

P. Moller, W.D. Myers, W.J. Swiatecki, and J. Treiner 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	-4.160	³¹ Na	12.450	³⁸ Si	-3.940	³⁴ Cl	-22.480	⁵⁴ K	-3.770	⁴¹ Ti	-18.030
¹⁷ O	-0.050	³² Na	18.390	³⁹ Si	1.090	³⁵ Cl	-27.020	⁵⁵ K	1.500	⁴² Ti	-27.050
¹⁸ O	-2.180	³³ Na	23.730	⁴⁰ Si	4.720	³⁶ Cl	-28.040	⁵⁶ K	7.920	⁴³ Ti	-32.020
¹⁹ O	2.550	³⁴ Na	29.730	⁴¹ Si	10.320	³⁷ Cl	-32.000			⁴⁴ Ti	-40.600
²⁰ O	4.270	³⁵ Na	36.260	⁴² Si	14.350	³⁸ Cl	-30.640	²⁹ Ca	92.910 †	⁴⁵ Ti	-42.220
²¹ O	9.520	³⁶ Na	43.640	⁴³ Si	22.940 †	³⁹ Cl	-30.740	³⁰ Ca	73.020 †	⁴⁶ Ti	-47.300
²² O	11.960	³⁷ Na	52.060 †	⁴⁴ Si	29.910	⁴⁰ Cl	-29.070	³¹ Ca	57.630 †	⁴⁷ Ti	-47.420
²³ O	18.340	³⁸ Na	61.570 †	⁴⁵ Si	38.400 †	⁴¹ Cl	-28.780	³² Ca	42.390 †	⁴⁸ Ti	-51.310
²⁴ O	22.850	³⁹ Na	68.950 ‡	⁴⁶ Si	45.970	⁴² Cl	-25.920	³³ Ca	29.890 †	⁴⁹ Ti	-49.480
²⁵ O	32.580 †					⁴³ Cl	-24.550	³⁴ Ca	14.670 ‡	⁵⁰ Ti	-52.650
²⁶ O	38.530	²⁰ Mg	18.050	²³ P	46.400 †	⁴⁴ Cl	-20.690	³⁵ Ca	5.880	⁵¹ Ti	-50.140
²⁷ O	47.620 †	²¹ Mg	9.360	²⁴ P	32.980 †	⁴⁵ Cl	-18.140	³⁶ Ca	-5.510	⁵² Ti	-50.810
²⁸ O	53.780	²² Mg	-0.700	²⁵ P	19.750 †	⁴⁶ Cl	-13.290	³⁷ Ca	-11.580	⁵³ Ti	-47.590
²⁹ O	64.150 †	²³ Mg	-5.230	²⁶ P	10.290	⁴⁷ Cl	-8.510	³⁸ Ca	-22.400	⁵⁴ Ti	-45.850
³⁰ O	76.710 †	²⁴ Mg	-13.890	²⁷ P	-0.010	⁴⁸ Cl	-2.640	³⁹ Ca	-26.630	⁵⁵ Ti	-41.230
³¹ O	83.140 ‡	²⁵ Mg	-13.270	²⁸ P	-5.830	⁴⁹ Cl	2.910	⁴⁰ Ca	-34.110	⁵⁶ Ti	-39.490
³² O	94.000 †	²⁶ Mg	-16.370	²⁹ P	-15.050	⁵⁰ Cl	9.310	⁴¹ Ca	-36.120	⁵⁷ Ti	-34.740
³³ O	101.860 ‡	²⁷ Mg	-13.490	³⁰ P	-17.810	⁵¹ Cl	15.010	⁴² Ca	-40.730	⁵⁸ Ti	-32.260
		²⁸ Mg	-14.160	³¹ P	-22.930	⁵² Cl	22.370	⁴³ Ca	-40.920	⁵⁹ Ti	-26.850
¹⁷ F	2.320	²⁹ Mg	-9.690	³² P	-21.740			⁴⁴ Ca	-43.840	⁶⁰ Ti	-23.800
¹⁸ F	2.020	³⁰ Mg	-8.570	³³ P	-23.990	²⁷ Ar	66.590 †	⁴⁵ Ca	-42.940	⁶¹ Ti	-18.810
¹⁹ F	-2.250	³¹ Mg	-2.870	³⁴ P	-21.890	²⁸ Ar	48.480 †	⁴⁶ Ca	-44.700	⁶² Ti	-14.970
²⁰ F	-1.240	³² Mg	0.030	³⁵ P	-23.560	²⁹ Ar	35.460 †	⁴⁷ Ca	-42.680		
²¹ F	-0.750	³³ Mg	5.950	³⁶ P	-20.250	³⁰ Ar	20.850 †	⁴⁸ Ca	-43.130	³⁷ V	47.160 †
²² F	2.940	³⁴ Mg	9.740	³⁷ P	-19.060	³¹ Ar	11.270	⁴⁹ Ca	-40.220	³⁸ V	34.430 †
²³ F	4.360	³⁵ Mg	15.700	³⁸ P	-15.410	³² Ar	-1.270	⁵⁰ Ca	-38.570	³⁹ V	20.150 †
²⁴ F	8.860	³⁶ Mg	20.290	³⁹ P	-13.240	³³ Ar	-8.030	⁵¹ Ca	-33.910	⁴⁰ V	9.770 †
²⁵ F	12.810	³⁷ Mg	27.200	⁴⁰ P	-8.600	³⁴ Ar	-17.220	⁵² Ca	-31.260	⁴¹ V	-2.170 †
²⁶ F	20.170	³⁸ Mg	33.370	⁴¹ P	-5.490	³⁵ Ar	-21.360	⁵³ Ca	-25.450	⁴² V	-10.150 †
²⁷ F	26.070	³⁹ Mg	41.740 †	⁴² P	-0.110	³⁶ Ar	-29.180	⁵⁴ Ca	-22.240	⁴³ V	-19.800
²⁸ F	33.670	⁴⁰ Mg	47.890	⁴³ P	3.550	³⁷ Ar	-30.610	⁵⁵ Ca	-16.200	⁴⁴ V	-26.020
²⁹ F	39.390	⁴¹ Mg	57.990 †	⁴⁴ P	10.150	³⁸ Ar	-34.940	⁵⁶ Ca	-12.290	⁴⁵ V	-35.180
³⁰ F	47.980 †			⁴⁵ P	16.560	³⁹ Ar	-34.970	⁵⁷ Ca	-6.120	⁴⁶ V	-38.010
³¹ F	55.850 ‡	²¹ Al	27.700 †	⁴⁶ P	23.720	⁴⁰ Ar	-37.650	⁵⁸ Ca	-1.490	⁴⁷ V	-43.410
³² F	66.200 †	²² Al	17.780 †	⁴⁷ P	30.920	⁴¹ Ar	-35.200			⁴⁸ V	-45.500
³³ F	74.060 ‡	²³ Al	5.940	⁴⁸ P	38.420	⁴² Ar	-36.470	³³ Sc	54.690 †	⁴⁹ V	-50.170
³⁴ F	83.260 †	²⁴ Al	-0.220			⁴³ Ar	-33.810	³⁴ Sc	41.170 †	⁵⁰ V	-49.920
³⁵ F	91.500 †	²⁵ Al	-9.180	²⁴ S	52.960 ‡	⁴⁴ Ar	-33.730	³⁵ Sc	25.710 †	⁵¹ V	-53.500
		²⁶ Al	-11.150	²⁵ S	43.320 †	⁴⁵ Ar	-29.620	³⁶ Sc	15.290 †	⁵² V	-52.010
¹⁸ Ne	4.430	²⁷ Al	-16.500	²⁶ S	27.870 †	⁴⁶ Ar	-29.020	³⁷ Sc	3.590 †	⁵³ V	-52.830
¹⁹ Ne	-0.710	²⁸ Al	-16.150	²⁷ S	17.190	⁴⁷ Ar	-24.550	³⁸ Sc	-4.260 †	⁵⁴ V	-50.160
²⁰ Ne	-7.120	²⁹ Al	-17.140	²⁸ S	4.200	⁴⁸ Ar	-20.900	³⁹ Sc	-13.820 †	⁵⁵ V	-49.540
²¹ Ne	-5.650	³⁰ Al	-14.890	²⁹ S	-2.710	⁴⁹ Ar	-14.910	⁴⁰ Sc	-21.230	⁵⁶ V	-46.330
²² Ne	-8.640	³¹ Al	-13.490	³⁰ S	-13.580	⁵⁰ Ar	-10.590	⁴¹ Sc	-29.490	⁵⁷ V	-44.880
²³ Ne	-5.630	³² Al	-10.020	³¹ S	-16.960	⁵¹ Ar	-4.180	⁴² Sc	-33.280	⁵⁸ V	-41.100
²⁴ Ne	-6.130	³³ Al	-9.920	³² S	-25.070	⁵² Ar	0.460	⁴³ Sc	-39.440	⁵⁹ V	-39.070
²⁵ Ne	-1.350	³⁴ Al	-3.380	³³ S	-25.110	⁵³ Ar	7.070	⁴⁴ Sc	-40.220	⁶⁰ V	-34.720
²⁶ Ne	2.000	³⁵ Al	-0.370	³⁴ S	-28.960	⁵⁴ Ar	13.020	⁴⁵ Sc	-43.980	⁶¹ V	-31.890
²⁷ Ne	7.920	³⁶ Al	4.050	³⁵ S	-27.090			⁴⁶ Sc	-44.050	⁶² V	-27.340
²⁸ Ne	11.550	³⁷ Al	8.640	³⁶ S	-30.620	³⁰ K	46.610 †	⁴⁷ Sc	-46.450	⁶³ V	-24.350
²⁹ Ne	18.950	³⁸ Al	13.920	³⁷ S	-26.500	³¹ K	32.040 †	⁴⁸ Sc	-44.820	⁶⁴ V	-18.500
³⁰ Ne	22.690	³⁹ Al	19.670	³⁸ S	-26.920	³² K	20.630 †	⁴⁹ Sc	-46.560		
³¹ Ne	31.120 †	⁴⁰ Al	26.620	³⁹ S	-23.570	³³ K	7.960 †	⁵⁰ Sc	-44.150	³⁶ Cr	91.910 †
³² Ne	36.950	⁴¹ Al	31.700	⁴⁰ S	-22.950	³⁴ K	-0.360 †	⁵¹ Sc	-43.250	³⁷ Cr	75.280 †
³³ Ne	44.880	⁴² Al	40.320 †	⁴¹ S	-18.610	³⁵ K	-9.820 †	⁵² Sc	-39.840	³⁸ Cr	57.730 †
³⁴ Ne	53.490 †	⁴³ Al	48.610 †	⁴² S	-16.920	³⁶ K	-15.840	⁵³ Sc	-37.180	³⁹ Cr	44.140 †
³⁵ Ne	62.640 †			⁴³ S	-11.970	³⁷ K	-23.000	⁵⁴ Sc	-32.570	⁴⁰ Cr	29.080 †
³⁶ Ne	70.320 ‡	²² Si	35.070 †	⁴⁴ S	-9.300	³⁸ K	-27.480	⁵⁵ Sc	-29.740	⁴¹ Cr	17.640 †
³⁷ Ne	79.880 †	²³ Si	24.390 ‡	⁴⁵ S	-3.630	³⁹ K	-34.260	⁵⁶ Sc	-24.830	⁴² Cr	4.310 ‡
		²⁴ Si	11.030	⁴⁶ S	1.680	⁴⁰ K	-34.020	⁵⁷ Sc	-21.040	⁴³ Cr	-4.080
¹⁹ Na	11.860 †	²⁵ Si	4.190	⁴⁷ S	8.650	⁴¹ K	-38.240	⁵⁸ Sc	-15.510	⁴⁴ Cr	-15.190
²⁰ Na	5.250	²⁶ Si	-7.110	⁴⁸ S	14.670	⁴² K	-37.680	⁵⁹ Sc	-11.230	⁴⁵ Cr	-21.790
²¹ Na	-2.400	²⁷ Si	-11.070	⁴⁹ S	22.210	⁴³ K	-39.090	⁶⁰ Sc	-6.370	⁴⁶ Cr	-32.330
²² Na	-4.660	²⁸ Si	-20.010	⁵⁰ S	28.340	⁴⁴ K	-37.610			⁴⁷ Cr	-36.080
²³ Na	-9.860	²⁹ Si	-19.890			⁴⁵ K	-38.030	³² Ti	101.840 †	⁴⁸ Cr	-43.430
²⁴ Na	-8.880	³⁰ Si	-22.810	²⁶ Cl	53.920 †	⁴⁶ K	-35.880	³³ Ti	84.630 †	⁴⁹ Cr	-45.850
²⁵ Na	-9.470	³¹ Si	-20.820	²⁷ Cl	38.580 †	⁴⁷ K	-35.060	³⁴ Ti	65.290 †	⁵⁰ Cr	-52.010
²⁶ Na	-6.200	³² Si	-21.170	²⁸ Cl	26.310 †	⁴⁸ K	-31.440	³⁵ Ti	51.630 †	⁵¹ Cr	-52.010
²⁷ Na	-4.840	³³ Si	-18.640	²⁹ Cl	13.490 †	⁴⁹ K	-28.570	³⁶ Ti	34.060 †	⁵² Cr	-56.940
²⁸ Na	-0.080	³⁴ Si	-20.000	³⁰ Cl	4.410	⁵⁰ K	-23.840	³⁷ Ti	22.550 ‡	⁵³ Cr	-55.580
²⁹ Na	2.720	³⁵ Si	-14.670	³¹ Cl	-6.190 †	⁵¹ K	-19.700	³⁸ Ti	10.100 ‡	⁵⁴ Cr	-57.600
³⁰ Na	8.480	³⁶ Si	-12.070	³² Cl	-12.620	⁵² K	-14.370	³⁹ Ti	0.600	⁵⁵ Cr	-55.180
		³⁷ Si	-7.290	³³ Cl	-19.820	⁵³ K	-9.710	⁴⁰ Ti	-11.600	⁵⁶ Cr	-55.780

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
⁵⁷ Cr	-52.730	⁷³ Fe	-25.530	⁷⁴ Ni	-49.620	⁷⁷ Zn	-59.720	⁸² Ge	-65.810	⁸¹ Se	-76.780
⁵⁸ Cr	-52.460	⁷⁴ Fe	-21.850	⁷⁵ Ni	-45.630	⁷⁸ Zn	-57.920	⁸³ Ge	-61.050	⁸² Se	-77.850
⁵⁹ Cr	-48.750	⁷⁵ Fe	-15.820	⁷⁶ Ni	-43.120	⁷⁹ Zn	-54.240	⁸⁴ Ge	-58.100	⁸³ Se	-75.650
⁶⁰ Cr	-47.920	⁷⁶ Fe	-12.110	⁷⁷ Ni	-38.690	⁸⁰ Zn	-52.790	⁸⁵ Ge	-52.610	⁸⁴ Se	-76.070
⁶¹ Cr	-43.520	⁷⁷ Fe	-4.660	⁷⁸ Ni	-35.640	⁸¹ Zn	-46.990	⁸⁶ Ge	-48.860	⁸⁵ Se	-72.240
⁶² Cr	-41.840	⁷⁸ Fe	1.360	⁷⁹ Ni	-29.360	⁸² Zn	-43.100	⁸⁷ Ge	-43.130	⁸⁶ Se	-70.320
⁶³ Cr	-36.130			⁸⁰ Ni	-24.060	⁸³ Zn	-36.640	⁸⁸ Ge	-39.030	⁸⁷ Se	-65.620
⁶⁴ Cr	-35.510	⁴³ Co	63.190 †	⁸¹ Ni	-16.860	⁸⁴ Zn	-31.700	⁸⁹ Ge	-33.180	⁸⁸ Se	-62.940
⁶⁵ Cr	-29.690	⁴⁴ Co	49.620 †	⁸² Ni	-10.760	⁸⁵ Zn	-24.890	⁹⁰ Ge	-28.440	⁸⁹ Se	-58.100
⁶⁶ Cr	-26.970	⁴⁵ Co	35.230 †			⁸⁶ Zn	-19.610	⁹¹ Ge	-22.490	⁹⁰ Se	-55.130
⁶⁷ Cr	-20.800	⁴⁶ Co	23.200 †	⁴⁸ Cu	44.720 †			⁹² Ge	-17.700	⁹¹ Se	-50.080
		⁴⁷ Co	9.930 †	⁴⁹ Cu	29.550 †	⁵⁴ Ga	17.050 †	⁹³ Ge	-11.110	⁹² Se	-46.570
⁴¹ Mn	40.960 †	⁴⁸ Co	1.180 †	⁵⁰ Cu	19.200 †	⁵⁵ Ga	4.450 †			⁹³ Se	-41.240
⁴² Mn	28.790 †	⁴⁹ Co	-10.500 †	⁵¹ Cu	6.110 †	⁵⁶ Ga	-4.650 †	⁵⁹ As	2.860 †	⁹⁴ Se	-37.390
⁴³ Mn	14.620 †	⁵⁰ Co	-18.160 †	⁵² Cu	-2.930 †	⁵⁷ Ga	-15.740 †	⁶⁰ As	-6.370 †	⁹⁵ Se	-31.660
⁴⁴ Mn	4.970 †	⁵¹ Co	-28.030 †	⁵³ Cu	-14.190 †	⁵⁸ Ga	-23.430 †	⁶¹ As	-17.140 †	⁹⁶ Se	-27.220
⁴⁵ Mn	-6.610 †	⁵² Co	-34.600	⁵⁴ Cu	-21.950 †	⁵⁹ Ga	-33.350 †	⁶² As	-24.260 †	⁹⁷ Se	-20.940
⁴⁶ Mn	-14.180 †	⁵³ Co	-42.620	⁵⁵ Cu	-31.550 †	⁶⁰ Ga	-38.430 †	⁶³ As	-32.830 †	⁹⁸ Se	-15.920
⁴⁷ Mn	-24.760 †	⁵⁴ Co	-46.440	⁵⁶ Cu	-37.350	⁶¹ Ga	-45.650	⁶⁴ As	-38.290 †		
⁴⁸ Mn	-29.960	⁵⁵ Co	-52.720	⁵⁷ Cu	-45.740	⁶² Ga	-49.330	⁶⁵ As	-45.880	⁶² Br	13.260 †
⁴⁹ Mn	-38.230	⁵⁶ Co	-54.630	⁵⁸ Cu	-49.350	⁶³ Ga	-55.170	⁶⁶ As	-49.830	⁶³ Br	1.820 †
⁵⁰ Mn	-42.100	⁵⁷ Co	-58.300	⁵⁹ Cu	-54.930	⁶⁴ Ga	-57.430	⁶⁷ As	-55.750	⁶⁴ Br	-6.480 †
⁵¹ Mn	-48.840	⁵⁸ Co	-58.870	⁶⁰ Cu	-56.570	⁶⁵ Ga	-61.670	⁶⁸ As	-58.530	⁶⁵ Br	-16.820 †
⁵² Mn	-50.900	⁵⁹ Co	-61.200	⁶¹ Cu	-60.350	⁶⁶ Ga	-63.050	⁶⁹ As	-63.200	⁶⁶ Br	-23.880 †
⁵³ Mn	-55.470	⁶⁰ Co	-60.750	⁶² Cu	-61.340	⁶⁷ Ga	-66.410	⁷⁰ As	-64.470	⁶⁷ Br	-32.490 †
⁵⁴ Mn	-55.530	⁶¹ Co	-62.130	⁶³ Cu	-64.120	⁶⁸ Ga	-66.720	⁷¹ As	-68.160	⁶⁸ Br	-38.280 †
⁵⁵ Mn	-57.650	⁶² Co	-60.790	⁶⁴ Cu	-64.030	⁶⁹ Ga	-69.040	⁷² As	-68.640	⁶⁹ Br	-46.020 †
⁵⁶ Mn	-56.530	⁶³ Co	-61.400	⁶⁵ Cu	-66.140	⁷⁰ Ga	-68.430	⁷³ As	-71.470	⁷⁰ Br	-49.770
⁵⁷ Mn	-57.490	⁶⁴ Co	-59.580	⁶⁶ Cu	-65.210	⁷¹ Ga	-70.200	⁷⁴ As	-71.380	⁷¹ Br	-56.440
⁵⁸ Mn	-55.650	⁶⁵ Co	-59.870	⁶⁷ Cu	-66.450	⁷² Ga	-69.110	⁷⁵ As	-73.610	⁷² Br	-59.060
⁵⁹ Mn	-55.710	⁶⁶ Co	-56.960	⁶⁸ Cu	-65.460	⁷³ Ga	-70.330	⁷⁶ As	-73.040	⁷³ Br	-64.070
⁶⁰ Mn	-53.410	⁶⁷ Co	-56.280	⁶⁹ Cu	-65.590	⁷⁴ Ga	-68.700	⁷⁷ As	-74.430	⁷⁴ Br	-66.400
⁶¹ Mn	-52.580	⁶⁸ Co	-53.020	⁷⁰ Cu	-63.380	⁷⁵ Ga	-68.740	⁷⁸ As	-73.240	⁷⁵ Br	-69.580
⁶² Mn	-49.330	⁶⁹ Co	-51.670	⁷¹ Cu	-63.120	⁷⁶ Ga	-66.710	⁷⁹ As	-73.980	⁷⁶ Br	-70.620
