{118}Ce	-39.380	‡
^{119}Ce	-42.890	
^{120}Ce	-48.690	
^{121}Ce	-51.820	
^{122}Ce	-57.060	
^{123}Ce	-59.600	
^{124}Ce	-64.200	
^{125}Ce	-66.090	
^{126}Ce	-70.130	
^{127}Ce	-71.590	
^{128}Ce	-75.050	
^{129}Ce	-75.950	
^{130}Ce	-78.790	
^{131}Ce	-79.350	
^{132}Ce	-82.000	
^{133}Ce	-82.200	
^{134}Ce	-84.470	
^{135}Ce	-84.410	
^{136}Ce	-86.200	
^{137}Ce	-85.930	
^{138}Ce	-87.560	
^{139}Ce	-86.970	
^{140}Ce	-88.050	
^{141}Ce	-85.310	
^{142}Ce	-84.480	
^{143}Ce	-81.570	
^{144}Ce	-80.420	
^{145}Ce	-77.090	

Isotope	Mass Excess	
^{146}Ce	-75.660	
^{147}Ce	-72.130	
^{148}Ce	-70.580	
^{149}Ce	-66.780	
^{150}Ce	-65.030	
^{151}Ce	-61.000	
^{152}Ce	-58.750	
^{153}Ce	-54.330	
^{154}Ce	-51.660	
^{155}Ce	-46.800	
^{156}Ce	-43.520	
^{157}Ce	-38.110	
^{158}Ce	-34.040	
^{159}Ce	-27.760	
^{160}Ce	-22.740	
^{161}Ce	-15.730	
^{162}Ce	-9.830	
^{163}Ce	-1.910	
^{164}Ce	5.050	
^{165}Ce	13.820	†
^{166}Ce	21.580	‡
^{167}Ce	31.530	†
^{168}Ce	40.440	†
^{169}Ce	51.490	†
^{170}Ce	61.360	†
^{119}Pr	-29.920	†
^{120}Pr	-34.100	†
^{121}Pr	-40.110	†
^{122}Pr	-43.780	†
^{123}Pr	-49.220	†
^{124}Pr	-52.280	†
^{125}Pr	-56.980	
^{126}Pr	-59.460	
^{127}Pr	-63.580	
^{128}Pr	-65.580	
^{129}Pr	-69.140	
^{130}Pr	-70.520	
^{131}Pr	-73.550	
^{132}Pr	-74.620	
^{133}Pr	-77.370	
^{134}Pr	-78.110	
^{135}Pr	-80.670	
^{136}Pr	-80.950	
^{137}Pr	-82.970	
^{138}Pr	-83.160	
^{139}Pr	-84.890	
^{140}Pr	-84.840	
^{141}Pr	-85.860	
^{142}Pr	-83.850	
^{143}Pr	-83.080	
^{144}Pr	-80.770	
^{145}Pr	-79.670	
^{146}Pr	-76.820	
^{147}Pr	-75.630	
^{148}Pr	-72.550	
^{149}Pr	-71.040	
^{150}Pr	-67.980	
^{151}Pr	-66.330	
^{152}Pr	-63.040	
^{153}Pr	-60.860	
^{154}Pr	-57.160	
^{155}Pr	-54.640	
^{156}Pr	-50.460	
^{157}Pr	-47.450	
^{158}Pr	-42.590	
^{159}Pr	-38.810	
^{160}Pr	-33.190	
^{161}Pr	-28.560	
^{162}Pr	-22.350	
^{163}Pr	-16.740	
^{164}Pr	-9.610	
^{165}Pr	-3.120	
^{166}Pr	4.730	
^{167}Pr	11.980	
^{168}Pr	20.920	†

Isotope	Mass Excess	
^{169}Pr	29.220	†
^{170}Pr	39.250	†
^{171}Pr	48.410	†
^{172}Pr	59.500	†
^{173}Pr	69.540	†
^{120}Nd	-22.560	†
^{121}Nd	-26.940	‡
^{122}Nd	-33.500	‡
^{123}Nd	-37.370	
^{124}Nd	-43.330	
^{125}Nd	-46.490	
^{126}Nd	-51.790	
^{127}Nd	-54.350	
^{128}Nd	-59.010	
^{129}Nd	-61.120	
^{130}Nd	-65.170	
^{131}Nd	-66.740	
^{132}Nd	-70.300	
^{133}Nd	-71.480	
^{134}Nd	-74.790	
^{135}Nd	-75.840	
^{136}Nd	-78.750	
^{137}Nd	-79.270	
^{138}Nd	-81.780	
^{139}Nd	-82.090	
^{140}Nd	-84.370	
^{141}Nd	-84.280	
^{142}Nd	-85.910	
^{143}Nd	-83.950	
^{144}Nd	-83.770	
^{145}Nd	-81.510	
^{146}Nd	-80.890	
^{147}Nd	-78.270	
^{148}Nd	-77.520	
^{149}Nd	-74.470	
^{150}Nd	-73.700	
^{151}Nd	-70.730	
^{152}Nd	-69.800	
^{153}Nd	-66.570	
^{154}Nd	-65.080	
^{155}Nd	-61.520	
^{156}Nd	-59.650	
^{157}Nd	-55.710	
^{158}Nd	-53.210	
^{159}Nd	-48.610	
^{160}Nd	-45.440	
^{161}Nd	-40.160	
^{162}Nd	-36.300	
^{163}Nd	-30.320	
^{164}Nd	-25.430	
^{165}Nd	-18.710	
^{166}Nd	-13.070	
^{167}Nd	-5.670	
^{168}Nd	0.660	
^{169}Nd	9.080	†
^{170}Nd	16.450	
^{171}Nd	25.870	†
^{172}Nd	33.890	‡
^{173}Nd	44.190	†
^{174}Nd	53.360	†
^{175}Nd	64.940	†
^{176}Nd	75.070	†
^{123}Pm	-23.870	†
^{124}Pm	-28.250	†
^{125}Pm	-34.310	†
^{126}Pm	-38.070	†
^{127}Pm	-43.440	†
^{128}Pm	-46.550	†
^{129}Pm	-51.330	†
^{130}Pm	-53.930	
^{131}Pm	-58.180	
^{132}Pm	-60.290	
^{133}Pm	-63.980	
^{134}Pm	-65.730	

Isotope	Mass Excess	
^{135}Pm	-69.360	
^{136}Pm	-70.770	
^{137}Pm	-73.940	
^{138}Pm	-74.970	
^{139}Pm	-77.620	
^{140}Pm	-78.500	
^{141}Pm	-80.760	
^{142}Pm	-81.300	
^{143}Pm	-82.900	
^{144}Pm	-81.530	
^{145}Pm	-81.390	
^{146}Pm	-79.600	
^{147}Pm	-79.200	
^{148}Pm	-77.020	
^{149}Pm	-76.290	
^{150}Pm	-73.970	
^{151}Pm	-73.270	
^{152}Pm	-71.010	
^{153}Pm	-70.110	
^{154}Pm	-67.560	
^{155}Pm	-66.190	
^{156}Pm	-63.260	
^{157}Pm	-61.600	
^{158}Pm	-58.150	
^{159}Pm	-55.870	
^{160}Pm	-51.850	
^{161}Pm	-48.980	
^{162}Pm	-44.420	
^{163}Pm	-40.740	
^{164}Pm	-35.430	
^{165}Pm	-30.900	
^{166}Pm	-24.970	
^{167}Pm	-19.700	
^{168}Pm	-13.150	
^{169}Pm	-7.280	
^{170}Pm	0.300	
^{171}Pm	7.140	
^{172}Pm	15.520	†
^{173}Pm	22.850	
^{174}Pm	32.370	†
^{175}Pm	40.730	†
^{176}Pm	51.190	†
^{177}Pm	60.590	†
^{125}Sm	-20.480	†
^{126}Sm	-27.130	‡
^{127}Sm	-30.970	‡
^{128}Sm	-36.900	‡
^{129}Sm	-40.120	
^{130}Sm	-45.410	
^{131}Sm	-48.220	
^{132}Sm	-53.010	
^{133}Sm	-55.260	
^{134}Sm	-59.520	
^{135}Sm	-61.610	
^{136}Sm	-65.610	
^{137}Sm	-67.300	
^{138}Sm	-70.990	
^{139}Sm	-72.180	
^{140}Sm	-75.420	
^{141}Sm	-76.310	
^{142}Sm	-79.220	
^{143}Sm	-79.760	
^{144}Sm	-81.930	
^{145}Sm	-80.590	
^{146}Sm	-80.910	
^{147}Sm	-79.330	
^{148}Sm	-79.350	
^{149}Sm	-77.180	
^{150}Sm	-77.170	
^{151}Sm	-74.900	
^{152}Sm	-74.900	
^{153}Sm	-72.650	
^{154}Sm	-72.430	
^{155}Sm	-69.970	
^{156}Sm	-69.210	

