

P. Moller and J.R. Nix Masses

† Nuclide is unstable to one-particle emission

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

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁶ O	-5.710	³¹ Na	13.480	³⁸ Si	-3.160	³⁴ Cl	-22.600	⁵⁴ K	-2.510	⁴¹ Ti	-18.250
¹⁷ O	-1.280	³² Na	19.540	³⁹ Si	1.910	³⁵ Cl	-27.150	⁵⁵ K	2.860	⁴² Ti	-27.210
¹⁸ O	-3.120	³³ Na	24.980	⁴⁰ Si	6.010	³⁶ Cl	-28.020	⁵⁶ K	9.420	⁴³ Ti	-32.120
¹⁹ O	1.860	³⁴ Na	31.090	⁴¹ Si	12.180	³⁷ Cl	-31.840			⁴⁴ Ti	-40.660
²⁰ O	3.750	³⁵ Na	37.270	⁴² Si	16.680	³⁸ Cl	-30.360	²⁹ Ca	92.520 †	⁴⁵ Ti	-42.150
²¹ O	9.180	³⁶ Na	44.580	⁴³ Si	24.650	³⁹ Cl	-30.310	³⁰ Ca	72.130 †	⁴⁶ Ti	-47.130
²² O	11.690	³⁷ Na	52.890 †	⁴⁴ Si	31.530	⁴⁰ Cl	-28.550	³¹ Ca	56.620 †	⁴⁷ Ti	-47.140
²³ O	18.170	³⁸ Na	63.120 †	⁴⁵ Si	39.920 †	⁴¹ Cl	-28.170	³² Ca	41.350 †	⁴⁸ Ti	-50.950
²⁴ O	22.920	³⁹ Na	70.160 ‡	⁴⁶ Si	47.760 ‡	⁴² Cl	-25.180	³³ Ca	28.990 †	⁴⁹ Ti	-49.030
²⁵ O	32.570 †					⁴³ Cl	-23.760	³⁴ Ca	13.940 ‡	⁵⁰ Ti	-52.130
²⁶ O	38.390	²⁰ Mg	16.470	²³ P	44.500 †	⁴⁴ Cl	-19.860	³⁵ Ca	5.300	⁵¹ Ti	-49.550
²⁷ O	47.480 †	²¹ Mg	8.220	²⁴ P	31.450 †	⁴⁵ Cl	-17.240	³⁶ Ca	-5.870	⁵² Ti	-50.150
²⁸ O	53.830	²² Mg	-1.550	²⁵ P	18.480 †	⁴⁶ Cl	-12.270	³⁷ Ca	-11.910	⁵³ Ti	-46.870
²⁹ O	64.240 †	²³ Mg	-5.910	²⁶ P	9.560	⁴⁷ Cl	-7.400	³⁸ Ca	-22.660	⁵⁴ Ti	-45.050
³⁰ O	77.430 †	²⁴ Mg	-14.430	²⁷ P	-0.530	⁴⁸ Cl	-1.400	³⁹ Ca	-26.820	⁵⁵ Ti	-40.360
³¹ O	84.610 ‡	²⁵ Mg	-13.600	²⁸ P	-6.050	⁴⁹ Cl	4.260	⁴⁰ Ca	-34.240	⁵⁶ Ti	-38.570
³² O	94.550 †	²⁶ Mg	-16.500	²⁹ P	-15.310	⁵⁰ Cl	10.820	⁴¹ Ca	-36.110	⁵⁷ Ti	-33.750
³³ O	108.880 †	²⁷ Mg	-13.690	³⁰ P	-18.210	⁵¹ Cl	16.650	⁴² Ca	-40.590	⁵⁸ Ti	-31.230
		²⁸ Mg	-14.140	³¹ P	-23.110	⁵² Cl	24.130	⁴³ Ca	-40.670	⁵⁹ Ti	-25.760
¹⁷ F	0.860	²⁹ Mg	-9.610	³² P	-21.820			⁴⁴ Ca	-43.490	⁶⁰ Ti	-22.670
¹⁸ F	0.790	³⁰ Mg	-8.410	³³ P	-23.950	²⁷ Ar	65.210 †	⁴⁵ Ca	-42.500	⁶¹ Ti	-17.630
¹⁹ F	-3.290	³¹ Mg	-2.620	³⁴ P	-21.720	²⁸ Ar	47.200 †	⁴⁶ Ca	-44.180	⁶² Ti	-13.730
²⁰ F	-1.730	³² Mg	0.760	³⁵ P	-23.270	²⁹ Ar	34.430 †	⁴⁷ Ca	-42.080		
²¹ F	-1.200	³³ Mg	6.820	³⁶ P	-19.860	³⁰ Ar	19.970 †	⁴⁸ Ca	-42.460	³⁷ V	46.320 †
²² F	2.630	³⁴ Mg	10.700	³⁷ P	-18.520	³¹ Ar	10.580	⁴⁹ Ca	-39.490	³⁸ V	33.700 †
²³ F	4.180	³⁵ Mg	16.700	³⁸ P	-14.800	³² Ar	-1.800	⁵⁰ Ca	-37.770	³⁹ V	19.570 †
²⁴ F	8.790	³⁶ Mg	21.240	³⁹ P	-12.510	³³ Ar	-8.410	⁵¹ Ca	-33.050	⁴⁰ V	9.360 †
²⁵ F	12.990	³⁷ Mg	28.190	⁴⁰ P	-7.730	³⁴ Ar	-17.470	⁵² Ca	-30.340	⁴¹ V	-2.510 †
²⁶ F	20.320	³⁸ Mg	34.520	⁴¹ P	-4.530	³⁵ Ar	-21.520	⁵³ Ca	-24.470	⁴² V	-10.400 †
²⁷ F	26.090	³⁹ Mg	43.980 †	⁴² P	0.790	³⁶ Ar	-29.380	⁵⁴ Ca	-21.200	⁴³ V	-19.980
²⁸ F	33.710	⁴⁰ Mg	50.310	⁴³ P	5.000	³⁷ Ar	-30.680	⁵⁵ Ca	-15.100	⁴⁴ V	-26.110
²⁹ F	39.530	⁴¹ Mg	59.420 †	⁴⁴ P	11.120	³⁸ Ar	-34.860	⁵⁶ Ca	-11.140	⁴⁵ V	-35.250
³⁰ F	48.390 †			⁴⁵ P	17.650	³⁹ Ar	-34.770	⁵⁷ Ca	-4.910	⁴⁶ V	-37.840
³¹ F	57.110 †	²¹ Al	26.060 †	⁴⁶ P	24.900	⁴⁰ Ar	-37.340	⁵⁸ Ca	-0.220	⁴⁷ V	-43.200
³² F	67.460 †	²² Al	16.570 †	⁴⁷ P	32.260	⁴¹ Ar	-34.780			⁴⁸ V	-45.180
³³ F	74.850 ‡	²³ Al	5.000	⁴⁸ P	40.050	⁴² Ar	-35.970	³³ Sc	53.670 †	⁴⁹ V	-49.860
³⁴ F	84.550 †	²⁴ Al	-0.900			⁴³ Ar	-33.210	³⁴ Sc	40.250 †	⁵⁰ V	-49.540
³⁵ F	95.730 †	²⁵ Al	-9.640	²⁴ S	54.600 †	⁴⁴ Ar	-33.060	³⁵ Sc	24.930 †	⁵¹ V	-53.060
		²⁶ Al	-11.310	²⁵ S	42.590 †	⁴⁵ Ar	-28.870	³⁶ Sc	14.650 †	⁵² V	-51.480
¹⁸ Ne	3.200	²⁷ Al	-16.630	²⁶ S	27.160 †	⁴⁶ Ar	-28.230	³⁷ Sc	3.090 †	⁵³ V	-52.200
¹⁹ Ne	-1.820	²⁸ Al	-16.330	²⁷ S	16.620	⁴⁷ Ar	-23.660	³⁸ Sc	-4.640	⁵⁴ V	-49.450
²⁰ Ne	-7.770	²⁹ Al	-17.150	²⁸ S	3.730	⁴⁸ Ar	-19.790	³⁹ Sc	-14.100 †	⁵⁵ V	-48.780
²¹ Ne	-6.140	³⁰ Al	-14.720	²⁹ S	-3.200	⁴⁹ Ar	-13.660	⁴⁰ Sc	-21.430	⁵⁶ V	-45.510
²² Ne	-8.980	³¹ Al	-13.330	³⁰ S	-14.020	⁵⁰ Ar	-9.230	⁴¹ Sc	-29.630	⁵⁷ V	-44.000
²³ Ne	-5.980	³² Al	-9.770	³¹ S	-17.420	⁵¹ Ar	-2.660	⁴² Sc	-33.310	⁵⁸ V	-40.160
²⁴ Ne	-6.360	³³ Al	-9.570	³² S	-25.340	⁵² Ar	2.070	⁴³ Sc	-39.400	⁵⁹ V	-38.090
²⁵ Ne	-1.530	³⁴ Al	-2.680	³³ S	-25.190	⁵³ Ar	8.860	⁴⁴ Sc	-40.050	⁶⁰ V	-33.690
²⁶ Ne	1.950	³⁵ Al	0.420	³⁴ S	-28.990	⁵⁴ Ar	14.900	⁴⁵ Sc	-43.710	⁶¹ V	-30.810
²⁷ Ne	7.950	³⁶ Al	4.880	³⁵ S	-26.980			⁴⁶ Sc	-43.670	⁶² V	-26.240
²⁸ Ne	11.640	³⁷ Al	9.530	³⁶ S	-30.390	³⁰ K	45.610 †	⁴⁷ Sc	-45.990	⁶³ V	-23.200
²⁹ Ne	19.090	³⁸ Al	14.920	³⁷ S	-26.160	³¹ K	31.160 †	⁴⁸ Sc	-44.280	⁶⁴ V	-17.250
³⁰ Ne	22.880	³⁹ Al	20.980	³⁸ S	-26.420	³² K	19.910 †	⁴⁹ Sc	-45.960		
³¹ Ne	32.430 †	⁴⁰ Al	27.500	³⁹ S	-22.980	³³ K	7.430 †	⁵⁰ Sc	-43.470	³⁶ Cr	91.520 †
³² Ne	38.920	⁴¹ Al	34.110	⁴⁰ S	-22.170	³⁴ K	-0.770 †	⁵¹ Sc	-42.500	³⁷ Cr	74.590 †
³³ Ne	46.630	⁴² Al	41.940	⁴¹ S	-17.720	³⁵ K	-10.080 †	⁵² Sc	-39.020	³⁸ Cr	56.960 †
³⁴ Ne	54.720 †	⁴³ Al	49.660	⁴² S	-15.900	³⁶ K	-16.010	⁵³ Sc	-36.300	³⁹ Cr	43.420 †
³⁵ Ne	63.640 †			⁴³ S	-11.090	³⁷ K	-23.230	⁵⁴ Sc	-31.630	⁴⁰ Cr	28.560 †
³⁶ Ne	72.830 †	²² Si	33.310 ‡	⁴⁴ S	-8.370	³⁸ K	-27.610	⁵⁵ Sc	-28.750	⁴¹ Cr	17.200 †
³⁷ Ne	80.950 †	²³ Si	23.860 †	⁴⁵ S	-2.620	³⁹ K	-34.280	⁵⁶ Sc	-23.780	⁴² Cr	3.950 ‡
		²⁴ Si	10.390	⁴⁶ S	2.920	⁴⁰ K	-33.910	⁵⁷ Sc	-19.930	⁴³ Cr	-4.350
¹⁹ Na	10.850 †	²⁵ Si	3.710	⁴⁷ S	9.930	⁴¹ K	-38.010	⁵⁸ Sc	-14.340	⁴⁴ Cr	-15.390
²⁰ Na	4.240	²⁶ Si	-7.470	⁴⁸ S	16.170	⁴² K	-37.340	⁵⁹ Sc	-10.010	⁴⁵ Cr	-21.910
²¹ Na	-3.130	²⁷ Si	-11.300	⁴⁹ S	24.000	⁴³ K	-38.660	⁶⁰ Sc	-5.100	⁴⁶ Cr	-32.410
²² Na	-5.240	²⁸ Si	-20.230	⁵⁰ S	30.350	⁴⁴ K	-37.090			⁴⁷ Cr	-35.960
²³ Na	-10.300	²⁹ Si	-20.040			⁴⁵ K	-37.420	³² Ti	100.870 †	⁴⁸ Cr	-43.310
²⁴ Na	-9.120	³⁰ Si	-22.880	²⁶ Cl	52.780 †	⁴⁶ K	-35.200	³³ Ti	83.470 †	⁴⁹ Cr	-45.630
²⁵ Na	-9.570	³¹ Si	-20.740	²⁷ Cl	37.310 †	⁴⁷ K	-34.320	³⁴ Ti	64.230 †	⁵⁰ Cr	-51.780
²⁶ Na	-6.370	³² Si	-21.050	²⁸ Cl	25.340 †	⁴⁸ K	-30.620	³⁵ Ti	50.740 †	⁵¹ Cr	-51.710
²⁷ Na	-4.840	³³ Si	-18.410	²⁹ Cl	12.670 †	⁴⁹ K	-27.690	³⁶ Ti	33.350 †	⁵² Cr	-56.590
²⁸ Na	-0.010	³⁴ Si	-19.670	³⁰ Cl	3.770	⁵⁰ K	-22.900	³⁷ Ti	21.950 †	⁵³ Cr	-55.130
²⁹ Na	2.860	³⁵ Si	-14.210	³¹ Cl	-6.690 †	⁵¹ K	-18.690	³⁸ Ti	9.610 ‡	⁵⁴ Cr	-57.060
³⁰ Na	8.690	³⁶ Si	-11.340	³² Cl	-13.020	⁵² K	-13.290	³⁹ Ti	0.200	⁵⁵ Cr	-54.560
		³⁷ Si	-6.560	³³ Cl	-20.080	⁵³ K	-8.540	⁴⁰ Ti	-11.910	⁵⁶ Cr	-55.100

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
⁵⁷ Cr	-51.990	⁷³ Fe	-24.240	⁷⁴ Ni	-48.640	⁷⁷ Zn	-58.870	⁸² Ge	-65.070	⁸¹ Se	-76.290
⁵⁸ Cr	-51.650	⁷⁴ Fe	-20.520	⁷⁵ Ni	-44.590	⁷⁸ Zn	-57.050	⁸³ Ge	-60.240	⁸² Se	-77.330
⁵⁹ Cr	-47.880	⁷⁵ Fe	-14.400	⁷⁶ Ni	-42.030	⁷⁹ Zn	-53.310	⁸⁴ Ge	-57.230	⁸³ Se	-75.120
⁶⁰ Cr	-47.010	⁷⁶ Fe	-10.640	⁷⁷ Ni	-37.530	⁸⁰ Zn	-51.830	⁸⁵ Ge	-51.650	⁸⁴ Se	-75.550
⁶¹ Cr	-42.390	⁷⁷ Fe	-3.110	⁷⁸ Ni	-34.430	⁸¹ Zn	-45.930	⁸⁶ Ge	-47.840	⁸⁵ Se	-71.660
⁶² Cr	-40.860	⁷⁸ Fe	2.980	⁷⁹ Ni	-28.080	⁸² Zn	-41.970	⁸⁷ Ge	-42.040	⁸⁶ Se	-69.690
⁶³ Cr	-34.850			⁸⁰ Ni	-22.720	⁸³ Zn	-35.320	⁸⁸ Ge	-37.880	⁸⁷ Se	-64.920
⁶⁴ Cr	-34.450	⁴³ Co	63.000 †	⁸¹ Ni	-15.440	⁸⁴ Zn	-30.320	⁸⁹ Ge	-31.930	⁸⁸ Se	-62.170
⁶⁵ Cr	-28.540	⁴⁴ Co	49.110 †	⁸² Ni	-9.280	⁸⁵ Zn	-23.440	⁹⁰ Ge	-27.140	⁸⁹ Se	-57.270
⁶⁶ Cr	-25.800	⁴⁵ Co	34.810 †			⁸⁶ Zn	-18.090	⁹¹ Ge	-20.680	⁹⁰ Se	-54.190
⁶⁷ Cr	-19.540	⁴⁶ Co	22.880 †	⁴⁸ Cu	44.380 †			⁹² Ge	-15.780	⁹¹ Se	-49.050
		⁴⁷ Co	9.680 †	⁴⁹ Cu	29.280 †	⁵⁴ Ga	17.050 †	⁹³ Ge	-9.160	⁹² Se	-45.470
⁴¹ Mn	40.440 †	⁴⁸ Co	1.010 †	⁵⁰ Cu	19.050 †	⁵⁵ Ga	4.470 †			⁹³ Se	-39.860
⁴² Mn	28.380 †	⁴⁹ Co	-10.610 †	⁵¹ Cu	5.990 †	⁵⁶ Ga	-4.600 †	⁵⁹ As	3.010 †	⁹⁴ Se	-35.900
⁴³ Mn	14.250 †	⁵⁰ Co	-18.220 †	⁵² Cu	-2.980 †	⁵⁷ Ga	-15.680 †	⁶⁰ As	-6.250 †	⁹⁵ Se	-30.140
⁴⁴ Mn	4.680 †	⁵¹ Co	-28.050 †	⁵³ Cu	-14.200 †	⁵⁸ Ga	-23.370 †	⁶¹ As	-17.000 †	⁹⁶ Se	-25.690
⁴⁵ Mn	-6.830 †	⁵² Co	-34.580	⁵⁴ Cu	-21.930 †	⁵⁹ Ga	-33.300 †	⁶² As	-24.160 †	⁹⁷ Se	-19.380
⁴⁶ Mn	-14.300 †	⁵³ Co	-42.600	⁵⁵ Cu	-31.520 †	⁶⁰ Ga	-38.350 †	⁶³ As	-32.710 †	⁹⁸ Se	-14.350
⁴⁷ Mn	-24.850 †	⁵⁴ Co	-46.360	⁵⁶ Cu	-37.310	⁶¹ Ga	-45.560	⁶⁴ As	-38.160 †		
⁴⁸ Mn	-29.890	⁵⁵ Co	-52.610	⁵⁷ Cu	-45.710	⁶² Ga	-49.210	⁶⁵ As	-45.750	⁶² Br	13.470 †
⁴⁹ Mn	-38.150	⁵⁶ Co	-54.430	⁵⁸ Cu	-49.250	⁶³ Ga	-55.020	⁶⁶ As	-49.660	⁶³ Br	2.070 †
⁵⁰ Mn	-41.950	⁵⁷ Co	-58.030	⁵⁹ Cu	-54.800	⁶⁴ Ga	-57.220	⁶⁷ As	-55.560	⁶⁴ Br	-6.260 †
⁵¹ Mn	-48.660	⁵⁸ Co	-58.520	⁶⁰ Cu	-56.370	⁶⁵ Ga	-61.420	⁶⁸ As	-58.300	⁶⁵ Br	-16.610 †
⁵² Mn	-50.690	⁵⁹ Co	-60.800	⁶¹ Cu	-60.100	⁶⁶ Ga	-62.750	⁶⁹ As	-62.950	⁶⁶ Br	-23.680 †
⁵³ Mn	-55.200	⁶⁰ Co	-60.270	⁶² Cu	-61.030	⁶⁷ Ga	-66.070	⁷⁰ As	-64.200	⁶⁷ Br	-32.310 †
⁵⁴ Mn	-55.160	⁶¹ Co	-61.600	⁶³ Cu	-63.770	⁶⁸ Ga	-66.330	⁷¹ As	-67.860	⁶⁸ Br	-38.110 †
⁵⁵ Mn	-57.170	⁶² Co	-60.200	⁶⁴ Cu	-63.630	⁶⁹ Ga	-68.630	⁷² As	-68.310	⁶⁹ Br	-45.860 †
⁵⁶ Mn	-55.980	⁶³ Co	-60.790	⁶⁵ Cu	-65.700	⁷⁰ Ga	-67.960	⁷³ As	-71.100	⁷⁰ Br	-49.580
⁵⁷ Mn	-56.880	⁶⁴ Co	-58.920	⁶⁶ Cu	-64.710	⁷¹ Ga	-69.700	⁷⁴ As	-70.960	⁷¹ Br	-56.260
⁵⁸ Mn	-54.960	⁶⁵ Co	-59.170	⁶⁷ Cu	-65.920	⁷² Ga	-68.560	⁷⁵ As	-73.160	⁷² Br	-58.830
⁵⁹ Mn	-54.960	⁶⁶ Co	-56.220	⁶⁸ Cu	-64.890	⁷³ Ga	-69.790	⁷⁶ As	-72.530	⁷³ Br	-63.840
⁶⁰ Mn	-52.600	⁶⁷ Co	-55.500	⁶⁹ Cu	-64.980	⁷⁴ Ga	-68.110	⁷⁷ As	-73.980	⁷⁴ Br	-66.080
⁶¹ Mn	-51.700	⁶⁸ Co	-52.180	⁷⁰ Cu	-62.720	⁷⁵ Ga	-68.110	⁷⁸ As	-72.750	⁷⁵ Br	-69.320
⁶² Mn	-48.340	⁶⁹ Co	-50.780	⁷¹ Cu	-62.420	⁷⁶ Ga	-66.030	⁷⁹ As	-73.450	⁷⁶ Br	-70.330