⁶³ Mn	-47.910	⁷⁰ Co	-47.770	⁷² Cu	-60.420	⁷⁷ Ga	-66.400	⁸⁰ As	-72.510	⁷⁷ Br	-73.970
⁶⁴ Mn	-44.030	⁷¹ Co	-45.630	⁷³ Cu	-59.530	⁷⁸ Ga	-64.080	⁸¹ As	-72.530	⁷⁸ Br	-74.400
⁶⁵ Mn	-42.860	⁷² Co	-41.760	⁷⁴ Cu	-56.740	⁷⁹ Ga	-63.140	⁸² As	-70.380	⁷⁹ Br	-76.950
⁶⁶ Mn	-38.010	⁷³ Co	-38.920	⁷⁵ Cu	-55.070	⁸⁰ Ga	-59.900	⁸³ As	-69.460	⁸⁰ Br	-76.910
⁶⁷ Mn	-35.990	⁷⁴ Co	-34.870	⁷⁶ Cu	-51.920	⁸¹ Ga	-58.300	⁸⁴ As	-66.060	⁸¹ Br	-78.770
⁶⁸ Mn	-30.650	⁷⁵ Co	-31.020	⁷⁷ Cu	-49.450	⁸² Ga	-53.650	⁸⁵ As	-63.210	⁸² Br	-78.140
⁶⁹ Mn	-26.900	⁷⁶ Co	-26.570	⁷⁸ Cu	-45.530	⁸³ Ga	-49.650	⁸⁶ As	-58.580	⁸³ Br	-79.340
⁷⁰ Mn	-22.420	⁷⁷ Co	-23.230	⁷⁹ Cu	-43.110	⁸⁴ Ga	-44.020	⁸⁷ As	-55.050	⁸⁴ Br	-77.800
		⁷⁸ Co	-16.320	⁸⁰ Cu	-37.340	⁸⁵ Ga	-39.390	⁸⁸ As	-50.180	⁸⁵ Br	-78.390
⁴⁰ Fe	81.520 †	⁷⁹ Co	-10.310	⁸¹ Cu	-32.460	⁸⁶ Ga	-33.500	⁸⁹ As	-46.260	⁸⁶ Br	-75.630
⁴¹ Fe	67.690 †	⁸⁰ Co	-3.000	⁸² Cu	-26.160	⁸⁷ Ga	-28.530	⁹⁰ As	-41.250	⁸⁷ Br	-73.810
⁴² Fe	50.870 †			⁸³ Cu	-20.450	⁸⁸ Ga	-22.410	⁹¹ As	-36.800	⁸⁸ Br	-69.930
⁴³ Fe	38.050 †	⁴⁴ Ni	75.140 †	⁸⁴ Cu	-13.720			⁹² As	-31.470	⁸⁹ Br	-67.380
⁴⁴ Fe	23.020 †	⁴⁵ Ni	61.180 †			⁵³ Ge	53.430 †	⁹³ As	-26.790	⁹⁰ Br	-63.390
⁴⁵ Fe	12.620 †	⁴⁶ Ni	44.730 †	⁴⁹ Zn	56.490 †	⁵⁴ Ge	37.760 †	⁹⁴ As	-20.960	⁹¹ Br	-60.620
⁴⁶ Fe	-0.270 †	⁴⁷ Ni	32.620 †	⁵⁰ Zn	40.270 †	⁵⁵ Ge	26.960 †	⁹⁵ As	-15.750	⁹² Br	-56.460
⁴⁷ Fe	-8.400	⁴⁸ Ni	18.220 †	⁵¹ Zn	29.030 †	⁵⁶ Ge	13.210 †	⁹⁶ As	-9.410	⁹³ Br	-53.260
⁴⁸ Fe	-20.580	⁴⁹ Ni	8.270 †	⁵² Zn	14.220 †	⁵⁷ Ge	3.820 †			⁹⁴ Br	-48.740
⁴⁹ Fe	-26.550	⁵⁰ Ni	-4.850 †	⁵³ Zn	5.400 †	⁵⁸ Ge	-8.420 †	⁵⁷ Se	51.020 †	⁹⁵ Br	-45.130
⁵⁰ Fe	-35.580	⁵¹ Ni	-12.880	⁵⁴ Zn	-7.000 †	⁵⁹ Ge	-16.430 †	⁵⁸ Se	35.920 †	⁹⁶ Br	-40.150
⁵¹ Fe	-40.790	⁵² Ni	-23.910	⁵⁵ Zn	-14.740 †	⁶⁰ Ge	-27.500 †	⁵⁹ Se	25.040 †	⁹⁷ Br	-35.930
⁵² Fe	-49.230	⁵³ Ni	-30.530	⁵⁶ Zn	-25.930	⁶¹ Ge	-32.980	⁶⁰ Se	11.570 †	⁹⁸ Br	-30.400
⁵³ Fe	-50.700	⁵⁴ Ni	-40.030	⁵⁷ Zn	-32.110	⁶² Ge	-41.310	⁶¹ Se	2.020 †	⁹⁹ Br	-25.490
⁵⁴ Fe	-56.930	⁵⁵ Ni	-44.030	⁵⁸ Zn	-42.150	⁶³ Ge	-45.690	⁶² Se	-9.960 †		
⁵⁵ Fe	-57.050	⁵⁶ Ni	-52.600	⁵⁹ Zn	-45.970	⁶⁴ Ge	-53.090	⁶³ Se	-17.290 †	⁶³ Kr	23.300 †
⁵⁶ Fe	-60.600	⁵⁷ Ni	-54.700	⁶⁰ Zn	-52.930	⁶⁵ Ge	-55.530	⁶⁴ Se	-26.970	⁶⁴ Kr	9.870 †
⁵⁷ Fe	-59.590	⁵⁸ Ni	-59.670	⁶¹ Zn	-54.640	⁶⁶ Ge	-60.840	⁶⁵ Se	-32.650	⁶⁵ Kr	1.410 †
⁵⁸ Fe	-61.720	⁵⁹ Ni	-60.430	⁶² Zn	-59.710	⁶⁷ Ge	-62.440	⁶⁶ Se	-41.290	⁶⁶ Kr	-9.620 †
⁵⁹ Fe	-60.010	⁶⁰ Ni	-63.180	⁶³ Zn	-61.090	⁶⁸ Ge	-67.050	⁶⁷ Se	-45.910	⁶⁷ Kr	-16.690 †
⁶⁰ Fe	-61.200	⁶¹ Ni	-63.440	⁶⁴ Zn	-65.050	⁶⁹ Ge	-67.120	⁶⁸ Se	-53.440	⁶⁸ Kr	-26.760
⁶¹ Fe	-58.690	⁶² Ni	-65.660	⁶⁵ Zn	-65.100	⁷⁰ Ge	-70.540	⁶⁹ Se	-56.230	⁶⁹ Kr	-32.560
⁶² Fe	-59.340	⁶³ Ni	-64.850	⁶⁶ Zn	-68.540	⁷¹ Ge	-70.070	⁷⁰ Se	-62.070	⁷⁰ Kr	-41.270
⁶³ Fe	-56.580	⁶⁴ Ni	-66.560	⁶⁷ Zn	-67.530	⁷² Ge	-72.720	⁷¹ Se	-63.490	⁷¹ Kr	-45.660
⁶⁴ Fe	-56.150	⁶⁵ Ni	-64.520	⁶⁸ Zn	-69.880	⁷³ Ge	-71.730	⁷² Se	-68.180	⁷² Kr	-53.810
⁶⁵ Fe	-53.100	⁶⁶ Ni	-65.960	⁶⁹ Zn	-68.460	⁷⁴ Ge	-73.890	⁷³ Se	-68.980	⁷³ Kr	-56.760
⁶⁶ Fe	-52.030	⁶⁷ Ni	-63.390	⁷⁰ Zn	-70.700	⁷⁵ Ge	-72.320	⁷⁴ Se	-72.630	⁷⁴ Kr	-62.750
⁶⁷ Fe	-47.490	⁶⁸ Ni	-63.610	⁷¹ Zn	-68.220	⁷⁶ Ge	-73.490	⁷⁵ Se	-72.650	⁷⁵ Kr	-64.940
⁶⁸ Fe	-45.870	⁶⁹ Ni	-60.850	⁷² Zn	-69.350	⁷⁷ Ge	-71.500	⁷⁶ Se	-75.830	⁷⁶ Kr	-69.710
⁶⁹ Fe	-40.600	⁷⁰ Ni	-60.010	⁷³ Zn	-66.340	⁷⁸ Ge	-72.110	⁷⁷ Se	-75.340	⁷⁷ Kr	-70.490
⁷⁰ Fe	-38.680	⁷¹ Ni	-56.710	⁷⁴ Zn	-66.260	⁷⁹ Ge	-69.780	⁷⁸ Se	-77.550	⁷⁸ Kr	-74.900
⁷¹ Fe	-33.190	⁷² Ni	-55.350	⁷⁵ Zn	-63.530	⁸⁰ Ge	-69.700	⁷⁹ Se	-76.540	⁷⁹ Kr	-75.450
⁷² Fe	-29.860	⁷³ Ni	-51.480	⁷⁶ Zn	-62.990	⁸¹ Ge	-66.460	⁸⁰ Se	-78.190	⁸⁰ Kr	-79.030

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
⁸¹ Kr	-78.990	⁸¹ Sr	-72.340	⁸¹ Zr	-57.200	⁸⁵ Mo	-57.420	⁹³ Ru	-77.160	⁸⁹ Pd	-31.320 ‡		
⁸² Kr	-81.800	⁸² Sr	-77.620	⁸² Zr	-63.710	⁸⁶ Mo	-65.090	⁹⁴ Ru	-83.100	⁹⁰ Pd	-41.090		
⁸³ Kr	-81.270	⁸³ Sr	-78.530	⁸³ Zr	-66.020	⁸⁷ Mo	-68.150	⁹⁵ Ru	-83.430	⁹¹ Pd	-46.790		
⁸⁴ Kr	-83.480	⁸⁴ Sr	-82.580	⁸⁴ Zr	-72.830	⁸⁸ Mo	-74.240	⁹⁶ Ru	-86.930	⁹² Pd	-55.610		
⁸⁵ Kr	-81.790	⁸⁵ Sr	-83.200	⁸⁵ Zr	-74.920	⁸⁹ Mo	-76.230	⁹⁷ Ru	-85.930	⁹³ Pd	-59.170		
⁸⁶ Kr	-83.540	⁸⁶ Sr	-86.130	⁸⁶ Zr	-79.980	⁹⁰ Mo	-81.790	⁹⁸ Ru	-88.120	⁹⁴ Pd	-67.160		
⁸⁷ Kr	-80.660	⁸⁷ Sr	-85.400	⁸⁷ Zr	-81.350	⁹¹ Mo	-82.950	⁹⁹ Ru	-87.140	⁹⁵ Pd	-69.240		
⁸⁸ Kr	-79.830	⁸⁸ Sr	-87.800	⁸⁸ Zr	-85.510	⁹² Mo	-87.140	¹⁰⁰ Ru	-88.690	⁹⁶ Pd	-76.260		
⁸⁹ Kr	-75.700	⁸⁹ Sr	-85.490	⁸⁹ Zr	-85.670	⁹³ Mo	-87.080	¹⁰¹ Ru	-87.470	⁹⁷ Pd	-77.720		
⁹⁰ Kr	-74.010	⁹⁰ Sr	-85.910	⁹⁰ Zr	-88.970	⁹⁴ Mo	-89.560	¹⁰² Ru	-88.740	⁹⁸ Pd	-81.960		
⁹¹ Kr	-69.880	⁹¹ Sr	-82.950	⁹¹ Zr	-87.870	⁹⁵ Mo	-88.250	¹⁰³ Ru	-87.190	⁹⁹ Pd	-81.630		
⁹² Kr	-67.920	⁹² Sr	-81.770	⁹² Zr	-89.210	⁹⁶ Mo	-88.950	¹⁰⁴ Ru	-87.900	¹⁰⁰ Pd	-84.650		
⁹³ Kr	-63.720	⁹³ Sr	-78.720	⁹³ Zr	-87.330	⁹⁷ Mo	-87.070	¹⁰⁵ Ru	-86.010	¹⁰¹ Pd	-84.620		
⁹⁴ Kr	-61.280	⁹⁴ Sr	-77.750	⁹⁴ Zr	-86.890	⁹⁸ Mo	-87.800	¹⁰⁶ Ru	-86.210	¹⁰² Pd	-87.140		
⁹⁵ Kr	-56.960	⁹⁵ Sr	-74.140	⁹⁵ Zr	-84.390	⁹⁹ Mo	-85.910	¹⁰⁷ Ru	-83.770	¹⁰³ Pd	-86.520		
⁹⁶ Kr	-54.060	⁹⁶ Sr	-72.690	⁹⁶ Zr	-84.320	¹⁰⁰ Mo	-86.240	¹⁰⁸ Ru	-83.420	¹⁰⁴ Pd	-88.630		
⁹⁷ Kr	-49.250	⁹⁷ Sr	-69.050	⁹⁷ Zr	-81.360	¹⁰¹ Mo	-84.040	¹⁰⁹ Ru	-80.690	¹⁰⁵ Pd	-87.680		
⁹⁸ Kr	-45.770	⁹⁸ Sr	-67.260	⁹⁸ Zr	-81.060	¹⁰² Mo	-83.910	¹¹⁰ Ru	-79.870	¹⁰⁶ Pd	-89.310		
⁹⁹ Kr	-40.250	⁹⁹ Sr	-63.190	⁹⁹ Zr	-78.070	¹⁰³ Mo	-81.250	¹¹¹ Ru	-76.940	¹⁰⁷ Pd	-88.110		
¹⁰⁰ Kr	-36.290	¹⁰⁰ Sr	-60.700	¹⁰⁰ Zr	-77.190	¹⁰⁴ Mo	-80.640	¹¹² Ru	-75.690	¹⁰⁸ Pd	-89.160		
¹⁰¹ Kr	-30.620	¹⁰¹ Sr	-56.150	¹⁰¹ Zr	-73.860	¹⁰⁵ Mo	-77.520	¹¹³ Ru	-72.380	¹⁰⁹ Pd	-87.510		
⁶⁵ Rb	23.080 †	¹⁰² Sr	-53.080	¹⁰² Zr	-72.330	¹⁰⁶ Mo	-76.310	¹¹⁴ Ru	-70.570	¹¹⁰ Pd	-88.150		
⁶⁶ Rb	13.320 †	¹⁰³ Sr	-48.220	¹⁰³ Zr	-68.510	¹⁰⁷ Mo	-72.860	¹¹⁵ Ru	-66.830	¹¹¹ Pd	-86.040		
⁶⁷ Rb	1.680 †	¹⁰⁴ Sr	-44.770	¹⁰⁴ Zr	-66.410	¹⁰⁸ Mo	-71.210	¹¹⁶ Ru	-64.390	¹¹² Pd	-86.170		
⁶⁸ Rb	-6.400 †	¹⁰⁵ Sr	-39.700	¹⁰⁵ Zr	-62.250	¹⁰⁹ Mo	-67.530	¹¹⁷ Ru	-60.220	¹¹³ Pd	-83.810		
⁶⁹ Rb	-16.650 †	⁶⁹ Y	22.750 †	¹⁰⁶ Zr	-59.660	¹¹⁰ Mo	-65.430	¹¹⁸ Ru	-57.650	¹¹⁴ Pd	-83.500		
⁷⁰ Rb	-23.660 †	⁷⁰ Y	13.430 †	¹⁰⁷ Zr	-55.300	¹¹¹ Mo	-61.420	¹¹⁹ Ru	-53.380	¹¹⁵ Pd	-80.850		
⁷¹ Rb	-32.760 †	⁷¹ Y	2.030 †	¹⁰⁸ Zr	-52.210	¹¹² Mo	-58.690	¹²⁰ Ru	-50.370	¹¹⁶ Pd	-79.920		
⁷² Rb	-38.130 †	⁷² Y	-6.220 †	¹⁰⁹ Zr	-47.710	¹¹³ Mo	-54.070	⁸⁶ Rh	-21.070 †	¹¹⁷ Pd	-76.850		
⁷³ Rb	-46.310 †	⁷³ Y	-16.400 †	⁷⁵ Nb	2.390 †	⁸² Tc	-20.960 †	⁸⁷ Rh	-31.430 †	¹¹⁸ Pd	-75.440		
⁷⁴ Rb	-50.300	⁷⁴ Y	-23.380 †	⁷⁶ Nb	-5.310 †	⁸³ Tc	-30.510 †	⁸⁸ Rh	-37.770 †	¹¹⁹ Pd	-72.030		
⁷⁵ Rb	-57.050	⁷⁵ Y	-32.550 †	⁷⁷ Nb	-15.650 †	⁸⁴ Tc	-36.900 †	⁸⁹ Rh	-46.690 †	¹²⁰ Pd	-70.460		
⁷⁶ Rb	-60.190	⁷⁶ Y	-38.330 †	⁷⁸ Nb	-22.530 †	⁸⁵ Tc	-45.110 †	⁹⁰ Rh	-50.190 †	¹²¹ Pd	-66.980		
⁷⁷ Rb	-65.140	⁷⁷ Y	-46.710 †	⁷⁹ Nb	-32.140 †	⁸⁶ Tc	-50.390	⁹¹ Rh	-58.700 †	¹²² Pd	-64.490		
⁷⁸ Rb	-67.040	⁷⁸ Y	-51.390	⁸⁰ Nb	-38.280 †	⁸⁷ Tc	-57.860	⁹² Rh	-63.100	¹²³ Pd	-60.890		
⁷⁹ Rb	-71.160	⁷⁹ Y	-57.720	⁸¹ Nb	-46.250 †	⁸⁸ Tc	-61.820	⁹³ Rh	-70.130	¹²⁴ Pd	-58.690		
⁸⁰ Rb	-72.830	⁸⁰ Y	-60.550	⁸² Nb	-50.760	⁸⁹ Tc	-68.850	⁹⁴ Rh	-72.170	¹²⁵ Pd	-55.190		
⁸¹ Rb	-76.740	⁸¹ Y	-65.730	⁸³ Nb	-57.350	⁹⁰ Tc	-71.580	⁹⁵ Rh	-78.390	¹²⁶ Pd	-52.740		
⁸² Rb	-77.510	⁸² Y	-67.960	⁸⁴ Nb	-60.700	⁹¹ Tc	-77.450	⁹⁶ Rh	-79.320	¹²⁷ Pd	-49.140		
⁸³ Rb	-80.440	⁸³ Y	-73.440	⁸⁵ Nb	-66.680	⁹² Tc	-78.970	⁹⁷ Rh	-83.210	¹²⁸ Pd	-46.160		
⁸⁴ Rb	-80.900	⁸⁴ Y	-75.600	⁸⁶ Nb	-69.940	⁹³ Tc	-83.740	⁹⁸ Rh	-82.900	¹²⁹ Pd	-39.850		
⁸⁵ Rb	-83.220	⁸⁵ Y	-79.660	⁸⁷ Nb	-75.150	⁹⁴ Tc	-84.200	⁹⁹ Rh	-85.240	¹³⁰ Pd	-34.300		
⁸⁶ Rb	-82.450	⁸⁶ Y	-81.380	⁸⁸ Nb	-77.470	⁹⁵ Tc	-87.040	¹⁰⁰ Rh	-85.000	¹³¹ Pd	-27.320		
⁸⁷ Rb	-84.360	⁸⁷ Y	-84.370	⁸⁹ Nb	-82.150	⁹⁶ Tc	-85.800	¹⁰¹ Rh	-86.790	¹³² Pd	-21.260		
⁸⁸ Rb	-82.040	⁸⁸ Y	-84.940	⁹⁰ Nb	-82.830	⁹⁷ Tc	-87.180	¹⁰² Rh	-86.260	⁹⁰ Ag	-20.070 †		
⁸⁹ Rb	-81.390	⁸⁹ Y	-86.900	⁹¹ Nb	-86.770	⁹⁸ Tc	-86.180	¹⁰³ Rh	-87.630	⁹¹ Ag	-31.000 †		
⁹⁰ Rb	-78.500	⁹⁰ Y	-85.950	⁹² Nb	-86.840	⁹⁹ Tc	-87.130	¹⁰⁴ Rh	-86.750	⁹² Ag	-37.570 †		
⁹¹ Rb	-76.820	⁹¹ Y	-86.220	⁹³ Nb	-88.130	¹⁰⁰ Tc	-85.860	¹⁰⁵ Rh	-87.640	⁹³ Ag	-46.460 †		
⁹² Rb	-73.790	⁹² Y	-84.190	⁹⁴ Nb	-86.660	¹⁰¹ Tc	-86.400	¹⁰⁶ Rh	-86.320	⁹⁴ Ag	-52.550		
⁹³ Rb	-71.930	⁹³ Y	-82.910	⁹⁵ Nb	-86.430	¹⁰² Tc	-84.810	¹⁰⁷ Rh	-86.690	⁹⁵ Ag	-60.300		
⁹⁴ Rb	-68.310	⁹⁴ Y	-80.620	⁹⁶ Nb	-84.960	¹⁰³ Tc	-84.940	¹⁰⁸ Rh	-85.050	⁹⁶ Ag	-63.410		
⁹⁵ Rb	-66.130	⁹⁵ Y	-79.820	⁹⁷ Nb	-84.590	¹⁰⁴ Tc	-82.980	¹⁰⁹ Rh	-84.800	⁹⁷ Ag	-70.500		
⁹⁶ Rb	-62.470	⁹⁶ Y	-76.960	⁹⁸ Nb	-82.890	¹⁰⁵ Tc	-82.470	¹¹⁰ Rh	-82.720	⁹⁸ Ag	-72.400		
⁹⁷ Rb	-59.870	⁹⁷ Y	-75.850	⁹⁹ Nb	-82.630	¹⁰⁶ Tc	-80.090	¹¹¹ Rh	-82.190	⁹⁹ Ag	-77.150		
⁹⁸ Rb	-55.670	⁹⁸ Y	-72.920	¹⁰⁰ Nb	-80.250	¹⁰⁷ Tc	-78.990	¹¹² Rh	-79.880	¹⁰⁰ Ag	-77.770		
⁹⁹ Rb	-52.390	⁹⁹ Y	-71.390	¹⁰¹ Nb	-79.580	¹⁰⁸ Tc	-76.240	¹¹³ Rh	-78.850	¹⁰¹ Ag	-81.110		
¹⁰⁰ Rb	-47.690	¹⁰⁰ Y	-68.070	¹⁰² Nb	-77.030	¹⁰⁹ Tc	-74.760	¹¹⁴ Rh	-76.150	¹⁰² Ag	-81.510		
¹⁰¹ Rb	-43.920	¹⁰¹ Y	-65.800	¹⁰³ Nb	-75.690	¹¹⁰ Tc	-71.690	¹¹⁵ Rh	-74.560	¹⁰³ Ag	-84.070		
¹⁰² Rb	-39.020	¹⁰² Y	-61.920	¹⁰⁴ Nb	-72.570	¹¹¹ Tc	-69.670	¹¹⁶ Rh	-71.510	¹⁰⁴ Ag	-84.170		
