

L. Satpathy and R.C. Nayak 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
¹⁸ B	48.990±2.120	¹⁹ Na	13.090±0.420	³⁵ Si	-15.150±0.220	²⁸ Ar	43.690±4.490 ‡	⁴² Sc	-31.080±0.230	⁵⁷ Cr	-52.570±0.500
¹⁹ B	50.160±4.230	²⁰ Na	6.750±0.240	³⁶ Si	-13.630±0.260	²⁹ Ar	37.020±2.110 ‡	⁴³ Sc	-36.630±0.180	⁵⁸ Cr	-52.050±0.430
¹⁸ C	24.580±0.640	²¹ Na	-2.150±0.230	³⁷ Si	-8.130±0.310	³⁰ Ar	21.140±1.050 ‡	⁴⁴ Sc	-37.830±0.160	⁵⁹ Cr	-48.220±0.440
¹⁹ C	32.550±0.980	²² Na	-4.510±0.240	³⁸ Si	-7.720±1.430	³¹ Ar	10.600±0.540 ‡	⁴⁵ Sc	-41.780±0.210	⁶⁰ Cr	-46.540±0.580
²⁰ C	34.780±1.950	²³ Na	-10.380±0.480	³⁹ Si	-2.330±1.970	³² Ar	-2.420±0.290	⁴⁶ Sc	-42.110±0.240	⁶¹ Cr	-39.400±1.180
²¹ C	43.790±4.140 †	²⁴ Na	-8.130±0.290	⁴⁰ Si	-0.840±2.760	³³ Ar	-9.680±0.210	⁴⁷ Sc	-45.570±0.240	⁶² Cr	-36.780±1.680
²² C	47.870±5.400	²⁵ Na	-10.090±0.220	⁴¹ Si	4.100±3.820	³⁴ Ar	-19.150±0.170	⁴⁸ Sc	-44.450±0.190	⁶³ Cr	-30.900±2.330
¹⁸ N	13.600±0.370	²⁶ Na	-6.850±0.260	⁴² Si	1.250±5.480	³⁵ Ar	-23.220±0.160	⁴⁹ Sc	-45.950±0.170	⁶⁴ Cr	-24.090±3.580
¹⁹ N	15.160±0.320	²⁷ Na	-6.490±0.290	⁴³ Si	4.620±6.990	³⁶ Ar	-29.800±0.180	⁵⁰ Sc	-43.430±0.170	⁴⁶ Mn	-10.860±0.510 †
²⁰ N	22.360±0.460	²⁸ Na	-0.910±0.540	²⁵ P	20.360±0.860 †	³⁷ Ar	-31.320±0.230	⁵¹ Sc	-43.380±0.220	⁴⁷ Mn	-22.400±0.430
²¹ N	24.450±0.950	²⁹ Na	2.950±0.280	²⁶ P	12.090±0.420 †	³⁸ Ar	-35.460±0.350	⁵² Sc	-39.780±0.260	⁴⁸ Mn	-29.240±0.280
²² N	32.150±2.000	³⁰ Na	7.600±0.220	²⁷ P	-0.780±0.330	³⁹ Ar	-33.980±0.230	⁵³ Sc	-38.820±0.430	⁴⁹ Mn	-37.850±0.180
²³ N	35.910±2.780	³¹ Na	10.930±0.220	²⁸ P	-6.950±0.390	⁴⁰ Ar	-35.680±0.180	⁵⁴ Sc	-34.070±0.780	⁵⁰ Mn	-41.770±0.180
²⁴ N	44.160±4.180 †	³² Na	18.580±0.260	²⁹ P	-16.170±0.200	⁴¹ Ar	-33.320±0.190	⁵⁵ Sc	-31.770±1.440	⁵¹ Mn	-48.420±0.180
²⁵ N	48.050±6.110	³³ Na	21.870±0.320	³⁰ P	-19.010±0.180	⁴² Ar	-34.210±0.240	⁵⁶ Sc	-25.540±2.630	⁵² Mn	-50.570±0.290
¹⁸ O	-1.130±0.390	³⁴ Na	25.990±0.540	³¹ P	-23.990±0.150	⁴³ Ar	-31.480±0.210	⁵⁷ Sc	-22.060±3.890	⁵³ Mn	-54.920±0.200
¹⁹ O	3.040±0.300	³⁵ Na	29.280±0.730	³² P	-23.450±0.150	⁴⁴ Ar	-32.140±0.200	⁴⁰ Ti	-9.040±0.380	⁵⁴ Mn	-55.320±0.150
²⁰ O	3.070±0.280	³⁶ Na	36.230±0.970	³³ P	-25.680±0.160	⁴⁵ Ar	-29.210±0.250	⁴¹ Ti	-16.350±0.230	⁵⁵ Mn	-58.080±0.170
²¹ O	9.030±0.340	³⁷ Na	35.720±1.620	³⁴ P	-23.770±0.150	⁴⁶ Ar	-29.650±0.440	⁴² Ti	-25.800±0.250	⁵⁶ Mn	-56.420±0.190
²² O	10.400±0.570	¹⁸ Mg	56.190±2.560	³⁵ P	-24.150±0.160	⁴⁷ Ar	-26.360±0.480	⁴³ Ti	-30.100±0.200	⁵⁷ Mn	-57.240±0.330
²³ O	17.180±1.090	¹⁹ Mg	37.780±1.030	³⁶ P	-19.800±0.210	⁴⁸ Ar	-22.740±2.130	⁴⁴ Ti	-36.870±0.190	⁵⁸ Mn	-55.550±0.200
²⁴ O	19.760±1.680	²⁰ Mg	19.290±0.470 ‡	³⁷ P	-18.610±0.280	⁴⁹ Ar	-17.590±3.010	⁴⁵ Ti	-39.250±0.230	⁵⁹ Mn	-55.890±0.200
²⁵ O	27.340±2.540	²¹ Mg	10.020±0.260	³⁸ P	-14.950±0.600	⁵⁰ Ar	-15.080±4.220	⁴⁶ Ti	-44.270±0.340	⁶⁰ Mn	-52.770±0.210
²⁶ O	30.580±3.730	²² Mg	-1.260±0.260	³⁹ P	-13.840±0.590	⁵¹ Ar	-8.590±5.840	⁴⁷ Ti	-44.790±0.330	⁶¹ Mn	-52.020±0.280
²⁷ O	38.750±5.350 †	²³ Mg	-5.170±0.350	⁴⁰ P	-9.100±0.810	³⁴ K	-0.740±0.280 †	⁴⁸ Ti	-48.790±0.240	⁶² Mn	-46.930±0.580
²⁸ O	47.690±2.210	²⁴ Mg	-12.810±0.250	⁴¹ P	-8.230±1.160	³⁵ K	-11.570±0.180 †	⁴⁹ Ti	-48.570±0.190	⁶³ Mn	-45.710±0.870
²⁹ O	50.060±2.760	²⁵ Mg	-13.240±0.210	⁴² P	-6.330±1.840	³⁶ K	-17.120±0.190	⁵⁰ Ti	-50.860±0.170	⁶⁴ Mn	-39.830±1.400
³⁰ O	46.600±4.130	²⁶ Mg	-16.850±0.210	⁴³ P	-5.530±2.980	³⁷ K	-25.000±0.200	⁵¹ Ti	-49.120±0.190	⁶⁵ Mn	-35.380±2.220