Isotope	Mass Excess	
^{157}Sm	-66.470	
^{158}Sm	-65.270	
^{159}Sm	-62.000	
^{160}Sm	-60.280	
^{161}Sm	-56.520	
^{162}Sm	-54.340	
^{163}Sm	-49.920	
^{164}Sm	-46.860	
^{165}Sm	-41.860	
^{166}Sm	-38.060	
^{167}Sm	-32.450	
^{168}Sm	-27.980	
^{169}Sm	-21.810	
^{170}Sm	-16.700	
^{171}Sm	-9.580	
^{172}Sm	-3.690	
^{173}Sm	4.080	
^{174}Sm	10.730	
^{175}Sm	19.530	†
^{176}Sm	26.860	
^{177}Sm	36.700	†
^{178}Sm	44.970	†
^{179}Sm	55.770	†
^{180}Sm	65.010	†
^{128}Eu	-21.100	†
^{129}Eu	-27.150	†
^{130}Eu	-30.880	†
^{131}Eu	-36.380	†
^{132}Eu	-39.730	†
^{133}Eu	-44.680	†
^{134}Eu	-47.510	†
^{135}Eu	-52.120	†
^{136}Eu	-54.590	
^{137}Eu	-58.890	
^{138}Eu	-61.120	
^{139}Eu	-64.990	
^{140}Eu	-66.780	
^{141}Eu	-70.050	
^{142}Eu	-71.610	
^{143}Eu	-74.550	
^{144}Eu	-75.670	
^{145}Eu	-77.940	
^{146}Eu	-77.050	
^{147}Eu	-77.560	
^{148}Eu	-76.390	
^{149}Eu	-76.410	
^{150}Eu	-74.940	
^{151}Eu	-74.970	
^{152}Eu	-73.390	
^{153}Eu	-73.380	
^{154}Eu	-71.790	
^{155}Eu	-71.640	
^{156}Eu	-69.780	
^{157}Eu	-69.180	
^{158}Eu	-66.870	
^{159}Eu	-65.840	
^{160}Eu	-63.100	
^{161}Eu	-61.610	
^{162}Eu	-58.500	
^{163}Eu	-56.420	
^{164}Eu	-52.580	
^{165}Eu	-49.790	
^{166}Eu	-45.480	
^{167}Eu	-41.940	
^{168}Eu	-37.070	
^{169}Eu	-32.920	
^{170}Eu	-27.460	
^{171}Eu	-22.740	
^{172}Eu	-16.510	
^{173}Eu	-11.150	
^{174}Eu	-3.980	
^{175}Eu	2.040	
^{176}Eu	9.910	
^{177}Eu	16.720	
^{178}Eu	25.530	†

Isotope	Mass Excess	
^{179}Eu	33.180	‡
^{180}Eu	42.790	†
^{181}Eu	51.280	†
^{182}Eu	61.670	†
^{183}Eu	71.460	†
^{131}Gd	-22.920	†
^{132}Gd	-28.970	†
^{133}Gd	-32.480	‡
^{134}Gd	-38.020	‡
^{135}Gd	-41.210	
^{136}Gd	-46.210	
^{137}Gd	-49.000	
^{138}Gd	-53.850	
^{139}Gd	-56.270	
^{140}Gd	-60.770	
^{141}Gd	-62.600	
^{142}Gd	-66.560	
^{143}Gd	-68.170	
^{144}Gd	-71.720	
^{145}Gd	-72.970	
^{146}Gd	-75.850	
^{147}Gd	-75.130	
^{148}Gd	-76.040	
^{149}Gd	-74.850	
^{150}Gd	-75.560	
^{151}Gd	-74.120	
^{152}Gd	-74.810	
^{153}Gd	-73.210	
^{154}Gd	-73.840	
^{155}Gd	-72.310	
^{156}Gd	-72.730	
^{157}Gd	-71.000	
^{158}Gd	-70.820	
^{159}Gd	-68.660	
^{160}Gd	-68.130	
^{161}Gd	-65.590	
^{162}Gd	-64.720	
^{163}Gd	-61.680	
^{164}Gd	-60.150	
^{165}Gd	-56.540	
^{166}Gd	-54.390	
^{167}Gd	-50.300	
^{168}Gd	-47.460	
^{169}Gd	-42.860	
^{170}Gd	-39.360	
^{171}Gd	-34.230	
^{172}Gd	-30.330	
^{173}Gd	-24.560	
^{174}Gd	-19.730	
^{175}Gd	-13.110	
^{176}Gd	-7.940	
^{177}Gd	-0.500	
^{178}Gd	5.360	
^{179}Gd	13.640	†
^{180}Gd	20.200	
^{181}Gd	29.170	†
^{182}Gd	36.510	‡
^{183}Gd	46.390	†
^{184}Gd	55.180	†
^{134}Tb	-22.360	†
^{135}Tb	-28.260	†
^{136}Tb	-31.860	†
^{137}Tb	-37.180	†
^{138}Tb	-40.530	†
^{139}Tb	-45.590	†
^{140}Tb	-48.660	†
^{141}Tb	-53.210	†
^{142}Tb	-55.760	
^{143}Tb	-59.790	
^{144}Tb	-62.030	
^{145}Tb	-65.730	
^{146}Tb	-67.620	
^{147}Tb	-70.950	
^{148}Tb	-70.610	

Isotope	Mass Excess
^{149}Tb	-71.480
^{150}Tb	-70.960
^{151}Tb	-71.680
^{152}Tb	-70.880
^{153}Tb	-71.540
^{154}Tb	-70.560
^{155}Tb	-71.230
^{156}Tb	-70.240
^{157}Tb	-70.790
^{158}Tb	-69.460
^{159}Tb	-69.390
^{160}Tb	-67.710
^{161}Tb	-67.350
^{162}Tb	-65.410
^{163}Tb	-64.580
^{164}Tb	-62.060
^{165}Tb	-60.720
^{166}Tb	-57.720
^{167}Tb	-55.760
^{168}Tb	-52.320
^{169}Tb	-49.700
^{170}Tb	-45.710
^{171}Tb	-42.490
^{172}Tb	-38.120
^{173}Tb	-34.630
^{174}Tb	-29.320
^{175}Tb	-24.980
^{176}Tb	-19.140
^{177}Tb	-14.330
^{178}Tb	-7.750
^{179}Tb	-2.320
^{180}Tb	4.960
^{181}Tb	10.970
^{182}Tb	18.890
^{183}Tb	25.820
^{184}Tb	34.820 †
^{185}Tb	42.670 ‡
^{186}Tb	52.370 †
^{187}Tb	61.030 †
^{136}Dy	-19.810 †
^{137}Dy	-23.730 †
^{138}Dy	-29.630 †
^{139}Dy	-33.200 †
^{140}Dy	-38.920 ‡
^{141}Dy	-42.060
^{142}Dy	-47.350
^{143}Dy	-49.980
^{144}Dy	-54.670
^{145}Dy	-57.080
^{146}Dy	-61.440
^{147}Dy	-63.810
^{148}Dy	-67.920
^{149}Dy	-67.530
^{150}Dy	-69.040
^{151}Dy	-68.510
^{152}Dy	-69.860
^{153}Dy	-69.010
^{154}Dy	-70.260
^{155}Dy	-69.300
^{156}Dy	-70.500
^{157}Dy	-69.620
^{158}Dy	-70.540
^{159}Dy	-69.300
^{160}Dy	-69.690
^{161}Dy	-68.160
^{162}Dy	-68.380
^{163}Dy	-66.450
^{164}Dy	-66.110
^{165}Dy	-63.750
^{166}Dy	-63.000
^{167}Dy	-60.150
^{168}Dy	-58.800
^{169}Dy	-55.540
^{170}Dy	-53.490
^{171}Dy	-49.720