¹⁰³ Rb	-34.950	¹⁰³ Y	-59.130	¹⁰⁵ Nb	-70.540	¹¹² Tc	-66.320	¹¹⁷ Rh	-69.280	¹⁰⁵ Ag	-86.380		
⁶⁷ Sr	23.170 †	¹⁰⁴ Y	-54.930	¹⁰⁶ Nb	-67.050	¹¹³ Tc	-63.830	¹¹⁸ Rh	-65.790	¹⁰⁶ Ag	-86.020		
⁶⁸ Sr	10.400 †	¹⁰⁵ Y	-51.610	¹⁰⁷ Nb	-64.540	¹¹⁴ Tc	-60.010	¹¹⁹ Rh	-63.310	¹⁰⁷ Ag	-87.780		
⁶⁹ Sr	1.930 †	¹⁰⁶ Y	-47.280	¹⁰⁸ Nb	-60.740	¹¹⁵ Tc	-56.830	¹²⁰ Rh	-59.720	¹⁰⁸ Ag	-88.070		
⁷⁰ Sr	-9.310 †	¹⁰⁷ Y	-43.570	¹⁰⁹ Nb	-57.820	¹¹⁶ Tc	-52.580	¹²¹ Rh	-56.790	¹⁰⁹ Ag	-88.320		
⁷¹ Sr	-16.600 ‡	⁷¹ Zr	23.040 †	¹¹⁰ Nb	-53.700	¹¹⁷ Tc	-49.220	¹²² Rh	-53.420	¹¹⁰ Ag	-87.310		
⁷² Sr	-26.600 ‡	⁷² Zr	10.760 †	¹¹¹ Nb	-50.340	⁸⁴ Ru	-23.750 ‡	¹²³ Rh	-49.660	¹¹¹ Ag	-88.110		
⁷³ Sr	-32.580	⁷³ Zr	2.210 †	⁷⁷ Mo	3.220 †	⁸⁵ Ru	-30.040 ‡	¹²⁴ Rh	-45.990	¹¹² Ag	-86.810		
⁷⁴ Sr	-41.340	⁷⁴ Zr	-8.910 †	⁷⁸ Mo	-7.550 †	⁸⁶ Ru	-40.580	¹²⁵ Rh	-42.810	¹¹³ Ag	-87.130		
⁷⁵ Sr	-46.170	⁷⁵ Zr	-15.840 †	⁷⁹ Mo	-15.190 †	⁸⁷ Ru	-46.330	¹²⁶ Rh	-39.670	¹¹⁴ Ag	-85.320		
⁷⁶ Sr	-54.220	⁷⁶ Zr	-26.060 ‡	⁸⁰ Mo	-25.480 ‡	⁸⁸ Ru	-55.120	¹²⁷ Rh	-36.020	¹¹⁵ Ag	-85.160		
⁷⁷ Sr	-57.500	⁷⁷ Zr	-32.100	⁸¹ Mo	-30.270 †	⁸⁹ Ru	-59.210	¹²⁸ Rh	-29.750	¹¹⁶ Ag	-83.120		
⁷⁸ Sr	-63.240	⁷⁸ Zr	-41.310	⁸² Mo	-39.670 ‡	⁹⁰ Ru	-66.290	¹²⁹ Rh	-23.580	¹¹⁷ Ag	-82.410		
⁷⁹ Sr	-65.460	⁷⁹ Zr	-46.510	⁸³ Mo	-44.960	⁹¹ Ru	-68.960	¹³⁰ Rh	-16.500	¹¹⁸ Ag	-79.970		
⁸⁰ Sr	-70.490	⁸⁰ Zr	-54.270	⁸⁴ Mo	-53.320	⁹² Ru	-75.850	⁸⁸ Pd	-24.680 ‡	¹¹⁹ Ag	-79.020		
										¹²⁰ Ag	-75.870		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹²¹ Ag	-74.610	¹¹¹ In	-87.710	⁹⁹ Sb	-29.950 †	¹²⁹ Te	-87.900	¹¹⁴ Xe	-66.390	¹⁴⁵ Cs	-59.800
¹²² Ag	-71.670	¹¹² In	-87.320	¹⁰⁰ Sb	-36.130 †	¹³⁰ Te	-88.150	¹¹⁵ Xe	-68.390	¹⁴⁶ Cs	-55.840
¹²³ Ag	-70.110	¹¹³ In	-89.020	¹⁰¹ Sb	-45.050 †	¹³¹ Te	-86.080	¹¹⁶ Xe	-72.580	¹⁴⁷ Cs	-52.550
¹²⁴ Ag	-66.860	¹¹⁴ In	-88.190	¹⁰² Sb	-49.060 †	¹³² Te	-85.940	¹¹⁷ Xe	-73.980	¹⁴⁸ Cs	-48.270
¹²⁵ Ag	-65.060	¹¹⁵ In	-89.470	¹⁰³ Sb	-55.570 †	¹³³ Te	-83.570	¹¹⁸ Xe	-77.710	¹⁴⁹ Cs	-44.460
¹²⁶ Ag	-61.950	¹¹⁶ In	-88.220	¹⁰⁴ Sb	-58.020 †	¹³⁴ Te	-82.790	¹¹⁹ Xe	-78.610	¹⁵⁰ Cs	-39.780
¹²⁷ Ag	-59.690	¹¹⁷ In	-89.070	¹⁰⁵ Sb	-62.870 †	¹³⁵ Te	-78.250	¹²⁰ Xe	-81.790	¹⁵¹ Cs	-35.640
¹²⁸ Ag	-56.610	¹¹⁸ In	-87.550	¹⁰⁶ Sb	-65.180 †	¹³⁶ Te	-75.040	¹²¹ Xe	-82.290	¹⁰⁸ Ba	-7.410 †
¹²⁹ Ag	-53.740	¹¹⁹ In	-87.930	¹⁰⁷ Sb	-69.520 †	¹³⁷ Te	-69.810	¹²² Xe	-84.960	¹⁰⁹ Ba	-13.150 †
¹³⁰ Ag	-48.000	¹²⁰ In	-86.150	¹⁰⁸ Sb	-71.160	¹³⁸ Te	-65.890	¹²³ Xe	-85.010	¹¹⁰ Ba	-21.460 †
¹³¹ Ag	-42.580	¹²¹ In	-86.080	¹⁰⁹ Sb	-75.050	¹³⁹ Te	-59.980	¹²⁴ Xe	-87.170	¹¹¹ Ba	-26.570 †
¹³² Ag	-36.180	¹²² In	-84.000	¹¹⁰ Sb	-76.230	¹⁴⁰ Te	-56.050	¹²⁵ Xe	-86.680	¹¹² Ba	-34.250 ‡
¹³³ Ag	-30.250	¹²³ In	-83.570	¹¹¹ Sb	-79.710	¹⁴¹ Te	-50.130	¹²⁶ Xe	-88.490	¹¹³ Ba	-38.250 ‡
¹³⁴ Ag	-23.520	¹²⁴ In	-81.300	¹¹² Sb	-80.470	¹⁴² Te	-46.130	¹²⁷ Xe	-87.700	¹¹⁴ Ba	-44.900
⁹³ Cd	-31.610 ‡	¹²⁵ In	-80.700	¹¹³ Sb	-83.440	¹⁴³ Te	-40.560	¹²⁸ Xe	-89.290	¹¹⁵ Ba	-48.270
⁹⁴ Cd	-41.270	¹²⁶ In	-78.110	¹¹⁴ Sb	-83.690	¹⁴⁴ Te	-36.220	¹²⁹ Xe	-88.270	¹¹⁶ Ba	-54.240
⁹⁵ Cd	-47.320	¹²⁷ In	-77.160	¹¹⁵ Sb	-86.220	¹⁴⁵ Te	-30.610	¹³⁰ Xe	-89.870	¹¹⁷ Ba	-56.890
⁹⁶ Cd	-56.140	¹²⁸ In	-74.620	¹¹⁶ Sb	-86.030	¹⁴⁶ Te	-25.920	¹³¹ Xe	-88.590	¹¹⁸ Ba	-62.140
⁹⁷ Cd	-59.970	¹²⁹ In	-73.190	¹¹⁷ Sb	-88.110			¹³² Xe	-89.600	¹¹⁹ Ba	-64.230
⁹⁸ Cd	-67.060	¹³⁰ In	-70.470	¹¹⁸ Sb	-87.610	¹⁰² I	-15.130 †	¹³³ Xe	-88.120	¹²⁰ Ba	-68.670
⁹⁹ Cd	-69.510	¹³¹ In	-68.320	¹¹⁹ Sb	-89.270	¹⁰³ I	-25.430 †	¹³⁴ Xe	-88.820	¹²¹ Ba	-70.260
¹⁰⁰ Cd	-74.690	¹³² In	-63.140	¹²⁰ Sb	-88.420	¹⁰⁴ I	-30.160 †	¹³⁵ Xe	-86.720	¹²² Ba	-74.220
¹⁰¹ Cd	-75.930	¹³³ In	-58.550	¹²¹ Sb	-89.630	¹⁰⁵ I	-37.460 †	¹³⁶ Xe	-86.810	¹²³ Ba	-75.360
¹⁰² Cd	-78.990	¹³⁴ In	-52.720	¹²² Sb	-88.460	¹⁰⁶ I	-41.410 †	¹³⁷ Xe	-82.900	¹²⁴ Ba	-78.730
¹⁰³ Cd	-79.720	¹³⁵ In	-47.480	¹²³ Sb	-89.300	¹⁰⁷ I	-47.720 †	¹³⁸ Xe	-80.410	¹²⁵ Ba	-79.420
¹⁰⁴ Cd	-83.330	¹³⁶ In	-41.260	¹²⁴ Sb	-87.890	¹⁰⁸ I	-50.940 †	¹³⁹ Xe	-75.680	¹²⁶ Ba	-82.160
¹⁰⁵ Cd	-83.260	¹³⁷ In	-35.840	¹²⁵ Sb	-88.280	¹⁰⁹ I	-56.250 †	¹⁴⁰ Xe	-72.260	¹²⁷ Ba	-82.430
¹⁰⁶ Cd	-86.230	¹³⁸ In	-29.340	¹²⁶ Sb	-86.580	¹¹⁰ I	-58.860 †	¹⁴¹ Xe	-68.000	¹²⁸ Ba	-84.600
¹⁰⁷ Cd	-85.870	⁹⁷ Sn	-31.890 ‡	¹²⁷ Sb	-86.700	¹¹¹ I	-63.770	¹⁴² Xe	-64.780	¹²⁹ Ba	-84.340
¹⁰⁸ Cd	-88.380	⁹⁸ Sn	-41.410 ‡	¹²⁸ Sb	-84.880	¹¹² I	-66.020	¹⁴³ Xe	-59.940	¹³⁰ Ba	-86.390
¹⁰⁹ Cd	-87.640	⁹⁹ Sn	-47.090	¹²⁹ Sb	-84.830	¹¹³ I	-70.290	¹⁴⁴ Xe	-56.610	¹³¹ Ba	-86.030
¹¹⁰ Cd	-89.670	¹⁰⁰ Sn	-55.450	¹³⁰ Sb	-82.980	¹¹⁴ I	-72.030	¹⁴⁵ Xe	-51.850	¹³² Ba	-87.790
¹¹¹ Cd	-88.590	¹⁰¹ Sn	-58.900	¹³¹ Sb	-82.050	¹¹⁵ I	-75.710	¹⁴⁶ Xe	-48.380	¹³³ Ba	-87.240
¹¹² Cd	-90.130	¹⁰² Sn	-64.870	¹³² Sb	-79.540	¹¹⁶ I	-76.940	¹⁴⁷ Xe	-43.480	¹³⁴ Ba	-88.870
¹¹³ Cd	-88.570	¹⁰³ Sn	-67.030	¹³³ Sb	-78.360	¹¹⁷ I	-80.130	¹⁴⁸ Xe	-39.480	¹³⁵ Ba	-88.060
¹¹⁴ Cd	-89.660	¹⁰⁴ Sn	-71.650	¹³⁴ Sb	-73.620	¹¹⁸ I	-80.860	¹⁴⁹ Xe	-34.280	¹³⁶ Ba	-89.500
¹¹⁵ Cd	-88.030	¹⁰⁵ Sn	-73.080	¹³⁵ Sb	-70.000	¹¹⁹ I	-83.570			¹³⁷ Ba	-87.800
¹¹⁶ Cd	-88.530	¹⁰⁶ Sn	-77.150	¹³⁶ Sb	-64.840	¹²⁰ I	-83.950	¹⁰⁶ Cs	-8.540 †	¹³⁸ Ba	-88.740
¹¹⁷ Cd	-86.420	¹⁰⁷ Sn	-77.860	¹³⁷ Sb	-60.260	¹²¹ I	-86.000	¹⁰⁷ Cs	-16.820 †	¹³⁹ Ba	-85.310
¹¹⁸ Cd	-86.450	¹⁰⁸ Sn	-81.470	¹³⁸ Sb	-54.510	¹²² I	-85.950	¹⁰⁸ Cs	-22.320 †	¹⁴⁰ Ba	-83.750
¹¹⁹ Cd	-83.910	¹⁰⁹ Sn	-81.430	¹³⁹ Sb	-49.870	¹²³ I	-87.800	¹⁰⁹ Cs	-29.920 †	¹⁴¹ Ba	-79.280
¹²⁰ Cd	-84.000	¹⁴⁰ Sn	-44.110	¹⁴⁰ Sb	-44.110	¹²⁴ I	-87.330	¹¹⁰ Cs	-34.530 †	¹⁴² Ba	-77.110
¹²¹ Cd	-81.250	¹¹⁰ Sn	-84.990	¹⁴¹ Sb	-39.340	¹²⁵ I	-88.660	¹¹¹ Cs	-41.100 †	¹⁴³ Ba	-73.360
¹²² Cd	-80.920	¹¹¹ Sn	-85.000	¹⁴² Sb	-33.400	¹²⁶ I	-87.790	¹¹² Cs	-44.900 †	¹⁴⁴ Ba	-70.950
¹²³ Cd	-77.950	¹¹² Sn	-88.010	¹⁴³ Sb	-28.480	¹²⁷ I	-89.080	¹¹³ Cs	-50.690 †	¹⁴⁵ Ba	-66.980
¹²⁴ Cd	-77.050	¹¹³ Sn	-87.600	¹⁴⁴ Sb	-22.600	¹²⁸ I	-88.080	¹¹⁴ Cs	-54.080	¹⁴⁶ Ba	-64.540
¹²⁵ Cd	-74.020	¹¹⁴ Sn	-90.170	¹⁴⁵ Sb	-17.380	¹²⁹ I	-88.760	¹¹⁵ Cs	-59.250	¹⁴⁷ Ba	-60.650
¹²⁶ Cd	-72.640	¹¹⁵ Sn	-89.120			¹³⁰ I	-87.480	¹¹⁶ Cs	-61.770	¹⁴⁸ Ba	-58.010
¹²⁷ Cd	-69.560	¹¹⁶ Sn	-91.270	¹⁰¹ Te	-27.820 †	¹³¹ I	-87.820	¹¹⁷ Cs	-66.260	¹⁴⁹ Ba	-53.800
¹²⁸ Cd	-67.860	¹¹⁷ Sn	-90.170	¹⁰² Te	-37.240 †	¹³² I	-86.440	¹¹⁸ Cs	-68.290	¹⁵⁰ Ba	-50.550
¹²⁹ Cd	-64.810	¹¹⁸ Sn	-91.650	¹⁰³ Te	-41.930 ‡	¹³³ I	-86.540	¹¹⁹ Cs	-72.060	¹⁵¹ Ba	-46.010
¹³⁰ Cd	-62.570	¹¹⁹ Sn	-90.110	¹⁰⁴ Te	-49.720 ‡	¹³⁴ I	-84.580	¹²⁰ Cs	-73.600	¹⁵² Ba	-42.400
¹³¹ Cd	-56.830	¹²⁰ Sn	-91.230	¹⁰⁵ Te	-51.380 ‡	¹³⁵ I	-83.990	¹²¹ Cs	-76.900	¹⁵³ Ba	-37.460
¹³² Cd	-52.050	¹²¹ Sn	-89.430	¹⁰⁶ Te	-57.210	¹³⁶ I	-79.990	¹²² Cs	-78.010		
¹³³ Cd	-45.620	¹²² Sn	-90.070	¹⁰⁷ Te	-59.400	¹³⁷ I	-77.060	¹²³ Cs	-80.720	¹¹² La	-15.690 †
¹³⁴ Cd	-40.260	¹²³ Sn	-88.060	¹⁰⁸ Te	-64.520	¹³⁸ I	-71.790	¹²⁴ Cs	-81.410	¹¹³ La	-23.570 †
¹³⁵ Cd	-33.480	¹²⁴ Sn	-88.330	¹⁰⁹ Te	-66.410	¹³⁹ I	-68.140	¹²⁵ Cs	-83.580	¹¹⁴ La	-28.680 †
¹³⁶ Cd	-27.970	¹²⁵ Sn	-86.170	¹¹⁰ Te	-71.000	¹⁴⁰ I	-63.660	¹²⁶ Cs	-83.680	¹¹⁵ La	-35.840 †
		¹²⁶ Sn	-86.120	¹¹¹ Te	-72.330	¹⁴¹ I	-59.780	¹²⁷ Cs	-85.460	¹¹⁶ La	-39.900 †
⁹⁵ In	-32.190 †	¹²⁷ Sn	-83.770	¹¹² Te	-76.460	¹⁴² I	-54.700	¹²⁸ Cs	-85.180	¹¹⁷ La	-46.040 †
⁹⁶ In	-38.260 †	¹²⁸ Sn	-83.260	¹¹³ Te	-77.360	¹⁴³ I	-50.760	¹²⁹ Cs	-86.740	¹¹⁸ La	-49.350 †
⁹⁷ In	-47.990 †	¹²⁹ Sn	-80.760	¹¹⁴ Te	-80.990	¹⁴⁴ I	-45.700	¹³⁰ Cs	-86.310	¹¹⁹ La	-54.740 †
⁹⁸ In	-53.090	¹³⁰ Sn	-79.890	¹¹⁵ Te	-81.450	¹⁴⁵ I	-41.610	¹³¹ Cs	-87.560	¹²⁰ La	-57.520
⁹⁹ In	-60.660	¹³¹ Sn	-77.120	¹¹⁶ Te	-84.660	¹⁴⁶ I	-36.610	¹³² Cs	-86.980	¹²¹ La	-61.930
¹⁰⁰ In	-63.640	¹³² Sn	-75.730	¹¹⁷ Te	-84.780	¹⁴⁷ I	-32.060	¹³³ Cs	-87.870	¹²² La	-64.170
¹⁰¹ In	-69.110	¹³³ Sn	-70.540	¹¹⁸ Te	-87.490			¹³⁴ Cs	-87.030	¹²³ La	-68.230
¹⁰² In	-70.260	¹³⁴ Sn	-66.580	¹¹⁹ Te	-86.940	¹⁰⁴ Xe	-15.840 †	¹³⁵ Cs	-87.960	¹²⁴ La	-70.000
¹⁰³ In	-74.030	¹³⁵ Sn	-60.670	¹²⁰ Te	-89.230	¹⁰⁵ Xe	-20.760 †	¹³⁶ Cs	-86.320	¹²⁵ La	-73.450
¹⁰⁴ In	-75.540	¹³⁶ Sn	-56.070	¹²¹ Te	-88.490	¹⁰⁶ Xe	-29.030 †	¹³⁷ Cs	-86.740	¹²⁶ La	-74.740
¹⁰⁵ In	-78.970	¹³⁷ Sn	-49.860	¹²² Te	-90.330	¹⁰⁷ Xe	-33.520 †	¹³⁸ Cs	-83.210	¹²⁷ La	-77.590
¹⁰⁶ In	-79.740	¹³⁸ Sn	-44.960	¹²³ Te	-89.300	¹⁰⁸ Xe	-40.920 ‡	¹³⁹ Cs	-81.060	¹²⁸ La	-78.390
¹⁰⁷ In	-82.770	¹³⁹ Sn	-38.400	¹²⁴ Te	-90.770	¹⁰⁹ Xe	-44.310 ‡	¹⁴⁰ Cs	-76.630	¹²⁹ La	-80.590
¹⁰⁸ In	-83.060	¹⁴⁰ Sn	-33.460	¹²⁵ Te	-89.310	¹¹⁰ Xe	-50.360	¹⁴¹ Cs	-73.960	¹³⁰ La	-80.890
¹⁰⁹ In	-85.620	¹⁴¹ Sn	-26.760	¹²⁶ Te	-90.500	¹¹¹ Xe	-53.240	¹⁴² Cs	-70.110	¹³¹ La	-82.830
¹¹⁰ In	-85.550	¹⁴² Sn	-21.500	¹²⁷ Te	-88.800	¹¹² Xe	-58.870	¹⁴³ Cs	-67.070	¹³² La	-82.900
				¹²⁸ Te	-89.710	¹¹³ Xe	-61.370	¹⁴⁴ Cs	-62.950		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹³³ La	-84.730	¹²³ Pr	-49.960 †	¹⁵⁶ Nd	-60.250	¹⁶⁰ Sm	-60.150	¹⁶⁴ Gd	-59.340	¹⁶³ Dy	-65.580		
¹³⁴ La	-84.740	¹²⁴ Pr	-52.920	¹⁵⁷ Nd	-56.510	¹⁶¹ Sm	-56.660	¹⁶⁵ Gd	-56.200	¹⁶⁴ Dy	-65.150		
¹³⁵ La	-86.420	¹²⁵ Pr	-57.630	¹⁵⁸ Nd	-53.970	¹⁶² Sm	-54.410	¹⁶⁶ Gd	-54.190	¹⁶⁵ Dy	-62.930		
¹³⁶ La	-86.230	¹²⁶ Pr	-60.060	¹⁵⁹ Nd	-49.900	¹⁶³ Sm	-50.660	¹⁶⁷ Gd	-50.730	¹⁶⁶ Dy	-62.030		