³¹ O	46.750±4.960	²⁷ Mg	-14.940±0.320	⁴⁴ P	-2.600±3.900	³⁸ K	-28.150±0.240	⁵² Ti	-49.860±0.250	⁶⁶ Mn	-25.860±3.470 †
¹⁸ F	2.740±0.320	²⁸ Mg	-15.730±0.330	⁴⁵ P	-3.540±5.000	³⁹ K	-33.290±0.230	⁵³ Ti	-46.830±0.250	⁶⁹ Mn	-22.280±3.970
¹⁹ F	-1.940±0.280	²⁹ Mg	-10.540±0.260	⁴⁶ P	0.080±6.970	⁴⁰ K	-33.150±0.160	⁵⁴ Ti	-46.420±0.310	⁴⁸ Fe	-16.400±0.380
²⁰ F	0.260±0.210	³⁰ Mg	-9.490±0.190	²⁶ S	26.630±1.570 ‡	⁴¹ K	-36.090±0.170	⁵⁵ Ti	-42.290±0.500	⁴⁹ Fe	-25.000±0.240
²¹ F	-1.120±0.230	³¹ Mg	-4.480±0.180	²⁷ S	18.340±0.720 ‡	⁴² K	-34.990±0.190	⁵⁶ Ti	-40.740±0.870	⁵⁰ Fe	-35.100±0.180
²² F	3.740±0.310	³² Mg	-1.550±0.210	²⁸ S	3.730±0.550	⁴³ K	-36.770±0.180	⁵⁷ Ti	-35.260±1.570	⁵¹ Fe	-40.360±0.200
²³ F	4.070±0.580	³³ Mg	5.730±0.290	²⁹ S	-4.570±0.260	⁴⁴ K	-35.080±0.170	⁵⁸ Ti	-26.580±1.970 †	⁵² Fe	-48.070±0.240
²⁴ F	9.350±0.420	³⁴ Mg	7.940±0.270	³⁰ S	-14.670±0.180	⁴⁵ K	-36.740±0.240	⁴² V	-6.670±0.380 †	⁵³ Fe	-51.120±0.180
²⁵ F	11.180±0.640	³⁵ Mg	13.380±0.290	³¹ S	-18.960±0.160	⁴⁶ K	-34.870±0.380	⁴³ V	-17.960±0.240 †	⁵⁴ Fe	-56.350±0.150
²⁶ F	17.880±1.020	³⁶ Mg	17.110±0.370	³² S	-25.460±0.150	⁴⁷ K	-36.300±0.370	⁴⁴ V	-23.950±0.200	⁵⁵ Fe	-57.560±0.160
²⁷ F	20.080±1.550	³⁷ Mg	22.940±0.540	³³ S	-26.540±0.210	⁴⁸ K	-32.110±0.270	⁴⁵ V	-32.290±0.200	⁵⁶ Fe	-61.060±0.230
²⁸ F	26.630±2.230	²² Al	19.100±0.480 †	³⁴ S	-30.290±0.150	⁴⁹ K	-30.080±0.790	⁴⁶ V	-36.240±0.240	⁵⁷ Fe	-59.860±0.230
²⁹ F	32.490±0.840	²³ Al	6.060±0.330 †	³⁵ S	-29.300±0.150	⁵⁰ K	-25.780±1.150	⁴⁷ V	-42.420±0.220	⁵⁸ Fe	-62.150±0.220
³⁰ F	40.800±1.070 †	²⁴ Al	0.100±0.270	³⁶ S	-30.830±0.180	⁵¹ K	-24.200±1.670	⁴⁸ V	-43.910±0.230	⁵⁹ Fe	-60.550±0.160
³¹ F	41.820±1.590	²⁵ Al	-9.050±0.230	³⁷ S	-27.580±0.270	⁵² K	-17.800±2.500	⁴⁹ V	-48.740±0.160	⁶⁰ Fe	-61.500±0.130
³² F	44.470±2.350	²⁶ Al	-11.590±0.240	³⁸ S	-26.980±0.390	⁵³ K	-13.520±4.510	⁵⁰ V	-49.290±0.150	⁶¹ Fe	-59.020±0.130
³³ F	48.240±2.810	²⁷ Al	-17.030±0.310	³⁹ S	-23.150±0.350	³⁵ Ca	5.550±0.450 ‡	⁵¹ V	-52.280±0.170	⁶² Fe	-58.990±0.160
³⁴ F	51.910±3.650	²⁸ Al	-16.760±0.450	⁴⁰ S	-22.700±0.300	³⁶ Ca	-6.480±0.250	⁵² V	-51.310±0.200	⁶³ Fe	-55.150±0.300
³⁵ F	50.430±4.680	²⁹ Al	-19.130±0.200	⁴¹ S	-18.540±0.440	³⁷ Ca	-13.460±0.270	⁵³ V	-52.520±0.180	⁶⁴ Fe	-54.120±0.490
¹⁸ Ne	4.090±0.430	³⁰ Al	-15.760±0.180	⁴² S	-19.350±0.790	³⁸ Ca	-22.810±0.350	⁵⁴ V	-50.010±0.210	⁶⁵ Fe	-49.420±0.820
¹⁹ Ne	0.770±0.260	³¹ Al	-15.810±0.150	⁴³ S	-15.570±1.040	³⁹ Ca	-26.880±0.190	⁵⁵ V	-50.130±0.310	⁶⁶ Fe	-46.550±1.350
²⁰ Ne	-5.800±0.230	³² Al	-11.370±0.160	⁴⁴ S	-15.210±1.630	⁴⁰ Ca	-33.400±0.180	⁵⁶ V	-46.620±0.460	⁶⁷ Fe	-39.360±2.160
²¹ Ne	-5.740±0.200	³³ Al	-9.420±0.190	⁴⁵ S	-12.610±2.250	⁴¹ Ca	-34.580±0.180	⁵⁷ V	-45.710±0.660	⁶⁸ Fe	-32.830±3.410
²² Ne	-8.790±0.290	³⁴ Al	-3.510±0.220	⁴⁶ S	-12.800±3.150	⁴² Ca	-38.690±0.290	⁵⁸ V	-39.280±0.750	⁶⁹ Fe	-41.760±0.620
²³ Ne	-4.670±0.520	³⁵ Al	-1.480±0.240	³⁰ Cl	4.650±0.270 †	⁴³ Ca	-38.750±0.190	⁵⁹ V	-36.300±1.080	⁷⁰ Fe	-37.070±1.780
²⁴ Ne	-5.840±0.280	³⁶ Al	4.240±0.270	³¹ Cl	-7.150±0.180 †	⁴⁴ Ca	-41.600±0.170	⁶⁰ V	-25.380±2.350 †	⁷¹ Fe	-30.970±2.410
²⁵ Ne	-1.640±0.260	³⁷ Al	6.770±0.310	³² Cl	-13.030±0.170	⁴⁵ Ca	-40.890±0.190	⁶¹ V	-20.760±3.210	⁷² Fe	-26.980±3.240
²⁶ Ne	-0.270±0.360	³⁸ Al	8.290±3.350	³³ Cl	-20.980±0.200	⁴⁶ Ca	-43.460±0.300	⁶² V	-12.090±4.300 †	⁷³ Fe	-19.530±4.320
²⁷ Ne	6.190±0.640	³⁹ Al	9.830±4.240	³⁴ Cl	-23.710±0.150	⁴⁷ Ca	-42.540±0.300	⁶³ V	-5.590±5.740	⁵⁰ Co	-15.800±0.560 †