Isotope	Mass Excess
^{172}Dy	-47.220
^{173}Dy	-43.210
^{174}Dy	-40.130
^{175}Dy	-35.240
^{176}Dy	-31.620
^{177}Dy	-26.070
^{178}Dy	-22.050
^{179}Dy	-15.840
^{180}Dy	-11.330
^{181}Dy	-4.520
^{182}Dy	0.540
^{183}Dy	8.140
^{184}Dy	14.290
^{185}Dy	22.450 †
^{186}Dy	29.490
^{187}Dy	38.240 †
^{188}Dy	46.030 ‡
^{189}Dy	55.810 †
^{190}Dy	64.330 †
^{139}Ho	-18.780 †
^{140}Ho	-23.020 †
^{141}Ho	-28.830 †
^{142}Ho	-32.710 †
^{143}Ho	-38.100 †
^{144}Ho	-41.420 †
^{145}Ho	-46.300 †
^{146}Ho	-49.400 †
^{147}Ho	-54.260
^{148}Ho	-57.430
^{149}Ho	-62.020
^{150}Ho	-62.250
^{151}Ho	-63.740
^{152}Ho	-63.810
^{153}Ho	-65.080
^{154}Ho	-64.810
^{155}Ho	-66.060
^{156}Ho	-65.610
^{157}Ho	-66.890
^{158}Ho	-66.370
^{159}Ho	-67.360
^{160}Ho	-66.560
^{161}Ho	-67.080
^{162}Ho	-66.100
^{163}Ho	-66.300
^{164}Ho	-64.840
^{165}Ho	-64.640
^{166}Ho	-62.830
^{167}Ho	-62.190
^{168}Ho	-59.930
^{169}Ho	-58.730
^{170}Ho	-56.000
^{171}Ho	-54.140
^{172}Ho	-51.050
^{173}Ho	-48.860
^{174}Ho	-45.210
^{175}Ho	-42.500
^{176}Ho	-38.280
^{177}Ho	-34.880
^{178}Ho	-30.070
^{179}Ho	-26.350
^{180}Ho	-20.980
^{181}Ho	-16.870
^{182}Ho	-10.930
^{183}Ho	-6.110
^{184}Ho	0.800
^{185}Ho	6.200
^{186}Ho	13.640
^{187}Ho	19.830
^{188}Ho	27.820
^{189}Ho	34.910
^{190}Ho	43.540 †
^{191}Ho	51.230 ‡
^{192}Ho	60.360 †
^{193}Ho	69.180 †

Isotope	Mass Excess
^{142}Er	-20.250 †
^{143}Er	-24.260 †
^{144}Er	-30.350 †
^{145}Er	-33.880 †
^{146}Er	-39.460 ‡
^{147}Er	-43.090
^{148}Er	-48.780
^{149}Er	-52.460
^{150}Er	-58.340
^{151}Er	-58.520
^{152}Er	-60.580
^{153}Er	-60.560
^{154}Er	-62.390
^{155}Er	-62.090
^{156}Er	-63.840
^{157}Er	-63.450
^{158}Er	-65.060
^{159}Er	-64.590
^{160}Er	-66.000
^{161}Er	-65.310
^{162}Er	-66.360
^{163}Er	-65.340
^{164}Er	-65.990
^{165}Er	-64.640
^{166}Er	-64.960
^{167}Er	-63.250
^{168}Er	-63.160
^{169}Er	-61.020
^{170}Er	-60.310
^{171}Er	-57.740
^{172}Er	-56.520
^{173}Er	-53.700
^{174}Er	-51.830
^{175}Er	-48.510
^{176}Er	-46.410
^{177}Er	-42.380
^{178}Er	-39.660
^{179}Er	-35.080
^{180}Er	-32.150
^{181}Er	-27.120
^{182}Er	-23.810
^{183}Er	-18.030
^{184}Er	-13.840
^{185}Er	-7.590
^{186}Er	-2.820
^{187}Er	3.870
^{188}Er	9.390
^{189}Er	16.770
^{190}Er	22.820
^{191}Er	30.730
^{192}Er	37.390
^{193}Er	45.760 †
^{194}Er	53.460
^{147}Tm	-29.650 †
^{148}Tm	-34.140 †
^{149}Tm	-40.360 †
^{150}Tm	-45.360
^{151}Tm	-52.000
^{152}Tm	-52.740
^{153}Tm	-54.690
^{154}Tm	-55.200
^{155}Tm	-56.980
^{156}Tm	-57.150
^{157}Tm	-58.930
^{158}Tm	-58.860
^{159}Tm	-60.510
^{160}Tm	-60.430
^{161}Tm	-61.930
^{162}Tm	-61.740
^{163}Tm	-62.740
^{164}Tm	-62.140
^{165}Tm	-62.880
^{166}Tm	-62.030
^{167}Tm	-62.420
^{168}Tm	-61.240

Isotope	Mass Excess
^{169}Tm	-61.250
^{170}Tm	-59.570
^{171}Tm	-58.990
^{172}Tm	-57.030
^{173}Tm	-56.050
^{174}Tm	-53.510
^{175}Tm	-51.930
^{176}Tm	-49.180
^{177}Tm	-47.230
^{178}Tm	-43.820
^{179}Tm	-41.300
^{180}Tm	-37.460
^{181}Tm	-34.800
^{182}Tm	-30.510
^{183}Tm	-27.300
^{184}Tm	-22.080
^{185}Tm	-18.470
^{186}Tm	-12.790
^{187}Tm	-8.690
^{188}Tm	-2.590
^{189}Tm	2.410
^{190}Tm	8.840
^{191}Tm	14.260
^{192}Tm	21.250
^{193}Tm	27.270
^{194}Tm	34.630
^{195}Tm	41.740
^{196}Tm	52.420 †
^{197}Tm	61.700 †
^{147}Yb	-14.210 †
^{148}Yb	-21.220 †
^{149}Yb	-26.250 †
^{150}Yb	-33.820 ‡
^{151}Yb	-39.610
^{152}Yb	-47.780
^{153}Yb	-48.370
^{154}Yb	-50.830
^{155}Yb	-51.270
^{156}Yb	-53.500
^{157}Yb	-53.690
^{158}Yb	-55.760
^{159}Yb	-55.700
^{160}Yb	-57.720
^{161}Yb	-57.720
^{162}Yb	-59.700
^{163}Yb	-59.440
^{164}Yb	-60.830
^{165}Yb	-60.310
^{166}Yb	-61.520
^{167}Yb	-60.720
^{168}Yb	-61.620
^{169}Yb	-60.510
^{170}Yb	-60.960
^{171}Yb	-59.380
^{172}Yb	-59.390
^{173}Yb	-57.640
^{174}Yb	-56.910
^{175}Yb	-54.630
^{176}Yb	-53.590
^{177}Yb	-50.950
^{178}Yb	-49.580
^{179}Yb	-46.330
^{180}Yb	-44.490
^{181}Yb	-40.880
^{182}Yb	-38.920
^{183}Yb	-34.670
^{184}Yb	-31.960
^{185}Yb	-27.270
^{186}Yb	-24.150
^{187}Yb	-19.080
^{188}Yb	-15.500
^{189}Yb	-9.840
^{190}Yb	-5.710
^{191}Yb	0.190
^{192}Yb	4.780

Isotope	Mass Excess
^{193}Yb	11.210
^{194}Yb	16.310
^{195}Yb	23.190
^{196}Yb	29.310
^{197}Yb	39.390 †
^{198}Yb	47.690 †
^{199}Yb	57.570 †
^{200}Yb	65.630 ‡
^{149}Lu	-9.590 †
^{150}Lu	-16.000 †
^{151}Lu	-24.390 †
^{152}Lu	-31.730 †
^{153}Lu	-40.870
^{154}Lu	-41.940
^{155}Lu	-44.300
^{156}Lu	-45.170
^{157}Lu	-47.390
^{158}Lu	-47.850
^{159}Lu	-49.920
^{160}Lu	-50.210
^{161}Lu	-52.280
^{162}Lu	-52.740
^{163}Lu	-54.630
^{164}Lu	-54.750
^{165}Lu	-56.190
^{166}Lu	-56.130
^{167}Lu	-57.380
^{168}Lu	-57.060
^{169}Lu	-58.010
^{170}Lu	-57.320
^{171}Lu	-57.850
^{172}Lu	-56.830
^{173}Lu	-57.020
^{174}Lu	-55.500
^{175}Lu	-55.000
^{176}Lu	-53.230
^{177}Lu	-52.260
^{178}Lu	-50.180
^{179}Lu	-48.930
^{180}Lu	-46.320
^{181}Lu	-44.670
^{182}Lu	-41.710
^{183}Lu	-39.750
^{184}Lu	-35.960
^{185}Lu	-33.720
^{186}Lu	-29.470
^{187}Lu	-26.900
^{188}Lu	-22.270
^{189}Lu	-19.070
^{190}Lu	-14.210
^{191}Lu	-10.550
^{192}Lu	-5.400
^{193}Lu	-1.290
^{194}Lu	4.320
^{195}Lu	9.030
^{196}Lu	15.010
^{197}Lu	20.600
^{198}Lu	29.710 †
^{199}Lu	37.650 ‡
^{200}Lu	46.610 †
^{201}Lu	54.440 ‡
^{150}Hf	0.410 †
^{151}Hf	-6.840 †
^{152}Hf	-16.800 †
^{153}Hf	-25.140
^{154}Hf	-36.030
^{155}Hf	-36.980
^{156}Hf	-39.740
^{157}Hf	-40.580
^{158}Hf	-43.050
^{159}Hf	-43.480
^{160}Hf	-45.880
^{161}Hf	-46.200
^{162}Hf	-48.710