¹³⁷ La	-87.530	¹²⁷ Pr	-64.170	¹⁶⁰ Nd	-46.950	¹⁶⁴ Sm	-47.960	¹⁶⁸ Gd	-48.260	¹⁶⁷ Dy	-59.510		
¹³⁸ La	-86.430	¹²⁸ Pr	-66.190	¹⁶¹ Nd	-42.640	¹⁶⁵ Sm	-43.910	¹⁶⁹ Gd	-44.380	¹⁶⁸ Dy	-58.120		
¹³⁹ La	-87.510	¹²⁹ Pr	-69.650	¹⁶² Nd	-39.290	¹⁶⁶ Sm	-40.800	¹⁷⁰ Gd	-41.600	¹⁶⁹ Dy	-55.300		
¹⁴⁰ La	-84.570	¹³⁰ Pr	-70.990					¹⁷¹ Gd	-37.460	¹⁷⁰ Dy	-53.470		
¹⁴¹ La	-83.200	¹³¹ Pr	-73.950	¹²⁷ Pm	-44.820 †	¹³³ Eu	-47.230 †	¹⁷² Gd	-34.280	¹⁷¹ Dy	-50.180		
¹⁴² La	-79.280	¹³² Pr	-74.910	¹²⁸ Pm	-47.820 †	¹³⁴ Eu	-49.790	¹⁷³ Gd	-29.810	¹⁷² Dy	-48.000		
¹⁴³ La	-77.630	¹³³ Pr	-77.250	¹²⁹ Pm	-52.800	¹³⁵ Eu	-54.150			¹⁷³ Dy	-44.480		
¹⁴⁴ La	-74.390	¹³⁴ Pr	-77.830	¹³⁰ Pm	-55.400	¹³⁶ Eu	-56.230	¹³⁷ Tb	-40.970 †	¹⁷⁴ Dy	-41.930		
¹⁴⁵ La	-72.230	¹³⁵ Pr	-80.070	¹³¹ Pm	-59.580	¹³⁷ Eu	-60.000	¹³⁸ Tb	-43.650 †	¹⁷⁵ Dy	-37.970		
¹⁴⁶ La	-68.940	¹³⁶ Pr	-80.510	¹³² Pm	-61.560	¹³⁸ Eu	-61.440	¹³⁹ Tb	-48.060 †	¹⁷⁶ Dy	-34.960		
¹⁴⁷ La	-66.720	¹³⁷ Pr	-82.680	¹³³ Pm	-65.100	¹³⁹ Eu	-64.810	¹⁴⁰ Tb	-50.180	¹⁷⁷ Dy	-30.410		
¹⁴⁸ La	-63.560	¹³⁸ Pr	-83.250	¹³⁴ Pm	-66.470	¹⁴⁰ Eu	-66.330	¹⁴¹ Tb	-54.230	¹⁷⁸ Dy	-26.910		
¹⁴⁹ La	-61.110	¹³⁹ Pr	-85.110	¹³⁵ Pm	-69.520	¹⁴¹ Eu	-69.700	¹⁴² Tb	-56.230				
¹⁵⁰ La	-57.470	¹⁴⁰ Pr	-84.600	¹³⁶ Pm	-70.660	¹⁴² Eu	-70.780	¹⁴³ Tb	-60.550	¹⁴¹ Ho	-34.440 †		
¹⁵¹ La	-54.440	¹⁴¹ Pr	-86.320	¹³⁷ Pm	-73.400	¹⁴³ Eu	-73.890	¹⁴⁴ Tb	-62.020	¹⁴² Ho	-37.280 †		
¹⁵² La	-50.400	¹⁴² Pr	-84.050	¹³⁸ Pm	-74.340	¹⁴⁴ Eu	-75.450	¹⁴⁵ Tb	-65.560	¹⁴³ Ho	-41.910 †		
¹⁵³ La	-46.870	¹⁴³ Pr	-83.450	¹³⁹ Pm	-77.050	¹⁴⁵ Eu	-78.110	¹⁴⁶ Tb	-67.750	¹⁴⁴ Ho	-44.350 †		
¹⁵⁴ La	-42.500	¹⁴⁴ Pr	-80.060	¹⁴⁰ Pm	-77.700	¹⁴⁶ Eu	-77.190	¹⁴⁷ Tb	-71.230	¹⁴⁵ Ho	-49.170 †		
¹⁵⁵ La	-38.680	¹⁴⁵ Pr	-79.170	¹⁴¹ Pm	-80.960	¹⁴⁷ Eu	-77.960	¹⁴⁸ Tb	-70.730	¹⁴⁶ Ho	-51.190		
		¹⁴⁶ Pr	-76.710	¹⁴² Pm	-81.330	¹⁴⁸ Eu	-75.810	¹⁴⁹ Tb	-72.250	¹⁴⁷ Ho	-55.230		
¹¹⁴ Ce	-15.320 †	¹⁴⁷ Pr	-75.450	¹⁴³ Pm	-83.180	¹⁴⁹ Eu	-76.090	¹⁵⁰ Tb	-70.660	¹⁴⁸ Ho	-58.140		
¹¹⁵ Ce	-20.790 †	¹⁴⁸ Pr	-72.920	¹⁴⁴ Pm	-81.690	¹⁵⁰ Eu	-74.890	¹⁵¹ Tb	-71.540	¹⁴⁹ Ho	-62.360		
¹¹⁶ Ce	-28.880 ‡	¹⁴⁹ Pr	-71.620	¹⁴⁵ Pm	-81.720	¹⁵¹ Eu	-75.090	¹⁵² Tb	-70.790	¹⁵⁰ Ho	-62.260		
¹¹⁷ Ce	-33.200 ‡	¹⁵⁰ Pr	-69.080	¹⁴⁶ Pm	-79.050	¹⁵² Eu	-73.780	¹⁵³ Tb	-71.640	¹⁵¹ Ho	-64.350		
¹¹⁸ Ce	-40.010	¹⁵¹ Pr	-67.310	¹⁴⁷ Pm	-78.650	¹⁵³ Eu	-73.940	¹⁵⁴ Tb	-70.850	¹⁵² Ho	-63.740		
¹¹⁹ Ce	-43.490	¹⁵² Pr	-64.290	¹⁴⁸ Pm	-76.910	¹⁵⁴ Eu	-72.540	¹⁵⁵ Tb	-71.580	¹⁵³ Ho	-65.170		
¹²⁰ Ce	-49.550	¹⁵³ Pr	-61.960	¹⁴⁹ Pm	-76.450	¹⁵⁵ Eu	-72.100	¹⁵⁶ Tb	-70.610	¹⁵⁴ Ho	-64.860		
¹²¹ Ce	-52.470	¹⁵⁴ Pr	-58.580	¹⁵⁰ Pm	-74.570	¹⁵⁶ Eu	-70.130	¹⁵⁷ Tb	-70.790	¹⁵⁵ Ho	-66.210		
¹²² Ce	-57.670	¹⁵⁵ Pr	-55.720	¹⁵¹ Pm	-74.070	¹⁵⁷ Eu	-69.300	¹⁵⁸ Tb	-69.480	¹⁵⁶ Ho	-65.890		
¹²³ Ce	-59.990	¹⁵⁶ Pr	-51.950	¹⁵² Pm	-72.100	¹⁵⁸ Eu	-67.040	¹⁵⁹ Tb	-69.140	¹⁵⁷ Ho	-67.150		
¹²⁴ Ce	-64.570	¹⁵⁷ Pr	-48.830	¹⁵³ Pm	-71.010	¹⁵⁹ Eu	-65.720	¹⁶⁰ Tb	-67.480	¹⁵⁸ Ho	-66.620		
¹²⁵ Ce	-66.350	¹⁵⁸ Pr	-44.750	¹⁵⁴ Pm	-68.530	¹⁶⁰ Eu	-63.060	¹⁶¹ Tb	-66.780	¹⁵⁹ Ho	-67.450		
¹²⁶ Ce	-70.410	¹⁵⁹ Pr	-41.240	¹⁵⁵ Pm	-67.010	¹⁶¹ Eu	-61.350	¹⁶² Tb	-64.780	¹⁶⁰ Ho	-66.620		
¹²⁷ Ce	-71.830	¹⁶⁰ Pr	-36.920	¹⁵⁶ Pm	-64.240	¹⁶² Eu	-58.470	¹⁶³ Tb	-63.760	¹⁶¹ Ho	-66.970		
¹²⁸ Ce	-75.230			¹⁵⁷ Pm	-62.140	¹⁶³ Eu	-56.320	¹⁶⁴ Tb	-61.500	¹⁶² Ho	-65.820		
¹²⁹ Ce	-76.010	¹¹⁹ Nd	-15.400 †	¹⁵⁸ Pm	-58.960	¹⁶⁴ Eu	-53.150	¹⁶⁵ Tb	-60.040	¹⁶³ Ho	-65.850		
¹³⁰ Ce	-78.930	¹²⁰ Nd	-23.540 ‡	¹⁵⁹ Pm	-56.550	¹⁶⁵ Eu	-50.530	¹⁶⁶ Tb	-57.480	¹⁶⁴ Ho	-64.400		
¹³¹ Ce	-79.210	¹²¹ Nd	-27.900 ‡	¹⁶⁰ Pm	-52.980	¹⁶⁶ Eu	-47.030	¹⁶⁷ Tb	-55.580	¹⁶⁵ Ho	-64.110		
¹³² Ce	-81.670	¹²² Nd	-34.730 ‡	¹⁶¹ Pm	-50.180	¹⁶⁷ Eu	-44.000	¹⁶⁸ Tb	-52.630	¹⁶⁶ Ho	-62.430		
¹³³ Ce	-81.770	¹²³ Nd	-38.430	¹⁶² Pm	-46.370	¹⁶⁸ Eu	-40.070	¹⁶⁹ Tb	-50.280	¹⁶⁷ Ho	-61.650		
¹³⁴ Ce	-84.100	¹²⁴ Nd	-44.400	¹⁶³ Pm	-43.140	¹⁶⁹ Eu	-36.670	¹⁷⁰ Tb	-46.910	¹⁶⁸ Ho	-59.680		
¹³⁵ Ce	-84.040	¹²⁵ Nd	-47.450	¹⁶⁴ Pm	-39.060	¹⁷⁰ Eu	-32.460	¹⁷¹ Tb	-44.240	¹⁶⁹ Ho	-58.420		
¹³⁶ Ce	-86.290	¹²⁶ Nd	-52.780			¹³⁵ Gd	-44.090	¹⁷² Tb	-40.560	¹⁷⁰ Ho	-56.030		
¹³⁷ Ce	-86.300	¹²⁷ Nd	-55.250	¹³¹ Sm	-50.090	¹³⁶ Gd	-49.040	¹⁷³ Tb	-37.460	¹⁷¹ Ho	-54.330		
¹³⁸ Ce	-88.130	¹²⁸ Nd	-60.060	¹³² Sm	-54.920	¹³⁷ Gd	-51.170	¹⁷⁴ Tb	-33.470	¹⁷² Ho	-51.620		
¹³⁹ Ce	-87.040	¹²⁹ Nd	-62.090	¹³³ Sm	-56.850	¹³⁸ Gd	-55.530	¹⁷⁵ Tb	-29.950	¹⁷³ Ho	-49.540		
¹⁴⁰ Ce	-88.640	¹³⁰ Nd	-66.160	¹³⁴ Sm	-61.130	¹³⁹ Gd	-57.150	¹⁷⁶ Tb	-25.330	¹⁷⁴ Ho	-46.550		
¹⁴¹ Ce	-85.850	¹³¹ Nd	-67.490	¹³⁵ Sm	-62.630	¹⁴⁰ Gd	-61.150	¹³⁹ Dy	-37.750	¹⁷⁵ Ho	-44.100		
¹⁴² Ce	-85.020	¹³² Nd	-71.040	¹³⁶ Sm	-66.320	¹⁴¹ Gd	-62.810	¹⁴⁰ Dy	-42.690	¹⁷⁶ Ho	-40.600		
¹⁴³ Ce	-81.130	¹³³ Nd	-72.120	¹³⁷ Sm	-67.390	¹⁴² Gd	-67.050	¹⁴¹ Dy	-44.960	¹⁷⁷ Ho	-37.720		
¹⁴⁴ Ce	-79.930	¹³⁴ Nd	-75.040	¹³⁸ Sm	-70.770	¹⁴³ Gd	-67.980	¹⁴² Dy	-49.570	¹⁷⁸ Ho	-33.630		
¹⁴⁵ Ce	-76.710	¹³⁵ Nd	-75.580	¹³⁹ Sm	-71.820	¹⁴⁴ Gd	-71.290	¹⁴³ Dy	-51.690	¹⁷⁹ Ho	-30.200		
¹⁴⁶ Ce	-75.190	¹³⁶ Nd	-78.430	¹⁴⁰ Sm	-75.250	¹⁴⁵ Gd	-73.260	¹⁴⁴ Dy	-56.630	¹⁸⁰ Ho	-26.070		
¹⁴⁷ Ce	-72.030	¹³⁷ Nd	-78.900	¹⁴¹ Sm	-75.810	¹⁴⁶ Gd	-76.530	¹⁴⁵ Dy	-58.220	¹⁴³ Er	-30.840		
¹⁴⁸ Ce	-70.440	¹³⁸ Nd	-81.680	¹⁴² Sm	-79.600	¹⁴⁷ Gd	-75.600	¹⁴⁶ Dy	-62.090	¹⁴⁴ Er	-36.110		
¹⁴⁹ Ce	-67.340	¹³⁹ Nd	-81.820	¹⁴³ Sm	-79.880	¹⁴⁸ Gd	-76.940	¹⁴⁷ Dy	-64.770	¹⁴⁵ Er	-38.710		
¹⁵⁰ Ce	-65.470	¹⁴⁰ Nd	-84.780	¹⁴⁴ Sm	-82.430	¹⁴⁹ Gd	-74.860	¹⁴⁸ Dy	-68.820	¹⁴⁶ Er	-43.990		
¹⁵¹ Ce	-61.920	¹⁴¹ Nd	-84.330	¹⁴⁵ Sm	-81.000	¹⁵⁰ Gd	-75.460	¹⁴⁹ Dy	-68.340	¹⁴⁷ Er	-46.160		
¹⁵² Ce	-59.450	¹⁴² Nd	-86.520	¹⁴⁶ Sm	-81.600	¹⁵¹ Gd	-74.150	¹⁵⁰ Dy	-70.500	¹⁴⁸ Er	-50.810		
¹⁵³ Ce	-55.500	¹⁴³ Nd	-84.360	¹⁴⁷ Sm	-78.970	¹⁵² Gd	-74.800	¹⁵¹ Dy	-69.020	¹⁴⁹ Er	-54.010		
¹⁵⁴ Ce	-52.580	¹⁴⁴ Nd	-84.280	¹⁴⁸ Sm	-78.950	¹⁵³ Gd	-73.460	¹⁵² Dy	-70.090	¹⁵⁰ Er	-58.740		
¹⁵⁵ Ce	-48.240	¹⁴⁵ Nd	-80.900	¹⁴⁹ Sm	-77.150	¹⁵⁴ Gd	-74.070	¹⁵³ Dy	-69.210	¹⁵¹ Er	-58.800		
¹⁵⁶ Ce	-45.020	¹⁴⁶ Nd	-80.490	¹⁵⁰ Sm	-77.160	¹⁵⁵ Gd	-72.650	¹⁵⁴ Dy	-69.390	¹⁵² Er	-61.550		
¹⁵⁷ Ce	-40.380	¹⁴⁷ Nd	-78.010	¹⁵¹ Sm	-75.300	¹⁵⁶ Gd	-72.710	¹⁵⁵ Dy	-69.600	¹⁵³ Er	-60.880		
		¹⁴⁸ Nd	-77.370	¹⁵² Sm	-75.340	¹⁵⁷ Gd	-70.880	¹⁵⁶ Dy	-70.710	¹⁵⁴ Er	-62.640		
¹¹⁶ Pr	-9.980 †	¹⁴⁹ Nd	-74.920	¹⁵³ Sm	-73.400	¹⁵⁸ Gd	-70.460	¹⁵⁷ Dy	-69.740	¹⁵⁵ Er	-62.360		
¹¹⁷ Pr	-18.190 †	¹⁵⁰ Nd	-74.180	¹⁵⁴ Sm	-72.880	¹⁵⁹ Gd	-68.300	¹⁵⁸ Dy	-70.440	¹⁵⁶ Er	-64.110		
¹¹⁸ Pr	-23.440 †	¹⁵¹ Nd	-71.690	¹⁵⁵ Sm	-70.390	¹⁶⁰ Gd	-67.480	¹⁵⁹ Dy	-69.120	¹⁵⁷ Er	-63.660		
¹¹⁹ Pr	-30.580 †	¹⁵² Nd	-70.480	¹⁵⁶ Sm	-69.420	¹⁶¹ Gd	-64.900	¹⁶⁰ Dy	-69.400	¹⁵⁸ Er	-65.370		
¹²⁰ Pr	-34.790 †	¹⁵³ Nd	-67.540	¹⁵⁷ Sm	-66.640	¹⁶² Gd	-63.770	¹⁶¹ Dy	-67.700	¹⁵⁹ Er	-64.790		
¹²¹ Pr	-41.010 †	¹⁵⁴ Nd	-65.800	¹⁵⁸ Sm	-65.150	¹⁶³ Gd	-60.900	¹⁶² Dy	-67.590	¹⁶⁰ Er	-66.090		
¹²² Pr	-44.660 †	¹⁵⁵ Nd	-62.470	¹⁵⁹ Sm	-61.990								

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁶¹ Er	-65.280	¹⁵⁵ Yb	-50.890	¹⁸⁸ Lu	-25.210	¹⁷⁵ Ta	-52.810	¹⁵⁶ Re	-2.010 †	¹⁸³ Os	-43.830		
¹⁶² Er	-66.260	¹⁵⁶ Yb	-53.410	¹⁸⁹ Lu	-22.180	¹⁷⁶ Ta	-51.970	¹⁵⁷ Re	-7.970 †	¹⁸⁴ Os	-44.210		
¹⁶³ Er	-65.050	¹⁵⁷ Yb	-53.530	¹⁹⁰ Lu	-18.470	¹⁷⁷ Ta	-52.200	¹⁵⁸ Re	-10.570 †	¹⁸⁵ Os	-42.760		
¹⁶⁴ Er	-65.630	¹⁵⁸ Yb	-55.860	¹⁹¹ Lu	-15.580	¹⁷⁸ Ta	-51.060	¹⁵⁹ Re	-15.400 †	¹⁸⁶ Os	-42.770		
¹⁶⁵ Er	-64.180	¹⁵⁹ Yb	-55.820	¹⁵⁰ Hf	-13.880 ‡	¹⁷⁹ Ta	-50.950	¹⁶⁰ Re	-17.350 †	¹⁸⁷ Os	-41.010		
¹⁶⁶ Er	-64.430	¹⁶⁰ Yb	-57.980	¹⁵¹ Hf	-17.330 ‡	¹⁸⁰ Ta	-49.490	¹⁶¹ Re	-20.760 †	¹⁸⁸ Os	-40.600		
¹⁶⁷ Er	-62.760	¹⁶¹ Yb	-57.820	¹⁵² Hf	-23.270 ‡	¹⁸¹ Ta	-48.770	¹⁶² Re	-22.370 †	¹⁸⁹ Os	-38.680		
¹⁶⁸ Er	-62.510	¹⁶² Yb	-59.760	¹⁵³ Hf	-27.470	¹⁸² Ta	-46.900	¹⁶³ Re	-25.820 †	¹⁹⁰ Os	-38.040		
¹⁶⁹ Er	-60.560	¹⁶³ Yb	-59.380	¹⁵⁴ Hf	-33.270	¹⁸³ Ta	-45.820	¹⁶⁴ Re	-27.160 †	¹⁹¹ Os	-36.060		
¹⁷⁰ Er	-59.830	¹⁶⁴ Yb	-60.990	¹⁵⁵ Hf	-34.580	¹⁸⁴ Ta	-43.470	¹⁶⁵ Re	-30.410 †	¹⁹² Os	-35.380		
¹⁷¹ Er	-57.510	¹⁶⁵ Yb	-60.380	¹⁵⁶ Hf	-38.630	¹⁸⁵ Ta	-41.970	¹⁶⁶ Re	-31.560	¹⁹³ Os	-32.860		
¹⁷² Er	-56.340	¹⁶⁶ Yb	-61.480	¹⁵⁷ Hf	-39.130	¹⁸⁶ Ta	-39.450	¹⁶⁷ Re	-34.470	¹⁹⁴ Os	-31.970		
¹⁷³ Er	-53.700	¹⁶⁷ Yb	-60.530	¹⁵⁸ Hf	-42.170	¹⁸⁷ Ta	-37.650	¹⁶⁸ Re	-35.370	¹⁹⁵ Os	-29.600		
¹⁷⁴ Er	-52.170	¹⁶⁸ Yb	-61.410	¹⁵⁹ Hf	-42.750	¹⁸⁸ Ta	-34.650	¹⁶⁹ Re	-38.090	¹⁹⁶ Os	-28.440		
¹⁷⁵ Er	-49.250	¹⁶⁹ Yb	-60.220	¹⁶⁰ Hf	-45.720	¹⁸⁹ Ta	-32.630	¹⁷⁰ Re	-38.730	¹⁹⁷ Os	-25.920		
¹⁷⁶ Er	-47.310	¹⁷⁰ Yb	-60.600	¹⁶¹ Hf	-46.120	¹⁹⁰ Ta	-29.640	¹⁷¹ Re	-41.160	¹⁹⁸ Os	-24.270		
¹⁷⁷ Er	-43.880	¹⁷¹ Yb	-59.170	¹⁶² Hf	-48.860	¹⁹¹ Ta	-27.420	¹⁷² Re	-41.560	¹⁹⁹ Os	-21.150		
¹⁷⁸ Er	-41.410	¹⁷² Yb	-59.150	¹⁶³ Hf	-49.030	¹⁹² Ta	-24.190	¹⁷³ Re	-43.550	²⁰⁰ Os	-19.060		
¹⁷⁹ Er	-37.470	¹⁷³ Yb	-57.380	¹⁶⁴ Hf	-51.540	¹⁹³ Ta	-21.790	¹⁷⁴ Re	-43.690	²⁰¹ Os	-16.550		
¹⁸⁰ Er	-34.530	¹⁷⁴ Yb	-56.910	¹⁶⁵ Hf	-51.540	¹⁹⁴ Ta	-18.400	¹⁷⁵ Re	-45.330	²⁰² Os	-13.930		
¹⁸¹ Er	-30.420	¹⁷⁵ Yb	-54.750	¹⁶⁶ Hf	-53.650	¹⁹⁵ Ta	-15.720	¹⁷⁶ Re	-45.240	²⁰³ Os	-8.760		
¹⁸² Er	-27.370	¹⁷⁶ Yb	-53.950	¹⁶⁷ Hf	-53.510	¹⁹⁶ Ta	-12.110	¹⁷⁷ Re	-46.400	²⁰⁴ Os	-5.040		
¹⁸³ Er	-22.980	¹⁷⁷ Yb	-51.610	¹⁶⁸ Hf	-55.310	¹⁹⁷ Ta	-8.940	¹⁷⁸ Re	-46.040	²⁰⁵ Os	0.540		