⁶³ Mn	-46.880	⁷⁰ Co	-46.830	⁷² Cu	-59.650	⁷⁷ Ga	-65.690	⁸⁰ As	-71.930	⁷⁷ Br	-73.650
⁶⁴ Mn	-42.900	⁷¹ Co	-44.640	⁷³ Cu	-58.720	⁷⁸ Ga	-63.330	⁸¹ As	-71.920	⁷⁸ Br	-74.050
⁶⁵ Mn	-41.890	⁷² Co	-40.700	⁷⁴ Cu	-55.870	⁷⁹ Ga	-62.360	⁸² As	-69.760	⁷⁹ Br	-76.670
⁶⁶ Mn	-36.960	⁷³ Co	-37.810	⁷⁵ Cu	-54.160	⁸⁰ Ga	-59.070	⁸³ As	-68.820	⁸⁰ Br	-76.590
⁶⁷ Mn	-34.920	⁷⁴ Co	-33.700	⁷⁶ Cu	-50.950	⁸¹ Ga	-57.450	⁸⁴ As	-65.370	⁸¹ Br	-78.410
⁶⁸ Mn	-29.470	⁷⁵ Co	-29.790	⁷⁷ Cu	-48.450	⁸² Ga	-52.710	⁸⁵ As	-62.460	⁸² Br	-77.740
⁶⁹ Mn	-25.640	⁷⁶ Co	-25.260	⁷⁸ Cu	-44.480	⁸³ Ga	-48.620	⁸⁶ As	-57.760	⁸³ Br	-78.940
⁷⁰ Mn	-21.070	⁷⁷ Co	-21.880	⁷⁹ Cu	-41.990	⁸⁴ Ga	-42.920	⁸⁷ As	-54.170	⁸⁴ Br	-77.370
		⁷⁸ Co	-14.880	⁸⁰ Cu	-36.080	⁸⁵ Ga	-38.220	⁸⁸ As	-49.220	⁸⁵ Br	-77.960
⁴⁰ Fe	81.750 †	⁷⁹ Co	-8.820	⁸¹ Cu	-31.140	⁸⁶ Ga	-32.270	⁸⁹ As	-45.220	⁸⁶ Br	-75.150
⁴¹ Fe	67.110 †	⁸⁰ Co	-1.430	⁸² Cu	-24.750	⁸⁷ Ga	-27.230	⁹⁰ As	-40.110	⁸⁷ Br	-73.290
⁴² Fe	50.510 †			⁸³ Cu	-18.930	⁸⁸ Ga	-21.010	⁹¹ As	-35.600	⁸⁸ Br	-69.350
⁴³ Fe	37.680 †	⁴⁴ Ni	74.890 †	⁸⁴ Cu	-12.120			⁹² As	-29.830	⁸⁹ Br	-66.730
⁴⁴ Fe	22.600 †	⁴⁵ Ni	60.680 †			⁵³ Ge	53.310 †	⁹³ As	-25.080	⁹⁰ Br	-62.670
⁴⁵ Fe	12.300 †	⁴⁶ Ni	44.270 †	⁴⁹ Zn	56.160 †	⁵⁴ Ge	37.690 †	⁹⁴ As	-19.220	⁹¹ Br	-59.830
⁴⁶ Fe	-0.500 †	⁴⁷ Ni	32.270 †	⁵⁰ Zn	40.000 †	⁵⁵ Ge	26.980 †	⁹⁵ As	-14.020	⁹² Br	-55.590
⁴⁷ Fe	-8.560	⁴⁸ Ni	17.960 †	⁵¹ Zn	28.880 †	⁵⁶ Ge	13.240 †	⁹⁶ As	-7.640	⁹³ Br	-52.330
⁴⁸ Fe	-20.690	⁴⁹ Ni	8.090 †	⁵² Zn	14.100 †	⁵⁷ Ge	3.890 †			⁹⁴ Br	-47.560
⁴⁹ Fe	-26.590	⁵⁰ Ni	-4.980 †	⁵³ Zn	5.400 †	⁵⁸ Ge	-8.340 †	⁵⁷ Se	51.080 †	⁹⁵ Br	-43.830
⁵⁰ Fe	-35.570	⁵¹ Ni	-12.960	⁵⁴ Zn	-6.970 †	⁵⁹ Ge	-16.350 †	⁵⁸ Se	36.040 †	⁹⁶ Br	-38.830
⁵¹ Fe	-40.730	⁵² Ni	-23.950	⁵⁵ Zn	-14.690 †	⁶⁰ Ge	-27.440 †	⁵⁹ Se	25.190 †	⁹⁷ Br	-34.580
⁵² Fe	-49.190	⁵³ Ni	-30.540	⁵⁶ Zn	-25.890	⁶¹ Ge	-32.900	⁶⁰ Se	11.770 †	⁹⁸ Br	-29.000
⁵³ Fe	-50.580	⁵⁴ Ni	-40.020	⁵⁷ Zn	-32.070	⁶² Ge	-41.220	⁶¹ Se	2.180 †	⁹⁹ Br	-24.090
⁵⁴ Fe	-56.740	⁵⁵ Ni	-44.010	⁵⁸ Zn	-42.120	⁶³ Ge	-45.600	⁶² Se	-9.810 †		
⁵⁵ Fe	-56.780	⁵⁶ Ni	-52.570	⁵⁹ Zn	-45.900	⁶⁴ Ge	-53.000	⁶³ Se	-17.160 †	⁶³ Kr	23.590 †
⁵⁶ Fe	-60.250	⁵⁷ Ni	-54.600	⁶⁰ Zn	-52.850	⁶⁵ Ge	-55.380	⁶⁴ Se	-26.820	⁶⁴ Kr	10.130 †
⁵⁷ Fe	-59.150	⁵⁸ Ni	-59.490	⁶¹ Zn	-54.490	⁶⁶ Ge	-60.630	⁶⁵ Se	-32.510	⁶⁵ Kr	1.640 †
⁵⁸ Fe	-61.210	⁵⁹ Ni	-60.190	⁶² Zn	-59.510	⁶⁷ Ge	-62.160	⁶⁶ Se	-41.130	⁶⁶ Kr	-9.380 †
⁵⁹ Fe	-59.400	⁶⁰ Ni	-62.880	⁶³ Zn	-60.830	⁶⁸ Ge	-66.760	⁶⁷ Se	-45.740	⁶⁷ Kr	-16.470 †
⁶⁰ Fe	-60.520	⁶¹ Ni	-63.070	⁶⁴ Zn	-64.750	⁶⁹ Ge	-66.790	⁶⁸ Se	-53.260	⁶⁸ Kr	-26.550 †
⁶¹ Fe	-57.980	⁶² Ni	-65.250	⁶⁵ Zn	-64.760	⁷⁰ Ge	-70.190	⁶⁹ Se	-56.040	⁶⁹ Kr	-32.360
⁶² Fe	-58.580	⁶³ Ni	-64.380	⁶⁶ Zn	-68.160	⁷¹ Ge	-69.680	⁷⁰ Se	-61.860	⁷⁰ Kr	-41.090
⁶³ Fe	-55.830	⁶⁴ Ni	-66.050	⁶⁷ Zn	-67.100	⁷² Ge	-72.290	⁷¹ Se	-63.270	⁷¹ Kr	-45.480
⁶⁴ Fe	-55.360	⁶⁵ Ni	-63.960	⁶⁸ Zn	-69.420	⁷³ Ge	-71.250	⁷² Se	-67.930	⁷² Kr	-53.660
⁶⁵ Fe	-52.280	⁶⁶ Ni	-65.370	⁶⁹ Zn	-67.940	⁷⁴ Ge	-73.380	⁷³ Se	-68.710	⁷³ Kr	-56.560
⁶⁶ Fe	-51.160	⁶⁷ Ni	-62.750	⁷⁰ Zn	-70.190	⁷⁵ Ge	-71.840	⁷⁴ Se	-72.330	⁷⁴ Kr	-62.510
⁶⁷ Fe	-46.560	⁶⁸ Ni	-62.930	⁷¹ Zn	-67.650	⁷⁶ Ge	-72.950	⁷⁵ Se	-72.310	⁷⁵ Kr	-64.660
⁶⁸ Fe	-44.900	⁶⁹ Ni	-60.120	⁷² Zn	-68.760	⁷⁷ Ge	-70.930	⁷⁶ Se	-75.460	⁷⁶ Kr	-69.420
⁶⁹ Fe	-39.560	⁷⁰ Ni	-59.230	⁷³ Zn	-65.680	⁷⁸ Ge	-71.500	⁷⁷ Se	-74.920	⁷⁷ Kr	-70.270
⁷⁰ Fe	-37.590	⁷¹ Ni	-55.890	⁷⁴ Zn	-65.540	⁷⁹ Ge	-69.120	⁷⁸ Se	-77.180	⁷⁸ Kr	-74.660
⁷¹ Fe	-32.030	⁷² Ni	-54.480	⁷⁵ Zn	-62.740	⁸⁰ Ge	-69.020	⁷⁹ Se	-76.140	⁷⁹ Kr	-75.160
⁷² Fe	-28.650	⁷³ Ni	-50.560	⁷⁶ Zn	-62.180	⁸¹ Ge	-65.740	⁸⁰ Se	-77.750	⁸⁰ Kr	-78.820

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
⁸¹ Kr	-78.750	⁸¹ Sr	-72.170	⁸¹ Zr	-57.000	⁸⁵ Mo	-57.300	⁹³ Ru	-77.170	⁸⁹ Pd	-31.030 ‡		
⁸² Kr	-81.540	⁸² Sr	-77.520	⁸² Zr	-63.610	⁸⁶ Mo	-65.070	⁹⁴ Ru	-83.120	⁹⁰ Pd	-40.870		
⁸³ Kr	-80.970	⁸³ Sr	-78.410	⁸³ Zr	-65.900	⁸⁷ Mo	-68.130	⁹⁵ Ru	-83.460	⁹¹ Pd	-46.640		
⁸⁴ Kr	-83.180	⁸⁴ Sr	-82.450	⁸⁴ Zr	-72.790	⁸⁸ Mo	-74.230	⁹⁶ Ru	-86.960	⁹² Pd	-55.530		
⁸⁵ Kr	-81.450	⁸⁵ Sr	-83.050	⁸⁵ Zr	-74.880	⁸⁹ Mo	-76.210	⁹⁷ Ru	-85.960	⁹³ Pd	-59.110		
⁸⁶ Kr	-83.200	⁸⁶ Sr	-85.970	⁸⁶ Zr	-79.930	⁹⁰ Mo	-81.780	⁹⁸ Ru	-88.140	⁹⁴ Pd	-67.120		
⁸⁷ Kr	-80.280	⁸⁷ Sr	-85.220	⁸⁷ Zr	-81.290	⁹¹ Mo	-82.940	⁹⁹ Ru	-87.150	⁹⁵ Pd	-69.220		
⁸⁸ Kr	-79.420	⁸⁸ Sr	-87.600	⁸⁸ Zr	-85.450	⁹² Mo	-87.130	¹⁰⁰ Ru	-88.690	⁹⁶ Pd	-76.270		
⁸⁹ Kr	-75.240	⁸⁹ Sr	-85.270	⁸⁹ Zr	-85.600	⁹³ Mo	-87.070	¹⁰¹ Ru	-87.470	⁹⁷ Pd	-77.740		
⁹⁰ Kr	-73.490	⁹⁰ Sr	-85.670	⁹⁰ Zr	-88.890	⁹⁴ Mo	-89.550	¹⁰² Ru	-88.730	⁹⁸ Pd	-82.000		
⁹¹ Kr	-69.290	⁹¹ Sr	-82.680	⁹¹ Zr	-87.780	⁹⁵ Mo	-88.230	¹⁰³ Ru	-87.150	⁹⁹ Pd	-81.680		
⁹² Kr	-67.260	⁹² Sr	-81.460	⁹² Zr	-89.110	⁹⁶ Mo	-88.900	¹⁰⁴ Ru	-87.850	¹⁰⁰ Pd	-84.710		
⁹³ Kr	-62.990	⁹³ Sr	-78.340	⁹³ Zr	-87.210	⁹⁷ Mo	-86.990	¹⁰⁵ Ru	-85.890	¹⁰¹ Pd	-84.680		
⁹⁴ Kr	-60.450	⁹⁴ Sr	-77.290	⁹⁴ Zr	-86.720	⁹⁸ Mo	-87.710	¹⁰⁶ Ru	-86.100	¹⁰² Pd	-87.210		
⁹⁵ Kr	-55.970	⁹⁵ Sr	-73.580	⁹⁵ Zr	-84.190	⁹⁹ Mo	-85.790	¹⁰⁷ Ru	-83.610	¹⁰³ Pd	-86.600		
⁹⁶ Kr	-52.990	⁹⁶ Sr	-72.030	⁹⁶ Zr	-84.070	¹⁰⁰ Mo	-86.080	¹⁰⁸ Ru	-83.260	¹⁰⁴ Pd	-88.710		
⁹⁷ Kr	-48.130	⁹⁷ Sr	-68.320	⁹⁷ Zr	-81.030	¹⁰¹ Mo	-83.790	¹⁰⁹ Ru	-80.490	¹⁰⁵ Pd	-87.750		
⁹⁸ Kr	-44.620	⁹⁸ Sr	-66.480	⁹⁸ Zr	-80.640	¹⁰² Mo	-83.610	¹¹⁰ Ru	-79.620	¹⁰⁶ Pd	-89.380		
⁹⁹ Kr	-39.040	⁹⁹ Sr	-62.360	⁹⁹ Zr	-77.580	¹⁰³ Mo	-80.900	¹¹¹ Ru	-76.650	¹⁰⁷ Pd	-88.160		
¹⁰⁰ Kr	-35.030	¹⁰⁰ Sr	-59.830	¹⁰⁰ Zr	-76.660	¹⁰⁴ Mo	-80.270	¹¹² Ru	-75.340	¹⁰⁸ Pd	-89.210		
¹⁰¹ Kr	-29.280	¹⁰¹ Sr	-55.230	¹⁰¹ Zr	-73.280	¹⁰⁵ Mo	-77.100	¹¹³ Ru	-71.920	¹⁰⁹ Pd	-87.550		
⁶⁵ Rb	23.420 †	¹⁰² Sr	-52.110	¹⁰² Zr	-71.710	¹⁰⁶ Mo	-75.860	¹¹⁴ Ru	-70.110	¹¹⁰ Pd	-88.170		
⁶⁶ Rb	13.640 †	¹⁰³ Sr	-47.190	¹⁰³ Zr	-67.860	¹⁰⁷ Mo	-72.370	¹¹⁵ Ru	-66.310	¹¹¹ Pd	-86.010		
⁶⁷ Rb	1.980 †	¹⁰⁴ Sr	-43.670	¹⁰⁴ Zr	-65.690	¹⁰⁸ Mo	-70.680	¹¹⁶ Ru	-63.850	¹¹² Pd	-86.110		
⁶⁸ Rb	-6.130 †	¹⁰⁵ Sr	-38.490	¹⁰⁵ Zr	-61.470	¹⁰⁹ Mo	-66.910	¹¹⁷ Ru	-59.640	¹¹³ Pd	-83.720		
⁶⁹ Rb	-16.390 †	⁶⁹ Y	23.190 †	¹⁰⁶ Zr	-58.810	¹¹⁰ Mo	-64.730	¹¹⁸ Ru	-56.990	¹¹⁴ Pd	-83.370		
⁷⁰ Rb	-23.410 †	⁷⁰ Y	13.850 †	¹⁰⁷ Zr	-54.350	¹¹¹ Mo	-60.590	¹¹⁹ Ru	-52.670	¹¹⁵ Pd	-80.680		
⁷¹ Rb	-32.540 †	⁷¹ Y	2.420 †	¹⁰⁸ Zr	-51.130	¹¹² Mo	-57.730	¹²⁰ Ru	-49.600	¹¹⁶ Pd	-79.730		
⁷² Rb	-37.910 †	⁷² Y	-5.870 †	¹⁰⁹ Zr	-46.510	¹¹³ Mo	-53.160	⁸⁶ Rh	-20.660 †	¹¹⁷ Pd	-76.610		
⁷³ Rb	-46.130 †	⁷³ Y	-16.080 †	⁷⁵ Nb	2.850 †	⁸² Tc	-20.600 †	⁸⁷ Rh	-31.160 †	¹¹⁸ Pd	-75.190		
⁷⁴ Rb	-50.110	⁷⁴ Y	-23.080 †	⁷⁶ Nb	-4.890 †	⁸³ Tc	-30.210 †	⁸⁸ Rh	-37.570 †	¹¹⁹ Pd	-71.730		
⁷⁵ Rb	-56.850	⁷⁵ Y	-32.290 †	⁷⁷ Nb	-15.270 †	⁸⁴ Tc	-36.660 †	⁸⁹ Rh	-46.560 †	¹²⁰ Pd	-70.130		
⁷⁶ Rb	-59.960	⁷⁶ Y	-38.100 †	⁷⁸ Nb	-22.200 †	⁸⁵ Tc	-44.930 †	⁹⁰ Rh	-50.100 †	¹²¹ Pd	-66.610		
⁷⁷ Rb	-64.890	⁷⁷ Y	-46.500 †	⁷⁹ Nb	-31.840 †	⁸⁶ Tc	-50.230	⁹¹ Rh	-58.650 †	¹²² Pd	-64.280		
⁷⁸ Rb	-66.780	⁷⁸ Y	-51.180	⁸⁰ Nb	-38.010 †	⁸⁷ Tc	-57.750 †	⁹² Rh	-63.060	¹²³ Pd	-60.650		
⁷⁹ Rb	-70.880	⁷⁹ Y	-57.520	⁸¹ Nb	-46.020 †	⁸⁸ Tc	-61.790	⁹³ Rh	-70.120	¹²⁴ Pd	-58.400		
⁸⁰ Rb	-72.610	⁸⁰ Y	-60.330	⁸² Nb	-50.540	⁸⁹ Tc	-68.830	⁹⁴ Rh	-72.180	¹²⁵ Pd	-54.850		
⁸¹ Rb	-76.580	⁸¹ Y	-65.500	⁸³ Nb	-57.250	⁹⁰ Tc	-71.570	⁹⁵ Rh	-78.410	¹²⁶ Pd	-52.360		
⁸² Rb	-77.330	⁸² Y	-67.720	⁸⁴ Nb	-60.590	⁹¹ Tc	-77.450	⁹⁶ Rh	-79.350	¹²⁷ Pd	-48.700		
⁸³ Rb	-80.250	⁸³ Y	-73.380	⁸⁵ Nb	-66.580	⁹² Tc	-78.980	⁹⁷ Rh	-83.250	¹²⁸ Pd	-45.670		
⁸⁴ Rb	-80.680	⁸⁴ Y	-75.530	⁸⁶ Nb	-69.920	⁹³ Tc	-83.750	⁹⁸ Rh	-82.940	¹²⁹ Pd	-39.300		
⁸⁵ Rb	-82.990	⁸⁵ Y	-79.580	⁸⁷ Nb	-75.120	⁹⁴ Tc	-84.210	⁹⁹ Rh	-85.270	¹³⁰ Pd	-33.690		
⁸⁶ Rb	-82.190	⁸⁶ Y	-81.280	⁸⁸ Nb	-77.440	⁹⁵ Tc	-87.060	¹⁰⁰ Rh	-85.040	¹³¹ Pd	-26.650		
⁸⁷ Rb	-84.090	⁸⁷ Y	-84.260	⁸⁹ Nb	-82.110	⁹⁶ Tc	-85.790	¹⁰¹ Rh	-86.830	¹³² Pd	-20.530		
⁸⁸ Rb	-81.740	⁸⁸ Y	-84.820	⁹⁰ Nb	-82.790	⁹⁷ Tc	-87.160	¹⁰² Rh	-86.300	⁹⁰ Ag	-19.670 †		
⁸⁹ Rb	-81.070	⁸⁹ Y	-86.770	⁹¹ Nb	-86.740	⁹⁸ Tc	-86.150	¹⁰³ Rh	-87.670	⁹¹ Ag	-30.670 †		
⁹⁰ Rb	-78.140	⁹⁰ Y	-85.790	⁹² Nb	-86.790	⁹⁹ Tc	-87.090	¹⁰⁴ Rh	-86.780	⁹² Ag	-37.320 †		
⁹¹ Rb	-76.410	⁹¹ Y	-86.060	⁹³ Nb	-88.080	¹⁰⁰ Tc	-85.800	¹⁰⁵ Rh	-87.650	⁹³ Ag	-46.290 †		
⁹² Rb	-73.290	⁹² Y	-84.010	⁹⁴ Nb	-86.580	¹⁰¹ Tc	-86.320	¹⁰⁶ Rh	-86.320	⁹⁴ Ag	-51.930		
⁹³ Rb	-71.340	⁹³ Y	-82.670	⁹⁵ Nb	-86.320	¹⁰² Tc	-84.680	¹⁰⁷ Rh	-86.680	⁹⁵ Ag	-60.220		
⁹⁴ Rb	-67.650	⁹⁴ Y	-80.340	⁹⁶ Nb	-84.810	¹⁰³ Tc	-84.770	¹⁰⁸ Rh	-85.010	⁹⁶ Ag	-63.360		
⁹⁵ Rb	-65.380	⁹⁵ Y	-79.380	⁹⁷ Nb	-84.420	¹⁰⁴ Tc	-82.750	¹⁰⁹ Rh	-84.720	⁹⁷ Ag	-70.480		
⁹⁶ Rb	-61.630	⁹⁶ Y	-76.440	⁹⁸ Nb	-82.650	¹⁰⁵ Tc	-82.230	¹¹⁰ Rh	-82.600	⁹⁸ Ag	-72.400		
⁹⁷ Rb	-58.960	⁹⁷ Y	-75.290	⁹⁹ Nb	-82.350	¹⁰⁶ Tc	-79.810	¹¹¹ Rh	-82.020	⁹⁹ Ag	-77.180		
⁹⁸ Rb	-54.710	⁹⁸ Y	-72.310	¹⁰⁰ Nb	-79.870	¹⁰⁷ Tc	-78.700	¹¹² Rh	-79.670	¹⁰⁰ Ag	-77.810		
⁹⁹ Rb	-51.390	⁹⁹ Y	-70.730	¹⁰¹ Nb	-79.150	¹⁰⁸ Tc	-75.900	¹¹³ Rh	-78.590	¹⁰¹ Ag	-81.160		
¹⁰⁰ Rb	-46.630	¹⁰⁰ Y	-67.380	¹⁰² Nb	-76.560	¹⁰⁹ Tc	-74.390	¹¹⁴ Rh	-75.810	¹⁰² Ag	-81.580		
¹⁰¹ Rb	-42.810	¹⁰¹ Y	-65.060	¹⁰³ Nb	-75.180	¹¹⁰ Tc	-71.260	¹¹⁵ Rh	-74.210	¹⁰³ Ag	-84.150		