²⁸ Ne	8.590±1.050	⁴⁰ Al	14.670±5.810	³⁵ Cl	-28.960±0.140	⁴⁸ Ca	-43.300±0.240	⁴⁴ Cr	-12.170±0.370	⁵¹ Co	-27.560±0.310 †
²⁹ Ne	15.030±0.350	²³ Si	25.370±0.850 ‡	³⁶ Cl	-29.230±0.170	⁴⁹ Ca	-39.960±0.190	⁴⁵ Cr	-19.820±0.320	⁵² Co	-34.320±0.270
³⁰ Ne	17.950±0.450	²⁴ Si	10.260±0.460	³⁷ Cl	-32.040±0.200	⁵⁰ Ca	-39.010±0.310	⁴⁶ Cr	-29.680±0.370	⁵³ Co	-43.060±0.200
³¹ Ne	24.780±0.650	²⁵ Si	2.920±0.280	³⁸ Cl	-29.040±0.250	⁵¹ Ca	-35.300±0.460	⁴⁷ Cr	-35.190±0.320	⁵⁴ Co	-47.310±0.180
³² Ne	26.940±0.960	²⁶ Si	-8.030±0.220	³⁹ Cl	-29.960±0.200	⁵² Ca	-33.570±0.820	⁴⁸ Cr	-42.470±0.180	⁵⁵ Co	-53.560±0.180
³³ Ne	32.060±1.400	²⁷ Si	-12.280±0.250	⁴⁰ Cl	-26.840±0.200	⁵³ Ca	-28.080±1.400	⁴⁹ Cr	-45.120±0.180	⁵⁶ Co	-55.700±0.240
³⁴ Ne	33.980±1.850	²⁸ Si	-19.080±0.320	⁴¹ Cl	-27.070±0.220	⁵⁴ Ca	-24.920±2.540	⁵⁰ Cr	-50.790±0.150	⁵⁷ Co	-60.030±0.340
³⁵ Ne	39.200±2.420	²⁹ Si	-21.520±0.230	⁴² Cl	-23.980±0.270	⁵⁵ Ca	-17.580±4.600	⁵¹ Cr	-52.090±0.200	⁵⁸ Co	-59.800±0.160
³⁶ Ne	39.730±3.110	³⁰ Si	-25.010±0.180	⁴³ Cl	-24.220±0.350	⁵⁶ Ca	-13.810±5.950	⁵² Cr	-55.670±0.280	⁵⁹ Co	-62.330±0.160
³⁷ Ne											

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
⁶⁴ Co	-59.550±0.140	⁸⁵ Cu	-13.140±4.300	⁶⁴ Ge	-54.280±0.300	⁷³ Se	-68.800±0.080	⁸⁰ Kr	-78.180±0.220	⁹¹ Sr	-83.950±0.170
⁶⁵ Co	-59.830±0.160	⁸⁶ Cu	-7.340±5.250	⁶⁵ Ge	-56.660±0.130	⁷⁴ Se	-72.240±0.080	⁸¹ Kr	-78.310±0.130	⁹² Sr	-83.400±0.150
⁶⁶ Co	-56.920±0.260	⁸⁷ Cu	-4.430±6.370	⁶⁶ Ge	-61.780±0.110	⁷⁵ Se	-72.580±0.070	⁸² Kr	-80.700±0.120	⁹³ Sr	-80.110±0.160
⁶⁷ Co	-56.530±0.450			⁶⁷ Ge	-63.400±0.110	⁷⁶ Se	-75.160±0.070	⁸³ Kr	-80.370±0.140	⁹⁴ Sr	-78.910±0.190
⁶⁸ Co	-52.980±0.720	⁵⁵ Zn	-14.800±0.960 †	⁶⁸ Ge	-67.270±0.140	⁷⁷ Se	-74.730±0.070	⁸⁴ Kr	-82.160±0.190	⁹⁵ Sr	-74.930±0.170
⁶⁹ Co	-52.530±0.210	⁵⁶ Zn	-26.890±0.350	⁶⁹ Ge	-66.960±0.120	⁷⁸ Se	-76.600±0.090	⁸⁵ Kr	-81.220±0.140	⁹⁶ Sr	-73.000±0.170
⁷⁰ Co	-48.260±0.310	⁵⁷ Zn	-34.110±0.370	⁷⁰ Ge	-70.100±0.090	⁷⁹ Se	-75.730±0.100	⁸⁶ Kr	-82.660±0.120	⁹⁷ Sr	-68.390±0.180
⁷¹ Co	-45.550±0.810	⁵⁸ Zn	-42.990±0.320	⁷¹ Ge	-70.070±0.080	⁸⁰ Se	-77.850±0.270	⁸⁷ Kr	-80.320±0.130	⁹⁸ Sr	-65.850±0.210
⁷² Co	-40.660±1.110	⁵⁹ Zn	-47.600±0.180	⁷² Ge	-72.510±0.070	⁸¹ Se	-76.540±0.200	⁸⁸ Kr	-80.120±0.230	⁹⁹ Sr	-60.710±0.270
⁷³ Co	-38.040±1.510	⁶⁰ Zn	-54.010±0.130	⁷³ Ge	-71.840±0.100	⁸² Se	-77.400±0.160	⁸⁹ Kr	-75.880±0.280	¹⁰⁰ Sr	-60.080±0.790
⁷⁴ Co	-32.340±2.030	⁶¹ Zn	-56.550±0.120	⁷⁴ Ge	-73.490±0.130	⁸³ Se	-75.350±0.150	⁹⁰ Kr	-74.810±0.230	¹⁰¹ Sr	-55.400±1.030
⁷⁵ Co	-27.080±3.380	⁶² Zn	-61.300±0.130	⁷⁵ Ge	-72.190±0.080	⁸⁴ Se	-75.540±0.180	⁹¹ Kr	-71.050±0.180	¹⁰² Sr	-52.560±1.570
		⁶³ Zn	-62.530±0.190	⁷⁶ Ge	-72.130±0.080	⁸⁵ Se	-72.580±0.170	⁹² Kr	-69.470±0.170	¹⁰³ Sr	-46.870±2.360
⁵¹ Ni	-9.420±0.860 †	⁶⁴ Zn	-66.400±0.110	⁷⁷ Ge	-71.260±0.090	⁸⁶ Se	-71.880±0.200	⁹³ Kr	-64.410±0.210	¹⁰⁴ Sr	-42.880±3.510
⁵² Ni	-21.990±0.430	⁶⁵ Zn	-66.520±0.100	⁷⁸ Ge	-71.750±0.120	⁸⁷ Se	-68.490±0.280	⁹⁴ Kr	-62.340±0.340	¹⁰⁵ Sr	-36.730±4.270
⁵³ Ni	-30.180±0.310	⁶⁶ Zn	-69.010±0.100	⁷⁹ Ge	-69.340±0.150	⁸⁸ Se	-67.490±0.400	⁹⁵ Kr	-57.330±0.360	⁷⁴ Y	-32.060±2.710
⁵⁴ Ni	-39.940±0.190	⁶⁷ Zn	-68.180±0.150	⁸⁰ Ge	-69.710±0.250	⁸⁹ Se	-59.970±0.480	⁹⁶ Kr	-54.480±0.390	⁷⁵ Y	-38.480±1.730
⁵⁵ Ni	-45.080±0.170	⁶⁸ Zn	-70.340±0.160	⁸¹ Ge	-66.130±0.190	⁹⁰ Se	-58.180±0.420	⁹⁷ Kr	-49.050±0.600	⁷⁶ Y	-42.180±1.110