¹⁸⁴ Er	-19.620	¹⁷⁸ Yb	-50.240	¹⁶⁹ Hf	-54.950	¹⁹⁸ Ta	-5.940	¹⁷⁹ Re	-46.850	²⁰⁶ Os	4.910		
		¹⁷⁹ Yb	-47.290	¹⁷⁰ Hf	-56.330			¹⁸⁰ Re	-46.170	¹⁶⁰ Ir	6.260 †		
¹⁴⁵ Tm	-27.310 †	¹⁸⁰ Yb	-45.340	¹⁷¹ Hf	-55.590	¹⁵³ W	-0.320 †	¹⁸¹ Re	-46.670	¹⁶¹ Ir	0.560 †		
¹⁴⁶ Tm	-30.330 †	¹⁸¹ Yb	-41.970	¹⁷² Hf	-56.560	¹⁵⁴ W	-6.860 ‡	¹⁸² Re	-45.780	¹⁶² Ir	-1.760 †		
¹⁴⁷ Tm	-35.890 †	¹⁸² Yb	-39.640	¹⁷³ Hf	-55.530	¹⁵⁵ W	-11.490 ‡	¹⁸³ Re	-45.670	¹⁶³ Ir	-5.850 †		
¹⁴⁸ Tm	-38.560 †	¹⁸³ Yb	-36.080	¹⁷⁴ Hf	-56.100	¹⁵⁶ W	-17.820 ‡	¹⁸⁴ Re	-44.310	¹⁶⁴ Ir	-7.880 †		
¹⁴⁹ Tm	-43.190 †	¹⁸⁴ Yb	-33.480	¹⁷⁵ Hf	-54.790	¹⁵⁷ W	-19.930 ‡	¹⁸⁵ Re	-43.750	¹⁶⁵ Ir	-11.780 †		
¹⁵⁰ Tm	-46.620 †	¹⁸⁵ Yb	-29.780	¹⁷⁶ Hf	-54.970	¹⁵⁸ W	-24.500	¹⁸⁶ Re	-41.970	¹⁶⁶ Ir	-13.430 †		
¹⁵¹ Tm	-51.400 †	¹⁸⁶ Yb	-26.870	¹⁷⁷ Hf	-53.360	¹⁵⁹ W	-25.730	¹⁸⁷ Re	-41.050	¹⁶⁷ Ir	-17.120 †		
¹⁵² Tm	-52.020	¹⁸⁷ Yb	-22.800	¹⁷⁸ Hf	-53.070	¹⁶⁰ W	-29.240	¹⁸⁸ Re	-39.040	¹⁶⁸ Ir	-18.580 †		
¹⁵³ Tm	-54.880	¹⁸⁸ Yb	-19.630	¹⁷⁹ Hf	-51.160	¹⁶¹ W	-30.170	¹⁸⁹ Re	-37.920	¹⁶⁹ Ir	-22.030 †		
¹⁵⁴ Tm	-54.840	¹⁸⁹ Yb	-15.500	¹⁸⁰ Hf	-50.360	¹⁶² W	-33.650	¹⁹⁰ Re	-35.740	¹⁷⁰ Ir	-23.260		
¹⁵⁵ Tm	-56.830	¹⁹⁰ Yb	-12.570	¹⁸¹ Hf	-47.870	¹⁶³ W	-34.530	¹⁹¹ Re	-34.480	¹⁷¹ Ir	-26.400		
¹⁵⁶ Tm	-57.070			¹⁸² Hf	-46.710	¹⁶⁴ W	-37.800	¹⁹² Re	-31.960	¹⁷² Ir	-27.400		
¹⁵⁷ Tm	-58.900	¹⁴⁹ Lu	-20.820 †	¹⁸³ Hf	-43.860	¹⁶⁵ W	-38.540	¹⁹³ Re	-30.450	¹⁷³ Ir	-30.240		
¹⁵⁸ Tm	-58.870	¹⁵⁰ Lu	-24.180 †	¹⁸⁴ Hf	-42.260	¹⁶⁶ W	-41.500	¹⁹⁴ Re	-27.800	¹⁷⁴ Ir	-30.970		
¹⁵⁹ Tm	-60.780	¹⁵¹ Lu	-29.450 †	¹⁸⁵ Hf	-39.250	¹⁶⁷ W	-41.950	¹⁹⁵ Re	-26.210	¹⁷⁵ Ir	-33.510		
¹⁶⁰ Tm	-60.650	¹⁵² Lu	-33.570 †	¹⁸⁶ Hf	-37.400	¹⁶⁸ W	-44.540	¹⁹⁶ Re	-23.410	¹⁷⁶ Ir	-34.100		
¹⁶¹ Tm	-62.110	¹⁵³ Lu	-38.710 †	¹⁸⁷ Hf	-34.030	¹⁶⁹ W	-44.750	¹⁹⁷ Re	-21.280	¹⁷⁷ Ir	-36.240		
¹⁶² Tm	-61.740	¹⁵⁴ Lu	-40.090 †	¹⁸⁸ Hf	-31.900	¹⁷⁰ W	-47.050	¹⁹⁸ Re	-18.120	¹⁷⁸ Ir	-36.570		
¹⁶³ Tm	-62.820	¹⁵⁵ Lu	-43.560 †	¹⁸⁹ Hf	-28.310	¹⁷¹ W	-47.120	¹⁹⁹ Re	-15.480	¹⁷⁹ Ir	-38.290		
¹⁶⁴ Tm	-62.110	¹⁵⁶ Lu	-44.200	¹⁹⁰ Hf	-25.900	¹⁷² W	-49.080	²⁰⁰ Re	-12.860	¹⁸⁰ Ir	-38.350		
¹⁶⁵ Tm	-62.800	¹⁵⁷ Lu	-46.590	¹⁹¹ Hf	-22.260	¹⁷³ W	-48.860	²⁰¹ Re	-9.790	¹⁸¹ Ir	-39.730		
¹⁶⁶ Tm	-61.850	¹⁵⁸ Lu	-47.300	¹⁹² Hf	-19.800	¹⁷⁴ W	-50.300	²⁰² Re	-4.650	¹⁸² Ir	-39.480		
¹⁶⁷ Tm	-62.230	¹⁵⁹ Lu	-49.790	¹⁹³ Hf	-15.960	¹⁷⁵ W	-49.840	²⁰³ Re	-0.460	¹⁸³ Ir	-40.470		
¹⁶⁸ Tm	-61.080	¹⁶⁰ Lu	-50.130	¹⁹⁴ Hf	-13.210	¹⁷⁶ W	-50.900	²⁰⁴ Re	5.040	¹⁸⁴ Ir	-39.830		
¹⁶⁹ Tm	-60.960	¹⁶¹ Lu	-52.430	¹⁹⁵ Hf	-9.130	¹⁷⁷ W	-49.990			¹⁸⁵ Ir	-40.420		
¹⁷⁰ Tm	-59.460	¹⁶² Lu	-52.750			¹⁷⁸ W	-50.700	¹⁵⁷ Os	5.920 †	¹⁸⁶ Ir	-39.380		
¹⁷¹ Tm	-58.920	¹⁶³ Lu	-54.700	¹⁵¹ Ta	-4.090 †	¹⁷⁹ W	-49.640	¹⁵⁸ Os	-0.810 ‡	¹⁸⁷ Ir	-39.450		
¹⁷² Tm	-57.110	¹⁶⁴ Lu	-54.790	¹⁵² Ta	-8.080 †	¹⁸⁰ W	-49.990	¹⁵⁹ Os	-3.440 ‡	¹⁸⁸ Ir	-38.180		
¹⁷³ Tm	-56.090	¹⁶⁵ Lu	-56.460	¹⁵³ Ta	-14.050 †	¹⁸¹ W	-48.540	¹⁶⁰ Os	-9.070 ‡	¹⁸⁹ Ir	-37.990		
¹⁷⁴ Tm	-53.960	¹⁶⁶ Lu	-56.330	¹⁵⁴ Ta	-18.620 †	¹⁸² W	-48.410	¹⁶¹ Os	-10.900 ‡	¹⁹⁰ Ir	-36.530		
¹⁷⁵ Tm	-52.560	¹⁶⁷ Lu	-57.600	¹⁵⁵ Ta	-24.250 †	¹⁸³ W	-46.430	¹⁶² Os	-14.820	¹⁹¹ Ir	-36.290		
¹⁷⁶ Tm	-50.120	¹⁶⁸ Lu	-57.050	¹⁵⁶ Ta	-26.090 †	¹⁸⁴ W	-45.900	¹⁶³ Os	-16.090	¹⁹² Ir	-34.730		
¹⁷⁷ Tm	-48.370	¹⁶⁹ Lu	-58.030	¹⁵⁷ Ta	-30.150 †	¹⁸⁵ W	-43.640	¹⁶⁴ Os	-19.990	¹⁹³ Ir	-34.280		
¹⁷⁸ Tm	-45.340	¹⁷⁰ Lu	-57.320	¹⁵⁸ Ta	-31.670 †	¹⁸⁶ W	-42.570	¹⁶⁵ Os	-21.210	¹⁹⁴ Ir	-32.250		
¹⁷⁹ Tm	-42.970	¹⁷¹ Lu	-57.820	¹⁵⁹ Ta	-34.650 †	¹⁸⁷ W	-40.090	¹⁶⁶ Os	-24.920	¹⁹⁵ Ir	-31.510		
¹⁸⁰ Tm	-39.490	¹⁷² Lu	-56.840	¹⁶⁰ Ta	-35.670	¹⁸⁸ W	-38.740	¹⁶⁷ Os	-25.960	¹⁹⁶ Ir	-29.610		
¹⁸¹ Tm	-36.660	¹⁷³ Lu	-56.920	¹⁶¹ Ta	-38.670	¹⁸⁹ W	-36.010	¹⁶⁸ Os	-29.430	¹⁹⁷ Ir	-28.730		
¹⁸² Tm	-33.020	¹⁷⁴ Lu	-55.650	¹⁶² Ta	-39.600	¹⁹⁰ W	-34.680	¹⁶⁹ Os	-30.310	¹⁹⁸ Ir	-26.700		
¹⁸³ Tm	-29.950	¹⁷⁵ Lu	-55.290	¹⁶³ Ta	-42.450	¹⁹¹ W	-31.680	¹⁷⁰ Os	-33.420	¹⁹⁹ Ir	-25.150		
¹⁸⁴ Tm	-26.070	¹⁷⁶ Lu	-53.680	¹⁶⁴ Ta	-43.150	¹⁹² W	-30.080	¹⁷¹ Os	-34.060	²⁰⁰ Ir	-22.410		
¹⁸⁵ Tm	-22.770	¹⁷⁷ Lu	-53.000	¹⁶⁵ Ta	-45.630	¹⁹³ W	-27.070	¹⁷² Os	-36.900	²⁰¹ Ir	-20.330		
¹⁸⁶ Tm	-18.570	¹⁷⁸ Lu	-51.070	¹⁶⁶ Ta	-46.090	¹⁹⁴ W	-25.120	¹⁷³ Os	-37.330	²⁰² Ir	-18.260		
		¹⁷⁹ Lu	-49.820	¹⁶⁷ Ta	-48.240	¹⁹⁵ W	-21.840	¹⁷⁴ Os	-39.880	²⁰³ Ir	-15.670		
¹⁴⁷ Yb	-23.630 ‡	¹⁸⁰ Lu	-47.310	¹⁶⁸ Ta	-48.460	¹⁹⁶ W	-19.740	¹⁷⁵ Os	-39.990	²⁰⁴ Ir	-10.920		
¹⁴⁸ Yb	-29.830	¹⁸¹ Lu	-45.510	¹⁶⁹ Ta	-50.380	¹⁹⁷ W	-16.100	¹⁷⁶ Os	-42.040	²⁰⁵ Ir	-7.290		
¹⁴⁹ Yb	-32.670	¹⁸² Lu	-42.640	¹⁷⁰ Ta	-50.430	¹⁹⁸ W	-13.470	¹⁷⁷ Os	-41.940	²⁰⁶ Ir	-2.140		
¹⁵⁰ Yb	-38.070	¹⁸³ Lu	-40.550	¹⁷¹ Ta	-51.870	¹⁹⁹ W	-10.500	¹⁷⁸ Os	-43.560	²⁰⁷ Ir	2.170		
¹⁵¹ Yb	-41.580	¹⁸⁴ Lu	-37.520	¹⁷² Ta	-51.670	²⁰⁰ W	-7.430	¹⁷⁹ Os	-43.170	²⁰⁸ Ir	7.670		
¹⁵² Yb	-46.870	¹⁸⁵ Lu	-34.990	¹⁷³ Ta	-52.720	²⁰¹ W	-1.850	¹⁸⁰ Os	-44.440	²⁰⁹ Ir	12.090		
¹⁵³ Yb	-47.590	¹⁸⁶ Lu	-31.670	¹⁷⁴ Ta	-52.170			¹⁸¹ Os	-43.720	²¹⁰ Ir	17.790		</

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁶² Pt	8.110 †	¹⁸⁸ Au	-33.710	²¹⁶ Hg	20.950	¹⁹⁵ Pb	-23.990	²²² Bi	29.330	¹⁹⁷ At	-6.780		
¹⁶³ Pt	6.020 †	¹⁹⁰ Au	-32.950	²¹⁷ Hg	26.440	¹⁹⁶ Pb	-25.580	²²³ Bi	32.690	¹⁹⁸ At	-7.140		
¹⁶⁴ Pt	1.160 ‡	¹⁹¹ Au	-33.770	²¹⁸ Hg	30.190	¹⁹⁷ Pb	-24.880	²²⁴ Bi	36.500	¹⁹⁹ At	-9.090		
¹⁶⁵ Pt	-0.800 ‡	¹⁹² Au	-32.810			¹⁹⁸ Pb	-26.160	²²⁵ Bi	40.030	²⁰⁰ At	-9.230		
¹⁶⁶ Pt	-5.210 ‡	¹⁹³ Au	-33.340	¹⁷¹ Tl	14.520 †	¹⁹⁹ Pb	-25.240	²²⁶ Bi	44.410	²⁰¹ At	-11.020		
¹⁶⁷ Pt	-6.830	¹⁹⁴ Au	-32.230	¹⁷² Tl	12.380 †	²⁰⁰ Pb	-26.220	²²⁷ Bi	48.110	²⁰² At	-10.940		
¹⁶⁸ Pt	-11.060	¹⁹⁵ Au	-32.400	¹⁷³ Tl	7.910 †	²⁰¹ Pb	-25.160			²⁰³ At	-12.560		
¹⁶⁹ Pt	-12.330	¹⁹⁶ Au	-31.120	¹⁷⁴ Tl	5.800 †	²⁰² Pb	-25.780	¹⁷⁷ Po	35.920 †	²⁰⁴ At	-11.960		
¹⁷⁰ Pt	-16.220	¹⁹⁷ Au	-30.970	¹⁷⁵ Tl	1.600 †	²⁰³ Pb	-24.630	¹⁷⁸ Po	29.900 †	²⁰⁵ At	-13.280		
¹⁷¹ Pt	-17.350	¹⁹⁸ Au	-29.380	¹⁷⁷ Tl	-3.840 †	²⁰⁴ Pb	-24.880	¹⁷⁹ Po	27.340 †	²⁰⁶ At	-13.180		
¹⁷² Pt	-21.050	¹⁹⁹ Au	-28.900	¹⁷⁸ Tl	-5.130	²⁰⁵ Pb	-23.540	¹⁸⁰ Po	22.610 †	²⁰⁷ At	-13.970		
¹⁷³ Pt	-22.000	²⁰⁰ Au	-27.380	¹⁷⁹ Tl	-8.690	²⁰⁶ Pb	-23.330	¹⁸¹ Po	19.340 ‡	²⁰⁸ At	-13.190		
¹⁷⁴ Pt	-25.310	²⁰¹ Au	-26.390	¹⁸⁰ Tl	-9.700	²⁰⁷ Pb	-21.370	¹⁸² Po	15.140 ‡	²⁰⁹ At	-13.590		
¹⁷⁵ Pt	-25.990	²⁰² Au	-24.200	¹⁸¹ Tl	-13.030	²⁰⁸ Pb	-20.230	¹⁸³ Po	13.160 ‡	²¹⁰ At	-12.440		
¹⁷⁶ Pt	-28.980	²⁰³ Au	-22.730	¹⁸² Tl	-13.820	²⁰⁹ Pb	-16.250	¹⁸⁴ Po	9.010 ‡	²¹¹ At	-11.690		
¹⁷⁷ Pt	-29.740	²⁰⁴ Au	-21.440	¹⁸³ Tl	-16.880	²¹⁰ Pb	-14.130	¹⁸⁵ Po	7.310 ‡	²¹² At	-8.650		
¹⁷⁸ Pt	-32.250	²⁰⁵ Au	-19.310	¹⁸⁴ Tl	-17.440	²¹¹ Pb	-9.780	¹⁸⁶ Po	3.670 ‡	²¹³ At	-7.160		
¹⁷⁹ Pt	-32.640	²⁰⁶ Au	-14.990	¹⁸⁵ Tl	-20.230	²¹² Pb	-6.870	¹⁸⁷ Po	2.270	²¹⁴ At	-3.750		
¹⁸⁰ Pt	-34.890	²⁰⁷ Au	-11.920	¹⁸⁶ Tl	-20.590	²¹³ Pb	-2.250	¹⁸⁸ Po	-1.240	²¹⁵ At	-1.440		
¹⁸¹ Pt	-34.810	²⁰⁸ Au	-7.240	¹⁸⁷ Tl	-23.040	²¹⁴ Pb	0.730	¹⁸⁹ Po	-2.210	²¹⁶ At	2.410		
¹⁸² Pt	-36.710	²⁰⁹ Au	-3.430	¹⁸⁸ Tl	-23.160	²¹⁵ Pb	5.580	¹⁹⁰ Po	-4.620	²¹⁷ At	4.730		
¹⁸³ Pt	-36.260	²¹⁰ Au	1.650	¹⁸⁹ Tl	-25.310	²¹⁶ Pb	8.660	¹⁹¹ Po	-5.380	²¹⁸ At	9.210		
¹⁸⁴ Pt	-37.820	²¹¹ Au	5.530	¹⁹⁰ Tl	-25.180	²¹⁷ Pb	13.700	¹⁹² Po	-8.290	²¹⁹ At	11.670		
¹⁸⁵ Pt	-37.180	²¹² Au	10.810	¹⁹¹ Tl	-27.070	²¹⁸ Pb	16.890	¹⁹³ Po	-8.740	²²⁰ At	15.070		
¹⁸⁶ Pt	-38.220	²¹³ Au	14.800	¹⁹² Tl	-26.770	²¹⁹ Pb	22.020	¹⁹⁴ Po	-11.260	²²¹ At	17.620		
¹⁸⁷ Pt	-37.170	²¹⁴ Au	20.080	¹⁹³ Tl	-27.650	²²⁰ Pb	25.350	¹⁹⁵ Po	-11.310	²²² At	21.330		
¹⁸⁸ Pt	-37.760	²¹⁵ Au	24.140	¹⁹⁴ Tl	-27.260	²²¹ Pb	30.600	¹⁹⁶ Po	-13.370	²²³ At	23.810		
¹⁸⁹ Pt	-36.430	²¹⁶ Au	29.410	¹⁹⁵ Tl	-28.170	²²² Pb	34.030	¹⁹⁷ Po	-13.600	²²⁴ At	27.290		
¹⁹⁰ Pt	-37.180			¹⁹⁶ Tl	-27.400			¹⁹⁸ Po	-15.930	²²⁵ At	30.120		
¹⁹¹ Pt	-35.800	¹⁶⁹ Hg	10.250 †	¹⁹⁷ Tl	-28.330	¹⁷⁵ Bi	28.230 †	¹⁹⁹ Po	-15.610	²²⁶ At	33.790		
¹⁹² Pt	-36.140	¹⁷⁰ Hg	5.550 †	¹⁹⁸ Tl	-27.400	¹⁷⁶ Bi	25.720 †	²⁰⁰ Po	-17.520	²²⁷ At	36.820		
¹⁹³ Pt	-34.610	¹⁷¹ Hg	3.790 †	¹⁹⁹ Tl	-28.340	¹⁷⁷ Bi	21.000 †	²⁰¹ Po	-16.930	²²⁸ At	40.880		
¹⁹⁴ Pt	-34.740	¹⁷² Hg	-0.660 ‡	²⁰⁰ Tl	-26.730	¹⁷⁸ Bi	18.720 †	²⁰² Po	-18.530	²²⁹ At	44.110		
¹⁹⁵ Pt	-32.990	¹⁷³ Hg	-2.120 ‡	²⁰¹ Tl	-27.390	¹⁷⁹ Bi	14.270 †	²⁰³ Po	-17.670	²³⁰ At	48.260		
¹⁹⁶ Pt	-32.710	¹⁷⁴ Hg	-6.290 ‡	²⁰² Tl	-26.270	¹⁸⁰ Bi	12.310 †	²⁰⁴ Po	-18.980	²³¹ At	51.850		
¹⁹⁷ Pt	-30.630	¹⁷⁵ Hg	-7.490	²⁰³ Tl	-25.860	¹⁸¹ Bi	8.140 †	²⁰⁵ Po	-18.420	²³² At	56.170		
¹⁹⁸ Pt	-30.020	¹⁷⁶ Hg	-11.320	²⁰⁴ Tl	-24.430	¹⁸² Bi	6.420 †	²⁰⁶ Po	-18.970				
¹⁹⁹ Pt	-28.040	¹⁷⁷ Hg	-12.270	²⁰⁵ Tl	-23.780	¹⁸³ Bi	2.560 †	²⁰⁷ Po	-17.930	¹⁸⁵ Rn	31.060 †		
²⁰⁰ Pt	-26.860	¹⁷⁸ Hg	-15.810	²⁰⁶ Tl	-21.790	¹⁸⁴ Bi	1.130 †	²⁰⁸ Po	-18.140	¹⁸⁶ Rn	26.390 †		
²⁰¹ Pt	-24.170	¹⁷⁹ Hg	-16.510	²⁰⁷ Tl	-20.190	¹⁸⁵ Bi	-2.460 †	²⁰⁹ Po	-16.590	¹⁸⁷ Rn	24.030 †		
²⁰² Pt	-22.610	¹⁸⁰ Hg	-19.760	²⁰⁸ Tl	-16.230	¹⁸⁶ Bi	-3.770 †	²¹⁰ Po	-15.830	¹⁸⁸ Rn	19.890 ‡		
²⁰³ Pt	-20.630	¹⁸¹ Hg	-20.220	²⁰⁹ Tl	-13.660	¹⁸⁷ Bi	-6.840 †	²¹¹ Po	-12.350	¹⁸⁹ Rn	17.990 ‡		
²⁰⁴ Pt	-18.480	¹⁸² Hg	-23.170	²¹⁰ Tl	-9.360	¹⁸⁸ Bi	-7.740 †	²¹² Po	-10.740	¹⁹⁰ Rn	14.080 ‡		
²⁰⁵ Pt	-13.730	¹⁸³ Hg	-23.370	²¹¹ Tl	-6.010	¹⁸⁹ Bi	-10.500 †	²¹³ Po	-6.850	¹⁹¹ Rn	12.540 ‡		
²⁰⁶ Pt	-10.560	¹⁸⁴ Hg	-26.030	²¹² Tl	-1.390	¹⁹⁰ Bi	-11.070	²¹⁴ Po	-4.450	¹⁹² Rn	9.130		