Isotope	Mass Excess
^{163}Hf	-49.060
^{164}Hf	-51.310
^{165}Hf	-51.470
^{166}Hf	-53.360
^{167}Hf	-53.310
^{168}Hf	-55.020
^{169}Hf	-54.740
^{170}Hf	-56.090
^{171}Hf	-55.460
^{172}Hf	-56.530
^{173}Hf	-55.680
^{174}Hf	-56.070
^{175}Hf	-54.760
^{176}Hf	-54.740
^{177}Hf	-53.020
^{178}Hf	-52.580
^{179}Hf	-50.580
^{180}Hf	-49.950
^{181}Hf	-47.500
^{182}Hf	-46.470
^{183}Hf	-43.470
^{184}Hf	-41.910
^{185}Hf	-38.550
^{186}Hf	-36.700
^{187}Hf	-32.950
^{188}Hf	-30.780
^{189}Hf	-26.470
^{190}Hf	-24.010
^{191}Hf	-19.550
^{192}Hf	-16.570
^{193}Hf	-11.830
^{194}Hf	-8.460
^{195}Hf	-3.160
^{196}Hf	0.730
^{197}Hf	6.270
^{198}Hf	10.950
^{199}Hf	19.720 †
^{200}Hf	26.750
^{201}Hf	35.480 †
^{202}Hf	42.410
^{203}Hf	50.940 †
^{204}Hf	57.610
^{152}Ta	4.560 †
^{153}Ta	-6.430 †
^{154}Ta	-16.540 †
^{155}Ta	-28.730 †
^{156}Ta	-30.050
^{157}Ta	-32.760
^{158}Ta	-33.820
^{159}Ta	-36.230
^{160}Ta	-36.980
^{161}Ta	-39.390
^{162}Ta	-40.130
^{163}Ta	-42.520
^{164}Ta	-43.210
^{165}Ta	-45.480
^{166}Ta	-46.060
^{167}Ta	-47.950
^{168}Ta	-48.350
^{169}Ta	-50.080
^{170}Ta	-50.190
^{171}Ta	-51.580
^{172}Ta	-51.480
^{173}Ta	-52.690
^{174}Ta	-52.020
^{175}Ta	-52.610
^{176}Ta	-51.760
^{177}Ta	-51.770
^{178}Ta	-50.560
^{179}Ta	-50.180
^{180}Ta	-48.770
^{181}Ta	-48.270
^{182}Ta	-46.400
^{183}Ta	-45.300
^{184}Ta	-42.670