⁵⁶ Ni	-52.080±0.170	⁶⁹ Zn	-67.930±0.110	⁸² Ge	-65.080±0.150	⁹¹ Se	-52.540±0.500	⁹⁸ Kr	-45.740±0.850	⁷⁷ Y	-48.310±0.710
⁵⁷ Ni	-54.920±0.210	⁷⁰ Zn	-69.330±0.100	⁸³ Ge	-60.940±0.280	⁹² Se	-49.170±0.660	⁹⁹ Kr	-39.780±1.270	⁷⁸ Y	-51.500±0.460
⁵⁸ Ni	-60.090±0.200	⁷¹ Zn	-67.620±0.090	⁸⁴ Ge	-57.760±0.510	⁹³ Se	-43.270±0.890	¹⁰⁰ Kr	-33.080±4.500	⁷⁹ Y	-56.750±0.230
⁵⁹ Ni	-60.970±0.130	⁷² Zn	-68.320±0.090	⁸⁵ Ge	-53.340±0.590	⁹⁴ Se	-41.410±1.280	⁶⁹ Rb	-30.100±4.690	⁸⁰ Y	-60.680±0.280
⁶⁰ Ni	-64.220±0.120	⁷³ Zn	-65.920±0.090	⁸⁶ Ge	-51.610±0.760	⁹⁵ Se	-35.800±2.520	⁷⁰ Rb	-33.800±3.410	⁸¹ Y	-65.470±0.190
⁶¹ Ni	-64.110±0.100	⁷⁴ Zn	-65.810±0.120	⁸⁷ Ge	-45.670±1.090	⁹⁶ Se	-32.030±3.300	⁷¹ Rb	-40.210±2.490	⁸² Y	-67.750±0.140
⁶² Ni	-66.410±0.140	⁷⁵ Zn	-62.800±0.160	⁸⁸ Ge	-43.370±1.390	⁹⁷ Se	-25.780±4.280	⁷² Rb	-42.800±1.130	⁸³ Y	-72.430±0.160
⁶³ Ni	-65.010±0.220	⁷⁶ Zn	-62.060±0.250	⁸⁹ Ge	-38.150±2.200	⁹⁸ Se	-21.770±5.520	⁷³ Rb	-48.730±0.510	⁸⁴ Y	-73.730±0.170
⁶⁴ Ni	-66.760±0.130	⁷⁷ Zn	-58.230±0.430	⁹⁰ Ge	-33.690±2.800	⁶⁵ Br	-27.390±5.150	⁷⁴ Rb	-51.970±0.250	⁸⁵ Y	-78.310±0.140
⁶⁵ Ni	-64.630±0.120	⁷⁸ Zn	-56.500±0.740	⁹¹ Ge	-27.650±3.960	⁶⁶ Br	-30.410±3.390	⁷⁵ Rb	-57.480±0.160	⁸⁶ Y	-79.390±0.120
⁶⁶ Ni	-65.550±0.110	⁷⁹ Zn	-51.500±1.230	⁹² Ge	-23.930±5.580	⁶⁷ Br	-36.670±2.240	⁷⁶ Rb	-59.890±0.120	⁸⁷ Y	-82.720±0.130
⁶⁷ Ni	-63.300±0.170	⁸⁰ Zn	-52.050±0.420	⁶¹ As	-30.640±5.650	⁶⁸ Br	-37.620±0.510 †	⁷⁷ Rb	-64.670±0.110	⁸⁸ Y	-83.280±0.180
⁶⁸ Ni	-63.570±0.280	⁸¹ Zn	-47.340±0.620	⁶² As	-31.310±2.830 †	⁶⁹ Br	-49.290±1.010	⁷⁸ Rb	-66.550±0.120	⁸⁹ Y	-86.420±0.190
⁶⁹ Ni	-60.040±0.130	⁸² Zn	-45.040±0.920	⁶³ As	-37.600±1.490 †	⁷⁰ Br	-51.890±0.450	⁷⁹ Rb	-70.600±0.120	⁹⁰ Y	-86.090±0.200
⁷⁰ Ni	-59.710±0.140	⁸³ Zn	-40.110±1.300	⁶⁴ As	-41.590±0.940	⁷¹ Br	-57.210±0.200	⁸⁰ Rb	-71.960±0.260	⁹¹ Y	-86.760±0.140
⁷¹ Ni	-56.170±0.170	⁸⁴ Zn	-35.010±1.850	⁶⁵ As	-47.920±0.590	⁷² Br	-59.490±0.110	⁸¹ Rb	-75.830±0.160	⁹² Y	-84.640±0.120
⁷² Ni	-54.620±0.370	⁸⁵ Zn	-29.150±2.400	⁶⁶ As	-50.590±0.180	⁷³ Br	-64.110±0.090	⁸² Rb	-76.710±0.180	⁹³ Y	-84.580±0.140
⁷³ Ni	-50.540±0.530	⁸⁶ Zn	-25.830±3.040	⁶⁷ As	-56.550±0.180	⁷⁴ Br	-65.630±0.100	⁸³ Rb	-79.790±0.120	⁹⁴ Y	-81.750±0.150
⁷⁴ Ni	-48.890±0.730	⁸⁷ Zn	-20.130±3.780	⁶⁸ As	-58.950±0.190	⁷⁵ Br	-69.490±0.090	⁸⁴ Rb	-79.940±0.140	⁹⁵ Y	-81.130±0.140
⁷⁵ Ni	-43.450±1.210	⁸⁸ Zn	-17.110±4.650	⁶⁹ As	-63.080±0.150	⁷⁶ Br	-70.300±0.080	⁸⁵ Rb	-82.460±0.130	⁹⁶ Y	-77.670±0.130
⁷⁶ Ni	-39.750±2.020	⁵⁸ Ga	-38.200±5.240	⁷⁰ As	-64.360±0.110	⁷⁷ Br	-73.380±0.080	⁸⁶ Rb	-82.180±0.120	⁹⁷ Y	-76.210±0.150
⁷⁷ Ni	-32.130±3.330	⁵⁹ Ga	-40.740±2.500	⁷¹ As	-68.000±0.080	⁷⁸ Br	-73.450±0.090	⁸⁷ Rb	-84.170±0.170	⁹⁸ Y	-72.070±0.210
⁷⁸ Ni	-28.200±4.170	⁶⁰ Ga	-42.970±1.200	⁷² As	-68.500±0.070	⁷⁹ Br	-75.790±0.110	⁸⁸ Rb	-82.240±0.180	⁹⁹ Y	-69.960±0.310
⁸⁰ Ni	-27.590±2.320	⁶¹ Ga	-48.830±0.570	⁷³ As	-71.470±0.080	⁸⁰ Br	-76.560±0.170	⁸⁹ Rb	-81.870±0.190	¹⁰⁰ Y	-67.030±0.280
⁸¹ Ni	-21.560±2.980	⁶² Ga	-51.580±0.280	⁷⁴ As	-71.390±0.120	⁸¹ Br	-78.330±0.160	⁹⁰ Rb	-78.980±0.160	¹⁰¹ Y	-65.340±0.430
⁸⁴ Ni	-2.750±5.930	⁶³ Ga	-56.820±0.190	⁷⁵ As	-73.450±0.100	⁸² Br	-77.500±0.130	⁹¹ Rb	-78.180±0.140	¹⁰² Y	-61.080±0.660
⁵⁴ Cu	-21.580±0.520 †	⁶⁴ Ga	-58.640±0.140	⁷⁶ As	-72.550±0.080	⁸³ Br	-78.770±0.140	⁹² Rb	-74.650±0.130	¹⁰³ Y	-58.790±1.010
⁵⁵ Cu	-32.470±0.230 †	⁶⁵ Ga	-62.960±0.120	⁷⁷ As	-73.960±0.080	⁸⁴ Br	-77.040±0.160	⁹³ Rb	-73.250±0.160	¹⁰⁴ Y	-53.810±1.520