²⁰⁷ Pt	-5.420	¹⁸⁵ Hg	-26.030	²¹³ Tl	1.980	¹⁹¹ Bi	-13.540	²¹⁵ Po	-0.300	¹⁹³ Rn	8.930		
²⁰⁸ Pt	-1.510	¹⁸⁶ Hg	-28.310	²¹⁴ Tl	6.850	¹⁹² Bi	-13.900	²¹⁶ Po	2.180	¹⁹⁴ Rn	5.750		
²⁰⁹ Pt	4.010	¹⁸⁷ Hg	-28.070	²¹⁵ Tl	10.340	¹⁹³ Bi	-16.020	²¹⁷ Po	6.540	¹⁹⁵ Rn	4.850		
²¹⁰ Pt	7.900	¹⁸⁸ Hg	-29.990	²¹⁶ Tl	15.380	¹⁹⁴ Bi	-16.070	²¹⁸ Po	9.070	¹⁹⁶ Rn	1.820		
²¹¹ Pt	13.660	¹⁸⁹ Hg	-29.450	²¹⁷ Tl	18.910	¹⁹⁵ Bi	-18.030	²¹⁹ Po	15.770	¹⁹⁷ Rn	1.180		
²¹² Pt	17.700	¹⁹⁰ Hg	-31.140	²¹⁸ Tl	24.000	¹⁹⁶ Bi	-17.890	²²⁰ Po	17.820	¹⁹⁸ Rn	-1.430		
²¹³ Pt	23.340	¹⁹¹ Hg	-30.420	²¹⁹ Tl	27.740	¹⁹⁷ Bi	-19.690	²²¹ Po	20.830	¹⁹⁹ Rn	-1.850		
²¹⁴ Pt	27.410	¹⁹² Hg	-31.760	²²⁰ Tl	32.900	¹⁹⁸ Bi	-19.330	²²² Po	23.610	²⁰⁰ Rn	-4.210		
		¹⁹³ Hg	-30.810			¹⁹⁹ Bi	-20.700	²²³ Po	27.410	²⁰¹ Rn	-4.350		
¹⁶⁷ Au	4.230 †	¹⁹⁴ Hg	-31.860	¹⁷³ Pb	21.060 †	²⁰⁰ Bi	-20.200	²²⁴ Po	30.280	²⁰² Rn	-6.510		
¹⁶⁸ Au	2.150 †	¹⁹⁵ Hg	-30.780	¹⁷⁴ Pb	16.150 †	²⁰¹ Bi	-21.260	²²⁵ Po	34.270	²⁰³ Rn	-6.420		
¹⁶⁹ Au	-2.020 †	¹⁹⁶ Hg	-31.460	¹⁷⁵ Pb	14.190 †	²⁰² Bi	-20.490	²²⁶ Po	37.370	²⁰⁴ Rn	-8.640		
¹⁷⁰ Au	-3.840 †	¹⁹⁷ Hg	-30.190	¹⁷⁶ Pb	9.560 †	²⁰³ Bi	-21.360	²²⁷ Po	41.820	²⁰⁵ Rn	-7.900		
¹⁷¹ Au	-7.770 †	¹⁹⁸ Hg	-30.540	¹⁷⁷ Pb	7.890 †	²⁰⁴ Bi	-21.030	²²⁸ Po	45.090	²⁰⁶ Rn	-9.970		
¹⁷² Au	-9.280 †	¹⁹⁹ Hg	-29.050	¹⁷⁸ Pb	3.530 †	²⁰⁵ Bi	-21.120	²²⁹ Po	49.660	²⁰⁷ Rn	-9.360		
¹⁷³ Au	-12.930 †	²⁰⁰ Hg	-29.110	¹⁷⁹ Pb	2.130	²⁰⁶ Bi	-20.110	²³⁰ Po	53.280	²⁰⁸ Rn	-10.570		
¹⁷⁴ Au	-14.120 †	²⁰¹ Hg	-27.490	¹⁸⁰ Pb	-1.910	²⁰⁷ Bi	-19.880			²⁰⁹ Rn	-9.740		
¹⁷⁵ Au	-17.450 †	²⁰² Hg	-26.500	¹⁸¹ Pb	-3.060	²⁰⁸ Bi	-18.220	¹⁸³ At	25.790 †	²¹⁰ Rn	-10.570		
¹⁷⁶ Au	-18.380 †	²⁰³ Hg	-24.320	¹⁸² Pb	-6.790	²⁰⁹ Bi	-17.050	¹⁸⁴ At	23.200 †	²¹¹ Rn	-9.450		
¹⁷⁷ Au	-21.430 †	²⁰⁴ Hg	-23.690	¹⁸³ Pb	-7.610	²¹⁰ Bi	-13.590	¹⁸⁵ At	18.930 †	²¹² Rn	-9.090		
¹⁷⁸ Au	-22.130 †	²⁰⁵ Hg	-22.560	¹⁸⁴ Pb	-11.100	²¹¹ Bi	-11.560	¹⁸⁶ At	16.720 †	²¹³ Rn	-6.070		
¹⁷⁹ Au	-24.900 †	²⁰⁶ Hg	-20.900	¹⁸⁵ Pb	-11.720	²¹² Bi	-7.680	¹⁸⁷ At	12.930 †	²¹⁴ Rn	-4.990		
¹⁸⁰ Au	-25.410	²⁰⁷ Hg	-16.630	¹⁸⁶ Pb	-14.860	²¹³ Bi	-4.860	¹⁸⁸ At	11.140 †	²¹⁵ Rn	-1.630		
¹⁸¹ Au	-27.850	²⁰⁸ Hg	-13.940	¹⁸⁷ Pb	-15.240	²¹⁴ Bi	-0.690	¹⁸⁹ At	7.520 †	²¹⁶ Rn	0.290		
¹⁸² Au	-28.140	²⁰⁹ Hg	-9.250	¹⁸⁸ Pb	-18.070	²¹⁵ Bi	2.200	¹⁹⁰ At	5.880 †	²¹⁷ Rn	3.980		
¹⁸³ Au	-30.250	²¹⁰ Hg	-5.840	¹⁸⁹ Pb	-18.190	²¹⁶ Bi	6.580	¹⁹¹ At	3.690 †	²¹⁸ Rn	5.950		
¹⁸⁴ Au	-30.290	²¹¹ Hg	-0.710	¹⁹⁰ Pb	-20.730	²¹⁷ Bi	9.460	¹⁹² At	2.490 †	²¹⁹ Rn	10.280		
¹⁸⁵ Au	-32.030	²¹² Hg	2.670	¹⁹¹ Pb	-20.610	²¹⁸ Bi	13.910	¹⁹³ At	-0.450 †	²²⁰ Rn	12.230		
¹⁸⁶ Au	-31.840	²¹³ Hg	8.030	¹⁹² Pb	-22.890	²¹⁹ Bi	17.010	¹⁹⁴ At	-1.370 †	²²¹ Rn	15.510		
¹⁸⁷ Au	-33.160	²¹⁴ Hg	11.560	¹⁹³ Pb	-22.570	²²⁰ Bi	22.930	¹⁹⁵ At	-3.900 †	²²² Rn	17.580		
¹⁸⁸ Au	-32.620	²¹⁵ Hg	17.290	¹⁹⁴ Pb	-24.490	²²¹ Bi	25.140	¹⁹⁶ At	-4.540	²²³ Rn	20.820		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²²⁴ Rn	23.000	²⁰⁸ Ra	5.270	²³⁵ Ac	46.920	²²¹ Pa	21.800 †	²⁰⁹ Np	44.180 †	²⁴³ Pu	57.600
²²⁵ Rn	26.490	²⁰⁶ Ra	3.060	²³⁶ Ac	50.470	²²² Pa	22.590	²¹⁰ Np	42.780 †	²⁴⁴ Pu	59.580
²²⁶ Rn	28.840	²⁰⁷ Ra	3.010	²³⁷ Ac	53.470	²²³ Pa	22.940	²¹¹ Np	39.810 †	²⁴⁵ Pu	62.730
²²⁷ Rn	32.530	²⁰⁸ Ra	1.040	²³⁸ Ac	57.230	²²⁴ Pa	24.640	²¹² Np	38.100 †	²⁴⁶ Pu	65.080
²²⁸ Rn	35.070	²⁰⁹ Ra	1.000	²³⁹ Ac	60.480	²²⁵ Pa	25.100	²¹³ Np	35.680 †	²⁴⁷ Pu	68.740
²²⁹ Rn	39.050	²¹⁰ Ra	-0.350	²⁴⁰ Ac	64.410	²²⁶ Pa	26.810	²¹⁴ Np	34.490 †	²⁴⁸ Pu	71.450
²³⁰ Rn	41.850	²¹¹ Ra	0.220	²⁴¹ Ac	67.970	²²⁷ Pa	27.480	²¹⁵ Np	32.340 †	²⁴⁹ Pu	75.330
²³¹ Rn	46.000	²¹² Ra	-1.280	²⁴² Ac	72.350	²²⁸ Pa	29.220	²¹⁶ Np	31.810 †	²⁵⁰ Pu	78.240
²³² Rn	49.210	²¹³ Ra	-0.740			²²⁹ Pa	30.240	²¹⁷ Np	30.160 †	²⁵¹ Pu	82.260
²³³ Rn	53.400	²¹⁴ Ra	-0.770	²⁰⁰ Th	31.940 ‡	²³⁰ Pa	32.290	²¹⁸ Np	28.730 †	²⁵² Pu	85.260
²³⁴ Rn	56.800	²¹⁵ Ra	1.780	²⁰¹ Th	31.040 ‡	²³¹ Pa	33.540	²¹⁹ Np	27.940 †	²⁵³ Pu	89.320
²³⁵ Rn	61.290	²¹⁶ Ra	2.320	²⁰² Th	27.740 ‡	²³² Pa	35.870	²²⁰ Np	29.040	²⁵⁴ Pu	92.510
		²¹⁷ Ra	5.220	²⁰³ Th	26.520 ‡	²³³ Pa	37.410	²²¹ Np	28.480	²⁵⁵ Pu	96.770
¹⁸⁹ Fr	29.730 †	²¹⁸ Ra	6.590	²⁰⁴ Th	23.100	²³⁴ Pa	40.120	²²² Np	31.370 †	²⁵⁶ Pu	100.090
¹⁹⁰ Fr	27.370 †	²¹⁹ Ra	10.490	²⁰⁵ Th	22.170	²³⁵ Pa	42.050	²²³ Np	30.700		
¹⁹¹ Fr	23.480 †	²²⁰ Ra	11.840	²⁰⁶ Th	19.290	²³⁶ Pa	44.880	²²⁴ Np	31.730	²²² Am	42.010 †
¹⁹² Fr	21.510 †	²²¹ Ra	14.640	²⁰⁷ Th	18.570	²³⁷ Pa	47.210	²²⁵ Np	31.490	²²³ Am	40.970 †
¹⁹³ Fr	18.160 †	²²² Ra	15.870	²⁰⁸ Th	15.940	²³⁸ Pa	50.290	²²⁶ Np	32.610	²²⁴ Am	43.100
¹⁹⁴ Fr	16.670 †	²²³ Ra	18.550	²⁰⁹ Th	15.560	²³⁹ Pa	52.860	²²⁷ Np	32.420	²²⁵ Am	41.830
¹⁹⁵ Fr	14.540 †	²²⁴ Ra	19.950	²¹⁰ Th	13.480	²⁴⁰ Pa	56.270	²²⁸ Np	33.680	²²⁶ Am	42.390
¹⁹⁶ Fr	13.140 †	²²⁵ Ra	22.760	²¹¹ Th	12.820	²⁴¹ Pa	59.110	²²⁹ Np	33.750	²²⁷ Am	41.470
¹⁹⁷ Fr	10.120 †	²²⁶ Ra	24.390	²¹² Th	11.120	²⁴² Pa	62.660	²³⁰ Np	35.120	²²⁸ Am	42.160
¹⁹⁸ Fr	9.050 †	²²⁷ Ra	27.300	²¹³ Th	11.330	²⁴³ Pa	65.830	²³¹ Np	35.590	²²⁹ Am	41.500
¹⁹⁹ Fr	6.420 †	²²⁸ Ra	29.120	²¹⁴ Th	9.440	²⁴⁴ Pa	69.880	²³² Np	37.150	²³⁰ Am	42.370
²⁰⁰ Fr	5.580 †	²²⁹ Ra	32.340	²¹⁵ Th	9.490	²⁴⁵ Pa	73.330	²³³ Np	37.940	²³¹ Am	41.990
²⁰¹ Fr	3.240 †	²³⁰ Ra	34.380	²¹⁶ Th	9.040	²⁴⁶ Pa	77.750	²³⁴ Np	39.910	²³² Am	43.030
²⁰² Fr	2.650	²³¹ Ra	37.840	²¹⁷ Th	11.150	²⁴⁷ Pa	81.340	²³⁵ Np	40.990	²³³ Am	42.900
²⁰³ Fr	0.610	²³² Ra	40.190	²¹⁸ Th	11.150	²⁴⁸ Pa	85.810	²³⁶ Np	43.320	²³⁴ Am	44.150
²⁰⁴ Fr	0.180	²³³ Ra	43.910	²¹⁹ Th	13.560			²³⁷ Np	44.790	²³⁵ Am	44.460
²⁰⁵ Fr	-1.820	²³⁴ Ra	46.670	²²⁰ Th	14.470	²⁰⁴ U	44.270 ‡	²³⁸ Np	47.270	²³⁶ Am	46.080
²⁰⁶ Fr	-2.110	²³⁵ Ra	50.550	²²¹ Th	17.730	²⁰⁵ U	42.810 ‡	²³⁹ Np	49.180	²³⁷ Am	46.600
²⁰⁷ Fr	-3.400	²³⁶ Ra	53.570	²²² Th	18.240	²⁰⁶ U	39.370 ‡	²⁴⁰ Np	51.900	²³⁸ Am	48.490
²⁰⁸ Fr	-3.330	²³⁷ Ra	57.680	²²³ Th	20.330	²⁰⁷ U	37.980 ‡	²⁴¹ Np	54.060	²³⁹ Am	49.510
²⁰⁹ Fr	-4.220	²³⁸ Ra	60.960	²²⁴ Th	21.010	²⁰⁸ U	34.760 ‡	²⁴² Np	57.070	²⁴⁰ Am	51.550
²¹⁰ Fr	-3.620	²³⁹ Ra	65.240	²²⁵ Th	23.160	²⁰⁹ U	33.730 ‡	²⁴³ Np	59.490	²⁴¹ Am	52.990
²¹¹ Fr	-4.980	²⁴⁰ Ra	68.820	²²⁶ Th	23.990	²¹⁰ U	30.270	²⁴⁴ Np	62.680	²⁴² Am	55.400
²¹² Fr	-4.370			²²⁷ Th	26.260	²¹¹ U	29.550	²⁴⁵ Np	65.410	²⁴³ Am	57.110
²¹³ Fr	-4.040	¹⁹⁶ Ac	32.950 †	²²⁸ Th	27.210	²¹² U	27.040	²⁴⁶ Np	69.100	²⁴⁴ Am	59.760
²¹⁴ Fr	-1.450	¹⁹⁷ Ac	29.620 †	²²⁹ Th	29.660	²¹³ U	26.110	²⁴⁷ Np	72.150	²⁴⁵ Am	61.720
²¹⁵ Fr	-0.470	¹⁹⁸ Ac	28.360 †	²³⁰ Th	30.970	²¹⁴ U	23.990	²⁴⁸ Np	76.120	²⁴⁶ Am	64.510
²¹⁶ Fr	2.460	¹⁹⁹ Ac	25.340 †	²³¹ Th	33.810	²¹⁵ U	23.830	²⁴⁹ Np	79.420	²⁴⁷ Am	66.830
²¹⁷ Fr	4.270	²⁰⁰ Ac	24.020 †	²³² Th	35.290	²¹⁶ U	22.100	²⁵⁰ Np	83.470	²⁴⁸ Am	70.150
²¹⁸ Fr	7.800	²⁰¹ Ac	21.000 †	²³³ Th	38.390	²¹⁷ U	21.180	²⁵¹ Np	86.860	²⁴⁹ Am	72.770
²¹⁹ Fr	10.150	²⁰² Ac	19.760 †	²³⁴ Th	40.360	²¹⁸ U	20.320	²⁵² Np	91.020	²⁵⁰ Am	76.320
²²⁰ Fr	12.880	²⁰³ Ac	16.980 †	²³⁵ Th	43.620	²¹⁹ U	21.970	²⁵³ Np	94.510	²⁵¹ Am	79.190
²²¹ Fr	14.650	²⁰⁴ Ac	15.990 †	²³⁶ Th	45.970	²²⁰ U	21.460			²⁵² Am	82.840
²²² Fr	17.490	²⁰⁵ Ac	13.540 †	²³⁷ Th	49.480	²²¹ U	23.420	²¹³ Pu	44.890 ‡	²⁵³ Am	85.820
²²³ Fr	19.350	²⁰⁶ Ac	12.750 †	²³⁸ Th	52.120	²²² U	25.140	²¹⁴ Pu	42.010 ‡	²⁵⁴ Am	89.520
²²⁴ Fr	22.240	²⁰⁷ Ac	10.600 †	²³⁹ Th	55.880	²²³ U	26.130	²¹⁵ Pu	40.850 ‡	²⁵⁵ Am	92.700
²²⁵ Fr	24.300	²⁰⁸ Ac	10.340 †	²⁴⁰ Th	58.760	²²⁴ U	26.100	²¹⁶ Pu	38.280	²⁵⁶ Am	96.590
²²⁶ Fr	27.400	²⁰⁹ Ac	8.350 †	²⁴¹ Th	62.680	²²⁵ U	27.730	²¹⁷ Pu	37.740	²⁵⁷ Am	99.890
²²⁷ Fr	29.660	²¹⁰ Ac	7.810	²⁴² Th	65.880	²²⁶ U	27.680	²¹⁸ Pu	35.660	²⁵⁸ Am	104.100
²²⁸ Fr	32.940	²¹¹ Ac	6.510	²⁴³ Th	70.250	²²⁷ U	29.320	²¹⁹ Pu	34.290	²⁵⁹ Am	107.910
²²⁹ Fr	35.440	²¹² Ac	6.700	²⁴⁴ Th	73.760	²²⁸ U	29.510	²²⁰ Pu	33.030		
²³⁰ Fr	38.940	²¹³ Ac	5.270	²⁴⁵ Th	78.470	²²⁹ U	31.310	²²¹ Pu	34.220	²²⁶ Cm	47.200
²³¹ Fr	41.740	²¹⁴ Ac	5.210	²⁴⁶ Th	82.080	²³⁰ U	31.880	²²² Pu	33.180	²²⁷ Cm	47.530
²³² Fr	45.350	²¹⁵ Ac	5.150			²³¹ U	33.830	²²³ Pu	36.160	²²⁸ Cm	46.270
²³³ Fr	48.550	²¹⁶ Ac	7.270	²⁰² Pa	40.200 †	²³² U	34.630	²²⁴ Pu	35.440	²²⁹ Cm	46.960
²³⁴ Fr	52.430	²¹⁷ Ac	7.720	²⁰³ Pa	37.110 †	²³³ U	36.980	²²⁵ Pu	36.060	²³⁰ Cm	45.900
²³⁵ Fr	55.810	²¹⁸ Ac	10.180	²⁰⁴ Pa	35.540 †	²³⁴ U	38.090	²²⁶ Pu	35.420	²³¹ Cm	46.780
²³⁶ Fr	59.950	²¹⁹ Ac	11.520	²⁰⁵ Pa	32.450 †	²³⁵ U	40.790	²²⁷ Pu	36.540	²³² Cm	46.040
²³⁷ Fr	63.500	²²⁰ Ac	14.850	²⁰⁶ Pa	31.080 †	²³⁶ U	42.340	²²⁸ Pu	35.930	²³³ Cm	47.090
²³⁸ Fr	67.790	²²¹ Ac	15.940	²⁰⁷ Pa	27.980 †	²³⁷ U	45.210	²²⁹ Pu	37.220	²³⁴ Cm	46.540
		²²² Ac	18.100	²⁰⁸ Pa	26.750 †	²³⁸ U	47.160	²³⁰ Pu	36.830	²³⁵ Cm	47.780
¹⁹³ Ra	28.920 †	²²³ Ac	19.130	²⁰⁹ Pa	24.260 †	²³⁹ U	50.250	²³¹ Pu	38.260	²³⁶ Cm	47.650
¹⁹⁴ Ra	25.110 †	²²⁴ Ac	21.390	²¹⁰ Pa	23.550 †	²⁴⁰ U	52.450	²³² Pu	38.270	²³⁷ Cm	49.330
¹⁹⁵ Ra	23.500	²²⁵ Ac	22.640	²¹¹ Pa	21.330 †	²⁴¹ U	55.850	²³³ Pu	39.830	²³⁸ Cm	49.420
¹⁹⁶ Ra	20.240	²²⁶ Ac	25.010	²¹² Pa	20.380 †	²⁴² U	58.290	²³⁴ Pu	40.190	²³⁹ Cm	51.260
¹⁹⁷ Ra	19.330	²²⁷ Ac	26.490	²¹³ Pa	18.670 †	²⁴³ U	61.840	²³⁵ Pu	42.180	²⁴⁰ Cm	51.910
¹⁹⁸ Ra	16.490 †	²²⁸ Ac	29.010	²¹⁴ Pa	18.530	²⁴⁴ U	64.630	²³⁶ Pu	42.850	²⁴¹ Cm	53.900
¹⁹⁹ Ra	15.330	²²⁹ Ac	30.750	²¹⁵ Pa	17.210 †	²⁴⁵ U	68.650	²³⁷ Pu	45.050	²⁴² Cm	54.890