¹⁰² Rb	-37.840	¹⁰² Y	-61.120	¹⁰⁴ Nb	-72.020	¹¹¹ Tc	-69.160	¹¹⁶ Rh	-71.090	¹⁰⁴ Ag	-84.250		
¹⁰³ Rb	-33.700	¹⁰³ Y	-58.290	¹⁰⁵ Nb	-69.950	¹¹² Tc	-65.730	¹¹⁷ Rh	-68.850	¹⁰⁵ Ag	-86.480		
⁶⁷ Sr	23.550 †	¹⁰⁴ Y	-54.020	¹⁰⁶ Nb	-66.400	¹¹³ Tc	-63.200	¹¹⁸ Rh	-65.320	¹⁰⁶ Ag	-86.110		
⁶⁸ Sr	10.770 †	¹⁰⁵ Y	-50.620	¹⁰⁷ Nb	-63.830	¹¹⁴ Tc	-59.320	¹¹⁹ Rh	-62.790	¹⁰⁷ Ag	-87.890		
⁶⁹ Sr	2.260 †	¹⁰⁶ Y	-46.190	¹⁰⁸ Nb	-59.950	¹¹⁵ Tc	-56.120	¹²⁰ Rh	-59.120	¹⁰⁸ Ag	-87.180		
⁷⁰ Sr	-8.990 †	¹⁰⁷ Y	-42.380	¹⁰⁹ Nb	-56.930	¹¹⁶ Tc	-51.820	¹²¹ Rh	-56.170	¹⁰⁹ Ag	-88.430		
⁷¹ Sr	-16.310 ‡	⁷¹ Zr	23.520 †	¹¹⁰ Nb	-52.670	¹¹⁷ Tc	-48.400	¹²² Rh	-52.710	¹¹⁰ Ag	-87.400		
⁷² Sr	-26.340 ‡	⁷² Zr	11.220 †	¹¹¹ Nb	-49.170	⁸⁴ Ru	-23.380 ‡	¹²³ Rh	-49.240	¹¹¹ Ag	-88.190		
⁷³ Sr	-32.340	⁷³ Zr	2.640 †	⁷⁷ Mo	3.680 †	⁸⁵ Ru	-29.720 ‡	¹²⁴ Rh	-45.510	¹¹² Ag	-86.880		
⁷⁴ Sr	-41.120	⁷⁴ Zr	-8.520 †	⁷⁸ Mo	-7.140 †	⁸⁶ Ru	-40.400	¹²⁵ Rh	-42.280	¹¹³ Ag	-87.140		
⁷⁵ Sr	-45.980	⁷⁵ Zr	-15.480 †	⁷⁹ Mo	-14.810 †	⁸⁷ Ru	-46.220	¹²⁶ Rh	-39.080	¹¹⁴ Ag	-85.300		
⁷⁶ Sr	-54.040	⁷⁶ Zr	-25.740 ‡	⁸⁰ Mo	-25.120 ‡	⁸⁸ Ru	-55.070	¹²⁷ Rh	-35.370	¹¹⁵ Ag	-85.110		
⁷⁷ Sr	-57.290	⁷⁷ Zr	-31.820	⁸¹ Mo	-30.010 †	⁸⁹ Ru	-59.170	¹²⁸ Rh	-29.040	¹¹⁶ Ag	-83.030		
⁷⁸ Sr	-63.020	⁷⁸ Zr	-41.060	⁸² Mo	-39.460 ‡	⁹⁰ Ru	-66.260	¹²⁹ Rh	-22.810	¹¹⁷ Ag	-82.300		
⁷⁹ Sr	-65.220	⁷⁹ Zr	-46.280	⁸³ Mo	-44.800	⁹¹ Ru	-68.950	¹³⁰ Rh	-15.650	¹¹⁸ Ag	-79.830		
⁸⁰ Sr	-70.240	⁸⁰ Zr	-54.070	⁸⁴ Mo	-53.210	⁹² Ru	-75.850	⁸⁸ Pd	-24.320 ‡	¹¹⁹ Ag	-78.880		
										¹²⁰ Ag	-75.790		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹²¹ Ag	-74.530	¹¹¹ In	-87.880	⁹⁹ Sb	-29.470 †	¹²⁹ Te	-88.190	¹¹⁴ Xe	-66.330	¹⁴⁵ Cs	-59.860		
¹²² Ag	-71.550	¹¹² In	-87.480	¹⁰⁰ Sb	-35.730 †	¹³⁰ Te	-88.430	¹¹⁵ Xe	-68.370	¹⁴⁶ Cs	-55.700		
¹²³ Ag	-70.020	¹¹³ In	-89.200	¹⁰¹ Sb	-44.740 †	¹³¹ Te	-86.350	¹¹⁶ Xe	-72.610	¹⁴⁷ Cs	-52.350		
¹²⁴ Ag	-66.730	¹¹⁴ In	-88.380	¹⁰² Sb	-48.810 †	¹³² Te	-86.200	¹¹⁷ Xe	-74.040	¹⁴⁸ Cs	-47.970		
¹²⁵ Ag	-64.900	¹¹⁵ In	-89.660	¹⁰³ Sb	-55.400 †	¹³³ Te	-83.810	¹¹⁸ Xe	-77.810	¹⁴⁹ Cs	-44.190		
¹²⁶ Ag	-61.740	¹¹⁶ In	-88.410	¹⁰⁴ Sb	-57.880 †	¹³⁴ Te	-83.000	¹¹⁹ Xe	-78.740	¹⁵⁰ Cs	-39.490		
¹²⁷ Ag	-59.440	¹¹⁷ In	-89.260	¹⁰⁵ Sb	-62.770 †	¹³⁵ Te	-78.440	¹²⁰ Xe	-81.950	¹⁵¹ Cs	-35.330		
¹²⁸ Ag	-56.310	¹¹⁸ In	-87.730	¹⁰⁶ Sb	-65.110 †	¹³⁶ Te	-75.200	¹²¹ Xe	-82.480				
¹²⁹ Ag	-53.390	¹¹⁹ In	-88.110	¹⁰⁷ Sb	-69.490 †	¹³⁷ Te	-69.950	¹²² Xe	-85.170	¹⁰⁸ Ba	-6.520 †		
¹³⁰ Ag	-47.600	¹²⁰ In	-86.320	¹⁰⁸ Sb	-71.170	¹³⁸ Te	-65.990	¹²³ Xe	-85.240	¹⁰⁹ Ba	-12.390 †		
¹³¹ Ag	-42.130	¹²¹ In	-86.240	¹⁰⁹ Sb	-75.100	¹³⁹ Te	-59.920	¹²⁴ Xe	-87.430	¹¹⁰ Ba	-20.800 †		
¹³² Ag	-35.670	¹²² In	-84.150	¹¹⁰ Sb	-76.310	¹⁴⁰ Te	-55.900	¹²⁵ Xe	-86.960	¹¹¹ Ba	-26.020 †		
¹³³ Ag	-29.680	¹²³ In	-83.710	¹¹¹ Sb	-79.810	¹⁴¹ Te	-49.840	¹²⁶ Xe	-88.790	¹¹² Ba	-33.810 ‡		
¹³⁴ Ag	-22.890	¹²⁴ In	-81.410	¹¹² Sb	-80.600	¹⁴² Te	-45.780	¹²⁷ Xe	-88.020	¹¹³ Ba	-37.860 ‡		
		¹²⁵ In	-80.800	¹¹³ Sb	-83.610	¹⁴³ Te	-40.100	¹²⁸ Xe	-89.630	¹¹⁴ Ba	-44.570		
⁹³ Cd	-31.260 ‡	¹²⁶ In	-78.180	¹¹⁴ Sb	-83.870	¹⁴⁴ Te	-35.700	¹²⁹ Xe	-88.620	¹¹⁵ Ba	-47.970		
⁹⁴ Cd	-41.000	¹²⁷ In	-77.210	¹¹⁵ Sb	-86.420	¹⁴⁵ Te	-29.960	¹³⁰ Xe	-90.220	¹¹⁶ Ba	-53.990		
⁹⁵ Cd	-47.120	¹²⁸ In	-74.640	¹¹⁶ Sb	-86.240	¹⁴⁶ Te	-25.300	¹³¹ Xe	-88.940	¹¹⁷ Ba	-56.710		
⁹⁶ Cd	-56.010	¹²⁹ In	-73.170	¹¹⁷ Sb	-88.340			¹³² Xe	-89.970	¹¹⁸ Ba	-62.010		
⁹⁷ Cd	-59.870	¹³⁰ In	-70.420	¹¹⁸ Sb	-87.840	¹⁰² I	-14.450 †	¹³³ Xe	-88.490	¹¹⁹ Ba	-64.160		
⁹⁸ Cd	-67.000	¹³¹ In	-68.240	¹¹⁹ Sb	-89.520	¹⁰³ I	-24.850 †	¹³⁴ Xe	-89.190	¹²⁰ Ba	-68.650		
⁹⁹ Cd	-69.480	¹³² In	-63.010	¹²⁰ Sb	-88.670	¹⁰⁴ I	-29.670 †	¹³⁵ Xe	-87.080	¹²¹ Ba	-70.290		
¹⁰⁰ Cd	-74.690	¹³³ In	-58.380	¹²¹ Sb	-89.890	¹⁰⁵ I	-37.050 †	¹³⁶ Xe	-87.160	¹²² Ba	-74.300		
¹⁰¹ Cd	-75.950	¹³⁴ In	-52.510	¹²² Sb	-88.720	¹⁰⁶ I	-41.070 †	¹³⁷ Xe	-83.240	¹²³ Ba	-75.470		
¹⁰² Cd	-79.030	¹³⁵ In	-47.210	¹²³ Sb	-89.560	¹⁰⁷ I	-47.460 †	¹³⁸ Xe	-80.740	¹²⁴ Ba	-78.880		
¹⁰³ Cd	-79.780	¹³⁶ In	-40.940	¹²⁴ Sb	-88.140	¹⁰⁸ I	-50.730 †	¹³⁹ Xe	-75.970	¹²⁵ Ba	-79.590		
¹⁰⁴ Cd	-83.410	¹³⁷ In	-35.460	¹²⁵ Sb	-88.540	¹⁰⁹ I	-56.090 †	¹⁴⁰ Xe	-72.470	¹²⁶ Ba	-82.370		
¹⁰⁵ Cd	-83.350	¹³⁸ In	-28.910	¹²⁶ Sb	-86.830	¹¹⁰ I	-58.750 †	¹⁴¹ Xe	-68.120	¹²⁷ Ba	-82.670		
¹⁰⁶ Cd	-86.330			¹²⁷ Sb	-86.930	¹¹¹ I	-63.700	¹⁴² Xe	-64.860	¹²⁸ Ba	-84.870		
¹⁰⁷ Cd	-85.980	⁹⁷ Sn	-31.450 ‡	¹²⁸ Sb	-85.100	¹¹² I	-65.990	¹⁴³ Xe	-59.920	¹²⁹ Ba	-84.640		
¹⁰⁸ Cd	-88.500	⁹⁸ Sn	-41.060 ‡	¹²⁹ Sb	-85.050	¹¹³ I	-70.290	¹⁴⁴ Xe	-56.560	¹³⁰ Ba	-86.710		
¹⁰⁹ Cd	-87.760	⁹⁹ Sn	-46.820	¹³⁰ Sb	-83.170	¹¹⁴ I	-72.070	¹⁴⁵ Xe	-51.650	¹³¹ Ba	-86.380		
¹¹⁰ Cd	-89.790	¹⁰⁰ Sn	-55.270	¹³¹ Sb	-82.230	¹¹⁵ I	-75.790	¹⁴⁶ Xe	-48.120	¹³² Ba	-88.170		
¹¹¹ Cd	-88.720	¹⁰¹ Sn	-58.750	¹³² Sb	-79.680	¹¹⁶ I	-77.040	¹⁴⁷ Xe	-43.100	¹³³ Ba	-87.630		
¹¹² Cd	-90.250	¹⁰² Sn	-64.770	¹³³ Sb	-78.480	¹¹⁷ I	-80.260	¹⁴⁸ Xe	-39.130	¹³⁴ Ba	-89.290		
¹¹³ Cd	-88.690	¹⁰³ Sn	-66.970	¹³⁴ Sb	-73.710	¹¹⁸ I	-81.020	¹⁴⁹ Xe	-33.850	¹³⁵ Ba	-88.480		
¹¹⁴ Cd	-89.770	¹⁰⁴ Sn	-71.620	¹³⁵ Sb	-70.060	¹¹⁹ I	-83.760			¹³⁶ Ba	-89.940		
¹¹⁵ Cd	-88.130	¹⁰⁵ Sn	-73.090	¹³⁶ Sb	-64.850	¹²⁰ I	-84.170	¹⁰⁶ Cs	-7.730 †	¹³⁷ Ba	-88.240		
¹¹⁶ Cd	-88.630	¹⁰⁶ Sn	-77.180	¹³⁷ Sb	-60.230	¹²¹ I	-86.250	¹⁰⁷ Cs	-16.100 †	¹³⁸ Ba	-89.180		
¹¹⁷ Cd	-86.440	¹⁰⁷ Sn	-77.930	¹³⁸ Sb	-54.370	¹²² I	-86.210	¹⁰⁸ Cs	-21.710 †	¹³⁹ Ba	-85.740		
¹¹⁸ Cd	-86.510	¹⁰⁸ Sn	-81.570	¹³⁹ Sb	-49.680	¹²³ I	-88.070	¹⁰⁹ Cs	-29.420 †	¹⁴⁰ Ba	-84.180		
¹¹⁹ Cd	-83.960	¹⁰⁹ Sn	-81.550	¹⁴⁰ Sb	-43.870	¹²⁴ I	-87.610	¹¹⁰ Cs	-34.120 †	¹⁴¹ Ba	-79.660		
¹²⁰ Cd	-84.060	¹¹⁰ Sn	-85.130	¹⁴¹ Sb	-39.010	¹²⁵ I	-88.960	¹¹¹ Cs	-40.770 †	¹⁴² Ba	-77.430		
¹²¹ Cd	-81.280	¹¹¹ Sn	-85.170	¹⁴² Sb	-32.970	¹²⁶ I	-88.100	¹¹² Cs	-44.620 †	¹⁴³ Ba	-73.650		
¹²² Cd	-80.980	¹¹² Sn	-88.190	¹⁴³ Sb	-27.990	¹²⁷ I	-89.400	¹¹³ Cs	-50.470 †	¹⁴⁴ Ba	-71.210		
¹²³ Cd	-77.990	¹¹³ Sn	-87.790	¹⁴⁴ Sb	-21.880	¹²⁸ I	-88.400	¹¹⁴ Cs	-53.880 †	¹⁴⁵ Ba	-67.160		
¹²⁴ Cd	-77.060	¹¹⁴ Sn	-90.380	¹⁴⁵ Sb	-16.670	¹²⁹ I	-89.090	¹¹⁵ Cs	-59.100	¹⁴⁶ Ba	-64.650		
¹²⁵ Cd	-74.000	¹¹⁵ Sn	-89.340			¹³⁰ I	-87.800	¹¹⁶ Cs	-61.650	¹⁴⁷ Ba	-60.580		
¹²⁶ Cd	-72.590	¹¹⁶ Sn	-91.510	¹⁰¹ Te	-27.290 †	¹³¹ I	-88.160	¹¹⁷ Cs	-66.220	¹⁴⁸ Ba	-57.870		
¹²⁷ Cd	-69.470	¹¹⁷ Sn	-90.410	¹⁰² Te	-36.810 †	¹³² I	-86.760	¹¹⁸ Cs	-68.290	¹⁴⁹ Ba	-53.620		
¹²⁸ Cd	-67.740	¹¹⁸ Sn	-91.900	¹⁰³ Te	-41.580 ‡	¹³³ I	-86.860	¹¹⁹ Cs	-72.110	¹⁵⁰ Ba	-50.390		
¹²⁹ Cd	-64.650	¹¹⁹ Sn	-90.360	¹⁰⁴ Te	-49.470 ‡	¹³⁴ I	-84.880	¹²⁰ Cs	-73.690	¹⁵¹ Ba	-45.830		
¹³⁰ Cd	-62.360	¹²⁰ Sn	-91.470	¹⁰⁵ Te	-51.140 ‡	¹³⁵ I	-84.280	¹²¹ Cs	-77.030	¹⁵² Ba	-42.240		
¹³¹ Cd	-56.570	¹²¹ Sn	-89.660	¹⁰⁶ Te	-57.030 ‡	¹³⁶ I	-80.240	¹²² Cs	-78.160	¹⁵³ Ba	-37.270		
¹³² Cd	-51.750	¹²² Sn	-90.300	¹⁰⁷ Te	-59.260	¹³⁷ I	-77.310	¹²³ Cs	-80.910				
¹³³ Cd	-45.270	¹²³ Sn	-88.290	¹⁰⁸ Te	-64.430	¹³⁸ I	-71.970	¹²⁴ Cs	-81.610	¹¹² La	-14.980 †		
¹³⁴ Cd	-39.850	¹²⁴ Sn	-88.540	¹⁰⁹ Te	-66.370	¹³⁹ I	-68.240	¹²⁵ Cs	-83.830	¹¹³ La	-22.970 †		
¹³⁵ Cd	-33.010	¹²⁵ Sn	-86.370	¹¹⁰ Te	-70.990	¹⁴⁰ I	-63.650	¹²⁶ Cs	-83.950	¹¹⁴ La	-28.150 †		
¹³⁶ Cd	-27.440	¹²⁶ Sn	-86.300	¹¹¹ Te	-72.350	¹⁴¹ I	-59.730	¹²⁷ Cs	-85.760	¹¹⁵ La	-35.380 †		
		¹²⁷ Sn	-83.940	¹¹² Te	-76.510	¹⁴² I	-54.560	¹²⁸ Cs	-85.490	¹¹⁶ La	-39.500 †		
⁹⁵ In	-31.800 †	¹²⁸ Sn	-83.400	¹¹³ Te	-77.430	¹⁴³ I	-50.600	¹²⁹ Cs	-87.080	¹¹⁷ La	-45.690 †		
⁹⁶ In	-37.940 †	¹²⁹ Sn	-80.870	¹¹⁴ Te	-81.100	¹⁴⁴ I	-45.410	¹³⁰ Cs	-86.660	¹¹⁸ La	-49.060 †		
⁹⁷ In	-47.760 †	¹³⁰ Sn	-79.980	¹¹⁵ Te	-81.580	¹⁴⁵ I	-41.270	¹³¹ Cs	-87.930	¹¹⁹ La	-54.530 †		
⁹⁸ In	-52.920	¹³¹ Sn	-77.180	¹¹⁶ Te	-84.820	¹⁴⁶ I	-36.090	¹³² Cs	-87.360	¹²⁰ La	-57.370		
⁹⁹ In	-60.540	¹³² Sn	-75.760	¹¹⁷ Te	-84.950	¹⁴⁷ I	-31.580	¹³³ Cs	-88.270	¹²¹ La	-61.840		
¹⁰⁰ In	-63.560	¹³³ Sn	-70.530	¹¹⁸ Te	-87.710			¹³⁴ Cs	-87.430	¹²² La	-64.130		
¹⁰¹ In	-69.070	¹³⁴ Sn	-66.530	¹¹⁹ Te	-87.170	¹⁰⁴ Xe	-15.100 †	¹³⁵ Cs	-88.360	¹²³ La	-68.240		
¹⁰² In	-70.250	¹³⁵ Sn	-60.580	¹²⁰ Te	-89.490	¹⁰⁵ Xe	-20.120 †	¹³⁶ Cs	-86.720	¹²⁴ La	-70.060		
¹⁰³ In	-74.040	¹³⁶ Sn	-55.940	¹²¹ Te	-88.750	¹⁰⁶ Xe	-28.470 †	¹³⁷ Cs	-87.140	¹²⁵ La	-73.550		
¹⁰⁴ In	-75.580	¹³⁷ Sn	-49.690	¹²² Te	-90.600	¹⁰⁷ Xe	-33.060 †	¹³⁸ Cs	-83.600	¹²⁶ La	-74.880		
¹⁰⁵ In	-79.030	¹³⁸ Sn	-44.740	¹²³ Te	-89.580	¹⁰⁸ Xe	-40.560 ‡	¹³⁹ Cs	-81.440	¹²⁷ La	-77.750		
¹⁰⁶ In	-79.830	¹³⁹ Sn	-38.130	¹²⁴ Te	-91.070	¹⁰⁹ Xe	-44.010 ‡	¹⁴⁰ Cs	-76.920	¹²⁸ La	-78.590		
¹⁰⁷ In	-82.880	¹⁴⁰ Sn	-33.130	¹²⁵ Te	-89.600	¹¹⁰ Xe	-50.120	¹⁴¹ Cs	-74.210	¹²⁹ La	-80.840		
¹⁰⁸ In	-83.180	¹⁴¹ Sn	-26.360	¹²⁶ Te	-90.810	¹¹¹ Xe	-53.060	¹⁴² Cs	-70.330	¹³⁰ La	-81.170		
¹⁰⁹ In	-85.760	¹⁴² Sn	-21.060	¹²⁷ Te	-89.100	¹¹² Xe	-58.730	¹⁴³ Cs	-67.260	¹³¹ La	-83.130		
¹¹⁰ In	-85.700			¹²⁸ Te	-90.010	¹¹³ Xe	-61.270	¹⁴⁴ Cs	-63.050	¹³² La	-83.230		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹³³ La	-85.090	¹²³ Pr	-49.690 †	¹⁵⁶ Nd	-60.470	¹⁶⁰ Sm	-60.550	¹⁶⁴ Gd	-59.860	¹⁶³ Dy	-66.110
¹³⁴ La	-85.110	¹²⁴ Pr	-52.710	¹⁵⁷ Nd	-56.740	¹⁶¹ Sm	-57.060	¹⁶⁵ Gd	-56.720	¹⁶⁴ Dy	-65.710
¹³⁵ La	-86.830	¹²⁵ Pr	-57.470	¹⁵⁸ Nd	-54.190	¹⁶² Sm	-54.810	¹⁶⁶ Gd	-54.700	¹⁶⁵ Dy	-63.490