Isotope	Mass Excess
^{185}Ta	-41.510
^{186}Ta	-38.500
^{187}Ta	-37.110
^{188}Ta	-33.710
^{189}Ta	-31.810
^{190}Ta	-28.190
^{191}Ta	-26.070
^{192}Ta	-22.240
^{193}Ta	-19.600
^{194}Ta	-15.550
^{195}Ta	-12.430
^{196}Ta	-7.870
^{197}Ta	-4.340
^{198}Ta	0.370
^{199}Ta	4.780
^{200}Ta	12.650
^{201}Ta	19.460
^{202}Ta	27.300
^{203}Ta	33.840
^{204}Ta	41.780
^{205}Ta	48.090
^{206}Ta	55.670
^{207}Ta	61.850
^{154}W	2.060 †
^{155}W	-9.380 ‡
^{156}W	-23.500
^{157}W	-24.740
^{158}W	-27.640
^{159}W	-28.630
^{160}W	-31.330
^{161}W	-32.060
^{162}W	-34.880
^{163}W	-35.480
^{164}W	-38.190
^{165}W	-38.890
^{166}W	-41.570
^{167}W	-42.130
^{168}W	-44.460
^{169}W	-44.860
^{170}W	-46.970
^{171}W	-47.100
^{172}W	-49.010
^{173}W	-49.030
^{174}W	-50.420
^{175}W	-49.930
^{176}W	-50.970
^{177}W	-50.130
^{178}W	-50.630
^{179}W	-49.450
^{180}W	-49.650
^{181}W	-48.340
^{182}W	-48.400
^{183}W	-46.440
^{184}W	-45.680
^{185}W	-43.410
^{186}W	-42.580
^{187}W	-39.990
^{188}W	-38.920
^{189}W	-35.750
^{190}W	-34.490
^{191}W	-31.180
^{192}W	-29.640
^{193}W	-26.100
^{194}W	-24.090
^{195}W	-20.220
^{196}W	-17.780
^{197}W	-13.530
^{198}W	-10.760
^{199}W	-6.250
^{200}W	-2.670
^{201}W	5.000
^{202}W	10.930
^{203}W	18.400
^{204}W	24.350
^{205}W	31.940
^{206}W	37.630
^{207}W	44.820
^{208}W	50.590
^{155}Re	13.420 †
^{156}Re	0.020 †
^{157}Re	-15.720 †
^{158}Re	-17.130 †
^{159}Re	-19.930 †
^{160}Re	-21.180 †
^{161}Re	-23.860 †
^{162}Re	-24.980
^{163}Re	-27.630
^{164}Re	-28.540
^{165}Re	-31.240
^{166}Re	-32.340
^{167}Re	-34.980
^{168}Re	-35.980
^{169}Re	-38.290
^{170}Re	-39.060
^{171}Re	-41.190
^{172}Re	-41.820
^{173}Re	-43.850
^{174}Re	-44.030
^{175}Re	-45.590
^{176}Re	-45.530
^{177}Re	-46.560
^{178}Re	-46.200
^{179}Re	-46.730
^{180}Re	-46.110
^{181}Re	-46.390
^{182}Re	-45.640
^{183}Re	-45.580
^{184}Re	-43.940
^{185}Re	-43.520
^{186}Re	-41.550
^{187}Re	-41.110
^{188}Re	-38.800
^{189}Re	-37.930
^{190}Re	-35.370
^{191}Re	-34.390
^{192}Re	-31.610
^{193}Re	-30.320
^{194}Re	-27.370
^{195}Re	-25.500
^{196}Re	-22.260
^{197}Re	-20.060
^{198}Re	-16.510
^{199}Re	-13.890
^{200}Re	-10.130
^{201}Re	-6.680
^{202}Re	0.120
^{203}Re	5.690
^{204}Re	12.570
^{205}Re	18.170
^{206}Re	25.150
^{207}Re	30.450
^{208}Re	37.240
^{209}Re	42.910
^{210}Re	49.490
^{211}Re	55.160
^{157}Os	8.060 †
^{158}Os	-9.690
^{159}Os	-10.970
^{160}Os	-14.010
^{161}Os	-15.210
^{162}Os	-18.250
^{163}Os	-19.190
^{164}Os	-22.140
^{165}Os	-23.020
^{166}Os	-26.110
^{167}Os	-27.160
^{168}Os	-30.220
^{169}Os	-31.200
^{170}Os	-33.870
^{171}Os	-34.640
^{172}Os	-37.260
^{173}Os	-38.010
^{174}Os	-40.190
^{175}Os	-40.530
^{176}Os	-42.520
^{177}Os	-42.450
^{178}Os	-43.950
^{179}Os	-43.600
^{180}Os	-44.680
^{181}Os	-44.140
^{182}Os	-44.950
^{183}Os	-44.060
^{184}Os	-44.310
^{185}Os	-42.990
^{186}Os	-42.850
^{187}Os	-41.260
^{188}Os	-41.080
^{189}Os	-38.950
^{190}Os	-38.670
^{191}Os	-36.340
^{192}Os	-35.870
^{193}Os	-33.310
^{194}Os	-32.560
^{195}Os	-29.710
^{196}Os	-28.430
^{197}Os	-25.390
^{198}Os	-23.850
^{199}Os	-20.390
^{200}Os	-18.470
^{201}Os	-14.790
^{202}Os	-12.120
^{203}Os	-5.670
^{204}Os	-0.680
^{205}Os	5.870
^{206}Os	10.870
^{207}Os	17.460
^{208}Os	22.360
^{209}Os	29.050
^{210}Os	34.170
^{211}Os	40.600
^{212}Os	45.670
^{213}Os	52.000
^{214}Os	56.630
^{158}Ir	18.690 †
^{159}Ir	-0.900 †
^{160}Ir	-2.400 †
^{161}Ir	-5.370 †
^{162}Ir	-6.910 †
^{163}Ir	-9.750 †
^{164}Ir	-10.960 †
^{165}Ir	-13.870 †
^{166}Ir	-15.130 †
^{167}Ir	-18.160 †
^{168}Ir	-19.620 †
^{169}Ir	-22.660 †
^{170}Ir	-23.970
^{171}Ir	-26.650
^{172}Ir	-27.910
^{173}Ir	-30.640
^{174}Ir	-31.530
^{175}Ir	-33.870
^{176}Ir	-34.630
^{177}Ir	-36.600
^{178}Ir	-37.000
^{179}Ir	-38.500
^{180}Ir	-38.700
^{181}Ir	-39.840
^{182}Ir	-39.830
^{183}Ir	-40.500
^{184}Ir	-39.910
^{185}Ir	-40.470
^{186}Ir	-39.420
^{187}Ir	-39.640
^{188}Ir	-38.290
^{189}Ir	-38.270
^{190}Ir	-36.710
^{191}Ir	-36.640
^{192}Ir	-34.810
^{193}Ir	-34.520
^{194}Ir	-32.480
^{195}Ir	-31.810
^{196}Ir	-29.510
^{197}Ir	-28.390
^{198}Ir	-25.980
^{199}Ir	-24.490
^{200}Ir	-21.690
^{201}Ir	-19.790
^{202}Ir	-16.840
^{203}Ir	-14.430
^{204}Ir	-8.540
^{205}Ir	-3.870
^{206}Ir	2.080
^{207}Ir	6.700
^{208}Ir	12.880
^{209}Ir	17.690
^{210}Ir	23.830
^{211}Ir	28.810
^{212}Ir	34.620
^{213}Ir	39.530
^{214}Ir	45.320
^{215}Ir	49.930
^{216}Ir	55.690
^{160}Pt	6.230 ‡
^{161}Pt	4.840 ‡
^{162}Pt	1.550 ‡
^{163}Pt	0.230 ‡
^{164}Pt	-2.870 ‡
^{165}Pt	-4.030 ‡
^{166}Pt	-7.300 ‡
^{167}Pt	-8.490
^{168}Pt	-11.920
^{169}Pt	-13.340
^{170}Pt	-16.720
^{171}Pt	-18.040
^{172}Pt	-21.200
^{173}Pt	-22.560
^{174}Pt	-25.440
^{175}Pt	-26.480
^{176}Pt	-29.240
^{177}Pt	-29.990
^{178}Pt	-32.410
^{179}Pt	-32.820
^{180}Pt	-34.870
^{181}Pt	-35.130
^{182}Pt	-36.790
^{183}Pt	-36.630
^{184}Pt	-37.600
^{185}Pt	-37.310
^{186}Pt	-38.140
^{187}Pt	-37.440
^{188}Pt	-37.900
^{189}Pt	-36.700
^{190}Pt	-37.240
^{191}Pt	-35.880
^{192}Pt	-36.270
^{193}Pt	-34.610
^{194}Pt	-34.830
^{195}Pt	-32.830
^{196}Pt	-32.700
^{197}Pt	-30.530
^{198}Pt	-30.010
^{199}Pt	-27.610
^{200}Pt	-26.740
^{201}Pt	-23.930
^{202}Pt	-22.730
^{203}Pt	-20.000
^{204}Pt	-18.050
^{205}Pt	-12.470
^{206}Pt	-8.390
^{207}Pt	-2.810
^{208}Pt	1.420
^{209}Pt	7.510
^{210}Pt	11.770
^{211}Pt	17.760
^{212}Pt	22.120
^{213}Pt	27.770
^{214}Pt	32.130
^{215}Pt	37.880
^{216}Pt	42.020
^{217}Pt	47.660
^{218}Pt	51.810
^{219}Pt	57.260
^{164}Au	9.670 †
^{165}Au	6.640 †
^{166}Au	5.130 †
^{167}Au	1.940 †
^{168}Au	0.360 †
^{169}Au	-3.030 †
^{170}Au	-4.790 †
^{171}Au	-8.170 †
^{172}Au	-9.970 †
^{173}Au	-13.230 †
^{174}Au	-14.750 †
^{175}Au	-17.770 †
^{176}Au	-19.240
^{177}Au	-21.980
^{178}Au	-23.190
^{179}Au	-25.630
^{180}Au	-26.580
^{181}Au	-28.690
^{182}Au	-29.480
^{183}Au	-31.000
^{184}Au	-31.130
^{185}Au	-32.410
^{186}Au	-32.380
^{187}Au	-33.550
^{188}Au	-33.090
^{189}Au	-33.700
^{190}Au	-33.050
^{191}Au	-33.780
^{192}Au	-32.880
^{193}Au	-33.440
^{194}Au	-32.260
^{195}Au	-32.510
^{196}Au	-31.040
^{197}Au	-31.010
^{198}Au	-29.420
^{199}Au	-28.890
^{200}Au	-27.100
^{201}Au	-26.190
^{202}Au	-24.040
^{203}Au	-23.020
^{204}Au	-20.720
^{205}Au	-18.980
^{206}Au	-13.980
^{207}Au	-10.250
^{208}Au	-5.060
^{209}Au	-0.920
^{210}Au	4.640
^{211}Au	8.740
^{212}Au	14.120
^{213}Au	18.310
^{214}Au	23.400
^{215}Au	27.720
^{216}Au	32.990
^{217}Au	37.000
^{218}Au	42.330
^{219}Au	46.460
^{220}Au	51.360
^{221}Au	55.390
^{168}Hg	9.750 †
^{169}Hg	8.220 †
^{170}Hg	4.490 †
^{171}Hg	2.740 †
^{172}Hg	-1.120 ‡
^{173}Hg	-3.030 ‡
^{174}Hg	-6.440 ‡
^{175}Hg	-8.110
^{176}Hg	-11.560
^{177}Hg	-13.030
^{178}Hg	-16.240
^{179}Hg	-17.460
^{180}Hg	-20.450
^{181}Hg	-21.470
^{182}Hg	-24.120
^{183}Hg	-24.760
^{184}Hg	-26.590
^{185}Hg	-27.030
^{186}Hg	-28.570
^{187}Hg	-28.900
^{188}Hg	-30.310
^{189}Hg	-30.000
^{190}Hg	-31.150
^{191}Hg	-30.690
^{192}Hg	-31.880
^{193}Hg	-31.130
^{194}Hg	-32.180
^{195}Hg	-31.030
^{196}Hg	-31.790
^{197}Hg	-30.420
^{198}Hg	-30.960
^{199}Hg	-29.350
^{200}Hg	-29.400
^{201}Hg	-27.540
^{202}Hg	-27.290
^{203}Hg	-25.300
^{204}Hg	-24.680
^{205}Hg	-22.560
^{206}Hg	-21.300
^{207}Hg	-16.640
^{208}Hg	-13.290
^{209}Hg	-8.170
^{210}Hg	-4.560
^{211}Hg	0.840
^{212}Hg	4.340
^{213}Hg	9.540
^{214}Hg	13.170
^{215}Hg	18.210
^{216}Hg	22.040
^{217}Hg	27.170
^{218}Hg	30.860
^{219}Hg	36.160
^{220}Hg	39.720
^{221}Hg	44.780
^{222}Hg	48.650
^{223}Hg	53.860
^{172}Tl	12.640 †
^{173}Tl	8.670 †
^{174}Tl	6.610 †
^{175}Tl	3.030 †
^{176}Tl	0.930 †
^{177}Tl	-2.530 †
^{178}Tl	-4.470 †
^{179}Tl	-7.710 †
^{180}Tl	-9.500 †
^{181}Tl	-12.570 †
^{182}Tl	-14.130 †
^{183}Tl	-16.650 †
^{184}Tl	-17.600
^{185}Tl	-19.750
^{186}Tl	-20.470
^{187}Tl	-22.370
^{188}Tl	-22.940
^{189}Tl	-24.510
^{190}Tl	-24.750
^{191}Tl	-26.100
^{192}Tl	-26.100
^{193}Tl	-27.450