²⁰⁰ Ra	12.300	²³⁰ Ac	33.510	²¹⁶ Pa	16.220	²⁴⁶ U	71.780	²³⁸ Pu	46.120	²⁴³ Cm	57.180
²⁰¹ Ra	11.440	²³¹ Ac	35.410	²¹⁷ Pa	15.760	²⁴⁷ U	76.110	²³⁹ Pu	48.650	²⁴⁴ Cm	58.460
²⁰² Ra	8.730	²³² Ac	38.540	²¹⁸ Pa	17.420	²⁴⁸ U	79.340	²⁴⁰ Pu	50.080	²⁴⁵ Cm	61.050
²⁰³ Ra	8.130	²³³ Ac	40.870	²¹⁹ Pa	17.350	²⁴⁹ U	83.700	²⁴¹ Pu	52.850	²⁴⁶ Cm	62.590
²⁰⁴ Ra	5.680	²³⁴ Ac	44.220	²²⁰ Pa	19.380	²⁵⁰ U	87.130	²⁴² Pu	54.610	²⁴⁷ Cm	65.380

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²⁴⁸ Cm	67.290	²⁵⁴ Cf	81.090	²⁵⁷ Fm	87.940	²⁵⁶ No	87.450	²⁵⁶ Rf	93.780	²⁶⁸ Sg	114.440
²⁴⁹ Cm	70.560	²⁵⁵ Cf	84.320	²⁵⁸ Fm	89.720	²⁵⁷ No	89.690	²⁵⁷ Rf	95.430	²⁶⁹ Sg	116.730
²⁵⁰ Cm	72.760	²⁵⁶ Cf	86.570	²⁵⁹ Fm	92.630	²⁵⁸ No	90.890	²⁵⁸ Rf	95.760	²⁷⁰ Sg	118.330
²⁵¹ Cm	76.360	²⁵⁷ Cf	89.910	²⁶⁰ Fm	94.600	²⁵⁹ No	93.340	²⁵⁹ Rf	97.590	²⁷¹ Sg	121.330
²⁵² Cm	78.770	²⁵⁸ Cf	92.210	²⁶¹ Fm	97.740	²⁶⁰ No	94.590	²⁶⁰ Rf	98.330	²⁷² Sg	123.180
²⁵³ Cm	82.480	²⁵⁹ Cf	95.750	²⁶² Fm	99.850	²⁶¹ No	97.170	²⁶¹ Rf	100.340	²⁷³ Sg	126.370
²⁵⁴ Cm	85.070	²⁶⁰ Cf	98.270	²⁶³ Fm	103.260	²⁶² No	98.640	²⁶² Rf	101.150	²⁷⁴ Sg	128.490
²⁵⁵ Cm	88.760	²⁶¹ Cf	102.130	²⁶⁴ Fm	106.030	²⁶³ No	101.360	²⁶³ Rf	103.290	²⁷⁵ Sg	131.530
²⁵⁶ Cm	91.560	²⁶² Cf	105.240	²⁶⁵ Fm	109.970	²⁶⁴ No	103.050	²⁶⁴ Rf	104.320	²⁷⁶ Sg	133.510
²⁵⁷ Cm	95.430	²⁶³ Cf	109.480	²⁶⁶ Fm	112.960	²⁶⁵ No	106.080	²⁶⁵ Rf	106.680	²⁷⁷ Sg	136.640
²⁵⁸ Cm	98.360	²⁶⁴ Cf	112.820	²⁶⁷ Fm	117.090	²⁶⁶ No	108.460	²⁶⁶ Rf	107.930	²⁷⁸ Sg	138.830
²⁵⁹ Cm	102.560	²⁶⁵ Cf	117.270	²⁶⁸ Fm	120.080	²⁶⁷ No	112.150	²⁶⁷ Rf	110.560	²⁷⁹ Sg	142.120
²⁶⁰ Cm	106.040	²⁶⁶ Cf	120.520	²⁶⁹ Fm	124.110	²⁶⁸ No	114.680	²⁶⁸ Rf	112.550	²⁸⁰ Sg	144.560
²⁶¹ Cm	110.570	²⁶⁷ Cf	124.690	²⁷⁰ Fm	127.130	²⁶⁹ No	118.580	²⁶⁹ Rf	115.940	²⁵⁵ Ns	112.410 †
²⁶² Cm	114.340	²⁶⁸ Cf	128.250	²⁷¹ Fm	131.330	²⁷⁰ No	121.240	²⁷⁰ Rf	118.090	²⁵⁶ Ns	112.680 †
²²⁹ Bk	53.190	²³⁴ Es	65.030	²⁷² Fm	134.530	²⁷¹ No	124.970	²⁷¹ Rf	121.610	²⁵⁷ Ns	111.600
²³⁰ Bk	53.410	²³⁵ Es	63.670	²⁷³ Fm	138.960	²⁷² No	127.690	²⁷² Rf	124.050	²⁵⁸ Ns	112.030
²³¹ Bk	52.300	²³⁶ Es	64.000	²⁷⁴ Fm	142.540	²⁷³ No	131.430	²⁷³ Rf	127.390	²⁵⁹ Ns	111.500
²³² Bk	52.840	²³⁷ Es	63.030	²³⁸ Md	77.100 †	²⁷⁴ No	134.410	²⁷⁴ Rf	129.810	²⁶⁰ Ns	112.380
²³³ Bk	52.050	²³⁸ Es	63.610	²³⁹ Md	75.690 †	²⁷⁵ No	138.500	²⁷⁵ Rf	133.200	²⁶¹ Ns	112.140
²³⁴ Bk	52.620	²³⁹ Es	62.910	²⁴⁰ Md	75.900	²⁷⁶ No	141.740	²⁷⁶ Rf	135.810	²⁶² Ns	113.180
²³⁵ Bk	52.090	²⁴⁰ Es	63.790	²⁴¹ Md	74.810	²⁷⁷ No	145.920	²⁷⁷ Rf	139.540	²⁶³ Ns	113.300
²³⁶ Bk	52.980	²⁴¹ Es	63.400	²⁴² Md	75.430	²⁷⁸ No	149.430	²⁷⁸ Rf	142.390	²⁶⁴ Ns	114.520
²³⁷ Bk	52.780	²⁴² Es	64.440	²⁴³ Md	74.490	²⁷⁹ No	153.890	²⁷⁹ Rf	146.240	²⁶⁵ Ns	114.830
²³⁸ Bk	54.070	²⁴³ Es	64.540	²⁴⁴ Md	75.150	²⁸⁰ No	157.750	²⁸⁰ Rf	149.440	²⁶⁶ Ns	116.130
²³⁹ Bk	54.130	²⁴⁴ Es	65.800	²⁴⁵ Md	74.800	²⁴³ Lr	88.410 †	²⁴⁸ Ha	101.690 †	²⁶⁷ Ns	116.670
²⁴⁰ Bk	55.600	²⁴⁵ Es	66.270	²⁴⁶ Md	75.740	²⁴⁴ Lr	88.490 †	²⁴⁹ Ha	100.320 †	²⁶⁸ Ns	118.320
²⁴¹ Bk	56.090	²⁴⁶ Es	67.840	²⁴⁷ Md	75.630	²⁴⁵ Lr	87.380 †	²⁵⁰ Ha	100.510 †	²⁶⁹ Ns	119.080
²⁴² Bk	57.800	²⁴⁷ Es	68.570	²⁴⁸ Md	76.780	²⁴⁶ Lr	87.690	²⁵¹ Ha	99.400	²⁷⁰ Ns	122.020
²⁴³ Bk	58.680	²⁴⁸ Es	70.380	²⁴⁹ Md	77.010	²⁴⁷ Lr	86.770	²⁵² Ha	99.750	²⁷¹ Ns	121.560
²⁴⁴ Bk	60.650	²⁴⁹ Es	71.300	²⁵⁰ Md	78.440	²⁴⁸ Lr	87.330	²⁵³ Ha	98.980	²⁷² Ns	125.220
²⁴⁵ Bk	61.860	²⁵⁰ Es	73.330	²⁵¹ Md	78.820	²⁴⁹ Lr	86.740	²⁵⁴ Ha	99.620	²⁷³ Ns	126.990
²⁴⁶ Bk	64.070	²⁵¹ Es	74.700	²⁵² Md	80.410	²⁵⁰ Lr	87.490	²⁵⁵ Ha	99.000	²⁷⁴ Ns	129.780
²⁴⁷ Bk	65.530	²⁵² Es	77.250	²⁵³ Md	81.300	²⁵¹ Lr	87.230	²⁵⁶ Ha	99.800	²⁷⁵ Ns	131.960
²⁴⁸ Bk	67.970	²⁵³ Es	78.900	²⁵⁴ Md	83.370	²⁵² Lr	88.270	²⁵⁷ Ha	99.750	²⁷⁶ Ns	134.700
²⁴⁹ Bk	69.810	²⁵⁴ Es	81.630	²⁵⁵ Md	84.620	²⁵³ Lr	88.180	²⁵⁸ Ha	101.000	²⁷⁷ Ns	136.730
²⁵⁰ Bk	72.720	²⁵⁵ Es	83.650	²⁵⁶ Md	86.920	²⁵⁴ Lr	89.280	²⁵⁹ Ha	101.210	²⁷⁸ Ns	139.520
²⁵¹ Bk	74.850	²⁵⁶ Es	86.530	²⁵⁷ Md	88.430	²⁵⁵ Lr	89.690	²⁶⁰ Ha	102.670	²⁷⁹ Ns	141.720
²⁵² Bk	78.090	²⁵⁷ Es	88.720	²⁵⁸ Md	90.960	²⁵⁶ Lr	91.410	²⁶¹ Ha	103.360	²⁸⁰ Ns	144.630
²⁵³ Bk	80.480	²⁵⁸ Es	91.740	²⁵⁹ Md	92.680	²⁵⁷ Lr	92.100	²⁶² Ha	104.980	²⁵⁷ Hs	119.300
²⁵⁴ Bk	83.840	²⁵⁹ Es	94.020	²⁶⁰ Md	95.220	²⁵⁸ Lr	93.960	²⁶³ Ha	105.720	²⁵⁸ Hs	117.850
²⁵⁵ Bk	86.380	²⁶⁰ Es	97.190	²⁶¹ Md	97.180	²⁵⁹ Lr	95.120	²⁶⁴ Ha	107.430	²⁵⁹ Hs	118.270
²⁵⁶ Bk	89.720	²⁶¹ Es	99.700	²⁶² Md	99.960	²⁶⁰ Lr	97.160	²⁶⁵ Ha	108.440	²⁶⁰ Hs	117.390
²⁵⁷ Bk	92.480	²⁶² Es	103.150	²⁶³ Md	102.030	²⁶¹ Lr	98.370	²⁶⁶ Ha	110.440	²⁶¹ Hs	118.250
²⁵⁸ Bk	96.040	²⁶³ Es	106.270	²⁶⁴ Md	105.100	²⁶² Lr	100.550	²⁶⁷ Ha	111.600	²⁶² Hs	117.590
²⁵⁹ Bk	98.950	²⁶⁴ Es	110.200	²⁶⁵ Md	107.850	²⁶³ Lr	101.960	²⁶⁸ Ha	113.920	²⁶³ Hs	118.620
²⁶⁰ Bk	102.840	²⁶⁵ Es	113.510	²⁶⁶ Md	111.500	²⁶⁴ Lr	104.360	²⁶⁹ Ha	115.890	²⁶⁴ Hs	118.340
²⁶¹ Bk	106.270	²⁶⁶ Es	117.730	²⁶⁷ Md	114.440	²⁶⁵ Lr	105.980	²⁷⁰ Ha	118.920	²⁶⁵ Hs	119.510
²⁶² Bk	110.510	²⁶⁷ Es	120.910	²⁶⁸ Md	118.290	²⁶⁶ Lr	108.670	²⁷¹ Ha	121.090	²⁶⁶ Hs	119.420
²⁶³ Bk	114.180	²⁶⁸ Es	124.910	²⁶⁹ Md	121.370	²⁶⁷ Lr	111.020	²⁷² Ha	124.260	²⁶⁷ Hs	120.690
²⁶⁴ Bk	118.560	²⁶⁹ Es	128.280	²⁷⁰ Md	125.060	²⁶⁸ Lr	114.400	²⁷³ Ha	126.720	²⁶⁸ Hs	120.840
²⁶⁵ Bk	122.120	²⁷⁰ Es	132.480	²⁷¹ Md	128.100	²⁶⁹ Lr	116.910	²⁷⁴ Ha	129.790	²⁶⁹ Hs	122.470
²³² Cf	57.500	²⁷¹ Es	136.030	²⁷² Md	131.850	²⁷⁰ Lr	120.420	²⁷⁵ Ha	132.210	²⁷⁰ Hs	122.900
²³³ Cf	58.030	²³⁶ Fm	69.400	²⁷³ Md	135.190	²⁷¹ Lr	123.140	²⁷⁶ Ha	135.230	²⁷¹ Hs	124.760
²³⁴ Cf	56.820	²³⁷ Fm	69.660	²⁷⁴ Md	139.310	²⁷² Lr	126.560	²⁷⁷ Ha	137.850	²⁷² Hs	125.930
²³⁵ Cf	57.410	²³⁸ Fm	68.280	²⁷⁵ Md	142.870	²⁷³ Lr	129.320	²⁷⁸ Ha	141.310	²⁷³ Hs	128.610
²³⁶ Cf	56.530	²³⁹ Fm	68.870	²⁷⁶ Md	147.080	²⁷⁴ Lr	132.690	²⁷⁹ Ha	144.140	²⁷⁴ Hs	130.030
²³⁷ Cf	57.400	²⁴⁰ Fm	67.810	²⁷⁷ Md	150.890	²⁷⁵ Lr	135.660	²⁸⁰ Ha	147.650	²⁷⁵ Hs	132.800
²³⁸ Cf	56.850	²⁴¹ Fm	68.670	²⁴⁰ No	81.740	²⁷⁶ Lr	139.440	²⁵² Sg	105.540	²⁷⁶ Hs	134.530
²³⁹ Cf	58.120	²⁴² Fm	67.910	²⁴¹ No	81.980	²⁷⁷ Lr	142.750	²⁵³ Sg	105.900	²⁷⁷ Hs	137.290
²⁴⁰ Cf	57.790	²⁴³ Fm	68.940	²⁴² No	80.520	²⁷⁸ Lr	146.620	²⁵⁴ Sg	104.680	²⁷⁸ Hs	139.100
²⁴¹ Cf	59.140	²⁴⁴ Fm	68.590	²⁴³ No	81.120	²⁷⁹ Lr	150.120	²⁵⁵ Sg	105.350	²⁷⁹ Hs	141.600
²⁴² Cf	59.320	²⁴⁵ Fm	69.900	²⁴⁴ No	79.820	²⁸⁰ Lr	154.320	²⁵⁶ Sg	104.350	²⁸⁰ Hs	143.340
²⁴³ Cf	61.010	²⁴⁶ Fm	69.950	²⁴⁵ No	80.480	²⁴⁵ Rf	95.100	²⁵⁷ Sg	105.130	²⁸¹ Hs	146.240
²⁴⁴ Cf	61.460	²⁴⁷ Fm	71.490	²⁴⁶ No	79.740	²⁴⁶ Rf	93.500	²⁵⁸ Sg	104.670	²⁸² Hs	148.380
²⁴⁵ Cf	63.400	²⁴⁸ Fm	71.770	²⁴⁷ No	80.670	²⁴⁷ Rf	93.790	²⁵⁹ Sg	105.930	²⁸³ Hs	151.540
²⁴⁶ Cf	64.210	²⁴⁹ Fm	73.540	²⁴⁸ No	80.140	²⁴⁸ Rf	92.500	²⁶⁰ Sg	105.810	²⁸⁴ Hs	154.000
²⁴⁷ Cf	66.400	²⁵⁰ Fm	74.100	²⁴⁹ No	81.300	²⁴⁹ Rf	93.060	²⁶¹ Sg	107.220	²⁸⁵ Hs	157.240
²⁴⁸ Cf	67.450	²⁵¹ Fm	76.090	²⁵⁰ No	81.130	²⁵⁰ Rf	92.130	²⁶² Sg	107.440	²⁸⁶ Hs	160.290
²⁴⁹ Cf	69.790	²⁵² Fm	77.050	²⁵¹ No	82.560	²⁵¹ Rf	92.810	²⁶³ Sg	109.020	²⁸⁷ Hs	163.790
²⁵⁰ Cf	71.250	²⁵³ Fm	79.480	²⁵² No	82.570	²⁵² Rf	92.130	²⁶⁴ Sg	109.370	²⁸⁸ Hs	167.030
²⁵¹ Cf	74.150	²⁵⁴ Fm	80.800	²⁵³ No	84.060	²⁵³ Rf	93.170	²⁶⁵ Sg	111.050	²⁸⁹ Hs	171.080
²⁵² Cf	75.880	²⁵⁵ Fm	83.460	²⁵⁴ No	84.550	²⁵⁴ Rf	92.600	²⁶⁶ Sg	111.640	²⁹⁰ Hs	174.400
²⁵³ Cf	79.090	²⁵⁶ Fm	85.040	²⁵⁵ No	86.670	²⁵⁵ Rf	93.760	²⁶⁷ Sg	113.630	²⁹¹ Hs	178.820

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²⁹² Hs	182.460	²⁷⁴ 110	135.660	³⁰³ 111	219.130	²⁸⁵ 113	161.700	²⁶⁷ 115	176.280 †	²⁹⁶ 116	189.420
²⁹³ Hs	187.890	²⁷⁵ 110	137.940	³⁰⁴ 111	223.270	²⁸⁶ 113	163.690	²⁶⁸ 115	175.620 †	²⁹⁷ 116	192.320
²⁹⁴ Hs	191.460	²⁷⁶ 110	138.960	³⁰⁵ 111	227.050	²⁸⁷ 113	165.020	²⁶⁹ 115	173.740 †	²⁹⁸ 116	194.360
²⁹⁵ Hs	197.030	²⁷⁷ 110	141.140	³⁰⁶ 111	231.400	²⁸⁸ 113	167.140	²⁷⁰ 115	173.300 †	²⁹⁹ 116	197.580
²⁹⁶ Hs	201.100	²⁷⁸ 110	142.330	³⁰⁷ 111	235.080	²⁸⁹ 113	168.730	²⁷¹ 115	171.730 †	³⁰⁰ 116	199.920
²⁹⁷ Hs	205.710	²⁷⁹ 110	144.610	²⁶² 112	150.130 †	²⁹⁰ 113	171.230	²⁷² 115	171.490 †	³⁰¹ 116	204.100
²⁹⁸ Hs	209.220	²⁸⁰ 110	145.790	²⁶³ 112	149.880 †	²⁹¹ 113	173.010	²⁷³ 115	170.030 †	³⁰² 116	206.130
²⁹⁹ Hs	213.870	²⁸¹ 110	148.030	²⁶⁴ 112	148.130 †	²⁹² 113	175.900	²⁷⁴ 115	169.920 †	³⁰³ 116	210.450
³⁰⁰ Hs	217.580	²⁸² 110	149.440	²⁶⁵ 112	148.230 †	²⁹³ 113	178.290	²⁷⁵ 115	168.790 †	³⁰⁴ 116	212.950
³⁰¹ Hs	222.380	²⁸³ 110	152.030	²⁶⁶ 112	146.760 ‡	²⁹⁴ 113	181.380	²⁷⁶ 115	169.030 †	³⁰⁵ 116	216.500
³⁰² Hs	226.260	²⁸⁴ 110	153.770	²⁶⁷ 112	147.010 ‡	²⁹⁵ 113	184.060	²⁷⁷ 115	168.680 †	³⁰⁶ 116	219.020
³⁰³ Hs	231.150	²⁸⁵ 110	156.570	²⁶⁸ 112	145.870 ‡	²⁹⁶ 113	187.520	²⁷⁸ 115	168.550 †	³⁰⁷ 116	222.820
³⁰⁴ Hs	235.150	²⁸⁶ 110	158.660	²⁶⁹ 112	146.340	²⁹⁷ 113	190.500	²⁷⁹ 115	167.020 †	³⁰⁸ 116	225.490
²⁵⁹ Mt	126.050 †	²⁸⁷ 110	161.550	²⁷⁰ 112	145.380	²⁹⁸ 113	194.970	²⁸⁰ 115	167.600	³⁰⁹ 116	229.410
²⁶⁰ Mt	126.100 †	²⁸⁸ 110	163.820	²⁷¹ 112	145.930	²⁹⁹ 113	197.740	²⁸¹ 115	167.490 †	³¹⁰ 116	232.430
²⁶¹ Mt	125.130 †	²⁸⁹ 110	167.160	²⁷² 112	145.270	³⁰⁰ 113	202.350	²⁸² 115	168.350	³¹¹ 116	236.640
²⁶² Mt	125.610 †	²⁹⁰ 110	169.920	²⁷³ 112	146.150	³⁰¹ 113	205.600	²⁸³ 115	168.310	³¹² 116	239.720