⁵⁶ Cu	-38.620±0.240	⁶⁶ Ga	-63.810±0.120	⁷⁸ As	-72.610±0.090	⁸⁵ Br	-78.060±0.120	⁹⁴ Rb	-68.940±0.150	¹⁰⁵ Y	-50.640±2.270
⁵⁷ Cu	-46.440±0.280	⁶⁷ Ga	-66.960±0.160	⁷⁹ As	-73.580±0.120	⁸⁶ Br	-75.360±0.130	⁹⁵ Rb	-66.770±0.170	¹⁰⁶ Y	-44.950±3.030
⁵⁸ Cu	-51.140±0.260	⁶⁸ Ga	-66.780±0.220	⁸⁰ As	-72.710±0.190	⁸⁷ Br	-74.830±0.180	⁹⁶ Rb	-61.950±0.190	¹⁰⁷ Y	-41.010±4.020
⁵⁹ Cu	-56.370±0.160	⁶⁹ Ga	-68.620±0.090	⁸¹ As	-72.780±0.150	⁸⁸ Br	-71.510±0.280	⁹⁷ Rb	-59.240±0.200	⁷⁶ Zr	-35.400±3.570
⁶⁰ Cu	-57.960±0.110	⁷⁰ Ga	-68.060±0.090	⁸² As	-69.950±0.130	⁸⁹ Br	-68.410±0.350	⁹⁸ Rb	-53.940±0.280	⁷⁷ Zr	-38.640±2.300
⁶¹ Cu	-61.920±0.120	⁷¹ Ga	-70.000±0.070	⁸³ As	-69.470±0.150	⁹⁰ Br	-64.500±0.290	⁹⁹ Rb	-50.740±0.440	⁷⁸ Zr	-44.660±1.490
⁶² Cu	-62.660±0.110	⁷² Ga	-68.850±0.070	⁸⁴ As	-65.290±0.210	⁹¹ Br	-62.810±0.260	¹⁰⁰ Rb	-46.130±1.900	⁷⁹ Zr	-47.980±0.970
⁶³ Cu	-66.030±0.230	⁷³ Ga	-70.110±0.080	⁸⁵ As	-63.960±0.270	⁹² Br	-57.440±0.300	¹⁰¹ Rb	-42.900±2.450	⁸⁰ Zr	-56.170±0.580
⁶⁴ Cu	-65.130±0.140	⁷⁴ Ga	-68.410±0.110	⁸⁶ As	-60.020±0.350	⁹³ Br	-54.290±0.400	¹⁰² Rb	-36.250±3.660	⁸¹ Zr	-58.920±0.360
⁶⁵ Cu	-67.030±0.100	⁷⁵ Ga	-68.690±0.090	⁸⁷ As	-58.570±0.480	⁹⁴ Br	-49.830±0.600	⁷² Sr	-36.790±3.840	⁸² Zr	-64.080±0.250
⁶⁶ Cu	-65.580±0.130	⁷⁶ Ga	-66.350±0.100	⁸⁸ As	-53.990±0.670	⁹⁵ Br	-46.920±0.710	⁷³ Sr	-38.870±1.760	⁸³ Zr	-66.480±0.220
⁶⁷ Cu	-67.120±0.120	⁷⁷ Ga	-66.360±0.130	⁸⁹ As	-50.760±0.930	⁹⁶ Br	-41.420±1.240	⁷⁴ Sr	-44.990±0.810	⁸⁴ Zr	-70.400±0.330
⁶⁸ Cu	-65.500±0.180	⁷⁸ Ga	-63.430±0.170	⁹⁰ As	-44.890±1.270	⁹⁷ Br	-37.860±1.660	⁷⁵ Sr	-48.570±0.520	⁸⁵ Zr	-73.030±0.200
⁶⁹ Cu	-65.130±0.100	⁷⁹ Ga	-62.830±0.240	⁹¹ As	-41.340±1.790	⁹⁸ Br	-31.810±2.190	⁷⁶ Sr	-54.460±0.330	⁸⁶ Zr	-78.010±0.150
⁷⁰ Cu	-62.920±0.090	⁸⁰ Ga	-58.810±0.270	⁹² As	-35.230±2.560	⁹⁹ Br	-27.880±3.310	⁷⁷ Sr	-57.300±0.210	⁸⁷ Zr	-79.300±0.180
⁷¹ Cu	-63.120±0.100	⁸¹ Ga	-57.450±0.210	⁹³ As	-31.430±3.630	⁶⁷ Kr	-28.570±6.230	⁷⁸ Sr	-62.410±0.160	⁸⁸ Zr	-82.900±0.250
⁷² Cu	-60.190±0.110	⁸² Ga	-52.910±0.360	⁹⁴ As	-27.420±5.110	⁶⁸ Kr	-33.350±4.150	⁷⁹ Sr	-64.820±0.160	⁸⁹ Zr	-84.640±0.230
⁷³ Cu	-59.460±0.180	⁸³ Ga	-50.620±0.590	⁹⁵ As	-23.440±6.620	⁶⁹ Kr	-39.970±2.180	⁸⁰ Sr	-69.120±0.260	⁹⁰ Zr	-87.540±0.150
⁷⁴ Cu	-56.080±0.260	⁸⁴ Ga	-43.610±0.910	⁶³ Se	-26.470±4.260	⁷⁰ Kr	-46.290±1.600	⁸¹ Sr	-71.170±0.170	⁹¹ Zr	-87.570±0.150
⁷⁵ Cu	-54.740±0.430	⁸⁵ Ga	-41.920±1.180	⁶⁴ Se	-33.240±2.780	⁷¹ Kr	-49.000±0.710	⁸² Sr	-75.550±0.140	⁹² Zr	-88.700±0.130
⁷⁶ Cu	-50.200±0.730	⁸⁶ Ga	-35								

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁰¹ Zr	-73.290±0.110	¹⁰⁶ Mo	-76.440±0.120	¹⁰⁴ Ru	-88.110±0.080	⁹² Pd	-63.290±4.070	¹²⁹ Ag	-52.150±1.140	¹²⁸ In	-74.390±0.110
¹⁰² Zr	-72.060±0.130	¹⁰⁷ Mo	-73.140±0.140	¹⁰⁵ Ru	-86.160±0.100	⁹³ Pd	-63.780±2.020	¹³⁰ Ag	-46.820±1.700	¹²⁹ In	-73.390±0.150
¹⁰³ Zr	-68.370±0.190	¹⁰⁸ Mo	-71.730±0.250	¹⁰⁶ Ru	-86.220±0.100	⁹⁴ Pd	-68.720±1.040			¹³⁰ In	-69.860±0.240
¹⁰⁴ Zr	-66.790±0.280	¹⁰⁹ Mo	-67.920±0.340	¹⁰⁷ Ru	-83.840±0.100	⁹⁵ Pd	-71.110±0.660	⁹⁵ Cd	-60.560±6.340	¹³¹ In	-69.350±0.490
¹⁰⁵ Zr	-62.790±0.420	¹¹⁰ Mo	-66.070±0.560	¹⁰⁸ Ru	-83.530±0.110	⁹⁶ Pd	-75.620±0.410	⁹⁶ Cd	-63.900±4.220	¹³² In	-64.810±0.750
¹⁰⁶ Zr	-59.920±1.070	¹¹¹ Mo	-58.330±1.510	¹⁰⁹ Ru	-80.810±0.130	⁹⁷ Pd	-77.430±0.300	⁹⁷ Cd	-65.360±2.810	¹³³ In	-61.480±1.060