Isotope	Mass Excess
^{194}Tl	-27.200
^{195}Tl	-28.270
^{196}Tl	-27.630
^{197}Tl	-28.490
^{198}Tl	-27.670
^{199}Tl	-28.180
^{200}Tl	-27.150
^{201}Tl	-27.140
^{202}Tl	-25.910
^{203}Tl	-25.800
^{204}Tl	-24.200
^{205}Tl	-23.740
^{206}Tl	-22.080
^{207}Tl	-21.070
^{208}Tl	-16.770
^{209}Tl	-13.480
^{210}Tl	-8.890
^{211}Tl	-5.430
^{212}Tl	-0.630
^{213}Tl	2.690
^{214}Tl	7.330
^{215}Tl	10.910
^{216}Tl	15.460
^{217}Tl	19.130
^{218}Tl	23.930
^{219}Tl	27.570
^{220}Tl	32.290
^{221}Tl	35.990
^{222}Tl	40.870
^{223}Tl	44.700
^{224}Tl	49.640
^{225}Tl	53.730
^{226}Tl	58.850
^{176}Pb	11.590 †
^{177}Pb	9.470 †
^{178}Pb	5.530 †
^{179}Pb	3.540 †
^{180}Pb	-0.270 †
^{181}Pb	-2.160 †
^{182}Pb	-5.780 ‡
^{183}Pb	-7.230
^{184}Pb	-10.080
^{185}Pb	-11.380
^{186}Pb	-13.810
^{187}Pb	-14.910
^{188}Pb	-17.070
^{189}Pb	-17.810
^{190}Pb	-19.940
^{191}Pb	-20.390
^{192}Pb	-22.210
^{193}Pb	-22.390
^{194}Pb	-24.230
^{195}Pb	-24.010
^{196}Pb	-25.590
^{197}Pb	-25.060
^{198}Pb	-26.480
^{199}Pb	-25.640
^{200}Pb	-26.730
^{201}Pb	-25.630
^{202}Pb	-26.240
^{203}Pb	-25.160
^{204}Pb	-25.420
^{205}Pb	-23.970
^{206}Pb	-23.960
^{207}Pb	-22.540
^{208}Pb	-21.820
^{209}Pb	-17.570
^{210}Pb	-14.790
^{211}Pb	-10.340
^{212}Pb	-7.480
^{213}Pb	-2.850
^{214}Pb	-0.080
^{215}Pb	4.500
^{216}Pb	7.590
^{217}Pb	11.970

Isotope	Mass Excess
^{218}Pb	15.310
^{219}Pb	20.050
^{220}Pb	23.100
^{221}Pb	27.930
^{222}Pb	31.440
^{223}Pb	36.250
^{224}Pb	39.800
^{225}Pb	44.930
^{226}Pb	48.820
^{227}Pb	54.120
^{228}Pb	58.270
^{189}Bi	-10.090
^{190}Bi	-11.180
^{191}Bi	-13.320
^{192}Bi	-14.050
^{193}Bi	-15.860
^{194}Bi	-16.350
^{195}Bi	-18.060
^{196}Bi	-18.190
^{197}Bi	-19.740
^{198}Bi	-19.630
^{199}Bi	-20.890
^{200}Bi	-20.510
^{201}Bi	-21.420
^{202}Bi	-20.840
^{203}Bi	-21.500
^{204}Bi	-20.710
^{205}Bi	-21.040
^{206}Bi	-19.960
^{207}Bi	-20.110
^{208}Bi	-18.910
^{209}Bi	-18.330
^{210}Bi	-14.560
^{211}Bi	-11.880
^{212}Bi	-7.990
^{213}Bi	-5.270
^{214}Bi	-1.160
^{215}Bi	1.560
^{216}Bi	5.670
^{217}Bi	8.590
^{218}Bi	12.630
^{219}Bi	15.870
^{220}Bi	19.970
^{221}Bi	23.070
^{222}Bi	27.620
^{223}Bi	30.940
^{224}Bi	35.330
^{225}Bi	38.890
^{226}Bi	43.620
^{227}Bi	47.440
^{228}Bi	52.320
^{229}Bi	56.570
^{230}Bi	61.620
^{191}Po	-5.990
^{192}Po	-8.380
^{193}Po	-9.070
^{194}Po	-11.170
^{195}Po	-11.510
^{196}Po	-13.550
^{197}Po	-13.620
^{198}Po	-15.560
^{199}Po	-15.270
^{200}Po	-16.970
^{201}Po	-16.390
^{202}Po	-17.800
^{203}Po	-17.250
^{204}Po	-18.180
^{205}Po	-17.440
^{206}Po	-18.120
^{207}Po	-17.190
^{208}Po	-17.550
^{209}Po	-16.470
^{210}Po	-16.190
^{211}Po	-12.530

Isotope	Mass Excess
^{212}Po	-10.430
^{213}Po	-6.690
^{214}Po	-4.500
^{215}Po	-0.450
^{216}Po	1.780
^{217}Po	5.710
^{218}Po	8.270
^{219}Po	12.200
^{220}Po	14.800
^{221}Po	18.930
^{222}Po	21.730
^{223}Po	26.080
^{224}Po	28.960
^{225}Po	33.360
^{226}Po	36.500
^{227}Po	41.150
^{228}Po	44.550
^{229}Po	49.520
^{230}Po	53.140
^{231}Po	58.280
^{232}Po	62.180
^{233}Po	67.430
^{194}At	-2.480
^{195}At	-4.390
^{196}At	-5.040
^{197}At	-6.990
^{198}At	-7.430
^{199}At	-9.180
^{200}At	-9.300
^{201}At	-10.770
^{202}At	-10.680
^{203}At	-12.090
^{204}At	-11.790
^{205}At	-12.760
^{206}At	-12.350
^{207}At	-13.170
^{208}At	-12.430
^{209}At	-12.910
^{210}At	-12.120
^{211}At	-11.750
^{212}At	-8.670
^{213}At	-6.720
^{214}At	-3.530
^{215}At	-1.400
^{216}At	2.140
^{217}At	4.190
^{218}At	7.750
^{219}At	10.190
^{220}At	13.460
^{221}At	16.070
^{222}At	19.900
^{223}At	22.490
^{224}At	26.390
^{225}At	29.270
^{226}At	33.230
^{227}At	36.290
^{228}At	40.500
^{229}At	43.980
^{230}At	48.310
^{231}At	52.030
^{232}At	56.770
^{233}At	60.630
^{234}At	65.490
^{235}At	69.700
^{196}Rn	0.720
^{197}Rn	0.180
^{198}Rn	-2.120
^{199}Rn	-2.340
^{200}Rn	-4.470
^{201}Rn	-4.350
^{202}Rn	-6.290
^{203}Rn	-6.180
^{204}Rn	-7.830
^{205}Rn	-7.550