²⁶³ Mt	124.940 †	²⁹¹ 110	173.690	²⁷⁴ 112	145.980	³⁰² 113	210.380	²⁸⁴ 115	169.450	²⁷² 117	192.180 †
²⁶⁴ Mt	125.530	²⁹² 110	176.700	²⁷⁵ 112	147.190	³⁰³ 113	213.690	²⁸⁵ 115	169.980	²⁷³ 117	190.100 †
²⁶⁵ Mt	125.250	²⁹³ 110	180.790	²⁷⁶ 112	147.550	³⁰⁴ 113	218.560	²⁸⁶ 115	171.190	²⁷⁴ 117	189.630 †
²⁶⁶ Mt	126.060	²⁹⁴ 110	184.110	²⁷⁷ 112	148.960	³⁰⁵ 113	222.010	²⁸⁷ 115	171.700	²⁷⁵ 117	187.740 †
²⁶⁷ Mt	125.870	²⁹⁵ 110	189.230	²⁷⁸ 112	149.540	³⁰⁶ 113	225.080	²⁸⁸ 115	173.450	²⁷⁶ 117	188.030 †
²⁶⁸ Mt	126.760	²⁹⁶ 110	192.410	²⁷⁹ 112	151.330	³⁰⁷ 113	228.660	²⁸⁹ 115	174.440	²⁷⁷ 117	186.040 †
²⁶⁹ Mt	126.860	²⁹⁷ 110	197.670	²⁸⁰ 112	151.420	³⁰⁸ 113	232.820	²⁹⁰ 115	176.230	²⁷⁸ 117	185.820 †
²⁷⁰ Mt	128.100	²⁹⁸ 110	201.350	²⁸¹ 112	153.180	³⁰⁹ 113	236.470	²⁹¹ 115	177.300	²⁷⁹ 117	184.300 †
²⁷¹ Mt	128.490	²⁹⁹ 110	206.760	²⁸² 112	153.960	²⁶⁴ 114	168.600 †	²⁹² 115	181.290	²⁸⁰ 117	184.200 †
²⁷² Mt	129.970	³⁰⁰ 110	210.510	²⁸³ 112	155.830	²⁶⁵ 114	168.000 †	²⁹³ 115	181.000	²⁸¹ 117	182.970 ‡
²⁷³ Mt	131.110	³⁰¹ 110	214.160	²⁸⁴ 112	156.810	²⁶⁶ 114	165.880 †	²⁹⁴ 115	183.380	²⁸² 117	183.130 †
²⁷⁴ Mt	133.430	³⁰² 110	217.860	²⁸⁵ 112	159.090	²⁶⁷ 114	165.650 †	²⁹⁵ 115	185.460	²⁸³ 117	182.400 †
²⁷⁵ Mt	134.830	³⁰³ 110	222.360	²⁸⁶ 112	160.450	²⁶⁸ 114	163.820 †	²⁹⁶ 115	188.360	²⁸⁴ 117	182.830 †
²⁷⁶ Mt	137.200	³⁰⁴ 110	225.940	²⁸⁷ 112	162.950	²⁶⁹ 114	163.720 †	²⁹⁷ 115	190.690	²⁸⁵ 117	182.470 †
²⁷⁷ Mt	138.840	³⁰⁵ 110	230.580	²⁸⁸ 112	164.290	²⁷⁰ 114	162.220 †	²⁹⁸ 115	193.870	²⁸⁶ 117	183.190 †
²⁷⁸ Mt	141.350	³⁰⁶ 110	234.290	²⁸⁹ 112	167.310	²⁷¹ 114	162.370 †	²⁹⁹ 115	196.530	²⁸⁷ 117	183.330 †
²⁷⁹ Mt	143.400	²⁶¹ 111	142.380 †	²⁹⁰ 112	168.910	²⁷² 114	161.060 ‡	³⁰⁰ 115	200.710	²⁸⁸ 117	184.260
²⁸⁰ Mt	145.250	²⁶² 111	142.120 †	²⁹¹ 112	172.020	²⁷³ 114	161.310 ‡	³⁰¹ 115	203.080	²⁸⁹ 117	184.550
²⁸¹ Mt	146.990	²⁶³ 111	140.710 †	²⁹² 112	174.410	²⁷⁴ 114	160.320 ‡	³⁰² 115	207.410	²⁹⁰ 117	185.870
²⁸² Mt	149.580	²⁶⁴ 111	140.800 †	²⁹³ 112	177.790	²⁷⁵ 114	160.910 ‡	³⁰³ 115	210.250	²⁹¹ 117	186.520
²⁸³ Mt	151.710	²⁶⁵ 111	139.680 †	²⁹⁴ 112	180.430	²⁷⁶ 114	160.250	³⁰⁴ 115	214.710	²⁹² 117	188.070
²⁸⁴ Mt	154.560	²⁶⁶ 111	139.910 †	²⁹⁵ 112	184.220	²⁷⁷ 114	160.980	³⁰⁵ 115	217.690	²⁹³ 117	188.670
²⁸⁵ Mt	157.060	²⁶⁷ 111	139.130 †	²⁹⁶ 112	187.220	²⁷⁸ 114	159.720	³⁰⁶ 115	222.260	²⁹⁴ 117	190.580
²⁸⁶ Mt	160.030	²⁶⁸ 111	139.600 †	²⁹⁷ 112	192.030	²⁷⁹ 114	160.580	³⁰⁷ 115	224.040	²⁹⁵ 117	193.040 †
²⁸⁷ Mt	162.800	²⁶⁹ 111	139.010 †	²⁹⁸ 112	194.820	²⁸⁰ 114	160.160	³⁰⁸ 115	228.080	²⁹⁶ 117	193.490
²⁸⁸ Mt	166.030	²⁷⁰ 111	139.560	²⁹⁹ 112	199.780	²⁸¹ 114	161.410	³⁰⁹ 115	231.250	²⁹⁷ 117	195.150
²⁸⁹ Mt	169.170	²⁷¹ 111	139.290	³⁰⁰ 112	203.050	²⁸² 114	161.600	³¹⁰ 115	235.410	²⁹⁸ 117	197.820
²⁹⁰ Mt	172.900	²⁷² 111	140.180	³⁰¹ 112	208.140	²⁸³ 114	162.850	³¹¹ 115	238.820	²⁹⁹ 117	199.830
²⁹¹ Mt	176.220	²⁷³ 111	140.290	³⁰² 112	211.530	²⁸⁴ 114	163.560	²⁶⁶ 116	188.570 †	³⁰⁰ 117	202.760
²⁹² Mt	180.300	²⁷⁴ 111	141.340	³⁰³ 112	215.650	²⁸⁵ 114	165.100	²⁶⁷ 116	187.520 †	³⁰¹ 117	205.120
²⁹³ Mt	183.930	²⁷⁵ 111	142.290	³⁰⁴ 112	219.090	²⁸⁶ 114	165.750	²⁶⁸ 116	185.090 †	³⁰² 117	208.960
²⁹⁴ Mt	189.050	²⁷⁶ 111	143.960	³⁰⁵ 112	223.490	²⁸⁷ 114	167.620	²⁶⁹ 116	184.470 †	³⁰³ 117	210.960
²⁹⁵ Mt	192.560	²⁷⁷ 111	144.550	³⁰⁶ 112	226.910	²⁸⁸ 114	168.640	²⁷⁰ 116	182.280 †	³⁰⁴ 117	214.950
²⁹⁶ Mt	197.820	²⁷⁸ 111	146.590	³⁰⁷ 112	231.360	²⁸⁹ 114	170.790	²⁷¹ 116	181.850 †	³⁰⁵ 117	217.400
²⁹⁷ Mt	201.830	²⁷⁹ 111	147.470	³⁰⁸ 112	234.680	²⁹⁰ 114	171.990	²⁷² 116	179.910 †	³⁰⁶ 117	220.200
²⁹⁸ Mt	207.230	²⁸⁰ 111	149.340	²⁶³ 113	160.310 †	²⁹¹ 114	174.430	²⁷³ 116	179.760 †	³⁰⁷ 117	222.690
²⁹⁹ Mt	210.100	²⁸¹ 111	150.400	²⁶⁴ 113	159.740 †	²⁹² 114	175.950	²⁷⁴ 116	177.940 †	³⁰⁸ 117	226.220
³⁰⁰ Mt	214.460	²⁸² 111	152.270	²⁶⁵ 113	157.880 †	²⁹³ 114	178.770	²⁷⁵ 116	177.830 †	³⁰⁹ 117	228.840
³⁰¹ Mt	218.190	²⁸³ 111	153.630	²⁶⁶ 113	157.630 †	²⁹⁴ 114	180.750	²⁷⁶ 116	176.950 †	³¹⁰ 117	232.450
³⁰² Mt	222.680	²⁸⁴ 111	155.900	²⁶⁷ 113	156.040 †	²⁹⁵ 114	183.840	²⁷⁷ 116	176.580 †	³¹¹ 117	235.300
³⁰³ Mt	226.550	²⁸⁵ 111	157.610	²⁶⁸ 113	155.920 †	²⁹⁶ 114	186.170	²⁷⁸ 116	175.500 ‡	³¹² 117	239.250
³⁰⁴ Mt	231.150	²⁸⁶ 111	160.090	²⁶⁹ 113	154.810 †	²⁹⁷ 114	189.640	²⁷⁹ 116	175.800 ‡	³¹³ 117	242.400
³⁰⁵ Mt	235.190	²⁸⁷ 111	162.080	²⁷⁰ 113	154.910 †	²⁹⁸ 114	192.300	²⁸⁰ 116	175.790 †	²⁶⁸ 118	209.870 †
²⁶⁰ 110	133.230 ‡	²⁸⁸ 111	164.650	²⁷¹ 113	153.910 †	²⁹⁹ 114	196.800	²⁸¹ 116	174.980 †	²⁶⁹ 118	208.390 †
²⁶¹ 110	133.310 ‡	²⁸⁹ 111	166.860	²⁷² 113	154.120 †	³⁰⁰ 114	199.200	²⁸² 116	174.320	²⁷⁰ 118	205.810 †
²⁶² 110	131.950	²⁹⁰ 111	169.990	²⁷³ 113	153.460 †	³⁰¹ 114	203.850	²⁸³ 116	175.080	²⁷¹ 118	204.840 †
²⁶³ 110	132.430	²⁹¹ 111	172.730	²⁷⁴ 113	154.160 †	³⁰² 114	206.730	²⁸⁴ 116	174.760	²⁷² 118	202.280 †
²⁶⁴ 110	131.370	²⁹² 111	176.110	²⁷⁵ 113	153.720 †	³⁰³ 114	211.510	²⁸⁵ 116	175.870	²⁷³ 118	201.520 †
²⁶⁵ 110	131.990	²⁹³ 111	179.090	²⁷⁶ 113	154.450	³⁰⁴ 114	214.520	²⁸⁶ 116	175.990	²⁷⁴ 118	199.110 †
²⁶⁶ 110	131.250	²⁹⁴ 111	182.890	²⁷⁷ 113	154.740	³⁰⁵ 114	219.420	²⁸⁷ 116	177.240	²⁷⁵ 118	198.630 †
²⁶⁷ 110	132.070	²⁹⁵ 111	186.220	²⁷⁸ 113	156.160	³⁰⁶ 114	222.540	²⁸⁸ 116	177.530	²⁷⁶ 118	196.420 †
²⁶⁸ 110	131.510	²⁹⁶ 111	191.030	²⁷⁹ 113	155.380	³⁰⁷ 114	225.760	²⁸⁹ 116	179.150	²⁷⁷ 118	196.210 †
²⁶⁹ 110	132.390	²⁹⁷ 111	194.160	²⁸⁰ 113	156.630	³⁰⁸ 114	229.070	²⁹⁰ 116	179.800	²⁷⁸ 118	194.410 †
²⁷⁰ 110	132.130	²⁹⁸ 1									

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²⁸³ ₁₁₈	190.640 †	²⁷¹ ₁₂₀	233.250 †	³⁰⁹ ₁₂₁	233.880
²⁸⁴ ₁₁₈	189.670 ‡	²⁷² ₁₂₀	229.070 †	³¹⁰ ₁₂₁	236.560
²⁸⁵ ₁₁₈	190.090 ‡	²⁷³ ₁₂₀	226.360 †	³¹¹ ₁₂₁	238.340
²⁸⁶ ₁₁₈	189.410 ‡	²⁷⁴ ₁₂₀	224.500 †	³¹² ₁₂₁	241.160
²⁸⁷ ₁₁₈	190.240	²⁷⁵ ₁₂₀	223.270 †	³¹³ ₁₂₁	243.180
²⁸⁸ ₁₁₈	189.960	²⁷⁶ ₁₂₀	220.470 †	³¹⁴ ₁₂₁	246.190
²⁸⁹ ₁₁₈	190.910	²⁷⁷ ₁₂₀	219.340 †	³¹⁵ ₁₂₁	248.560
²⁹⁰ ₁₁₈	190.890	²⁷⁸ ₁₂₀	216.810 †	³¹⁶ ₁₂₁	251.800
²⁹¹ ₁₁₈	192.260	²⁷⁹ ₁₂₀	215.080 †	³¹⁷ ₁₂₁	254.200
²⁹² ₁₁₈	192.630	²⁸⁰ ₁₂₀	212.980 †	²⁷⁶ ₁₂₂	245.930 †
²⁹³ ₁₁₈	194.190	²⁸¹ ₁₂₀	212.810 †	²⁷⁷ ₁₂₂	244.810 †
²⁹⁴ ₁₁₈	194.680	²⁸² ₁₂₀	211.140 †	²⁷⁸ ₁₂₂	242.170 †
²⁹⁵ ₁₁₈	196.320	²⁸³ ₁₂₀	211.070 †	²⁷⁹ ₁₂₂	241.030 †
²⁹⁶ ₁₁₈	198.300	²⁸⁴ ₁₂₀	208.700 †	²⁸⁰ ₁₂₂	238.030 †
²⁹⁷ ₁₁₈	199.040	²⁸⁵ ₁₂₀	208.490 †	²⁸¹ ₁₂₂	235.290 †
²⁹⁸ ₁₁₈	200.430	²⁸⁶ ₁₂₀	207.240 †	²⁸² ₁₂₂	233.070 †
²⁹⁹ ₁₁₈	203.130	²⁸⁷ ₁₂₀	207.270 †	²⁸³ ₁₂₂	232.700 †
³⁰⁰ ₁₁₈	204.850	²⁸⁸ ₁₂₀	206.360 †	²⁸⁴ ₁₂₂	230.560 †
³⁰¹ ₁₁₈	207.780	²⁸⁹ ₁₂₀	206.870 †	²⁸⁵ ₁₂₂	230.190 †
³⁰² ₁₁₈	209.790	²⁹⁰ ₁₂₀	206.070 †	²⁸⁶ ₁₂₂	228.400 †
³⁰³ ₁₁₈	213.660	²⁹¹ ₁₂₀	206.640 †	²⁸⁷ ₁₂₂	228.590 †
³⁰⁴ ₁₁₈	215.330	²⁹² ₁₂₀	206.370 †	²⁸⁸ ₁₂₂	226.600 †
³⁰⁵ ₁₁₈	217.790	²⁹³ ₁₂₀	207.400 †	²⁸⁹ ₁₂₂	225.600 †
³⁰⁶ ₁₁₈	219.780	²⁹⁴ ₁₂₀	207.420 ‡	²⁹⁰ ₁₂₂	224.100 †
³⁰⁷ ₁₁₈	223.130	²⁹⁵ ₁₂₀	208.680	²⁹¹ ₁₂₂	224.090 †
³⁰⁸ ₁₁₈	225.270	²⁹⁶ ₁₂₀	209.040	²⁹² ₁₂₂	222.960 †
³⁰⁹ ₁₁₈	228.800	²⁹⁷ ₁₂₀	210.210	²⁹³ ₁₂₂	223.420 †
³¹⁰ ₁₁₈	231.130	²⁹⁸ ₁₂₀	210.540	²⁹⁴ ₁₂₂	222.720 †
³¹¹ ₁₁₈	234.710	²⁹⁹ ₁₂₀	212.180	²⁹⁵ ₁₂₂	223.650 †
³¹² ₁₁₈	237.250	³⁰⁰ ₁₂₀	213.320	²⁹⁶ ₁₂₂	223.550 †
³¹³ ₁₁₈	241.240	³⁰¹ ₁₂₀	215.650	²⁹⁷ ₁₂₂	224.600 †
³¹⁴ ₁₁₈	243.960	³⁰² ₁₂₀	216.430	²⁹⁸ ₁₂₂	224.380 ‡
		³⁰³ ₁₂₀	218.680	²⁹⁹ ₁₂₂	225.420 †
²⁷⁵ ₁₁₉	210.360 †	³⁰⁴ ₁₂₀	219.920	³⁰⁰ ₁₂₂	225.170 ‡
²⁷⁶ ₁₁₉	209.400 †	³⁰⁵ ₁₂₀	222.450	³⁰¹ ₁₂₂	226.340
²⁷⁷ ₁₁₉	207.180 †	³⁰⁶ ₁₂₀	223.890	³⁰² ₁₂₂	226.520
²⁷⁸ ₁₁₉	206.260 †	³⁰⁷ ₁₂₀	226.700	³⁰³ ₁₂₂	228.040
²⁷⁹ ₁₁₉	204.510 †	³⁰⁸ ₁₂₀	228.340	³⁰⁴ ₁₂₂	228.650
²⁸⁰ ₁₁₉	204.160 †	³⁰⁹ ₁₂₀	231.320	³⁰⁵ ₁₂₂	230.560
²⁸¹ ₁₁₉	202.840 †	³¹⁰ ₁₂₀	233.130	³⁰⁶ ₁₂₂	231.430
²⁸² ₁₁₉	202.780 †	³¹¹ ₁₂₀	236.260	³⁰⁷ ₁₂₂	233.640
²⁸³ ₁₁₉	200.140 †	³¹² ₁₂₀	238.290	³⁰⁸ ₁₂₂	234.690
²⁸⁴ ₁₁₉	199.920 †	³¹³ ₁₂₀	241.610	³⁰⁹ ₁₂₂	237.170
²⁸⁵ ₁₁₉	198.950 †	³¹⁴ ₁₂₀	244.000	³¹⁰ ₁₂₂	238.450
²⁸⁶ ₁₁₉	198.920 †	³¹⁵ ₁₂₀	247.540	³¹¹ ₁₂₂	241.080
²⁸⁷ ₁₁₉	198.340 †	³¹⁶ ₁₂₀	249.950	³¹² ₁₂₂	242.550
²⁸⁸ ₁₁₉	198.870 †			³¹³ ₁₂₂	245.360
²⁸⁹ ₁₁₉	198.410 †	²⁸⁰ ₁₂₁	225.950 †	³¹⁴ ₁₂₂	247.080
²⁹⁰ ₁₁₉	199.030 †	²⁸¹ ₁₂₁	224.040 †	³¹⁵ ₁₂₂	250.080
²⁹¹ ₁₁₉	199.020 †	²⁸² ₁₂₁	223.490 †	³¹⁶ ₁₂₂	252.150
²⁹² ₁₁₉	200.060 †	²⁸³ ₁₂₁	221.670 †	³¹⁷ ₁₂₂	255.370
²⁹³ ₁₁₉	200.400 †	²⁸⁴ ₁₂₁	221.290 †	³¹⁸ ₁₂₂	257.520
²⁹⁴ ₁₁₉	201.690 †	²⁸⁵ ₁₂₁	219.820 †		
²⁹⁵ ₁₁₉	202.290 †	²⁸⁶ ₁₂₁	220.000 †		
²⁹⁶ ₁₁₉	203.340	²⁸⁷ ₁₂₁	217.010 †		
²⁹⁷ ₁₁₉	204.380	²⁸⁸ ₁₂₁	216.850 †		
²⁹⁸ ₁₁₉	205.790	²⁸⁹ ₁₂₁	215.640 †		
²⁹⁹ ₁₁₉	207.170	²⁹⁰ ₁₂₁	215.590 †		
³⁰⁰ ₁₁₉	209.610	²⁹¹ ₁₂₁	214.740 †		
³⁰¹ ₁₁₉	211.290	²⁹² ₁₂₁	215.120 †		
³⁰² ₁₁₉	213.930	²⁹³ ₁₂₁	214.740 †		
³⁰³ ₁₁₉	215.970	²⁹⁴ ₁₂₁	215.950 †		
³⁰⁴ ₁₁₉	217.970	²⁹⁵ ₁₂₁	215.970 †		
³⁰⁵ ₁₁₉	219.730	²⁹⁶ ₁₂₁	216.960 †		
³⁰⁶ ₁₁₉	222.580	²⁹⁷ ₁₂₁	217.250 †		
³⁰⁷ ₁₁₉	224.530	²⁹⁸ ₁₂₁	217.930 †		
³⁰⁸ ₁₁₉	227.540	²⁹⁹ ₁₂₁	218.400 †		
³⁰⁹ ₁₁₉	229.670	³⁰⁰ ₁₂₁	220.180 †		
³¹⁰ ₁₁₉	232.830	³⁰¹ ₁₂₁	220.650 †		
³¹¹ ₁₁₉	235.140	³⁰² ₁₂₁	222.170		
³¹² ₁₁₉	238.480	³⁰³ ₁₂₁	223.080		
³¹³ ₁₁₉	241.000	³⁰⁴ ₁₂₁	225.010		
³¹⁴ ₁₁₉	244.690	³⁰⁵ ₁₂₁	226.200		
³¹⁵ ₁₁₉	247.390	³⁰⁶ ₁₂₁	228.420		
		³⁰⁷ ₁₂₁	229.800		
²⁷⁰ ₁₂₀	234.030 †	³⁰⁸ ₁₂₁	232.290		