¹⁰⁷ Zr	-55.150±1.440	¹¹² Mo	-56.910±1.900	¹¹⁰ Ru	-80.110±0.150	⁹⁸ Pd	-80.930±0.220	⁹⁸ Cd	-69.380±1.890	¹³⁴ In	-51.510±2.130 †
¹⁰⁸ Zr	-52.310±1.930	¹¹³ Mo	-52.780±2.420	¹¹¹ Ru	-75.590±0.400	⁹⁹ Pd	-82.130±0.280	⁹⁹ Cd	-71.060±1.300	¹³⁵ In	-49.110±2.120
¹⁰⁹ Zr	-46.890±2.570	¹¹⁴ Mo	-49.300±3.320	¹¹² Ru	-74.270±0.400	¹⁰⁰ Pd	-84.980±0.120	¹⁰⁰ Cd	-72.840±0.220	¹³⁶ In	-42.100±2.770
¹¹⁰ Zr	-41.910±4.180	¹¹⁵ Mo	-46.020±3.860	¹¹³ Ru	-71.110±0.540	¹⁰¹ Pd	-85.410±0.090	¹⁰¹ Cd	-74.970±0.150	¹³⁷ In	-36.590±3.570
		¹¹⁶ Mo	-43.830±4.740	¹¹⁴ Ru	-69.940±0.720	¹⁰² Pd	-87.840±0.080	¹⁰² Cd	-79.000±0.110	¹³⁸ In	-28.620±4.600
⁷⁷ Nb	-28.250±4.810	¹¹⁷ Mo	-39.430±5.790	¹¹⁵ Ru	-66.010±0.980	¹⁰³ Pd	-87.650±0.070	¹⁰³ Cd	-80.360±0.090		
⁷⁸ Nb	-31.430±3.110	¹²⁰ Mo	-12.180±5.030	¹¹⁶ Ru	-64.250±1.370	¹⁰⁴ Pd	-89.420±0.090	¹⁰⁴ Cd	-83.640±0.090	⁹⁹ Sn	-57.760±5.320
⁷⁹ Nb	-37.590±2.030	¹²¹ Mo	-2.910±6.240	¹¹⁷ Ru	-60.480±1.770	¹⁰⁵ Pd	-88.570±0.110	¹⁰⁵ Cd	-84.290±0.100	¹⁰⁰ Sn	-56.260±2.860 †
⁸⁰ Nb	-46.010±1.220			¹¹⁸ Ru	-58.730±2.250	¹⁰⁶ Pd	-89.800±0.070	¹⁰⁶ Cd	-86.950±0.080	¹⁰¹ Sn	-59.210±2.170
⁸¹ Nb	-51.520±0.840	⁸⁴ Tc	-45.070±1.560	¹¹⁹ Ru	-54.680±2.960	¹⁰⁷ Pd	-88.580±0.070	¹⁰⁷ Cd	-87.000±0.070	¹⁰² Sn	-63.630±1.170
⁸² Nb	-54.490±0.580	⁸⁵ Tc	-51.520±1.190	¹²⁰ Ru	-50.530±1.090	¹⁰⁸ Pd	-89.260±0.070	¹⁰⁸ Cd	-88.970±0.070	¹⁰³ Sn	-66.000±0.630
⁸³ Nb	-59.950±0.430	⁸⁶ Tc	-54.310±0.820	¹²¹ Ru	-43.760±1.370	¹⁰⁹ Pd	-87.470±0.090	¹⁰⁹ Cd	-88.450±0.090	¹⁰⁴ Sn	-70.590±0.330
⁸⁴ Nb	-60.840±0.440	⁸⁷ Tc	-59.910±0.640	¹²² Ru	-39.820±1.920	¹¹⁰ Pd	-87.670±0.120	¹¹⁰ Cd	-89.880±0.090	¹⁰⁵ Sn	-72.690±0.180
⁸⁵ Nb	-66.500±0.320	⁸⁸ Tc	-63.150±0.540	¹²³ Ru	-33.320±2.700	¹¹¹ Pd	-86.100±0.180	¹¹¹ Cd	-89.530±0.130	¹⁰⁶ Sn	-76.760±0.130
⁸⁶ Nb	-69.530±0.220	⁸⁹ Tc	-67.730±1.080	¹²⁴ Ru	-31.430±3.830	¹¹² Pd	-86.110±0.160	¹¹² Cd	-90.480±0.150	¹⁰⁷ Sn	-78.220±0.090
⁸⁷ Nb	-74.910±0.210	⁹⁰ Tc	-74.130±0.530	¹²⁵ Ru	-21.420±4.550 †	¹¹³ Pd	-83.680±0.150	¹¹³ Cd	-89.340±0.090	¹⁰⁸ Sn	-81.670±0.090
⁸⁸ Nb	-76.320±0.310	⁹¹ Tc	-78.050±0.270	¹²⁶ Ru	-15.200±5.840 ‡	¹¹⁴ Pd	-83.180±0.140	¹¹⁴ Cd	-90.130±0.090	¹⁰⁹ Sn	-82.560±0.090
⁸⁹ Nb	-81.170±0.280	⁹² Tc	-79.430±0.180			¹¹⁵ Pd	-80.520±0.190	¹¹⁵ Cd	-88.510±0.120	¹¹⁰ Sn	-85.330±0.090
⁹⁰ Nb	-82.400±0.190	⁹³ Tc	-82.990±0.180	⁸⁴ Rh	-30.260±4.850	¹¹⁶ Pd	-79.750±0.230	¹¹⁶ Cd	-88.650±0.110	¹¹¹ Sn	-85.350±0.170
⁹¹ Nb	-85.630±0.130	⁹⁴ Tc	-83.830±0.200	⁸⁵ Rh	-35.360±3.770	¹¹⁷ Pd	-76.650±0.300	¹¹⁷ Cd	-86.580±0.100	¹¹² Sn	-87.870±0.110
⁹² Nb	-86.010±0.130	⁹⁵ Tc	-86.350±0.160	⁸⁶ Rh	-38.610±2.940	¹¹⁸ Pd	-75.520±0.460	¹¹⁸ Cd	-86.460±0.140	¹¹³ Sn	-87.900±0.080
⁹³ Nb	-87.580±0.140	⁹⁶ Tc	-86.150±0.150	⁸⁷ Rh	-44.810±2.290	¹¹⁹ Pd	-72.190±0.670	¹¹⁹ Cd	-84.010±0.200	¹¹⁴ Sn	-89.780±0.090
⁹⁴ Nb	-86.500±0.210	⁹⁷ Tc	-87.890±0.160	⁸⁸ Rh	-46.640±1.610	¹²⁰ Pd	-71.750±0.250	¹²⁰ Cd	-83.130±0.140	¹¹⁵ Sn	-89.330±0.110
⁹⁵ Nb	-87.530±0.160	⁹⁸ Tc	-86.840±0.210	⁸⁹ Rh	-56.150±4.850	¹²¹ Pd	-69.100±0.250	¹²¹ Cd	-80.990±0.110	¹¹⁶ Sn	-90.810±0.100
⁹⁶ Nb	-85.720±0.130	⁹⁹ Tc	-85.770±0.280	⁹⁰ Rh	-59.530±3.560	¹²² Pd	-66.770±0.280	¹²² Cd	-80.980±0.100	¹¹⁷ Sn	-89.880±0.090
⁹⁷ Nb	-85.820±0.140	¹⁰⁰ Tc	-86.080±0.090	⁹¹ Rh	-65.420±2.610	¹²³ Pd	-62.220±0.350	¹²³ Cd	-78.830±0.110	¹¹⁸ Sn	-90.840±0.120
⁹⁸ Nb	-83.440±0.150	¹⁰¹ Tc	-86.700±0.090	⁹² Rh	-66.490±1.270	¹²⁴ Pd	-59.620±0.470	¹²⁴ Cd	-77.190±0.120	¹¹⁹ Sn	-89.350±0.140
⁹⁹ Nb	-83.030±0.220	¹⁰² Tc	-84.790±0.080	⁹³ Rh	-70.550±0.630	¹²⁵ Pd	-55.730±0.670	¹²⁵ Cd	-73.910±0.190	¹²⁰ Sn	-91.070±0.170