¹³⁶ La	-86.660	¹²⁶ Pr	-59.960	¹⁵⁹ Nd	-50.120	¹⁶³ Sm	-51.060	¹⁶⁷ Gd	-51.220	¹⁶⁶ Dy	-62.600
¹³⁷ La	-87.980	¹²⁷ Pr	-64.130	¹⁶⁰ Nd	-47.170	¹⁶⁴ Sm	-48.340	¹⁶⁸ Gd	-48.730	¹⁶⁷ Dy	-60.080
¹³⁸ La	-86.890	¹²⁸ Pr	-66.190	¹⁶¹ Nd	-42.860	¹⁶⁵ Sm	-44.280	¹⁶⁹ Gd	-44.840	¹⁶⁸ Dy	-58.680
¹³⁹ La	-87.970	¹²⁹ Pr	-69.700	¹⁶² Nd	-39.480	¹⁶⁶ Sm	-41.140	¹⁷⁰ Gd	-42.030	¹⁶⁹ Dy	-55.850
¹⁴⁰ La	-85.040	¹³⁰ Pr	-71.090					¹⁷¹ Gd	-37.850	¹⁷⁰ Dy	-54.020
¹⁴¹ La	-83.670	¹³¹ Pr	-74.090	¹²⁷ Pm	-44.460 †	¹³³ Eu	-46.900 †	¹⁷² Gd	-34.620	¹⁷¹ Dy	-50.720
¹⁴² La	-79.660	¹³² Pr	-75.090	¹²⁸ Pm	-47.530 †	¹³⁴ Eu	-49.530	¹⁷³ Gd	-30.080	¹⁷² Dy	-48.510
¹⁴³ La	-77.990	¹³³ Pr	-77.480	¹²⁹ Pm	-52.570 †	¹³⁵ Eu	-53.940			¹⁷³ Dy	-44.960
¹⁴⁴ La	-74.710	¹³⁴ Pr	-78.090	¹³⁰ Pm	-55.230	¹³⁶ Eu	-56.090	¹³⁷ Tb	-40.520 †	¹⁷⁴ Dy	-42.370
¹⁴⁵ La	-72.530	¹³⁵ Pr	-80.370	¹³¹ Pm	-59.470	¹³⁷ Eu	-59.920	¹³⁸ Tb	-43.260 †	¹⁷⁵ Dy	-38.350
¹⁴⁶ La	-69.160	¹³⁶ Pr	-80.840	¹³² Pm	-61.500	¹³⁸ Eu	-61.420	¹³⁹ Tb	-47.740 †	¹⁷⁶ Dy	-35.310
¹⁴⁷ La	-66.880	¹³⁷ Pr	-83.050	¹³³ Pm	-65.090	¹³⁹ Eu	-64.840	¹⁴⁰ Tb	-49.930	¹⁷⁷ Dy	-30.680
¹⁴⁸ La	-63.580	¹³⁸ Pr	-83.640	¹³⁴ Pm	-66.500	¹⁴⁰ Eu	-66.400	¹⁴¹ Tb	-54.040	¹⁷⁸ Dy	-27.160
¹⁴⁹ La	-61.080	¹³⁹ Pr	-85.550	¹³⁵ Pm	-69.600	¹⁴¹ Eu	-69.830	¹⁴² Tb	-56.100		
¹⁵⁰ La	-57.390	¹⁴⁰ Pr	-85.050	¹³⁶ Pm	-70.800	¹⁴² Eu	-70.960	¹⁴³ Tb	-60.490	¹⁴¹ Ho	-33.830 †
¹⁵¹ La	-54.380	¹⁴¹ Pr	-86.800	¹³⁷ Pm	-73.590	¹⁴³ Eu	-74.130	¹⁴⁴ Tb	-62.010	¹⁴² Ho	-36.740 †
¹⁵² La	-50.320	¹⁴² Pr	-84.540	¹³⁸ Pm	-74.570	¹⁴⁴ Eu	-75.730	¹⁴⁵ Tb	-65.620	¹⁴³ Ho	-41.440 †
¹⁵³ La	-46.820	¹⁴³ Pr	-83.950	¹³⁹ Pm	-77.330	¹⁴⁵ Eu	-78.440	¹⁴⁶ Tb	-67.870	¹⁴⁴ Ho	-43.960 †
¹⁵⁴ La	-42.420	¹⁴⁴ Pr	-80.490	¹⁴⁰ Pm	-78.010	¹⁴⁶ Eu	-77.560	¹⁴⁷ Tb	-71.400	¹⁴⁵ Ho	-48.860 †
¹⁵⁵ La	-38.610	¹⁴⁵ Pr	-79.590	¹⁴¹ Pm	-81.330	¹⁴⁷ Eu	-78.360	¹⁴⁸ Tb	-70.950	¹⁴⁶ Ho	-50.950
		¹⁴⁶ Pr	-77.100	¹⁴² Pm	-81.720	¹⁴⁸ Eu	-76.200	¹⁴⁹ Tb	-72.510	¹⁴⁷ Ho	-55.050
¹¹⁴ Ce	-14.540 †	¹⁴⁷ Pr	-75.810	¹⁴³ Pm	-83.610	¹⁴⁹ Eu	-76.500	¹⁵⁰ Tb	-70.950	¹⁴⁸ Ho	-58.030
¹¹⁵ Ce	-20.110 †	¹⁴⁸ Pr	-73.240	¹⁴⁴ Pm	-82.140	¹⁵⁰ Eu	-75.310	¹⁵¹ Tb	-71.870	¹⁴⁹ Ho	-62.310
¹¹⁶ Ce	-28.300 ‡	¹⁴⁹ Pr	-71.870	¹⁴⁵ Pm	-82.200	¹⁵¹ Eu	-75.530	¹⁵² Tb	-71.150	¹⁵⁰ Ho	-62.280
¹¹⁷ Ce	-32.690 ‡	¹⁵⁰ Pr	-69.280	¹⁴⁶ Pm	-79.490	¹⁵² Eu	-74.220	¹⁵³ Tb	-72.030	¹⁵¹ Ho	-64.430
¹¹⁸ Ce	-39.570	¹⁵¹ Pr	-67.460	¹⁴⁷ Pm	-79.100	¹⁵³ Eu	-74.370	¹⁵⁴ Tb	-71.260	¹⁵² Ho	-63.860
¹¹⁹ Ce	-43.120	¹⁵² Pr	-64.420	¹⁴⁸ Pm	-77.350	¹⁵⁴ Eu	-72.950	¹⁵⁵ Tb	-72.010	¹⁵³ Ho	-65.350
¹²⁰ Ce	-49.240	¹⁵³ Pr	-62.110	¹⁴⁹ Pm	-76.860	¹⁵⁵ Eu	-72.510	¹⁵⁶ Tb	-71.040	¹⁵⁴ Ho	-65.080
¹²¹ Ce	-52.230	¹⁵⁴ Pr	-58.720	¹⁵⁰ Pm	-74.960	¹⁵⁶ Eu	-70.540	¹⁵⁷ Tb	-71.230	¹⁵⁵ Ho	-66.480
¹²² Ce	-57.500	¹⁵⁵ Pr	-55.870	¹⁵¹ Pm	-74.420	¹⁵⁷ Eu	-69.720	¹⁵⁸ Tb	-69.930	¹⁵⁶ Ho	-66.200
¹²³ Ce	-59.880	¹⁵⁶ Pr	-52.100	¹⁵² Pm	-72.390	¹⁵⁸ Eu	-67.480	¹⁵⁹ Tb	-69.630	¹⁵⁷ Ho	-67.490
¹²⁴ Ce	-64.500	¹⁵⁷ Pr	-48.970	¹⁵³ Pm	-71.290	¹⁵⁹ Eu	-66.160	¹⁶⁰ Tb	-67.980	¹⁵⁸ Ho	-66.990
¹²⁵ Ce	-66.340	¹⁵⁸ Pr	-44.890	¹⁵⁴ Pm	-68.810	¹⁶⁰ Eu	-63.520	¹⁶¹ Tb	-67.310	¹⁵⁹ Ho	-67.850
¹²⁶ Ce	-70.450	¹⁵⁹ Pr	-41.350	¹⁵⁵ Pm	-67.300	¹⁶¹ Eu	-61.820	¹⁶² Tb	-65.310	¹⁶⁰ Ho	-67.050
¹²⁷ Ce	-71.900	¹⁶⁰ Pr	-37.030	¹⁵⁶ Pm	-64.530	¹⁶² Eu	-58.940	¹⁶³ Tb	-64.300	¹⁶¹ Ho	-67.430
¹²⁸ Ce	-75.350			¹⁵⁷ Pm	-62.440	¹⁶³ Eu	-56.780	¹⁶⁴ Tb	-62.050	¹⁶² Ho	-66.300
¹²⁹ Ce	-76.170	¹¹⁹ Nd	-14.600 †	¹⁵⁸ Pm	-59.270	¹⁶⁴ Eu	-53.600	¹⁶⁵ Tb	-60.600	¹⁶³ Ho	-66.360
¹³⁰ Ce	-79.120	¹²⁰ Nd	-22.850 ‡	¹⁵⁹ Pm	-56.860	¹⁶⁵ Eu	-50.980	¹⁶⁶ Tb	-58.030	¹⁶⁴ Ho	-64.930
¹³¹ Ce	-79.440	¹²¹ Nd	-27.290 ‡	¹⁶⁰ Pm	-53.290	¹⁶⁶ Eu	-47.460	¹⁶⁷ Tb	-56.120	¹⁶⁵ Ho	-64.660
¹³² Ce	-81.940	¹²² Nd	-34.200 ‡	¹⁶¹ Pm	-50.490	¹⁶⁷ Eu	-44.410	¹⁶⁸ Tb	-53.160	¹⁶⁶ Ho	-62.990
¹³³ Ce	-82.070	¹²³ Nd	-37.970	¹⁶² Pm	-46.660	¹⁶⁸ Eu	-40.460	¹⁶⁹ Tb	-50.800	¹⁶⁷ Ho	-62.210
¹³⁴ Ce	-84.430	¹²⁴ Nd	-44.010	¹⁶³ Pm	-43.420	¹⁶⁹ Eu	-37.030	¹⁷⁰ Tb	-47.410	¹⁶⁸ Ho	-60.240
¹³⁵ Ce	-84.400	¹²⁵ Nd	-47.140	¹⁶⁴ Pm	-39.320	¹⁷⁰ Eu	-32.790	¹⁷¹ Tb	-44.710	¹⁶⁹ Ho	-58.990
¹³⁶ Ce	-86.680	¹²⁶ Nd	-52.530			¹³⁵ Gd	-43.700	¹⁷² Tb	-41.010	¹⁷⁰ Ho	-56.610
¹³⁷ Ce	-86.730	¹²⁷ Nd	-55.070	¹³¹ Sm	-49.820	¹³⁶ Gd	-48.720	¹⁷³ Tb	-37.880	¹⁷¹ Ho	-54.890
¹³⁸ Ce	-88.580	¹²⁸ Nd	-59.930	¹³² Sm	-54.710	¹³⁷ Gd	-50.910	¹⁷⁴ Tb	-33.830	¹⁷² Ho	-52.170
¹³⁹ Ce	-87.500	¹²⁹ Nd	-62.010	¹³³ Sm	-56.690	¹³⁸ Gd	-55.340	¹⁷⁵ Tb	-30.280	¹⁷³ Ho	-50.090
¹⁴⁰ Ce	-89.120	¹³⁰ Nd	-66.140	¹³⁴ Sm	-61.030	¹³⁹ Gd	-57.020	¹⁷⁶ Tb	-25.580	¹⁷⁴ Ho	-47.060
¹⁴¹ Ce	-86.330	¹³¹ Nd	-67.520	¹³⁵ Sm	-62.590	¹⁴⁰ Gd	-61.080	¹³⁹ Dy	-37.220	¹⁷⁵ Ho	-44.570
¹⁴² Ce	-85.510	¹³² Nd	-71.120	¹³⁶ Sm	-66.330	¹⁴¹ Gd	-62.790	¹⁴⁰ Dy	-42.230	¹⁷⁶ Ho	-41.040
¹⁴³ Ce	-81.550	¹³³ Nd	-72.240	¹³⁷ Sm	-67.450	¹⁴² Gd	-67.090	¹⁴¹ Dy	-44.560	¹⁷⁷ Ho	-38.110
¹⁴⁴ Ce	-80.350	¹³⁴ Nd	-75.210	¹³⁸ Sm	-70.890	¹⁴³ Gd	-68.070	¹⁴² Dy	-49.250	¹⁷⁸ Ho	-33.970
¹⁴⁵ Ce	-77.090	¹³⁵ Nd	-75.790	¹³⁹ Sm	-71.990	¹⁴⁴ Gd	-71.440	¹⁴³ Dy	-51.440	¹⁷⁹ Ho	-30.520
¹⁴⁶ Ce	-75.540	¹³⁶ Nd	-78.680	¹⁴⁰ Sm	-75.470	¹⁴⁵ Gd	-73.470	¹⁴⁴ Dy	-56.450	¹⁸⁰ Ho	-26.300
¹⁴⁷ Ce	-72.310	¹³⁷ Nd	-79.180	¹⁴¹ Sm	-76.060	¹⁴⁶ Gd	-76.790	¹⁴⁵ Dy	-58.100	¹⁴³ Er	-30.140
¹⁴⁸ Ce	-70.670	¹³⁸ Nd	-82.010	¹⁴² Sm	-79.910	¹⁴⁷ Gd	-75.900	¹⁴⁶ Dy	-62.040	¹⁴⁴ Er	-35.490
¹⁴⁹ Ce	-67.470	¹³⁹ Nd	-82.170	¹⁴³ Sm	-80.230	¹⁴⁸ Gd	-77.280	¹⁴⁷ Dy	-64.780	¹⁴⁵ Er	-38.160
¹⁵⁰ Ce	-65.550	¹⁴⁰ Nd	-85.180	¹⁴⁴ Sm	-82.820	¹⁴⁹ Gd	-75.210	¹⁴⁸ Dy	-68.890	¹⁴⁶ Er	-43.530
¹⁵¹ Ce	-61.970	¹⁴¹ Nd	-84.770	¹⁴⁵ Sm	-81.420	¹⁵⁰ Gd	-75.840	¹⁴⁹ Dy	-68.470	¹⁴⁷ Er	-45.780
¹⁵² Ce	-59.520	¹⁴² Nd	-86.980	¹⁴⁶ Sm	-82.040	¹⁵¹ Gd	-74.560	¹⁵⁰ Dy	-70.680	¹⁴⁸ Er	-50.500
¹⁵³ Ce	-55.550	¹⁴³ Nd	-84.840	¹⁴⁷ Sm	-79.400	¹⁵² Gd	-75.220	¹⁵¹ Dy	-69.240	¹⁴⁹ Er	-53.770
¹⁵⁴ Ce	-52.620	¹⁴⁴ Nd	-84.780	¹⁴⁸ Sm	-79.390	¹⁵³ Gd	-73.890	¹⁵² Dy	-70.350	¹⁵⁰ Er	-58.570
¹⁵⁵ Ce	-48.290	¹⁴⁵ Nd	-81.350	¹⁴⁹ Sm	-77.590	¹⁵⁴ Gd	-74.510	¹⁵³ Dy	-69.510	¹⁵¹ Er	-57.710
¹⁵⁶ Ce	-45.060	¹⁴⁶ Nd	-80.940	¹⁵⁰ Sm	-77.610	¹⁵⁵ Gd	-73.080	¹⁵⁴ Dy	-70.730	¹⁵² Er	-61.510
¹⁵⁷ Ce	-40.430	¹⁴⁷ Nd	-78.440	¹⁵¹ Sm	-75.730	¹⁵⁶ Gd	-73.140	¹⁵⁵ Dy	-69.960	¹⁵³ Er	-60.900
		¹⁴⁸ Nd	-77.780	¹⁵² Sm	-75.750	¹⁵⁷ Gd	-71.320	¹⁵⁶ Dy	-71.110	¹⁵⁴ Er	-62.720
¹¹⁶ Pr	-9.120 †	¹⁴⁹ Nd	-75.270	¹⁵³ Sm	-73.760	¹⁵⁸ Gd	-70.930	¹⁵⁷ Dy	-70.140	¹⁵⁵ Er	-62.490
¹¹⁷ Pr	-17.440 †	¹⁵⁰ Nd	-74.480	¹⁵⁴ Sm	-73.240	¹⁵⁹ Gd	-68.770	¹⁵⁸ Dy	-70.880	¹⁵⁶ Er	-64.290
¹¹⁸ Pr	-22.790 †	¹⁵¹ Nd	-71.920	¹⁵⁵ Sm	-70.740	¹⁶⁰ Gd	-67.970	¹⁵⁹ Dy	-69.560	¹⁵⁷ Er	-63.890
¹¹⁹ Pr	-30.020 †	¹⁵² Nd	-70.680	¹⁵⁶ Sm	-69.790	¹⁶¹ Gd	-65.390	¹⁶⁰ Dy	-69.880	¹⁵⁸ Er	-65.640
¹²⁰ Pr	-34.300 †	¹⁵³ Nd	-67.730	¹⁵⁷ Sm	-67.020	¹⁶² Gd	-64.290	¹⁶¹ Dy	-68.200	¹⁵⁹ Er	-65.100
¹²¹ Pr	-40.600 †	¹⁵⁴ Nd	-66.010	¹⁵⁸ Sm	-65.540	¹⁶³ Gd	-61.410	¹⁶² Dy	-68.110	¹⁶⁰ Er	-66.430
¹²² Pr	-44.330 †	¹⁵⁵ Nd	-62.680	¹⁵⁹ Sm	-62.380						

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁶¹ Er	-65.660	¹⁵⁵ Yb	-50.640	¹⁸⁸ Lu	-25.640	¹⁷⁵ Ta	-53.150	¹⁵⁶ Re	-0.410 †	¹⁸³ Os	-44.080
¹⁶² Er	-66.680	¹⁵⁶ Yb	-53.240	¹⁸⁹ Lu	-22.690	¹⁷⁶ Ta	-52.330	¹⁵⁷ Re	-6.470 †	¹⁸⁴ Os	-44.500
¹⁶³ Er	-65.490	¹⁵⁷ Yb	-53.420	¹⁹⁰ Lu	-19.100	¹⁷⁷ Ta	-52.580	¹⁵⁸ Re	-9.190 †	¹⁸⁵ Os	-43.080
¹⁶⁴ Er	-66.100	¹⁵⁸ Yb	-55.820	¹⁹¹ Lu	-16.210	¹⁷⁸ Ta	-51.460	¹⁵⁹ Re	-14.130 †	¹⁸⁶ Os	-43.120
¹⁶⁵ Er	-64.680	¹⁵⁹ Yb	-55.850	¹⁵⁰ Hf	-12.670 ‡	¹⁷⁹ Ta	-51.360	¹⁶⁰ Re	-16.190 †	¹⁸⁷ Os	-41.370
¹⁶⁶ Er	-64.950	¹⁶⁰ Yb	-58.060	¹⁵¹ Hf	-16.220 ‡	¹⁸⁰ Ta	-49.910	¹⁶¹ Re	-19.710 †	¹⁸⁸ Os	-41.010
¹⁶⁷ Er	-63.290	¹⁶¹ Yb	-57.960	¹⁵² Hf	-22.260 ‡	¹⁸¹ Ta	-49.190	¹⁶² Re	-21.410 †	¹⁸⁹ Os	-39.100
¹⁶⁸ Er	-63.060	¹⁶² Yb	-59.950	¹⁵³ Hf	-26.540	¹⁸² Ta	-47.320	¹⁶³ Re	-24.960 †	¹⁹⁰ Os	-38.510
¹⁶⁹ Er	-61.110	¹⁶³ Yb	-59.610	¹⁵⁴ Hf	-32.430	¹⁸³ Ta	-46.230	¹⁶⁴ Re	-26.400 †	¹⁹¹ Os	-36.540
¹⁷⁰ Er	-60.400	¹⁶⁴ Yb	-61.270	¹⁵⁵ Hf	-33.830	¹⁸⁴ Ta	-43.870	¹⁶⁵ Re	-29.740 †	¹⁹² Os	-35.900
¹⁷¹ Er	-58.080	¹⁶⁵ Yb	-60.700	¹⁵⁶ Hf	-37.980	¹⁸⁵ Ta	-42.370	¹⁶⁶ Re	-30.980	¹⁹³ Os	-33.380
¹⁷² Er	-56.910	¹⁶⁶ Yb	-61.840	¹⁵⁷ Hf	-38.560	¹⁸⁶ Ta	-39.820	¹⁶⁷ Re	-33.970	¹⁹⁴ Os	-32.520
¹⁷³ Er	-54.260	¹⁶⁷ Yb	-60.920	¹⁵⁸ Hf	-41.690	¹⁸⁷ Ta	-38.050	¹⁶⁸ Re	-34.950	¹⁹⁵ Os	-30.210
¹⁷⁴ Er	-52.720	¹⁶⁸ Yb	-61.830	¹⁵⁹ Hf	-42.350	¹⁸⁸ Ta	-35.020	¹⁶⁹ Re	-37.740	¹⁹⁶ Os	-29.150
¹⁷⁵ Er	-49.770	¹⁶⁹ Yb	-60.670	¹⁶⁰ Hf	-45.400	¹⁸⁹ Ta	-33.120	¹⁷⁰ Re	-38.460	¹⁹⁷ Os	-26.640
¹⁷⁶ Er	-47.800	¹⁷⁰ Yb	-61.080	¹⁶¹ Hf	-45.880	¹⁹⁰ Ta	-30.150	¹⁷¹ Re	-40.960	¹⁹⁸ Os	-25.030
¹⁷⁷ Er	-44.320	¹⁷¹ Yb	-59.650	¹⁶² Hf	-48.690	¹⁹¹ Ta	-27.990	¹⁷² Re	-41.430	¹⁹⁹ Os	-21.920
¹⁷⁸ Er	-41.830	¹⁷² Yb	-59.650	¹⁶³ Hf	-48.930	¹⁹² Ta	-24.890	¹⁷³ Re	-43.480	²⁰⁰ Os	-20.050
¹⁷⁹ Er	-37.820	¹⁷³ Yb	-57.900	¹⁶⁴ Hf	-51.500	¹⁹³ Ta	-22.500	¹⁷⁴ Re	-43.690	²⁰¹ Os	-17.360
¹⁸⁰ Er	-34.850	¹⁷⁴ Yb	-57.410	¹⁶⁵ Hf	-51.560	¹⁹⁴ Ta	-19.120	¹⁷⁵ Re	-45.380	²⁰² Os	-14.740
¹⁸¹ Er	-30.680	¹⁷⁵ Yb	-55.260	¹⁶⁶ Hf	-53.740	¹⁹⁵ Ta	-16.460	¹⁷⁶ Re	-45.340	²⁰³ Os	-9.570
¹⁸² Er	-27.650	¹⁷⁶ Yb	-54.450	¹⁶⁷ Hf	-53.640	¹⁹⁶ Ta	-12.860	¹⁷⁷ Re	-46.550	²⁰⁴ Os	-5.860
¹⁸³ Er	-23.240	¹⁷⁷ Yb	-52.090	¹⁶⁸ Hf	-55.500	¹⁹⁷ Ta	-9.690	¹⁷⁸ Re	-46.240	²⁰⁵ Os	-0.280
¹⁸⁴ Er	-19.880	¹⁷⁸ Yb	-50.710	¹⁶⁹ Hf	-55.190	¹⁹⁸ Ta	-6.710	¹⁷⁹ Re	-47.080	²⁰⁶ Os	4.100