Isotope	Mass Excess
^{206}Rn	-8.830
^{207}Rn	-8.540
^{208}Rn	-9.540
^{209}Rn	-8.900
^{210}Rn	-9.660
^{211}Rn	-8.770
^{212}Rn	-8.760
^{213}Rn	-5.840
^{214}Rn	-4.450
^{215}Rn	-1.320
^{216}Rn	0.300
^{217}Rn	3.650
^{218}Rn	5.310
^{219}Rn	8.740
^{220}Rn	10.510
^{221}Rn	13.790
^{222}Rn	16.090
^{223}Rn	19.690
^{224}Rn	21.820
^{225}Rn	25.710
^{226}Rn	28.140
^{227}Rn	32.010
^{228}Rn	34.620
^{229}Rn	38.910
^{230}Rn	41.750
^{231}Rn	46.160
^{232}Rn	49.470
^{233}Rn	54.170
^{234}Rn	57.630
^{235}Rn	62.530
^{236}Rn	66.320
^{237}Rn	71.510
^{238}Rn	75.460
^{199}Fr	5.040
^{200}Fr	4.440
^{201}Fr	2.570
^{202}Fr	2.250
^{203}Fr	0.340
^{204}Fr	0.240
^{205}Fr	-1.410
^{206}Fr	-1.430
^{207}Fr	-2.820
^{208}Fr	-2.690
^{209}Fr	-3.780
^{210}Fr	-3.410
^{211}Fr	-4.040
^{212}Fr	-3.510
^{213}Fr	-3.420
^{214}Fr	-1.060
^{215}Fr	0.260
^{216}Fr	2.880
^{217}Fr	4.290
^{218}Fr	7.250
^{219}Fr	8.780
^{220}Fr	11.530
^{221}Fr	13.300
^{222}Fr	16.250
^{223}Fr	18.320
^{224}Fr	21.450
^{225}Fr	23.560
^{226}Fr	27.000
^{227}Fr	29.330
^{228}Fr	32.750
^{229}Fr	35.420
^{230}Fr	39.050
^{231}Fr	41.960
^{232}Fr	45.960
^{233}Fr	49.220
^{234}Fr	53.520
^{235}Fr	57.000
^{236}Fr	61.480
^{237}Fr	65.190
^{238}Fr	70.020
^{239}Fr	73.890
^{240}Fr	79.280

Isotope	Mass Excess
^{201}Ra	9.920
^{202}Ra	7.620
^{203}Ra	7.350
^{204}Ra	5.240
^{205}Ra	5.160
^{206}Ra	3.220
^{207}Ra	3.120
^{208}Ra	1.580
^{209}Ra	1.630
^{210}Ra	0.290
^{211}Ra	0.790
^{212}Ra	-0.190
^{213}Ra	0.440
^{214}Ra	0.210
^{215}Ra	2.500
^{216}Ra	3.300
^{217}Ra	5.710
^{218}Ra	6.730
^{219}Ra	9.550
^{220}Ra	10.390
^{221}Ra	13.140
^{222}Ra	14.570
^{223}Ra	17.290
^{224}Ra	18.880
^{225}Ra	21.980
^{226}Ra	23.630
^{227}Ra	26.960
^{228}Ra	28.830
^{229}Ra	32.300
^{230}Ra	34.310
^{231}Ra	38.010
^{232}Ra	40.500
^{233}Ra	44.440
^{234}Ra	47.290
^{235}Ra	51.610
^{236}Ra	54.670
^{237}Ra	59.060
^{238}Ra	62.390
^{239}Ra	67.140
^{240}Ra	70.750
^{241}Ra	76.020
^{242}Ra	80.180
^{204}Ac	14.460
^{205}Ac	12.380
^{206}Ac	12.030
^{207}Ac	10.020
^{208}Ac	9.780
^{209}Ac	8.190
^{210}Ac	8.000
^{211}Ac	6.800
^{212}Ac	6.970
^{213}Ac	6.100
^{214}Ac	6.420
^{215}Ac	6.360
^{216}Ac	8.130
^{217}Ac	8.720
^{218}Ac	10.740
^{219}Ac	11.610
^{220}Ac	13.740
^{221}Ac	14.580
^{222}Ac	16.980
^{223}Ac	18.170
^{224}Ac	20.410
^{225}Ac	21.960
^{226}Ac	24.600
^{227}Ac	26.130
^{228}Ac	28.990
^{229}Ac	30.910
^{230}Ac	33.710
^{231}Ac	35.780
^{232}Ac	39.060
^{233}Ac	41.480
^{234}Ac	45.000
^{235}Ac	47.870
^{236}Ac	51.750

Isotope	Mass Excess
^{237}Ac	54.720
^{238}Ac	58.720
^{239}Ac	61.970
^{240}Ac	66.450
^{241}Ac	69.940
^{242}Ac	74.950
^{243}Ac	79.000
^{244}Ac	84.250
^{245}Ac	88.530
^{207}Th	17.200
^{208}Th	15.070
^{209}Th	14.790
^{210}Th	12.970
^{211}Th	12.940
^{212}Th	11.420
^{213}Th	11.710
^{214}Th	10.540
^{215}Th	11.040
^{216}Th	10.710
^{217}Th	12.270
^{218}Th	12.460
^{219}Th	14.330
^{220}Th	14.510
^{221}Th	16.630
^{222}Th	17.120
^{223}Th	19.280
^{224}Th	19.980
^{225}Th	22.180
^{226}Th	23.260
^{227}Th	25.780
^{228}Th	26.840
^{229}Th	29.740
^{230}Th	30.980
^{231}Th	33.840
^{232}Th	35.480
^{233}Th	38.680
^{234}Th	40.680
^{235}Th	44.210
^{236}Th	46.640
^{237}Th	50.420
^{238}Th	52.990
^{239}Th	56.910
^{240}Th	59.880
^{241}Th	64.240
^{242}Th	67.450
^{243}Th	72.340
^{244}Th	76.060
^{245}Th	81.200
^{246}Th	85.130
^{247}Th	90.540
^{209}Pa	22.270
^{210}Pa	21.780
^{211}Pa	20.130
^{212}Pa	19.790
^{213}Pa	18.400
^{214}Pa	18.410
^{215}Pa	17.430
^{216}Pa	17.670
^{217}Pa	17.360
^{218}Pa	18.520
^{219}Pa	18.570
^{220}Pa	19.740
^{221}Pa	19.900
^{222}Pa	21.680
^{223}Pa	21.930
^{224}Pa	23.590
^{225}Pa	24.250
^{226}Pa	25.970
^{227}Pa	26.930
^{228}Pa	28.970
^{229}Pa	30.060
^{230}Pa	32.290
^{231}Pa	33.580
^{232}Pa	36.000