¹⁰⁰ Nb	-79.450±0.130	¹⁰³ Tc	-85.010±0.070	⁹⁴ Rh	-73.160±0.380	¹²⁶ Pd	-53.000±1.270	¹²⁶ Cd	-72.970±0.200	¹²¹ Sn	-89.330±0.120
¹⁰¹ Nb	-79.190±0.100	¹⁰⁴ Tc	-82.760±0.080	⁹⁵ Rh	-77.590±0.210	¹²⁷ Pd	-47.230±1.650	¹²⁷ Cd	-69.800±0.220	¹²² Sn	-89.600±0.090
¹⁰² Nb	-76.330±0.090	¹⁰⁵ Tc	-82.440±0.070	⁹⁶ Rh	-79.220±0.180	¹²⁸ Pd	-43.200±2.150	¹²⁸ Cd	-68.430±0.320	¹²³ Sn	-87.730±0.080
¹⁰³ Nb	-75.410±0.090	¹⁰⁶ Tc	-79.760±0.080	⁹⁷ Rh	-82.530±0.160	¹²⁹ Pd	-36.750±2.780	¹²⁹ Cd	-64.000±0.450	¹²⁴ Sn	-87.910±0.090
¹⁰⁴ Nb	-72.060±0.120	¹⁰⁷ Tc	-79.170±0.100	⁹⁸ Rh	-83.340±0.190	¹³⁰ Pd	-31.490±4.200	¹³⁰ Cd	-61.790±0.670	¹²⁵ Sn	-86.000±0.100
¹⁰⁵ Nb	-70.860±0.160	¹⁰⁸ Tc	-76.180±0.110	⁹⁹ Rh	-86.190±0.240			¹³¹ Cd	-59.760±1.250	¹²⁶ Sn	-85.730±0.100
¹⁰⁶ Nb	-67.220±0.220	¹⁰⁹ Tc	-75.160±0.150	¹⁰⁰ Rh	-85.660±0.090	⁹³ Ag	-59.300±6.260	¹³² Cd	-56.160±1.710	¹²⁷ Sn	-83.290±0.090
¹⁰⁷ Nb	-65.260±0.500	¹¹⁰ Tc	-71.720±0.220	¹⁰¹ Rh	-87.700±0.080	⁹⁴ Ag	-60.330±3.180	¹³⁵ Cd	-34.600±3.990	¹²⁸ Sn	-82.800±0.100
¹⁰⁸ Nb	-61.050±0.690	¹¹¹ Tc	-67.310±0.730	¹⁰² Rh	-87.080±0.070	⁹⁵ Ag	-64.700±2.090	¹³⁶ Cd	-28.500±5.080	¹²⁹ Sn	-80.180±0.110
¹⁰⁹ Nb	-58.860±0.930	¹¹² Tc	-63.830±0.950	¹⁰³ Rh	-88.450±0.070	⁹⁶ Ag	-66.810±1.370	¹³⁷ Cd	-19.890±6.480 †	¹³⁰ Sn	-79.460±0.140
¹¹⁰ Nb	-53.800±1.540	¹¹³ Tc	-62.380±1.250	¹⁰⁴ Rh	-87.250±0.070	⁹⁷ Ag	-71.210±0.890			¹³¹ Sn	-76.640±0.370
¹¹¹ Nb	-47.970±2.840	¹¹⁴ Tc	-58.590±1.640	¹⁰⁵ Rh	-88.090±0.070	⁹⁸ Ag	-73.070±0.620	⁹⁷ In	-59.110±5.770	¹³² Sn	-74.820±0.300
¹¹² Nb	-43.920±3.480	¹¹⁵ Tc	-56.300±2.210	¹⁰⁶ Rh	-86.560±0.080	⁹⁹ Ag	-76.570±0.310	⁹⁸ In	-60.410±3.890	¹³³ Sn	-70.510±0.410
¹¹³ Nb	-37.780±5.270	¹¹⁶ Tc	-52.320±2.780	¹⁰⁷ Rh	-86.920±0.070	¹⁰⁰ Ag	-77.630±0.150	⁹⁹ In	-64.450±2.640	¹³⁴ Sn	-67.730±0.640
¹¹⁴ Nb	-32.260±6.540	¹¹⁷ Tc	-50.390±3.460	¹⁰⁸ Rh	-84.850±0.080	¹⁰¹ Ag	-81.210±0.110	¹⁰⁰ In	-63.230±1.430 †	¹³⁵ Sn	-60.930±1.040
¹¹⁵ Nb	-34.370±6.380	¹¹⁸ Tc	-46.240±4.280	¹⁰⁹ Rh	-84.830±0.100	¹⁰² Ag	-82.110±0.080	¹⁰¹ In	-67.640±0.760	¹³⁶ Sn	-56.920±1.400
		¹¹⁹ Tc	-44.140±5.260	¹¹⁰ Rh	-82.460±0.130	¹⁰³ Ag	-84.970±0.080	¹⁰² In	-69.780±0.400	¹³⁷ Sn	-50.460±1.870
⁷⁹ Mo	-26.510±4.170	¹²⁰ Tc	-31.250±2.350 †	¹¹¹ Rh	-81.890±0.320	¹⁰⁴ Ag	-85.230±0.080	¹⁰³ In	-74.040±0.220	¹³⁸ Sn	-45.520±2.470
⁸² Mo	-42.350±2.290 †	¹²¹ Tc	-25.620±2.940 ‡	¹¹² Rh	-79.020±0.260	¹⁰⁵ Ag	-87.490±0.120	¹⁰⁴ In	-75.740±0.130	¹³⁹ Sn	-38.140±3.230
⁸³ Mo	-49.020±1.330	¹²² Tc	-18.170±4.100	¹¹³ Rh	-78.110±0.230	¹⁰⁶ Ag	-87.060±0.090	¹⁰⁵ In	-79.410±0.100	¹⁴⁰ Sn	-34.450±3.910
⁸⁴ Mo	-56.450±0.840	¹²³ Tc	-20.710±6.020	¹¹⁴ Rh	-75.280±0.340	¹⁰⁷ Ag	-88.630±0.070	¹⁰⁶ In	-80.490±0.090	¹⁴¹ Sn	-27.150±4.890
⁸⁵ Mo	-59.470±0.540			¹¹⁵ Rh	-74.140±0.480	¹⁰⁸ Ag	-87.740±0.070	¹⁰⁷ In	-83.520±0.090	¹⁴² Sn	-21.380±6.750
⁸⁶ Mo	-65.170±0.370	⁸⁴ Ru	-39.310±2.780	¹¹⁶ Rh	-70.690±0.590	¹⁰⁹ Ag	-88.790±0.080	¹⁰⁸ In	-83.990±0.090	¹⁰¹ Sb	-49.700±4.270 ‡
⁸⁷ Mo	-68.420±0.300	⁸⁵ Ru	-42.880±2.150	¹¹⁷ Rh	-69.240±0.820	¹¹⁰ Ag	-87.360±0.110	¹⁰⁹ In	-86.370±0.100	¹⁰² Sb	-52.680±3.250
⁸⁸ Mo	-74.100±0.330	⁸⁶ Ru	-49.260±1.660	¹¹⁸ Rh	-65.710±1.130	¹¹¹ Ag	-88.340±0.210	¹¹⁰ In	-86.250±0.110	¹⁰³ Sb	-56.890±1.780
⁸⁹ Mo	-76.590±0.330	⁸⁷ Ru	-51.670±1.170	¹¹⁹ Rh	-64.110±1.500	¹¹² Ag	-86.820±0.140	¹¹¹ In	-88.500±0.160	¹⁰⁴ Sb	-59.390±0.970
⁹⁰ Mo	-80.770±0.230	⁸⁸ Ru	-57.080±0.990	¹²⁰ Rh	-61.850±0.510	¹¹³ Ag	-87.240±0.110	¹¹² In	-88.070±0.100	¹⁰⁵ Sb	-64.280±0.520