		¹⁷⁹ Yb	-47.720	¹⁷⁰ Hf	-56.600			¹⁸⁰ Re	-46.450	¹⁶⁰ Ir	8.150 †
¹⁴⁵ Tm	-26.520 †	¹⁸⁰ Yb	-45.780	¹⁷¹ Hf	-55.900	¹⁵³ W	1.250 †	¹⁸¹ Re	-46.980	¹⁶¹ Ir	2.320 †
¹⁴⁶ Tm	-29.610 †	¹⁸¹ Yb	-42.380	¹⁷² Hf	-56.910	¹⁵⁴ W	-5.410 †	¹⁸² Re	-46.110	¹⁶² Ir	-0.120 †
¹⁴⁷ Tm	-35.270 †	¹⁸² Yb	-40.000	¹⁷³ Hf	-55.920	¹⁵⁵ W	-10.130 †	¹⁸³ Re	-46.030	¹⁶³ Ir	-4.320 †
¹⁴⁸ Tm	-38.020 †	¹⁸³ Yb	-36.390	¹⁷⁴ Hf	-56.510	¹⁵⁶ W	-16.560 ‡	¹⁸⁴ Re	-44.670	¹⁶⁴ Ir	-6.470 †
¹⁴⁹ Tm	-42.720 †	¹⁸⁴ Yb	-33.810	¹⁷⁵ Hf	-55.220	¹⁵⁷ W	-18.780 ‡	¹⁸⁵ Re	-44.140	¹⁶⁵ Ir	-10.480 †
¹⁵⁰ Tm	-46.230 †	¹⁸⁵ Yb	-30.090	¹⁷⁶ Hf	-55.410	¹⁵⁸ W	-23.450	¹⁸⁶ Re	-42.370	¹⁶⁶ Ir	-12.240 †
¹⁵¹ Tm	-51.090 †	¹⁸⁶ Yb	-27.200	¹⁷⁷ Hf	-53.810	¹⁵⁹ W	-24.780	¹⁸⁷ Re	-41.460	¹⁶⁷ Ir	-16.030 †
¹⁵² Tm	-51.780	¹⁸⁷ Yb	-23.170	¹⁷⁸ Hf	-53.530	¹⁶⁰ W	-28.390	¹⁸⁸ Re	-39.470	¹⁶⁸ Ir	-17.590 †
¹⁵³ Tm	-54.710	¹⁸⁸ Yb	-20.120	¹⁷⁹ Hf	-51.610	¹⁶¹ W	-29.420	¹⁸⁹ Re	-38.390	¹⁶⁹ Ir	-21.140 †
¹⁵⁴ Tm	-54.740	¹⁸⁹ Yb	-16.090	¹⁸⁰ Hf	-50.790	¹⁶² W	-32.980	¹⁹⁰ Re	-36.220	¹⁷⁰ Ir	-22.470
¹⁵⁵ Tm	-56.790	¹⁹⁰ Yb	-13.150	¹⁸¹ Hf	-48.290	¹⁶³ W	-33.960	¹⁹¹ Re	-35.000	¹⁷¹ Ir	-25.690
¹⁵⁶ Tm	-57.090			¹⁸² Hf	-47.130	¹⁶⁴ W	-37.310	¹⁹² Re	-32.490	¹⁷² Ir	-26.780
¹⁵⁷ Tm	-58.990	¹⁴⁹ Lu	-19.820 †	¹⁸³ Hf	-44.260	¹⁶⁵ W	-38.130	¹⁹³ Re	-31.010	¹⁷³ Ir	-29.700
¹⁵⁸ Tm	-59.010	¹⁵⁰ Lu	-23.270 †	¹⁸⁴ Hf	-42.630	¹⁶⁶ W	-41.170	¹⁹⁴ Re	-28.410	¹⁷⁴ Ir	-30.510
¹⁵⁹ Tm	-60.970	¹⁵¹ Lu	-28.640 †	¹⁸⁵ Hf	-39.590	¹⁶⁷ W	-41.700	¹⁹⁵ Re	-26.940	¹⁷⁵ Ir	-33.130
¹⁶⁰ Tm	-60.890	¹⁵² Lu	-32.840 †	¹⁸⁶ Hf	-37.760	¹⁶⁸ W	-44.360	¹⁹⁶ Re	-24.150	¹⁷⁶ Ir	-33.800
¹⁶¹ Tm	-62.390	¹⁵³ Lu	-38.060 †	¹⁸⁷ Hf	-34.410	¹⁶⁹ W	-44.630	¹⁹⁷ Re	-22.040	¹⁷⁷ Ir	-36.010
¹⁶² Tm	-62.060	¹⁵⁴ Lu	-39.530 †	¹⁸⁸ Hf	-32.340	¹⁷⁰ W	-46.990	¹⁹⁸ Re	-18.880	¹⁷⁸ Ir	-36.410
¹⁶³ Tm	-63.180	¹⁵⁵ Lu	-43.080 †	¹⁸⁹ Hf	-28.810	¹⁷¹ W	-47.130	¹⁹⁹ Re	-16.260	¹⁷⁹ Ir	-38.190
¹⁶⁴ Tm	-62.500	¹⁵⁶ Lu	-43.810	¹⁹⁰ Hf	-26.440	¹⁷² W	-49.150	²⁰⁰ Re	-13.680	¹⁸⁰ Ir	-38.310
¹⁶⁵ Tm	-63.230	¹⁵⁷ Lu	-46.280	¹⁹¹ Hf	-22.940	¹⁷³ W	-48.980	²⁰¹ Re	-10.600	¹⁸¹ Ir	-39.750
¹⁶⁶ Tm	-62.310	¹⁵⁸ Lu	-47.060	¹⁹² Hf	-20.480	¹⁷⁴ W	-50.470	²⁰² Re	-5.450	¹⁸² Ir	-39.560
¹⁶⁷ Tm	-62.710	¹⁵⁹ Lu	-49.620	¹⁹³ Hf	-16.660	¹⁷⁵ W	-50.060	²⁰³ Re	-1.260	¹⁸³ Ir	-40.590
¹⁶⁸ Tm	-61.580	¹⁶⁰ Lu	-50.030	¹⁹⁴ Hf	-13.930	¹⁷⁶ W	-51.150	²⁰⁴ Re	4.240	¹⁸⁴ Ir	-39.990
¹⁶⁹ Tm	-61.480	¹⁶¹ Lu	-52.400	¹⁹⁵ Hf	-9.850	¹⁷⁷ W	-50.290			¹⁸⁵ Ir	-40.630
¹⁷⁰ Tm	-59.990	¹⁶² Lu	-52.780			¹⁷⁸ W	-51.020			¹⁸⁶ Ir	-39.630
¹⁷¹ Tm	-59.450	¹⁶³ Lu	-54.780	¹⁵¹ Ta	-2.660 †	¹⁷⁹ W	-49.990	¹⁵⁷ Os	7.780 †	¹⁸⁷ Ir	-39.740
¹⁷² Tm	-57.650	¹⁶⁴ Lu	-54.930	¹⁵² Ta	-6.750 †	¹⁸⁰ W	-50.360	¹⁵⁸ Os	0.930 †	¹⁸⁸ Ir	-38.510
¹⁷³ Tm	-56.640	¹⁶⁵ Lu	-56.650	¹⁵³ Ta	-12.830 †	¹⁸¹ W	-48.940	¹⁵⁹ Os	-1.810 †	¹⁸⁹ Ir	-38.370
¹⁷⁴ Tm	-54.500	¹⁶⁶ Lu	-56.560	¹⁵⁴ Ta	-17.490 †	¹⁸² W	-48.800	¹⁶⁰ Os	-7.560 ‡	¹⁹⁰ Ir	-36.940
¹⁷⁵ Tm	-53.090	¹⁶⁷ Lu	-57.870	¹⁵⁵ Ta	-23.210 †	¹⁸³ W	-46.830	¹⁶¹ Os	-9.500 ‡	¹⁹¹ Ir	-36.730
¹⁷⁶ Tm	-50.630	¹⁶⁸ Lu	-57.360	¹⁵⁶ Ta	-25.150 †	¹⁸⁴ W	-46.320	¹⁶² Os	-13.530 ‡	¹⁹² Ir	-35.200
¹⁷⁷ Tm	-48.840	¹⁶⁹ Lu	-58.380	¹⁵⁷ Ta	-29.310 †	¹⁸⁵ W	-44.060	¹⁶³ Os	-14.920	¹⁹³ Ir	-34.780
¹⁷⁸ Tm	-45.780	¹⁷⁰ Lu	-57.700	¹⁵⁸ Ta	-30.920 †	¹⁸⁶ W	-43.000	¹⁶⁴ Os	-18.920	¹⁹⁴ Ir	-32.760
¹⁷⁹ Tm	-43.400	¹⁷¹ Lu	-58.240	¹⁵⁹ Ta	-33.990 †	¹⁸⁷ W	-40.510	¹⁶⁵ Os	-20.240	¹⁹⁵ Ir	-32.040
¹⁸⁰ Tm	-39.890	¹⁷² Lu	-57.280	¹⁶⁰ Ta	-35.100	¹⁸⁸ W	-39.190	¹⁶⁶ Os	-24.050	¹⁹⁶ Ir	-30.200
¹⁸¹ Tm	-37.010	¹⁷³ Lu	-57.370	¹⁶¹ Ta	-38.190	¹⁸⁹ W	-36.490	¹⁶⁷ Os	-25.190	¹⁹⁷ Ir	-29.400
¹⁸² Tm	-33.320	¹⁷⁴ Lu	-56.110	¹⁶² Ta	-39.190	¹⁹⁰ W	-35.220	¹⁶⁸ Os	-28.740	¹⁹⁸ Ir	-27.420
¹⁸³ Tm	-30.260	¹⁷⁵ Lu	-55.760	¹⁶³ Ta	-42.130	¹⁹¹ W	-32.220	¹⁶⁹ Os	-29.710	¹⁹⁹ Ir	-25.880
¹⁸⁴ Tm	-26.360	¹⁷⁶ Lu	-54.150	¹⁶⁴ Ta	-42.910	¹⁹² W	-30.650	¹⁷⁰ Os	-32.900	²⁰⁰ Ir	-23.160
¹⁸⁵ Tm	-23.070	¹⁷⁷ Lu	-53.470	¹⁶⁵ Ta	-45.450	¹⁹³ W	-27.690	¹⁷¹ Os	-33.630	²⁰¹ Ir	-21.100
¹⁸⁶ Tm	-18.880	¹⁷⁸ Lu	-51.530	¹⁶⁶ Ta	-45.980	¹⁹⁴ W	-25.840	¹⁷² Os	-36.540	²⁰² Ir	-19.060
		¹⁷⁹ Lu	-50.260	¹⁶⁷ Ta	-48.190	¹⁹⁵ W	-22.580	¹⁷³ Os	-37.040	²⁰³ Ir	-16.470
¹⁴⁷ Yb	-22.730 ‡	¹⁸⁰ Lu	-47.730	¹⁶⁸ Ta	-48.480	¹⁹⁶ W	-20.500	¹⁷⁴ Os	-39.670	²⁰⁴ Ir	-11.730
¹⁴⁸ Yb	-29.020	¹⁸¹ Lu	-45.940	¹⁶⁹ Ta	-50.450	¹⁹⁷ W	-16.870	¹⁷⁵ Os	-39.850	²⁰⁵ Ir	-8.100
¹⁴⁹ Yb	-31.960	¹⁸² Lu	-43.030	¹⁷⁰ Ta	-50.560	¹⁹⁸ W	-14.250	¹⁷⁶ Os	-41.960	²⁰⁶ Ir	-2.950
¹⁵⁰ Yb	-37.440	¹⁸³ Lu	-40.910	¹⁷¹ Ta	-52.050	¹⁹⁹ W	-11.300	¹⁷⁷ Os	-41.920	²⁰⁷ Ir	1.350
¹⁵¹ Yb	-41.020	¹⁸⁴ Lu	-37.840	¹⁷² Ta	-51.900	²⁰⁰ W	-8.220	¹⁷⁸ Os	-43.590	²⁰⁸ Ir	6.850
¹⁵² Yb	-46.390	¹⁸⁵ Lu	-35.330	¹⁷³ Ta	-52.980	²⁰¹ W	-2.630	¹⁷⁹ Os	-43.260	²⁰⁹ Ir	11.270
¹⁵³ Yb	-47.200	¹⁸⁶ Lu	-32.000	¹⁷⁴ Ta	-52.470			¹⁸⁰ Os	-44.570	²¹⁰ Ir	16.980
¹⁵⁴ Yb	-50.580	¹⁸⁷ Lu	-29.190			¹⁵⁵ Re	4.770 †	¹⁸¹ Os	-43.900		
								¹⁸² Os	-44.970		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁶² Pt	10.150 †	¹⁸⁸ Au	-33.820	²¹⁶ Hg	20.130	¹⁹⁴ Pb	-24.280	²²¹ Bi	24.430	¹⁹⁶ At	-3.690		
¹⁶³ Pt	7.930 †	¹⁹⁰ Au	-33.120	²¹⁷ Hg	25.620	¹⁹⁵ Pb	-23.850	²²² Bi	28.660	¹⁹⁷ At	-6.020		
¹⁶⁴ Pt	2.950 ‡	¹⁹¹ Au	-33.990	²¹⁸ Hg	29.370	¹⁹⁶ Pb	-25.500	²²³ Bi	32.010	¹⁹⁸ At	-6.470		
¹⁶⁵ Pt	0.870 †	¹⁹² Au	-33.080			¹⁹⁷ Pb	-24.870	²²⁴ Bi	35.970	¹⁹⁹ At	-8.480		
¹⁶⁶ Pt	-3.660 ‡	¹⁹³ Au	-33.650	¹⁷¹ Tl	16.650 †	¹⁹⁸ Pb	-26.210	²²⁵ Bi	39.460	²⁰⁰ At	-8.690		
¹⁶⁷ Pt	-5.400 ‡	¹⁹⁴ Au	-32.590	¹⁷² Tl	14.380 †	¹⁹⁹ Pb	-25.350	²²⁶ Bi	43.840	²⁰¹ At	-10.560		
¹⁶⁸ Pt	-9.730	¹⁹⁵ Au	-32.800	¹⁷³ Tl	9.790 †	²⁰⁰ Pb	-26.390	²²⁷ Bi	47.510	²⁰² At	-10.560		
¹⁶⁹ Pt	-11.110	¹⁹⁶ Au	-31.570	¹⁷⁴ Tl	7.560 †	²⁰¹ Pb	-25.380			²⁰³ At	-12.250		
¹⁷⁰ Pt	-15.110	¹⁹⁷ Au	-31.450	¹⁷⁵ Tl	3.240 †	²⁰² Pb	-26.050	¹⁷⁷ Po	38.530 †	²⁰⁴ At	-11.720		
¹⁷¹ Pt	-16.330	¹⁹⁸ Au	-29.900	¹⁷⁶ Tl	1.530 †	²⁰³ Pb	-24.950	¹⁷⁸ Po	32.390 †	²⁰⁵ At	-13.110		
¹⁷² Pt	-20.140	¹⁹⁹ Au	-29.460	¹⁷⁷ Tl	-2.430 †	²⁰⁴ Pb	-25.250	¹⁷⁹ Po	29.690 †	²⁰⁶ At	-13.080		
¹⁷³ Pt	-21.180	²⁰⁰ Au	-27.980	¹⁷⁸ Tl	-3.830 †	²⁰⁵ Pb	-23.950	¹⁸⁰ Po	24.830 †	²⁰⁷ At	-13.930		
¹⁷⁴ Pt	-24.580	²⁰¹ Au	-27.010	¹⁷⁹ Tl	-7.480 †	²⁰⁶ Pb	-23.780	¹⁸¹ Po	21.380 ‡	²⁰⁸ At	-13.210		
¹⁷⁵ Pt	-25.350	²⁰² Au	-24.850	¹⁸⁰ Tl	-8.600	²⁰⁷ Pb	-21.860	¹⁸² Po	17.040 ‡	²⁰⁹ At	-13.670		
¹⁷⁶ Pt	-28.430	²⁰³ Au	-23.410	¹⁸¹ Tl	-12.030	²⁰⁸ Pb	-20.760	¹⁸³ Po	14.920 ‡	²¹⁰ At	-12.580		
¹⁷⁷ Pt	-29.270	²⁰⁴ Au	-22.150	¹⁸² Tl	-12.910	²⁰⁹ Pb	-16.820	¹⁸⁴ Po	10.650 ‡	²¹¹ At	-11.870		
¹⁷⁸ Pt	-31.860	²⁰⁵ Au	-20.050	¹⁸³ Tl	-16.070	²¹⁰ Pb	-14.730	¹⁸⁵ Po	8.840 ‡	²¹² At	-8.890		
¹⁷⁹ Pt	-32.330	²⁰⁶ Au	-15.740	¹⁸⁴ Tl	-16.720	²¹¹ Pb	-10.410	¹⁸⁶ Po	5.090 ‡	²¹³ At	-7.440		
¹⁸⁰ Pt	-34.650	²⁰⁷ Au	-12.690	¹⁸⁵ Tl	-19.590	²¹² Pb	-7.530	¹⁸⁷ Po	3.590	²¹⁴ At	-4.090		
¹⁸¹ Pt	-34.640	²⁰⁸ Au	-8.020	¹⁸⁶ Tl	-20.040	²¹³ Pb	-2.940	¹⁸⁸ Po	0.000	²¹⁵ At	-1.820		
¹⁸² Pt	-36.590	²⁰⁹ Au	-4.240	¹⁸⁷ Tl	-22.570	²¹⁴ Pb	0.030	¹⁸⁹ Po	-1.060	²¹⁶ At	2.000		
¹⁸³ Pt	-36.210	²¹⁰ Au	0.850	¹⁸⁸ Tl	-22.770	²¹⁵ Pb	4.860	¹⁹⁰ Po	-3.550	²¹⁷ At	4.280		
¹⁸⁴ Pt	-37.810	²¹¹ Au	4.720	¹⁸⁹ Tl	-24.990	²¹⁶ Pb	7.920	¹⁹¹ Po	-4.400	²¹⁸ At	8.770		
¹⁸⁵ Pt	-37.230	²¹² Au	9.990	¹⁹⁰ Tl	-24.930	²¹⁷ Pb	12.940	¹⁹² Po	-7.400	²¹⁹ At	11.200		
¹⁸⁶ Pt	-38.310	²¹³ Au	13.980	¹⁹¹ Tl	-26.890	²¹⁸ Pb	16.110	¹⁹³ Po	-7.930	²²⁰ At	14.620		
¹⁸⁷ Pt	-37.300	²¹⁴ Au	19.260	¹⁹² Tl	-26.660	²¹⁹ Pb	21.230	¹⁹⁴ Po	-10.520	²²¹ At	17.150		
¹⁸⁸ Pt	-37.960	²¹⁵ Au	23.320	¹⁹³ Tl	-27.610	²²⁰ Pb	24.540	¹⁹⁵ Po	-10.650	²²² At	20.860		
¹⁸⁹ Pt	-36.680	²¹⁶ Au	28.630	¹⁹⁴ Tl	-27.280	²²¹ Pb	29.780	¹⁹⁶ Po	-12.800	²²³ At	23.350		
¹⁹⁰ Pt	-37.510			¹⁹⁵ Tl	-28.250	²²² Pb	33.210	¹⁹⁷ Po	-13.100	²²⁴ At	26.860		
¹⁹¹ Pt	-36.180	¹⁶⁹ Hg	12.210 †	¹⁹⁶ Tl	-27.530			¹⁹⁸ Po	-15.510	²²⁵ At	29.640		
¹⁹² Pt	-36.560	¹⁷⁰ Hg	7.380 †	¹⁹⁷ Tl	-28.520	¹⁷⁵ Bi	30.680 †	¹⁹⁹ Po	-15.270	²²⁶ At	33.350		
¹⁹³ Pt	-35.060	¹⁷¹ Hg	5.500 †	¹⁹⁸ Tl	-27.640	¹⁷⁶ Bi	28.030 †	²⁰⁰ Po	-17.250	²²⁷ At	36.340		
¹⁹⁴ Pt	-35.230	¹⁷² Hg	0.940 †	¹⁹⁹ Tl	-28.640	¹⁷⁷ Bi	23.190 †	²⁰¹ Po	-16.720	²²⁸ At	40.380		
¹⁹⁵ Pt	-33.510	¹⁷³ Hg	-0.640 †	²⁰⁰ Tl	-27.070	¹⁷⁸ Bi	20.780 †	²⁰² Po	-18.400	²²⁹ At	43.580		
¹⁹⁶ Pt	-33.280	¹⁷⁴ Hg	-4.910 †	²⁰¹ Tl	-27.780	¹⁷⁹ Bi	16.220 †	²⁰³ Po	-17.600	²³⁰ At	47.710		
¹⁹⁷ Pt	-31.220	¹⁷⁵ Hg	-6.220 ‡	²⁰² Tl	-26.710	¹⁸⁰ Bi	14.130 †	²⁰⁴ Po	-18.970	²³¹ At	51.280		
¹⁹⁸ Pt	-30.650	¹⁷⁶ Hg	-10.150	²⁰³ Tl	-26.330	¹⁸¹ Bi	9.840 †	²⁰⁵ Po	-18.470	²³² At	55.580		
¹⁹⁹ Pt	-28.690	¹⁷⁷ Hg	-11.210	²⁰⁴ Tl	-24.940	¹⁸² Bi	8.020 †	²⁰⁶ Po	-19.080				
²⁰⁰ Pt	-27.550	¹⁷⁸ Hg	-14.850	²⁰⁵ Tl	-24.330	¹⁸³ Bi	4.040 †	²⁰⁷ Po	-18.100	¹⁸⁵ Rn	33.360 †		
²⁰¹ Pt	-24.870	¹⁷⁹ Hg	-15.630	²⁰⁶ Tl	-22.370	¹⁸⁴ Bi	2.510 †	²⁰⁸ Po	-18.360	¹⁸⁶ Rn	28.560 †		
²⁰² Pt	-23.340	¹⁸⁰ Hg	-18.980	²⁰⁷ Tl	-20.800	¹⁸⁵ Bi	-1.190 †	²⁰⁹ Po	-16.860	¹⁸⁷ Rn	26.080 †		
²⁰³ Pt	-21.390	¹⁸¹ Hg	-19.530	²⁰⁸ Tl	-16.870	¹⁸⁶ Bi	-2.600 †	²¹⁰ Po	-16.150	¹⁸⁸ Rn	21.810 ‡		
²⁰⁴ Pt	-19.260	¹⁸² Hg	-22.570	²⁰⁹ Tl	-14.330	¹⁸⁷ Bi	-5.770 †	²¹¹ Po	-12.710	¹⁸⁹ Rn	19.810 ‡		
²⁰⁵ Pt	-14.520	¹⁸³ Hg	-22.840	²¹⁰ Tl	-10.060	¹⁸⁸ Bi	-6.760 †	²¹² Po	-11.140	¹⁹⁰ Rn	15.800 ‡		
²⁰⁶ Pt	-11.360	¹⁸⁴ Hg	-25.590	²¹¹ Tl	-6.730	¹⁸⁹ Bi	-9.610 †	²¹³ Po	-7.300	¹⁹¹ Rn	14.160 ‡		
²⁰⁷ Pt	-6.230	¹⁸⁵ Hg	-25.670	²¹² Tl	-2.130	¹⁹⁰ Bi	-10.280 †	²¹⁴ Po	-4.940	¹⁹² Rn	10.650		