Isotope	Mass Excess
^{233}Pa	37.570
^{234}Pa	40.340
^{235}Pa	42.340
^{236}Pa	45.430
^{237}Pa	47.740
^{238}Pa	51.130
^{239}Pa	53.610
^{240}Pa	57.250
^{241}Pa	60.090
^{242}Pa	64.170
^{243}Pa	67.260
^{244}Pa	71.810
^{245}Pa	75.400
^{246}Pa	80.200
^{247}Pa	84.030
^{248}Pa	89.160
^{212}U	25.600
^{213}U	25.410
^{214}U	23.750
^{215}U	23.960
^{216}U	22.720
^{217}U	23.000
^{218}U	22.520
^{219}U	23.530
^{220}U	22.880
^{221}U	24.040
^{222}U	23.860
^{223}U	25.380
^{224}U	25.130
^{225}U	26.750
^{226}U	26.940
^{227}U	28.530
^{228}U	29.010
^{229}U	31.080
^{230}U	31.490
^{231}U	33.760
^{232}U	34.620
^{233}U	36.950
^{234}U	38.080
^{235}U	40.850
^{236}U	42.410
^{237}U	45.380
^{238}U	47.300
^{239}U	50.590
^{240}U	52.780
^{241}U	56.280
^{242}U	58.840
^{243}U	62.790
^{244}U	65.530
^{245}U	69.960
^{246}U	73.200
^{247}U	77.890
^{248}U	81.450
^{249}U	86.370
^{214}Np	33.070 †
^{215}Np	31.630 †
^{216}Np	31.590 †
^{217}Np	30.410 †
^{218}Np	30.520 †
^{219}Np	30.100 †
^{220}Np	30.410
^{221}Np	29.750
^{222}Np	30.550
^{223}Np	30.120
^{224}Np	31.150
^{225}Np	30.850
^{226}Np	32.000
^{227}Np	32.050
^{228}Np	33.160
^{229}Np	33.670
^{230}Np	35.060
^{231}Np	35.510
^{232}Np	37.340
^{233}Np	38.110
^{234}Np	40.000
^{235}Np	41.130
^{236}Np	43.450
^{237}Np	44.880
^{238}Np	47.450
^{239}Np	49.270
^{240}Np	52.260
^{241}Np	54.320
^{242}Np	57.530
^{243}Np	59.950
^{244}Np	63.550
^{245}Np	66.170
^{246}Np	70.240
^{247}Np	73.370
^{248}Np	77.770
^{249}Np	81.120
^{250}Np	85.810
^{217}Pu	38.200
^{218}Pu	36.870
^{219}Pu	37.050
^{220}Pu	36.120
^{221}Pu	36.410
^{222}Pu	35.400
^{223}Pu	35.950
^{224}Pu	35.020
^{225}Pu	36.000
^{226}Pu	35.230
^{227}Pu	36.240
^{228}Pu	35.810
^{229}Pu	36.950
^{230}Pu	36.770
^{231}Pu	38.200
^{232}Pu	38.210
^{233}Pu	39.950
^{234}Pu	40.270
^{235}Pu	42.160
^{236}Pu	42.830
^{237}Pu	45.030
^{238}Pu	46.060
^{239}Pu	48.520
^{240}Pu	50.040
^{241}Pu	52.890
^{242}Pu	54.650
^{243}Pu	57.720
^{244}Pu	59.800
^{245}Pu	63.260
^{246}Pu	65.510
^{247}Pu	69.470
^{248}Pu	72.310
^{249}Pu	76.490
^{250}Pu	79.600
^{251}Pu	84.100
^{219}Am	45.600 †
^{220}Am	45.280 †
^{221}Am	44.490 †
^{222}Am	44.440 †
^{223}Am	43.160 †
^{224}Am	43.220
^{225}Am	42.240
^{226}Am	42.740
^{227}Am	41.830
^{228}Am	42.350
^{229}Am	41.950
^{230}Am	42.410
^{231}Am	42.270
^{232}Am	43.250
^{233}Am	43.170
^{234}Am	44.460
^{235}Am	44.780
^{236}Am	46.210
^{237}Am	46.760
^{238}Am	48.550
^{239}Am	49.470
^{240}Am	51.630
^{241}Am	53.000
^{242}Am	55.550
^{243}Am	57.170
^{244}Am	59.890
^{245}Am	61.820
^{246}Am	64.910
^{247}Am	67.050
^{248}Am	70.700
^{249}Am	73.330
^{250}Am	77.270
^{251}Am	80.180
^{252}Am	84.450
^{222}Cm	51.620 ‡
^{223}Cm	51.300 ‡
^{224}Cm	49.530
^{225}Cm	49.530
^{226}Cm	48.070
^{227}Cm	48.440
^{228}Cm	47.040
^{229}Cm	47.590
^{230}Cm	46.500
^{231}Cm	46.990
^{232}Cm	46.410
^{233}Cm	47.300
^{234}Cm	46.780
^{235}Cm	48.060
^{236}Cm	47.920
^{237}Cm	49.230
^{238}Cm	49.360
^{239}Cm	51.040
^{240}Cm	51.650
^{241}Cm	53.660
^{242}Cm	54.730
^{243}Cm	57.140
^{244}Cm	58.400
^{245}Cm	60.970
^{246}Cm	62.530
^{247}Cm	65.500
^{248}Cm	67.330
^{249}Cm	70.770
^{250}Cm	73.150
^{251}Cm	76.880
^{252}Cm	79.560
^{253}Cm	83.660
^{224}Bk	60.090 †
^{225}Bk	58.270 †
^{226}Bk	57.780 †
^{227}Bk	56.190 †
^{228}Bk	56.060 †
^{229}Bk	54.690 †
^{230}Bk	54.560
^{231}Bk	53.500
^{232}Bk	53.550
^{233}Bk	52.870
^{234}Bk	53.320
^{235}Bk	52.780
^{236}Bk	53.600
^{237}Bk	53.340
^{238}Bk	54.230
^{239}Bk	54.250
^{240}Bk	55.620
^{241}Bk	56.080
^{242}Bk	57.790
^{243}Bk	58.720
^{244}Bk	60.760
^{245}Bk	61.870
^{246}Bk	64.070
^{247}Bk	65.500
^{248}Bk	68.170
^{249}Bk	69.770
^{250}Bk	72.960
^{251}Bk	75.120
^{252}Bk	78.630
^{253}Bk	81.130
^{254}Bk	84.880
^{227}Cf	65.040 ‡
^{228}Cf	62.950 ‡
^{229}Cf	62.850
^{230}Cf	60.790
^{231}Cf	60.690
^{232}Cf	59.190
^{233}Cf	59.140
^{234}Cf	58.020
^{235}Cf	58.450
^{236}Cf	57.450
^{237}Cf	58.150
^{238}Cf	57.470
^{239}Cf	58.250
^{240}Cf	57.960
^{241}Cf	59.180
^{242}Cf	59.340
^{243}Cf	60.900
^{244}Cf	61.460
^{245}Cf	63.350
^{246}Cf	64.080
^{247}Cf	66.150
^{248}Cf	67.270
^{249}Cf	69.710
^{250}Cf	71.060
^{251}Cf	74.030
^{252}Cf	75.960
^{253}Cf	79.280
^{254}Cf	81.430
^{255}Cf	85.140
^{229}Es	72.140 †
^{230}Es	71.350 †
^{231}Es	69.320 †
^{232}Es	68.770 †
^{233}Es	67.180 †
^{234}Es	66.680 †
^{235}Es	65.550 †
^{236}Es	65.520
^{237}Es	64.390
^{238}Es	64.680
^{239}Es	63.880
^{240}Es	64.350
^{241}Es	63.910
^{242}Es	64.820
^{243}Es	64.830
^{244}Es	66.020
^{245}Es	66.430
^{246}Es	67.940
^{247}Es	68.540
^{248}Es	70.300
^{249}Es	71.190
^{250}Es	73.370
^{251}Es	74.500
^{252}Es	77.230
^{253}Es	78.970
^{254}Es	81.940
^{255}Es	84.040
^{256}Es	87.410
^{231}Fm	79.060 †
^{232}Fm	76.580 ‡
^{233}Fm	75.930 ‡
^{234}Fm	73.890 ‡
^{235}Fm	73.380
^{236}Fm	71.780
^{237}Fm	71.630
^{238}Fm	70.090
^{239}Fm	70.250
^{240}Fm	69.150
^{241}Fm	69.460
^{242}Fm	68.720
^{243}Fm	69.480
^{244}Fm	69.120
^{245}Fm	70.150
^{246}Fm	70.180
^{247}Fm	71.560
^{248}Fm	71.850
^{249}Fm	73.370
^{250}Fm	74.000
^{251}Fm	75.960
^{252}Fm	76.850
^{253}Fm	79.390
^{254}Fm	80.770
^{255}Fm	83.690
^{256}Fm	85.440
^{257}Fm	88.580
^{234}Md	85.050 †
^{235}Md	83.000 †
^{236}Md	82.020 †
^{237}Md	80.290 †
^{238}Md	79.720 †
^{239}Md	78.070 †
^{240}Md	77.920 †
^{241}Md	76.660 †
^{242}Md	76.670
^{243}Md	75.770
^{244}Md	76.160
^{245}Md	75.650
^{246}Md	76.300
^{247}Md	76.190
^{248}Md	77.260
^{249}Md	77.310
^{250}Md	78.570
^{251}Md	78.980
^{252}Md	80.690
^{253}Md	81.390
^{254}Md	83.570
^{255}Md	84.900
^{256}Md	87.460
^{257}Md	88.980
^{258}Md	91.770
^{236}No	90.890 †
^{237}No	89.790 †
^{238}No	87.640 †
^{239}No	86.950 ‡
^{240}No	84.980 ‡
^{241}No	84.680
^{242}No	83.120
^{243}No	82.970
^{244}No	81.700
^{245}No	81.940
^{246}No	81.040
^{247}No	81.560
^{248}No	81.130
^{249}No	81.960
^{250}No	81.750
^{251}No	82.780
^{252}No	82.950
^{253}No	84.470
^{254}No	84.800
^{255}No	86.930
^{256}No	87.910
^{257}No	90.230
^{258}No	91.400
^{259}No	94.030
^{238}Lr	99.330 †
^{239}Lr	97.070 †
^{240}Lr	96.060 †
^{241}Lr	93.940 †
^{242}Lr	93.330 †
^{243}Lr	91.610 †
^{244}Lr	91.100 †
^{245}Lr	89.670 †
^{246}Lr	89.520 †
^{247}Lr	88.490 †
^{248}Lr	88.690
^{249}Lr	88.020
^{250}Lr	88.590
^{251}Lr	88.150
^{252}Lr	88.940
^{253}Lr	88.900
^{254}Lr	90.060
^{255}Lr	90.340
^{256}Lr	92.110
^{257}Lr	92.840
^{258}Lr	94.820
^{259}Lr	95.830
^{260}Lr	98.130