²⁰⁸ Pt	-2.330	¹⁸⁶ Hg	-28.010	²¹³ Tl	1.230	¹⁹¹ Bi	-12.830 †	²¹⁵ Po	-0.820	¹⁹³ Rn	10.370 ‡		
²⁰⁹ Pt	3.190	¹⁸⁷ Hg	-27.840	²¹⁴ Tl	6.070	¹⁹² Bi	-13.280	²¹⁶ Po	1.620	¹⁹⁴ Rn	7.090		
²¹⁰ Pt	7.080	¹⁸⁸ Hg	-29.830	²¹⁵ Tl	9.550	¹⁹³ Bi	-15.480	²¹⁷ Po	5.950	¹⁹⁵ Rn	6.090		
²¹¹ Pt	12.840	¹⁸⁹ Hg	-29.360	²¹⁶ Tl	14.580	¹⁹⁴ Bi	-15.610	²¹⁸ Po	8.450	¹⁹⁶ Rn	2.970		
²¹² Pt	16.880	¹⁹⁰ Hg	-31.110	²¹⁷ Tl	18.100	¹⁹⁵ Bi	-17.650	²¹⁹ Po	15.160	¹⁹⁷ Rn	2.240		
²¹³ Pt	22.540	¹⁹¹ Hg	-30.450	²¹⁸ Tl	23.180	¹⁹⁶ Bi	-17.580	²²⁰ Po	17.220	¹⁹⁸ Rn	-0.460		
²¹⁴ Pt	26.610	¹⁹² Hg	-31.850	²¹⁹ Tl	26.920	¹⁹⁷ Bi	-19.450	²²¹ Po	20.270	¹⁹⁹ Rn	-0.960		
		¹⁹³ Hg	-30.950	²²⁰ Tl	32.090	¹⁹⁸ Bi	-19.170	²²² Po	23.040	²⁰⁰ Rn	-3.410		
¹⁶⁷ Au	6.030 †	¹⁹⁴ Hg	-32.060			¹⁹⁹ Bi	-20.600	²²³ Po	26.930	²⁰¹ Rn	-3.640		
¹⁶⁸ Au	3.840 †	¹⁹⁵ Hg	-31.020	¹⁷³ Pb	23.340 †	²⁰⁰ Bi	-20.170	²²⁴ Po	29.770	²⁰² Rn	-5.860		
¹⁶⁹ Au	-0.450 †	¹⁹⁶ Hg	-31.750	¹⁷⁴ Pb	18.310 †	²⁰¹ Bi	-21.280	²²⁵ Po	33.760	²⁰³ Rn	-5.850		
¹⁷⁰ Au	-2.390 †	¹⁹⁷ Hg	-30.520	¹⁷⁵ Pb	16.220 †	²⁰² Bi	-20.570	²²⁶ Po	36.830	²⁰⁴ Rn	-8.150		
¹⁷¹ Au	-6.430 †	¹⁹⁸ Hg	-30.920	¹⁷⁶ Pb	11.470 †	²⁰³ Bi	-21.500	²²⁷ Po	41.290	²⁰⁵ Rn	-7.480		
¹⁷² Au	-8.040 †	¹⁹⁹ Hg	-29.470	¹⁷⁷ Pb	9.680 †	²⁰⁴ Bi	-21.230	²²⁸ Po	44.510	²⁰⁶ Rn	-9.620		
¹⁷³ Au	-11.790 †	²⁰⁰ Hg	-29.570	¹⁷⁸ Pb	5.210 †	²⁰⁵ Bi	-21.370	²²⁹ Po	49.070	²⁰⁷ Rn	-9.080		
¹⁷⁴ Au	-13.090 †	²⁰¹ Hg	-28.000	¹⁷⁹ Pb	3.690 †	²⁰⁶ Bi	-20.400	²³⁰ Po	52.670	²⁰⁸ Rn	-10.370		
¹⁷⁵ Au	-16.510 †	²⁰² Hg	-27.050	¹⁸⁰ Pb	-0.460	²⁰⁷ Bi	-20.230			²⁰⁹ Rn	-9.600		
¹⁷⁶ Au	-17.530 †	²⁰³ Hg	-24.900	¹⁸¹ Pb	-1.720	²⁰⁸ Bi	-18.610	¹⁸³ At	27.930 †	²¹⁰ Rn	-10.490		
¹⁷⁷ Au	-20.680 †	²⁰⁴ Hg	-24.300	¹⁸² Pb	-5.550	²⁰⁹ Bi	-17.480	¹⁸⁴ At	25.220 †	²¹¹ Rn	-9.430		
¹⁷⁸ Au	-21.470 †	²⁰⁵ Hg	-23.220	¹⁸³ Pb	-6.470	²¹⁰ Bi	-14.060	¹⁸⁵ At	20.830 †	²¹² Rn	-9.130		
¹⁷⁹ Au	-24.320 †	²⁰⁶ Hg	-21.580	¹⁸⁴ Pb	-10.060	²¹¹ Bi	-12.060	¹⁸⁶ At	18.490 †	²¹³ Rn	-6.170		
¹⁸⁰ Au	-24.910 †	²⁰⁷ Hg	-17.340	¹⁸⁵ Pb	-10.770	²¹² Bi	-8.230	¹⁸⁷ At	14.580 †	²¹⁴ Rn	-5.150		
¹⁸¹ Au	-27.430	²⁰⁸ Hg	-14.670	¹⁸⁶ Pb	-14.010	²¹³ Bi	-5.430	¹⁸⁸ At	12.680 †	²¹⁵ Rn	-1.840		
¹⁸² Au	-27.800	²⁰⁹ Hg	-10.000	¹⁸⁷ Pb	-14.480	²¹⁴ Bi	-1.300	¹⁸⁹ At	8.980 †	²¹⁶ Rn	0.040		
¹⁸³ Au	-29.990	²¹⁰ Hg	-6.600	¹⁸⁸ Pb	-17.390	²¹⁵ Bi	1.560	¹⁹⁰ At	7.250 †	²¹⁷ Rn	3.680		
¹⁸⁴ Au	-30.090	²¹¹ Hg	-1.490	¹⁸⁹ Pb	-17.600	²¹⁶ Bi	5.920	¹⁹¹ At	5.000 †	²¹⁸ Rn	5.610		
¹⁸⁵ Au	-31.910	²¹² Hg	1.880	¹⁹⁰ Pb	-20.230	²¹⁷ Bi	8.780	¹⁹² At	3.690 †	²¹⁹ Rn	9.940		
¹⁸⁶ Au	-31.780	²¹³ Hg	7.230	¹⁹¹ Pb	-20.180	²¹⁸ Bi	13.220	¹⁹³ At	0.660 †	²²⁰ Rn	11.870		
¹⁸⁷ Au	-33.160	²¹⁴ Hg	10.750	¹⁹² Pb	-22.540	²¹⁹ Bi	16.310	¹⁹⁴ At	-0.350 †	²²¹ Rn	15.150		
¹⁸⁸ Au	-32.670	²¹⁵ Hg	16.470	¹⁹³ Pb	-22.290	²²⁰ Bi	22.250	¹⁹⁵ At	-2.970 †	²²² Rn	17.210		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²²³ Rn	20.510	²⁰⁴ Ra	6.750	²³⁴ Ac	43.940	²²⁰ Pa	20.040	²⁵⁰ U	86.610	²⁴¹ Pu	53.050		
²²⁴ Rn	22.650	²⁰⁵ Ra	6.250	²³⁵ Ac	46.600	²²¹ Pa	22.400 †	²⁰⁹ Np	46.640 †	²⁴² Pu	54.730		
²²⁵ Rn	26.150	²⁰⁶ Ra	3.960	²³⁶ Ac	50.100	²²² Pa	23.170	²¹⁰ Np	45.110 †	²⁴³ Pu	57.670		
²²⁶ Rn	28.460	²⁰⁷ Ra	3.830	²³⁷ Ac	53.060	²²³ Pa	23.480	²¹¹ Np	42.040 †	²⁴⁴ Pu	59.590		
²²⁷ Rn	32.140	²⁰⁸ Ra	1.780	²³⁸ Ac	56.790	²²⁴ Pa	25.150	²¹² Np	40.200 †	²⁴⁵ Pu	62.670		
²²⁸ Rn	34.650	²⁰⁹ Ra	1.660	²³⁹ Ac	59.990	²²⁵ Pa	25.550	²¹³ Np	37.670 †	²⁴⁶ Pu	64.980		
²²⁹ Rn	38.600	²¹⁰ Ra	0.230	²⁴⁰ Ac	63.880	²²⁶ Pa	27.220	²¹⁴ Np	36.370 †	²⁴⁷ Pu	68.590		
²³⁰ Rn	41.370	²¹¹ Ra	0.730	²⁴¹ Ac	67.420	²²⁷ Pa	27.850	²¹⁵ Np	34.130 †	²⁴⁸ Pu	71.250		
²³¹ Rn	45.490	²¹² Ra	-0.840	²⁴² Ac	71.770	²²⁸ Pa	29.560	²¹⁶ Np	33.500 †	²⁴⁹ Pu	75.090		
²³² Rn	48.670	²¹³ Ra	-0.380	²⁰⁰ Th	34.080 ‡	²²⁹ Pa	30.520	²¹⁷ Np	31.750 †	²⁵⁰ Pu	77.960		
²³³ Rn	52.840	²¹⁴ Ra	-0.480	²⁰¹ Th	33.060 ‡	²³⁰ Pa	32.530	²¹⁸ Np	30.220 †	²⁵¹ Pu	81.950		
²³⁴ Rn	56.210	²¹⁵ Ra	2.000	²⁰² Th	29.770 ‡	²³¹ Pa	33.720	²¹⁹ Np	29.340 †	²⁵² Pu	84.920		
²³⁵ Rn	60.670	²¹⁶ Ra	2.480	²⁰³ Th	28.430 ‡	²³² Pa	36.010	²²⁰ Np	30.330 †	²⁵³ Pu	88.960		
¹⁸⁹ Fr	31.940 †	²¹⁷ Ra	5.320	²⁰⁴ Th	24.860 ‡	²³³ Pa	37.490	²²¹ Np	29.680	²⁵⁴ Pu	92.120		
¹⁹⁰ Fr	29.460 †	²¹⁸ Ra	6.620	²⁰⁵ Th	23.830	²³⁴ Pa	40.150	²²² Np	32.500 †	²⁵⁵ Pu	96.380		
¹⁹¹ Fr	25.460 †	²¹⁹ Ra	10.490	²⁰⁶ Th	20.860	²³⁵ Pa	42.040	²²³ Np	31.760	²⁵⁶ Pu	99.690		
¹⁹² Fr	23.390 †	²²⁰ Ra	11.810	²⁰⁷ Th	20.040	²³⁶ Pa	44.820	²²⁴ Np	32.740	²²² Am	43.840 †		
¹⁹³ Fr	19.930 †	²²¹ Ra	14.610	²⁰⁸ Th	17.320	²³⁷ Pa	47.090	²²⁵ Np	32.450	²²³ Am	42.710 †		
¹⁹⁴ Fr	18.330 †	²²² Ra	15.800	²⁰⁹ Th	16.840	²³⁸ Pa	50.110	²²⁶ Np	33.510	²²⁴ Am	44.740		
¹⁹⁵ Fr	16.120 †	²²³ Ra	18.500	²¹⁰ Th	14.670	²³⁹ Pa	52.630	²²⁷ Np	33.260	²²⁵ Am	43.400		
¹⁹⁶ Fr	14.620 †	²²⁴ Ra	19.860	²¹¹ Th	13.930	²⁴⁰ Pa	56.000	²²⁸ Np	34.460	²²⁶ Am	43.880		
¹⁹⁷ Fr	11.500 †	²²⁵ Ra	22.670	²¹² Th	12.150	²⁴¹ Pa	58.790	²²⁹ Np	34.470	²²⁷ Am	42.870		
¹⁹⁸ Fr	10.330 †	²²⁶ Ra	24.260	²¹³ Th	12.260	²⁴² Pa	62.290	²³⁰ Np	35.780	²²⁸ Am	43.480		
¹⁹⁹ Fr	7.610 †	²²⁷ Ra	27.160	²¹⁴ Th	10.300	²⁴³ Pa	65.430	²³¹ Np	36.180	²²⁹ Am	42.740		
²⁰⁰ Fr	6.680 †	²²⁸ Ra	28.930	²¹⁵ Th	10.260	²⁴⁴ Pa	69.440	²³² Np	37.710	²³⁰ Am	43.540		
²⁰¹ Fr	4.250 †	²²⁹ Ra	32.130	²¹⁶ Th	9.730	²⁴⁵ Pa	72.860	²³³ Np	38.430	²³¹ Am	43.090		
²⁰² Fr	3.580	²³⁰ Ra	34.120	²¹⁷ Th	11.750	²⁴⁶ Pa	77.230	²³⁴ Np	40.350	²³² Am	44.060		
²⁰³ Fr	1.450 †	²³¹ Ra	37.540	²¹⁸ Th	11.680	²⁴⁷ Pa	80.800	²³⁵ Np	41.350	²³³ Am	43.850		
²⁰⁴ Fr	0.950	²³² Ra	39.850	²¹⁹ Th	14.020	²⁴⁸ Pa	85.240	²³⁶ Np	43.640	²³⁴ Am	45.030		
²⁰⁵ Fr	-1.130	²³³ Ra	43.530	²²⁰ Th	14.850	²⁰⁴ U	46.890 †	²³⁷ Np	45.050	²³⁵ Am	45.270		
²⁰⁶ Fr	-1.490	²³⁴ Ra	46.260	²²¹ Th	18.100	²⁰⁵ U	45.310 †	²³⁸ Np	47.460	²³⁶ Am	46.830		
²⁰⁷ Fr	-2.860	²³⁵ Ra	50.100	²²² Th	18.550	²⁰⁶ U	41.760 ‡	²³⁹ Np	49.310	²³⁷ Am	47.280		
²⁰⁸ Fr	-2.870	²³⁶ Ra	53.090	²²³ Th	20.650	²⁰⁷ U	40.250 ‡	²⁴⁰ Np	51.970	²³⁸ Am	49.110		
²⁰⁹ Fr	-3.840	²³⁷ Ra	57.170	²²⁴ Th	21.280	²⁰⁸ U	36.920 ‡	²⁴¹ Np	54.070	²³⁹ Am	50.050		
²¹⁰ Fr	-3.300	²³⁸ Ra	60.400	²²⁵ Th	23.430	²⁰⁹ U	35.770 ‡	²⁴² Np	57.010	²⁴⁰ Am	52.020		
²¹¹ Fr	-4.730	²³⁹ Ra	64.650	²²⁶ Th	24.210	²¹⁰ U	32.170 ‡	²⁴³ Np	59.380	²⁴¹ Am	53.400		
²¹² Fr	-4.190	²⁴⁰ Ra	68.210	²²⁷ Th	26.430	²¹¹ U	31.360	²⁴⁴ Np	62.510	²⁴² Am	55.740		
²¹³ Fr	-3.920	¹⁹⁶ Ac	35.190 †	²²⁸ Th	27.340	²¹² U	28.750	²⁴⁵ Np	65.200	²⁴³ Am	57.380		
²¹⁴ Fr	-1.400	¹⁹⁷ Ac	31.720 †	²²⁹ Th	29.740	²¹³ U	27.720	²⁴⁶ Np	68.840	²⁴⁴ Am	59.980		
²¹⁵ Fr	-0.480	¹⁹⁸ Ac	30.330 †	²³⁰ Th	31.000	²¹⁴ U	25.510	²⁴⁷ Np	71.860	²⁴⁵ Am	61.870		
²¹⁶ Fr	2.400	¹⁹⁹ Ac	27.190 †	²³¹ Th	33.820	²¹⁵ U	25.260	²⁴⁸ Np	75.780	²⁴⁶ Am	64.590		
²¹⁷ Fr	4.150	²⁰⁰ Ac	25.820 †	²³² Th	35.230	²¹⁶ U	23.430	²⁴⁹ Np	79.040	²⁴⁷ Am	66.870		
²¹⁸ Fr	7.640	²⁰¹ Ac	22.690 †	²³³ Th	38.310	²¹⁷ U	22.410	²⁵⁰ Np	83.060	²⁴⁸ Am	70.140		
²¹⁹ Fr	9.980	²⁰² Ac	21.350 †	²³⁴ Th	40.220	²¹⁸ U	21.460	²⁵¹ Np	86.420	²⁴⁹ Am	72.710		
²²⁰ Fr	12.710	²⁰³ Ac	18.470 †	²³⁵ Th	43.440	²¹⁹ U	23.020	²⁵² Np	90.560	²⁵⁰ Am	76.200		
²²¹ Fr	14.450	²⁰⁴ Ac	17.390 †	²³⁶ Th	45.740	²²⁰ U	22.420	²⁵³ Np	94.040	²⁵¹ Am	79.030		
²²² Fr	17.300	²⁰⁵ Ac	14.850 †	²³⁷ Th	49.210	²²¹ U	24.300	²¹³ Pu	47.280 ‡	²⁵² Am	82.640		
²²³ Fr	19.160	²⁰⁶ Ac	13.970 †	²³⁸ Th	51.780	²²² U	25.960	²¹⁴ Pu	44.300 ‡	²⁵³ Am	85.580		
²²⁴ Fr	22.050	²⁰⁷ Ac	11.730 †	²³⁹ Th	55.520	²²³ U	26.910	²¹⁵ Pu	43.030 ‡	²⁵⁴ Am	89.250		
²²⁵ Fr	24.060	²⁰⁸ Ac	11.380 †	²⁴⁰ Th	58.340	²²⁴ U	26.850	²¹⁶ Pu	40.350 ‡	²⁵⁵ Am	92.400		
²²⁶ Fr	27.140	²⁰⁹ Ac	9.310 †	²⁴¹ Th	62.220	²²⁵ U	28.430	²¹⁷ Pu	39.710	²⁵⁶ Am	96.290		
²²⁷ Fr	29.380	²¹⁰ Ac	8.690	²⁴² Th	65.390	²²⁶ U	28.320	²¹⁸ Pu	37.530	²⁵⁷ Am	99.580		
²²⁸ Fr	32.650	²¹¹ Ac	7.300	²⁴³ Th	69.730	²²⁷ U	29.910	²¹⁹ Pu	36.060	²⁵⁸ Am	103.780		
²²⁹ Fr	35.100	²¹² Ac	7.410	²⁴⁴ Th	73.210	²²⁸ U	30.050	²²⁰ Pu	34.690	²⁵⁹ Am	107.570		
²³⁰ Fr	38.570	²¹³ Ac	5.900	²⁴⁵ Th	77.890	²²⁹ U	31.800	²²¹ Pu	35.780	²²⁶ Cm	49.030		
²³¹ Fr	41.330	²¹⁴ Ac	5.760	²⁴⁶ Th	81.480	²³⁰ U	32.320	²²² Pu	34.650	²²⁷ Cm	49.260		
²³² Fr	44.920	²¹⁵ Ac	5.630	²⁰² Pa	42.510 †	²³¹ U	34.220	²²³ Pu	37.540	²²⁸ Cm	47.910		
²³³ Fr	48.080	²¹⁶ Ac	7.680	²⁰³ Pa	39.440 †	²³² U	34.950	²²⁴ Pu	36.740	²²⁹ Cm	48.520		
²³⁴ Fr	51.930	²¹⁷ Ac	8.060	²⁰⁴ Pa	37.740 †	²³³ U	37.260	²²⁵ Pu	37.290	²³⁰ Cm	47.380		
²³⁵ Fr	55.280	²¹⁸ Ac	10.440	²⁰⁵ Pa	34.540 †	²³⁴ U	38.310	²²⁶ Pu	36.580	²³¹ Cm	48.180		
²³⁶ Fr	59.380	²¹⁹ Ac	11.720	²⁰⁶ Pa	33.060 †	²³⁵ U	40.950	²²⁷ Pu	37.640	²³² Cm	47.340		
²³⁷ Fr	62.900	²²⁰ Ac	15.040	²⁰⁷ Pa	29.810 †	²³⁶ U	42.460	²²⁸ Pu	36.960	²³³ Cm	48.330		
²³⁸ Fr	67.170	²²¹ Ac	16.090	²⁰⁸ Pa	28.490 †	²³⁷ U	45.240	²²⁹ Pu	38.190	²³⁴ Cm	47.690		
¹⁹³ Ra	31.090 †	²²² Ac	18.250	²⁰⁹ Pa	25.890 †	²³⁸ U	47.140	²³⁰ Pu	37.740	²³⁵ Cm	48.860		
¹⁹⁴ Ra	27.170 ‡	²²³ Ac	19.250	²¹⁰ Pa	25.080 †	²³⁹ U	50.180	²³¹ Pu	39.100	²³⁶ Cm	48.650		
¹⁹⁵ Ra	25.460 ‡	²²⁴ Ac	21.490	²¹¹ Pa	22.770 †	²⁴⁰ U	52.330	²³² Pu	39.030	²³⁷ Cm	50.260		
¹⁹⁶ Ra	22.060 ‡	²²⁵ Ac	22.700	²¹² Pa	21.730 †	²⁴¹ U	55.670	²³³ Pu	40.530	²³⁸ Cm	50.270		
¹⁹⁷ Ra	21.030 ‡	²²⁶ Ac	25.050	²¹³ Pa	19.930 †	²⁴² U	58.060	²³⁴ Pu	40.840	²³⁹ Cm	52.040		
¹⁹⁸ Ra	18.130 ‡	²²⁷ Ac	26.480	²¹⁴ Pa	19.700 †	²⁴³ U	61.550	²³⁵ Pu	42.760	²⁴⁰ Cm	52.610		
¹⁹⁹ Ra	16.870 ‡	²²⁸ Ac	28.970	²¹⁵ Pa	18.290 †	²⁴⁴ U	64.310	²³⁶ Pu	43.350	²⁴¹ Cm	54.530		
²⁰⁰ Ra	13.740	²²⁹ Ac	30.680	²¹⁶ Pa	17.210	²⁴⁵ U	68.290	²³⁷ Pu	45.490	²⁴² Cm	55.460		
²⁰¹ Ra	12.780	²³⁰ Ac	33.400	²¹⁷ Pa	16.660	²⁴⁶ U	71.380	²³⁸ Pu	46.490	²⁴³ Cm	57.680		
²⁰² Ra	9.980	²³¹ Ac	35.250	²¹⁸ Pa	18.250	²⁴⁷ U	75.670	²³⁹ Pu	48.970	²⁴⁴ Cm	58.890		
²⁰³ Ra	9.280	²³² Ac	38.330	²¹⁹ Pa	18.090	²⁴⁸ U	78.870	²⁴⁰ Pu	50.320	²⁴⁵ Cm	61.420		
		²³³ Ac	40.620			²							

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²⁴⁶ Cm	62.890	²⁵² Cf	76.270	²⁵⁵ Fm	84.170	²⁵⁴ No	85.930	²⁵⁴ Rf	94.700	²⁶⁶ Sg	113.450
²⁴⁷ Cm	65.610	²⁵³ Cf	79.420	²⁵⁶ Fm	85.690	²⁵⁵ No	87.970	²⁵⁵ Rf	95.760	²⁶⁷ Sg	115.360
²⁴⁸ Cm	67.470	²⁵⁴ Cf	81.360	²⁵⁷ Fm	88.530	²⁵⁶ No	88.680	²⁵⁶ Rf	95.690	²⁶⁸ Sg	116.130
²⁴⁹ Cm	70.680	²⁵⁵ Cf	84.550	²⁵⁸ Fm	90.250	²⁵⁷ No	90.840	²⁵⁷ Rf	97.250	²⁶⁹ Sg	118.330
²⁵⁰ Cm	72.830	²⁵⁶ Cf	86.750	²⁵⁹ Fm	93.110	²⁵⁸ No	91.970	²⁵⁸ Rf	97.500	²⁷⁰ Sg	119.870
²⁵¹ Cm	76.370	²⁵⁷ Cf	90.040	²⁶⁰ Fm	95.030	²⁵⁹ No	94.360	²⁵⁹ Rf	99.250	²⁷¹ Sg	122.790
²⁵² Cm	78.740	²⁵⁸ Cf	92.310	²⁶¹ Fm	98.130	²⁶⁰ No	95.540	²⁶⁰ Rf	99.910	²⁷² Sg	124.550
²⁵³ Cm	82.400	²⁵⁹ Cf	95.810	²⁶² Fm	100.210	²⁶¹ No	98.050	²⁶¹ Rf	101.830	²⁷³ Sg	127.650
²⁵⁴ Cm	84.960	²⁶⁰ Cf	98.310	²⁶³ Fm	103.580	²⁶² No	99.460	²⁶² Rf	102.570	²⁷⁴ Sg	129.660
²⁵⁵ Cm	88.610	²⁶¹ Cf	102.150	²⁶⁴ Fm	106.290	²⁶³ No	102.140	²⁶³ Rf	104.640	²⁷⁵ Sg	132.630
²⁵⁶ Cm	91.380	²⁶² Cf	105.210	²⁶⁵ Fm	110.190	²⁶⁴ No	103.780	²⁶⁴ Rf	105.600	²⁷⁶ Sg	134.540
²⁵⁷ Cm	95.240	²⁶³ Cf	109.410	²⁶⁶ Fm	113.100	²⁶⁵ No	106.770	²⁶⁵ Rf	107.900	²⁷⁷ Sg	137.550
²⁵⁸ Cm	98.140	²⁶⁴ Cf	112.680	²⁶⁷ Fm	117.150	²⁶⁶ No	109.100	²⁶⁶ Rf	109.110	²⁷⁸ Sg	139.680
²⁵⁹ Cm	102.330	²⁶⁵ Cf	117.060	²⁶⁸ Fm	120.090	²⁶⁷ No	112.720	²⁶⁷ Rf	111.670	²⁷⁹ Sg	142.910
²⁶⁰ Cm	105.790	²⁶⁶ Cf	120.250	²⁶⁹ Fm	124.070	²⁶⁸ No	115.180	²⁶⁸ Rf	113.600	²⁸⁰ Sg	145.320
²⁶¹ Cm	110.270	²⁶⁷ Cf	124.380	²⁷⁰ Fm	127.030	²⁶⁹ No	118.980	²⁶⁹ Rf	116.920	²⁵⁵ Ns	115.680 †
²⁶² Cm	113.950	²⁶⁸ Cf	127.890	²⁷¹ Fm	131.170	²⁷⁰ No	121.570	²⁷⁰ Rf	119.000	²⁵⁶ Ns	115.830 †
²²⁹ Bk	55.070	²³⁴ Es	67.180	²⁷² Fm	134.350	²⁷¹ No	125.240	²⁷¹ Rf	122.410	²⁵⁷ Ns	114.640 †
²³⁰ Bk	55.210	²³⁵ Es	65.720	²⁷³ Fm	138.740	²⁷² No	127.900	²⁷² Rf	124.770	²⁵⁸ Ns	114.960
²³¹ Bk	54.020	²³⁶ Es	65.960	²⁷⁴ Fm	142.310	²⁷³ No	131.570	²⁷³ Rf	128.050	²⁵⁹ Ns	114.330
²³² Bk	54.480	²³⁷ Es	64.890	²³⁸ Md	79.640 †	²⁷⁴ No	134.510	²⁷⁴ Rf	130.410	²⁶⁰ Ns	115.100
²³³ Bk	53.590	²³⁸ Es	65.380	²³⁹ Md	78.130 †	²⁷⁵ No	138.560	²⁷⁵ Rf	133.700	²⁶¹ Ns	114.770
²³⁴ Bk	54.080	²³⁹ Es	64.600	²⁴⁰ Md	78.240 †	²⁷⁶ No	141.770	²⁷⁶ Rf	136.260	²⁶² Ns	115.710
²³⁵ Bk	53.450	²⁴⁰ Es	65.390	²⁴¹ Md	77.050	²⁷⁷ No	145.930	²⁷⁷ Rf	139.940	²⁶³ Ns	115.740
²³⁶ Bk	54.280	²⁴¹ Es	64.900	²⁴² Md	77.580	²⁷⁸ No	149.420	²⁷⁸ Rf	142.750	²⁶⁴ Ns	116.860
²³⁷ Bk	53.990	²⁴² Es	65.870	²⁴³ Md	76.530	²⁷⁹ No	153.770	²⁷⁹ Rf	146.560	²⁶⁵ Ns	117.090
²³⁸ Bk	55.210	²⁴³ Es	65.890	²⁴⁴ Md	77.100	²⁸⁰ No	157.610	²⁸⁰ Rf	149.730	²⁶⁶ Ns	118.300
²³⁹ Bk	55.190	²⁴⁴ Es	67.060	²⁴⁵ Md	76.640	²⁴³ Lr	91.260 †	²⁴⁸ Ha	104.870 †	²⁶⁷ Ns	118.760
²⁴⁰ Bk	56.580	²⁴⁵ Es	67.440	²⁴⁶ Md	77.490	²⁴⁴ Lr	91.240 †	²⁴⁹ Ha	103.380 †	²⁶⁸ Ns	120.330
²⁴¹ Bk	56.980	²⁴⁶ Es	68.930	²⁴⁷ Md	77.280	²⁴⁵ Lr	90.020 †	²⁵⁰ Ha	103.450 †	²⁶⁹ Ns	121.020
²⁴² Bk	58.630	²⁴⁷ Es	69.580	²⁴⁸ Md	78.340	²⁴⁶ Lr	90.220 †	²⁵¹ Ha	102.230 †	²⁷⁰ Ns	122.880
²⁴³ Bk	59.430	²⁴⁸ Es	71.310	²⁴⁹ Md	78.480	²⁴⁷ Lr	89.180 †	²⁵² Ha	102.470	²⁷¹ Ns	124.350
²⁴⁴ Bk	61.340	²⁴⁹ Es	72.150	²⁵⁰ Md	79.830	²⁴⁸ Lr	89.640	²⁵³ Ha	101.590	²⁷² Ns	126.930
²⁴⁵ Bk	62.480	²⁵⁰ Es	74.110	²⁵¹ Md	80.130	²⁴⁹ Lr	88.940	²⁵⁴ Ha	102.120	²⁷³ Ns	128.630
²⁴⁶ Bk	64.610	²⁵¹ Es	75.410	²⁵² Md	81.630	²⁵⁰ Lr	89.590	²⁵⁵ Ha	101.400	²⁷⁴ Ns	131.330
²⁴⁷ Bk	65.990	²⁵² Es	77.890	²⁵³ Md	82.440	²⁵¹ Lr	89.230	²⁵⁶ Ha	102.100	²⁷⁵ Ns	133.390
²⁴⁸ Bk	68.370	²⁵³ Es	79.480	²⁵⁴ Md	84.430	²⁵² Lr	90.180	²⁵⁷ Ha	101.950	²⁷⁶ Ns	136.050
²⁴⁹ Bk	70.140	²⁵⁴ Es	82.140	²⁵⁵ Md	85.610	²⁵³ Lr	90.000	²⁵⁸ Ha	103.110	²⁷⁷ Ns	138.010
²⁵⁰ Bk	73.000	²⁵⁵ Es	84.110	²⁵⁶ Md	87.840	²⁵⁴ Lr	91.000	²⁵⁹ Ha	103.230	²⁷⁸ Ns	140.660
²⁵¹ Bk	75.080	²⁵⁶ Es	86.930	²⁵⁷ Md	89.280	²⁵⁵ Lr	91.330	²⁶⁰ Ha	104.600	²⁷⁹ Ns	142.790
²⁵² Bk	78.260	²⁵⁷ Es	89.060	²⁵⁸ Md	91.750	²⁵⁶ Lr	92.960	²⁶¹ Ha	105.210	²⁸⁰ Ns	145.650
²⁵³ Bk	80.590	²⁵⁸ Es	92.040	²⁵⁹ Md	93.410	²⁵⁷ Lr	93.580	²⁶² Ha	106.740	²⁵⁷ Hs	122.810 †
²⁵⁴ Bk	83.900	²⁵⁹ Es	94.280	²⁶⁰ Md	95.900	²⁵⁸ Lr	95.360	²⁶³ Ha	107.400	²⁵⁸ Hs	121.240
²⁵⁵ Bk	86.400	²⁶⁰ Es	97.410	²⁶¹ Md	97.790	²⁵⁹ Lr	96.440	²⁶⁴ Ha	109.040	²⁵⁹ Hs	121.540
²⁵⁶ Bk	89.710	²⁶¹ Es	99.880	²⁶² Md	100.520	²⁶⁰ Lr	98.410	²⁶⁵ Ha	109.980	²⁶⁰ Hs	120.560
²⁵⁷ Bk	92.430	²⁶² Es	103.310	²⁶³ Md	102.560	²⁶¹ Lr	99.550	²⁶⁶ Ha	111.910	²⁶¹ Hs	121.300
²⁵⁸ Bk	95.970	²⁶³ Es	106.370	²⁶⁴ Md	105.600	²⁶² Lr	101.660	²⁶⁷ Ha	113.020	²⁶² Hs	120.540
²⁵⁹ Bk	98.860	²⁶⁴ Es	110.240	²⁶⁵ Md	108.280	²⁶³ Lr	103.010	²⁶⁸ Ha	115.280	²⁶³ Hs	121.470
²⁶⁰ Bk	102.710	²⁶⁵ Es	113.500	²⁶⁶ Md	111.880	²⁶⁴ Lr	105.350	²⁶⁹ Ha	117.180	²⁶⁴ Hs	121.090
²⁶¹ Bk	106.110	²⁶⁶ Es	117.630	²⁶⁷ Md	114.760	²⁶⁵ Lr	106.930	²⁷⁰ Ha	120.140	²⁶⁵ Hs	122.160
²⁶² Bk	110.290	²⁶⁷ Es	120.770	²⁶⁸ Md	118.530	²⁶⁶ Lr	109.560	²⁷¹ Ha	122.220	²⁶⁶ Hs	121.980
²⁶³ Bk	113.900	²⁶⁸ Es	124.720	²⁶⁹ Md	121.530	²⁶⁷ Lr	111.850	²⁷² Ha	125.310	²⁶⁷ Hs	123.160
²⁶⁴ Bk	118.230	²⁶⁹ Es	128.040	²⁷⁰ Md	125.160	²⁶⁸ Lr	115.170	²⁷³ Ha	127.670	²⁶⁸ Hs	123.230
²⁶⁵ Bk	121.740	²⁷⁰ Es	132.200	²⁷¹ Md	128.150	²⁶⁹ Lr	117.610	²⁷⁴ Ha	130.670	²⁶⁹ Hs	124.780
		²⁷¹ Es	135.710	²⁷² Md	131.840	²⁷⁰ Lr	121.010	²⁷⁵ Ha	133.020	²⁷⁰ Hs	125.140
²³² Cf	59.470	²³⁶ Fm	71.740	²⁷³ Md	135.140	²⁷¹ Lr	123.670	²⁷⁶ Ha	135.950	²⁷¹ Hs	126.910
²³³ Cf	59.920	²³⁷ Fm	71.900	²⁷⁴ Md	139.220	²⁷² Lr	127.020	²⁷⁷ Ha	138.500	²⁷² Hs	128.000
²³⁴ Cf	58.610	²³⁸ Fm	70.430	²⁷⁵ Md	142.760	²⁷³ Lr	129.730	²⁷⁸ Ha	141.900	²⁷³ Hs	130.600
²³⁵ Cf	59.120	²³⁹ Fm	70.920	²⁷⁶ Md	146.960	²⁷⁴ Lr	133.020	²⁷⁹ Ha	144.680	²⁷⁴ Hs	131.930
²³⁶ Cf	58.140	²⁴⁰ Fm	69.760	²⁷⁷ Md	150.740	²⁷⁵ Lr	135.940	²⁸⁰ Ha	148.150	²⁷⁵ Hs	134.600
²³⁷ Cf	58.930	²⁴¹ Fm	70.530	²⁴⁰ No	84.490	²⁷⁶ Lr	139.660	²⁵² Sg	108.700	²⁷⁶ Hs	136.220
²³⁸ Cf	58.280	²⁴² Fm	69.680	²⁴¹ No	84.630	²⁷⁷ Lr	142.940	²⁵³ Sg	108.940	²⁷⁷ Hs	138.840
²³⁹ Cf	59.480	²⁴³ Fm	70.620	²⁴² No	83.060	²⁷⁸ Lr	146.780	²⁵⁴ Sg	107.610	²⁷⁸ Hs	140.560
²⁴⁰ Cf	59.060	²⁴⁴ Fm	70.180	²⁴³ No	83.560	²⁷⁹ Lr	150.260	²⁵⁵ Sg	108.170	²⁷⁹ Hs	142.990
²⁴¹ Cf	60.330	²⁴⁵ Fm	71.390	²⁴⁴ No	82.150	²⁸⁰ Lr	154.350	²⁵⁶ Sg	107.060	²⁸⁰ Hs	144.650
²⁴² Cf	60.420	²⁴⁶ Fm	71.350	²⁴⁵ No	82.710	²⁴⁵ Rf	98.170 †	²⁵⁷ Sg	107.740	²⁸¹ Hs	147.500
²⁴³ Cf	62.040	²⁴⁷ Fm	72.810	²⁴⁶ No	81.860	²⁴⁶ Rf	96.460	²⁵⁸ Sg	107.180	²⁸² Hs	149.570
²⁴⁴ Cf	62.410	²⁴⁸ Fm	73.000	²⁴⁷ No	82.690	²⁴⁷ Rf	96.640	²⁵⁹ Sg	108.350	²⁸³ Hs	152.680
²⁴⁵ Cf	64.280	²⁴⁹ Fm	74.690	²⁴⁸ No	82.060	²⁴⁸ Rf	95.230	²⁶⁰ Sg	108.120	²⁸⁴ Hs	155.080
²⁴⁶ Cf	65.010	²⁵⁰ Fm	75.170	²⁴⁹ No	83.130	²⁴⁹ Rf	95.680	²⁶¹ Sg	109.440	²⁸⁵ Hs	158.240
²⁴⁷ Cf	67.130	²⁵¹ Fm	77.080	²⁵⁰ No	82.860	²⁵⁰ Rf	94.640	²⁶² Sg	109.570	²⁸⁶ Hs	161.170
²⁴⁸ Cf	68.100	²⁵² Fm	77.970	²⁵¹ No	84.200	²⁵¹ Rf	95.210	²⁶³ Sg	111.070	²⁸⁷ Hs	164.590
²⁴⁹ Cf	70.370	²⁵³ Fm	80.320	²⁵² No	84.120	²⁵² Rf	94.430	²⁶⁴ Sg	111.330	²⁸⁸ Hs	167.770
²⁵⁰ Cf	71.760	²⁵⁴ Fm	81.580	²⁵³ No	85.520	²⁵³ Rf	95.370	²⁶⁵ Sg	112.930	²⁸⁹ Hs	171.760

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²⁹⁰ Hs	175.020	²⁷² 110	136.200	³⁰¹ 111	212.290	²⁸³ 113	162.180	²⁶⁵ 115	185.760 †	²⁹⁴ 116	188.600
²⁹¹ Hs	179.380	²⁷³ 110	137.570	³⁰² 111	216.460	²⁸⁴ 113	163.610	²⁶⁶ 115	184.600 †	²⁹⁵ 116	190.740
²⁹² Hs	182.970	²⁷⁴ 110	138.310	³⁰³ 111	220.130	²⁸⁵ 113	164.430	²⁶⁷ 115	182.290 †	²⁹⁶ 116	192.350
²⁹³ Hs	188.340	²⁷⁵ 110	140.510	³⁰⁴ 111	224.230	²⁸⁶ 113	166.330	²⁶⁸ 115	181.480 †	²⁹⁷ 116	195.150
²⁹⁴ Hs	191.850	²⁷⁶ 110	141.440	³⁰⁵ 111	227.780	²⁸⁷ 113	167.570	²⁶⁹ 115	179.460 †	²⁹⁸ 116	197.090
²⁹⁵ Hs	197.380	²⁷⁷ 110	143.500	³⁰⁶ 111	232.080	²⁸⁸ 113	169.610	²⁷⁰ 115	178.870 †	²⁹⁹ 116	200.210
²⁹⁶ Hs	201.390	²⁷⁸ 110	144.550	³⁰⁷ 111	235.720	²⁸⁹ 113	171.080	²⁷¹ 115	177.160 †	³⁰⁰ 116	202.460
²⁹⁷ Hs	206.160	²⁷⁹ 110	146.710			²⁹⁰ 113	173.490	²⁷² 115	176.780 †	³⁰¹ 116	206.550
²⁹⁸ Hs	209.620	²⁸⁰ 110	147.800	²⁶² 112	155.090 †	²⁹¹ 113	175.180	²⁷³ 115	175.180 †	³⁰² 116	208.480
²⁹⁹ Hs	214.220	²⁸¹ 110	149.950	²⁶³ 112	154.700 †	²⁹² 113	177.970	²⁷⁴ 115	174.930 †	³⁰³ 116	212.720
³⁰⁰ Hs	217.900	²⁸² 110	151.290	²⁶⁴ 112	152.810 †	²⁹³ 113	180.280	²⁷⁵ 115	173.670 †	³⁰⁴ 116	215.120
³⁰¹ Hs	222.660	²⁸³ 110	153.800	²⁶⁵ 112	152.770 †	²⁹⁴ 113	183.280	²⁷⁶ 115	173.780 †	³⁰⁵ 116	218.820
³⁰² Hs	226.500	²⁸⁴ 110	155.460	²⁶⁶ 112	151.190 †	²⁹⁵ 113	185.880	²⁷⁷ 115	173.310 †	³⁰⁶ 116	221.270
³⁰³ Hs	231.370	²⁸⁵ 110	158.200	²⁶⁷ 112	151.300 †	²⁹⁶ 113	189.260	²⁷⁸ 115	173.070 †	³⁰⁷ 116	225.000
³⁰⁴ Hs	235.340	²⁸⁶ 110	160.230	²⁶⁸ 112	150.040 ‡	²⁹⁷ 113	192.160	²⁷⁹ 115	171.400 †	³⁰⁸ 116	227.600
		²⁸⁷ 110	163.020	²⁶⁹ 112	150.390 ‡	²⁹⁸ 113	196.550	²⁸⁰ 115	171.850 †	³⁰⁹ 116	231.450
²⁵⁹ Mt	129.810 †	²⁸⁸ 110	165.160	²⁷⁰ 112	149.320 ‡	²⁹⁹ 113	199.240	²⁸¹ 115	171.610 †	³¹⁰ 116	234.410
²⁶⁰ Mt	129.740 †	²⁸⁹ 110	168.420	²⁷¹ 112	149.750	³⁰⁰ 113	203.790	²⁸² 115	172.350 †	³¹¹ 116	238.550
²⁶¹ Mt	128.650 †	²⁹⁰ 110	171.110	²⁷² 112	148.980	³⁰¹ 113	206.960	²⁸³ 115	172.200 †	³¹² 116	241.560
²⁶² Mt	129.020 †	²⁹¹ 110	174.810	²⁷³ 112	149.760	³⁰² 113	211.660	²⁸⁴ 115	173.210	²⁷² 117	198.690 †
²⁶³ Mt	128.240 †	²⁹² 110	177.750	²⁷⁴ 112	149.490	³⁰³ 113	214.910	²⁸⁵ 115	173.630	²⁷³ 117	196.450 †
²⁶⁴ Mt	128.720	²⁹³ 110	181.780	²⁷⁵ 112	150.590	³⁰⁴ 113	219.710	²⁸⁶ 115	174.720	²⁷⁴ 117	195.820 †
²⁶⁵ Mt	128.330	²⁹⁴ 110	185.030	²⁷⁶ 112	150.850	³⁰⁵ 113	223.100	²⁸⁷ 115	175.120	²⁷⁵ 117	193.790 †
²⁶⁶ Mt	129.040	²⁹⁵ 110	190.080	²⁷⁷ 112	152.140	³⁰⁶ 113	226.430	²⁸⁸ 115	176.760	²⁷⁶ 117	193.820 †
²⁶⁷ Mt	128.760	²⁹⁶ 110	193.200	²⁷⁸ 112	152.600	³⁰⁷ 113	229.950	²⁸⁹ 115	177.650	²⁷⁷ 117	191.810 †
²⁶⁸ Mt	129.540	²⁹⁷ 110	198.410	²⁷⁹ 112	154.280	³⁰⁸ 113	234.060	²⁹⁰ 115	179.350	²⁷⁸ 117	191.440 †
²⁶⁹ Mt	129.560	²⁹⁸ 110	202.020	²⁸⁰ 112	154.230	³⁰⁹ 113	237.650	²⁹¹ 115	180.300	²⁷⁹ 117	189.790 †
²⁷⁰ Mt	130.700	²⁹⁹ 110	207.380	²⁸¹ 112	155.900			²⁹² 115	184.180	²⁸⁰ 117	189.540 †
²⁷¹ Mt	131.030	³⁰⁰ 110	211.070	²⁸² 112	156.570	²⁶⁴ 114	174.440 †	²⁹³ 115	183.800	²⁸¹ 117	188.180 †
²⁷² Mt	132.420	³⁰¹ 110	215.020	²⁸³ 112	158.340	²⁶⁵ 114	173.690 †	²⁹⁴ 115	186.080	²⁸² 117	188.200 †
²⁷³ Mt	133.470	³⁰² 110	218.510	²⁸⁴ 112	159.230	²⁶⁶ 114	171.420 †	²⁹⁵ 115	188.060	²⁸³ 117	187.340 †
²⁷⁴ Mt	135.710	³⁰³ 110	222.970	²⁸⁵ 112	161.420	²⁶⁷ 114	171.040 †	²⁹⁶ 115	190.860	²⁸⁴ 117	187.630 †
²⁷⁵ Mt	137.010	³⁰⁴ 110	226.500	²⁸⁶ 112	162.700	²⁶⁸ 114	169.070 †	²⁹⁷ 115	193.100	²⁸⁵ 117	187.150 †
²⁷⁶ Mt	139.280	³⁰⁵ 110	231.100	²⁸⁷ 112	165.130	²⁶⁹ 114	168.840 †	²⁹⁸ 115	196.190	²⁸⁶ 117	187.730 †
²⁷⁷ Mt	140.790	³⁰⁶ 110	234.760	²⁸⁸ 112	166.370	²⁷⁰ 114	167.210 †	²⁹⁹ 115	198.760	²⁸⁷ 117	187.750 †
²⁷⁸ Mt	143.170			²⁸⁹ 112	169.270	²⁷¹ 114	167.220 †	³⁰⁰ 115	202.850	²⁸⁸ 117	188.560 †
²⁷⁹ Mt	144.760	²⁶¹ 111	146.920 †	²⁹⁰ 112	170.790	²⁷² 114	165.780 †	³⁰¹ 115	205.140	²⁸⁹ 117	188.730 †
²⁸⁰ Mt	146.890	²⁶² 111	146.530 †	²⁹¹ 112	173.810	²⁷³ 114	165.900 †	³⁰² 115	209.380	²⁹⁰ 117	189.930
²⁸¹ Mt	148.570	²⁶³ 111	144.990 †	²⁹² 112	176.120	²⁷⁴ 114	164.790 ‡	³⁰³ 115	212.140	²⁹¹ 117	190.470
²⁸² Mt	151.100	²⁶⁴ 111	144.950 †	²⁹³ 112	179.420	²⁷⁵ 114	165.250 ‡	³⁰⁴ 115	216.520	²⁹² 117	191.900
²⁸³ Mt	153.150	²⁶⁵ 111	143.710 †	²⁹⁴ 112	181.970	²⁷⁶ 114	164.490 ‡	³⁰⁵ 115	219.430	²⁹³ 117	192.390
²⁸⁴ Mt	155.950	²⁶⁶ 111	143.820 †	²⁹⁵ 112	185.690	²⁷⁷ 114	165.100	³⁰⁶ 115	223.920	²⁹⁴ 117	194.180
²⁸⁵ Mt	158.390	²⁶⁷ 111	142.920 †	²⁹⁶ 112	188.610	²⁷⁸ 114	163.700	³⁰⁷ 115	225.900	²⁹⁵ 117	196.530 †
²⁸⁶ Mt	161.260	²⁶⁸ 111	143.270 †	²⁹⁷ 112	193.360	²⁷⁹ 114	164.440	³⁰⁸ 115	229.880	²⁹⁶ 117	196.870
²⁸⁷ Mt	163.900	²⁶⁹ 111	142.570 †	²⁹⁸ 112	196.080	²⁸⁰ 114	163.910	³⁰⁹ 115	232.990	²⁹⁷ 117	198.420
²⁸⁸ Mt	167.060	²⁷⁰ 111	143.020 †	²⁹⁹ 112	200.960	²⁸¹ 114	165.030	³¹⁰ 115	237.080	²⁹⁸ 117	200.990
²⁸⁹ Mt	170.120	²⁷¹ 111	142.640 †	³⁰⁰ 112	204.170	²⁸² 114	165.110	³¹¹ 115	240.430	²⁹⁹ 117	202.890
²⁹⁰ Mt	173.790	²⁷² 111	143.440	³⁰¹ 112	209.190	²⁸³ 114	166.250			³⁰⁰ 117	205.720
²⁹¹ Mt	177.040	²⁷³ 111	143.460	³⁰² 112	212.510	²⁸⁴ 114	166.850	²⁶⁶ 116	195.380 †	³⁰¹ 117	207.980
²⁹² Mt	181.060	²⁷⁴ 111	144.410	³⁰³ 112	216.900	²⁸⁵ 114	168.270	²⁶⁷ 116	194.150 †	³⁰² 117	211.730
²⁹³ Mt	184.640	²⁷⁵ 111	145.270	³⁰⁴ 112	220.280	²⁸⁶ 114	168.830	²⁶⁸ 116	191.570 †	³⁰³ 117	213.630
²⁹⁴ Mt	189.700	²⁷⁶ 111	146.840	³⁰⁵ 112	224.630	²⁸⁷ 114	170.590	²⁶⁹ 116	190.790 †	³⁰⁴ 117	217.530
²⁹⁵ Mt	193.150	²⁷⁷ 111	147.310	³⁰⁶ 112	227.990	²⁸⁸ 114	171.510	²⁷⁰ 116	188.460 †	³⁰⁵ 117	219.880
²⁹⁶ Mt	198.360	²⁷⁸ 111	149.220	³⁰⁷ 112	232.390	²⁸⁹ 114	173.550	²⁷¹ 116	187.870 †	³⁰⁶ 117	222.800
²⁹⁷ Mt	202.310	²⁷⁹ 111	149.990	³⁰⁸ 112	235.620	²⁹⁰ 114	174.650	²⁷² 116	185.790 †	³⁰⁷ 117	225.210
²⁹⁸ Mt	207.650	²⁸⁰ 111	151.730			²⁹¹ 114	177.000	²⁷³ 116	185.490 †	³⁰⁸ 117	228.670
²⁹⁹ Mt	210.670	²⁸¹ 111	152.700	²⁶³ 113	165.710 †	²⁹² 114	178.420	²⁷⁴ 116	183.520 †	³⁰⁹ 117	231.210
³⁰⁰ Mt	214.980	²⁸² 111	154.480	²⁶⁴ 113	164.990 †	²⁹³ 114	181.140	²⁷⁵ 116	183.270 †	³¹⁰ 117	234.760
³⁰¹ Mt	218.660	²⁸³ 111	155.760	²⁶⁵ 113	162.980 †	²⁹⁴ 114	183.040	²⁷⁶ 116	182.280 †	³¹¹ 117	237.540
³⁰² Mt	223.110	²⁸⁴ 111	157.950	²⁶⁶ 113	162.590 †	²⁹⁵ 114	186.030	²⁷⁷ 116	181.750 †	³¹² 117	241.410
³⁰³ Mt	226.930	²⁸⁵ 111	159.580	²⁶⁷ 113	160.870 †	²⁹⁶ 114	188.270	²⁷⁸ 116	180.560 ‡	³¹³ 117	244.490
³⁰⁴ Mt	231.490	²⁸⁶ 111	161.980	²⁶⁸ 113	160.620 †	²⁹⁷ 114	191.660	²⁷⁹ 116	180.720 †		
³⁰⁵ Mt	235.510	²⁸⁷ 111	163.890	²⁶⁹ 113	159.380 †	²⁹⁸ 114	194.240	²⁸⁰ 116	180.570 †	²⁶⁸ 118	217.690 †
		²⁸⁸ 111	166.340	²⁷⁰ 113	159.350 †	²⁹⁹ 114	198.650	²⁸¹ 116	179.630 †	²⁶⁹ 118	215.990 †
²⁶⁰ 110	137.370 †	²⁸⁹ 111	168.460	²⁷¹ 113	158.230 †	³⁰⁰ 114	200.970	²⁸² 116	178.840 ‡	²⁷⁰ 118	213.290 †
²⁶¹ 110	137.320 †	²⁹⁰ 111	171.510	²⁷² 113	158.310 †	³⁰¹ 114	205.540	²⁸³ 116	179.470	²⁷¹ 118	212.150 †
²⁶² 110	135.840 ‡	²⁹¹ 111	174.170	²⁷³ 113	157.540 †	³⁰² 114	208.340	²⁸⁴ 116	179.040	²⁷² 118	209.440 †
²⁶³ 110	136.200 ‡	²⁹² 111	177.480	²⁷⁴ 113	158.130 †	³⁰³ 114	213.050	²⁸⁵ 116	180.020	²⁷³ 118	208.510 †
²⁶⁴ 110	135.030	²⁹³ 111	180.380	²⁷⁵ 113	157.590 †	³⁰⁴ 114	215.990	²⁸⁶ 116	180.010	²⁷⁴ 118	205.940 †
²⁶⁵ 110	135.530	²⁹⁴ 111	184.110	²⁷⁶ 113	158.210 †	³⁰⁵ 114	220.820	²⁸⁷ 116	181.150	²⁷⁵ 118	205.300 †
²⁶⁶ 110	134.680	²⁹⁵ 111	187.370	²⁷⁷ 113	158.390 †	³⁰⁶ 114	223.860	²⁸⁸ 116	181.320	²⁷⁶ 118	202.940 †

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
281 ₁₁₈	197.910 †	270 ₁₂₀	242.980 †	308 ₁₂₁	236.310
282 ₁₁₈	196.180 †	271 ₁₂₀	242.010 †	309 ₁₂₁	237.810
283 ₁₁₈	196.150 †	272 ₁₂₀	237.640 †	310 ₁₂₁	240.390
284 ₁₁₈	195.030 †	273 ₁₂₀	234.680 †	311 ₁₂₁	242.090
285 ₁₁₈	195.310 †	274 ₁₂₀	232.710 †	312 ₁₂₁	244.810
286 ₁₁₈	194.510 †	275 ₁₂₀	231.300 †	313 ₁₂₁	246.740
287 ₁₁₈	195.200 †	276 ₁₂₀	228.330 †	314 ₁₂₁	249.660
288 ₁₁₈	194.790 ‡	277 ₁₂₀	227.030 †	315 ₁₂₁	251.950
289 ₁₁₈	195.610	278 ₁₂₀	224.330 †	316 ₁₂₁	255.100
290 ₁₁₈	195.470	279 ₁₂₀	222.240 †	317 ₁₂₁	257.420
291 ₁₁₈	196.720	280 ₁₂₀	219.990 †	276 ₁₂₂	255.160 †
292 ₁₁₈	196.970	281 ₁₂₀	219.700 †	277 ₁₂₂	253.870 †
293 ₁₁₈	198.420	282 ₁₂₀	217.900 †	278 ₁₂₂	251.080 †
294 ₁₁₈	198.790	283 ₁₂₀	217.680 †	279 ₁₂₂	249.760 †
295 ₁₁₈	200.290	284 ₁₂₀	215.290 †	280 ₁₂₂	246.580 †
296 ₁₁₈	202.160	285 ₁₂₀	214.920 †	281 ₁₂₂	243.410 †
297 ₁₁₈	202.790	286 ₁₂₀	213.520 †	282 ₁₂₂	241.060 †
298 ₁₁₈	204.060	287 ₁₂₀	213.400 †	283 ₁₂₂	240.570 †
299 ₁₁₈	206.650	288 ₁₂₀	212.350 †	284 ₁₂₂	238.270 †
300 ₁₁₈	208.260	289 ₁₂₀	212.710 †	285 ₁₂₂	237.740 †
301 ₁₁₈	211.090	290 ₁₂₀	211.770 †	286 ₁₂₂	235.800 †
302 ₁₁₈	212.990	291 ₁₂₀	212.200 †	287 ₁₂₂	235.850 †
303 ₁₁₈	216.760	292 ₁₂₀	211.800 †	288 ₁₂₂	233.690 †
304 ₁₁₈	218.330	293 ₁₂₀	212.700 †	289 ₁₂₂	232.680 †
305 ₁₁₈	220.830	294 ₁₂₀	212.590 †	290 ₁₂₂	231.010 †
306 ₁₁₈	222.740	295 ₁₂₀	213.720 †	291 ₁₂₂	230.850 †
307 ₁₁₈	226.000	296 ₁₂₀	213.950 ‡	292 ₁₂₂	229.570 †
308 ₁₁₈	228.070	297 ₁₂₀	214.990 ‡	293 ₁₂₂	229.880 †
309 ₁₁₈	231.520	298 ₁₂₀	215.190	294 ₁₂₂	229.030 †
310 ₁₁₈	233.780	299 ₁₂₀	216.700	295 ₁₂₂	229.840 †
311 ₁₁₈	237.280	300 ₁₂₀	217.710	296 ₁₂₂	229.600 †
312 ₁₁₈	239.750	301 ₁₂₀	219.920	297 ₁₂₂	230.520 †
313 ₁₁₈	243.660	302 ₁₂₀	220.610	298 ₁₂₂	230.030 †
314 ₁₁₈	246.320	303 ₁₂₀	222.760	299 ₁₂₂	230.950 †
275 ₁₁₉	217.700 †	304 ₁₂₀	223.900	300 ₁₂₂	230.580 ‡
276 ₁₁₉	216.570 †	305 ₁₂₀	226.330	301 ₁₂₂	231.620 ‡
277 ₁₁₉	214.200 †	306 ₁₂₀	227.670	302 ₁₂₂	231.680
278 ₁₁₉	212.950 †	307 ₁₂₀	230.390	303 ₁₂₂	233.080
279 ₁₁₉	211.070 †	308 ₁₂₀	231.930	304 ₁₂₂	233.580
280 ₁₁₉	210.590 †	309 ₁₂₀	234.820	305 ₁₂₂	235.380
281 ₁₁₉	209.140 †	310 ₁₂₀	236.540	306 ₁₂₂	236.140
282 ₁₁₉	208.940 †	311 ₁₂₀	239.590	307 ₁₂₂	238.240
283 ₁₁₉	206.250 †	312 ₁₂₀	241.540	308 ₁₂₂	239.180
284 ₁₁₉	205.880 †	313 ₁₂₀	244.770	309 ₁₂₂	241.550
285 ₁₁₉	204.770 †	314 ₁₂₀	247.080	310 ₁₂₂	242.740
286 ₁₁₉	204.590 †	315 ₁₂₀	250.530	311 ₁₂₂	245.260
287 ₁₁₉	203.870 †	316 ₁₂₀	252.870	312 ₁₂₂	246.640
288 ₁₁₉	204.260 †	280 ₁₂₁	233.580 †	313 ₁₂₂	249.350
289 ₁₁₉	203.670 †	281 ₁₂₁	231.540 †	314 ₁₂₂	250.980
290 ₁₁₉	204.160 †	282 ₁₂₁	230.860 †	315 ₁₂₂	253.890
291 ₁₁₉	204.020 †	283 ₁₂₁	228.890 †	316 ₁₂₂	255.860
292 ₁₁₉	204.930 †	284 ₁₂₁	228.360 †	317 ₁₂₂	259.000
293 ₁₁₉	205.140 †	285 ₁₂₁	226.740 †	318 ₁₂₂	261.060
294 ₁₁₉	206.320 †	286 ₁₂₁	226.780 †		
295 ₁₁₉	206.800 †	287 ₁₂₁	223.760 †		
296 ₁₁₉	207.720 †	288 ₁₂₁	223.450 †		
297 ₁₁₉	208.630	289 ₁₂₁	222.080 †		
298 ₁₁₉	209.920	290 ₁₂₁	221.880 †		
299 ₁₁₉	211.170	291 ₁₂₁	220.880 †		
300 ₁₁₉	213.500	292 ₁₂₁	221.120 †		
301 ₁₁₉	215.070	293 ₁₂₁	220.600 †		
302 ₁₁₉	217.600	294 ₁₂₁	221.690 †		
303 ₁₁₉	219.530	295 ₁₂₁	221.570 †		
304 ₁₁₉	221.510	296 ₁₂₁	222.430 †		
305 ₁₁₉	223.180	297 ₁₂₁	222.590 †		
306 ₁₁₉	225.940	298 ₁₂₁	223.120 †		
307 ₁₁₉	227.790	299 ₁₂₁	223.460 †		
308 ₁₁₉	230.720	300 ₁₂₁	225.070 †		
309 ₁₁₉	232.770	301 ₁₂₁	225.410 †		
310 ₁₁₉	235.850	302 ₁₂₁	226.820		
311 ₁₁₉	238.070	303 ₁₂₁	227.620		
312 ₁₁₉	241.340	304 ₁₂₁	229.450		
313 ₁₁₉	243.790	305 ₁₂₁	230.540		
314 ₁₁₉	247.390	306 ₁₂₁	232.650		
315 ₁₁₉	250.020	307 ₁₂₁	233.930		