⁹¹ Mo	-82.190±0.170	⁸⁹ Ru	-64.160±2.280	¹²¹ Rh	-58.990±0.650	¹¹⁴ Ag	-85.240±0.120	¹¹³ In	-89.500±0.090	¹⁰⁶ Sb	-66.800±0.350
⁹² Mo	-85.660±0.140	⁹⁰ Ru	-70.270±1.660	¹²² Rh	-53.810±0.890	¹¹⁵ Ag	-85.160±0.140	¹¹⁴ In	-88.720±0.100	¹⁰⁷ Sb	-71.240±0.240
⁹³ Mo	-86.320±0.150	⁹¹ Ru	-71.610±0.790	¹²³ Rh	-50.450±1.250	¹¹⁶ Ag	-82.790±0.120	¹¹⁵ In	-89.890±0.130	¹⁰⁸ Sb	-73.040±0.110
⁹⁴ Mo	-88.200±0.160	⁹² Ru	-75.670±0.380	¹²⁴ Rh	-44.660±1.770	¹¹⁷ Ag	-82.370±0.120	¹¹⁶ In	-88.550±0.100	¹⁰⁹ Sb	-76.910±0.110
⁹⁵ Mo	-87.750±0.140	⁹³ Ru	-77.340±0.210	¹²⁵ Rh	-41.650±2.490	¹¹⁸ Ag	-79.630±0.160	¹¹⁷ In	-89.110±0.1		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹²⁰ Sb	-88.050±0.110	¹⁰⁹ I	-60.920±0.900	¹⁴¹ Xe	-68.720±0.230	¹⁴⁰ Ba	-82.670±0.190	¹⁴⁴ Ce	-80.660±0.150	¹⁴² Nd	-84.730±0.130
¹²¹ Sb	-89.970±0.110	¹¹⁰ I	-62.940±0.290	¹⁴² Xe	-66.170±0.230	¹⁴¹ Ba	-79.410±0.160	¹⁴⁵ Ce	-77.470±0.150	¹⁴³ Nd	-83.480±0.130
¹²² Sb	-88.510±0.080	¹¹¹ I	-64.950±0.370 †	¹⁴³ Xe	-61.140±0.230	¹⁴² Ba	-77.860±0.140	¹⁴⁶ Ce	-75.930±0.140	¹⁴⁴ Nd	-83.550±0.150
¹²³ Sb	-89.010±0.070	¹¹² I	-67.360±0.220	¹⁴⁴ Xe	-57.830±0.300	¹⁴³ Ba	-74.130±0.130	¹⁴⁷ Ce	-72.290±0.130	¹⁴⁵ Nd	-81.440±0.200
¹²⁴ Sb	-87.330±0.070	¹¹³ I	-71.600±0.140	¹⁴⁵ Xe	-53.160±0.410	¹⁴⁴ Ba	-72.070±0.160	¹⁴⁸ Ce	-70.310±0.150	¹⁴⁶ Nd	-81.040±0.160
¹²⁵ Sb	-87.700±0.080	¹¹⁴ I	-73.240±0.210	¹⁴⁶ Xe	-49.360±0.530	¹⁴⁵ Ba	-67.870±0.140	¹⁴⁹ Ce	-66.190±0.210	¹⁴⁷ Nd	-78.450±0.130
¹²⁶ Sb	-86.600±0.070	¹¹⁵ I	-76.530±0.270	¹⁴⁷ Xe	-43.180±1.010	¹⁴⁶ Ba	-65.290±0.150	¹⁵⁰ Ce	-63.720±0.290	¹⁴⁸ Nd	-77.450±0.140
¹²⁷ Sb	-86.640±0.070	¹¹⁶ I	-77.890±0.160	¹⁴⁸ Xe	-39.050±1.340	¹⁴⁷ Ba	-60.510±0.180	¹⁵¹ Ce	-61.530±1.060	¹⁴⁹ Nd	-74.520±0.150
¹²⁸ Sb	-84.520±0.070	¹¹⁷ I	-81.100±0.110	¹⁴⁹ Xe	-32.750±1.770	¹⁴⁸ Ba	-57.350±0.230	¹⁵² Ce	-59.490±1.400	¹⁵⁰ Nd	-73.220±0.220
¹²⁹ Sb	-84.350±0.100	¹¹⁸ I	-81.630±0.130	¹⁵⁰ Xe	-27.470±2.720	¹⁴⁹ Ba	-51.950±0.350	¹⁵³ Ce	-55.330±1.840	¹⁵¹ Nd	-71.220±0.130
¹³⁰ Sb	-82.100±0.150	¹¹⁹ I	-84.100±0.180	¹⁰⁹ Cs	-41.140±4.500 †	¹⁵⁰ Ba	-48.290±0.490	¹⁵⁴ Ce	-52.770±2.400	¹⁵² Nd	-70.330±0.140
¹³¹ Sb	-82.530±0.370	¹²⁰ I	-84.180±0.150	¹¹⁰ Cs	-43.850±3.150 †	¹⁵¹ Ba	-44.810±3.780	¹⁵⁵ Ce	-48.060±3.120	¹⁵³ Nd	-67.310±0.270
¹³² Sb	-79.140±0.250	¹²¹ I	-86.310±0.110	¹¹⁴ Cs	-53.410±0.740 †	¹⁵² Ba	-41.490±4.550	¹⁵⁶ Ce	-45.050±3.840	¹⁵⁴ Nd	-66.030±0.380
¹³³ Sb	-77.620±0.230	¹²² I	-86.280±0.080	¹¹⁵ Cs	-59.050±0.410 †	¹¹⁹ La	-51.480±0.570 †	¹⁵⁷ Ce	-39.880±4.710	¹⁵⁵ Nd	-62.740±0.510
¹³⁴ Sb	-73.610±0.320	¹²³ I	-88.330±0.080	¹¹⁶ Cs	-61.560±0.230	¹²⁰ La	-56.420±1.620	¹¹⁵ Pr	-2.320±5.990	¹⁵⁶ Nd	-60.990±0.800
¹³⁵ Sb	-70.030±0.510	¹²⁴ I	-87.650±0.080	¹¹⁷ Cs	-66.010±0.160	¹²¹ La	-60.750±1.180	¹¹⁶ Pr	-7.250±4.560 †	¹⁵⁷ Nd	-57.080±1.250
¹³⁶ Sb	-65.080±0.570	¹²⁵ I	-88.780±0.120	¹¹⁸ Cs	-68.100±0.160	¹²² La	-62.850±0.830	¹²¹ Pr	-39.020±5.310 †	¹⁵⁸ Nd	-55.010±1.560
¹³⁷ Sb	-61.360±0.820	¹²⁶ I	-88.570±0.090	¹¹⁹ Cs	-72.050±0.230	¹²³ La	-67.170±0.500	¹²² Pr	-41.860±3.960 †	¹⁵⁹ Nd	-50.710±2.120
¹³⁸ Sb	-55.210±1.140	¹²⁷ I	-89.050±0.070	¹²⁰ Cs	-73.800±0.260	¹²⁴ La	-69.090±0.380	¹²³ Pr	-46.640±2.960 †	¹⁶⁰ Nd	-45.690±2.950
¹³⁹ Sb	-51.020±1.560	¹²⁸ I	-88.150±0.070	¹²¹ Cs	-77.160±0.150	¹²⁵ La	-73.420±0.340	¹²⁴ Pr	-49.200±2.190 †	¹⁶¹ Nd	-41.100±3.580
¹⁴⁰ Sb	-45.160±1.820	¹²⁹ I	-88.910±0.070	¹²² Cs	-78.150±0.110	¹²⁶ La	-74.280±0.230	¹²⁵ Pr	-55.940±1.270	¹⁶² Nd	-38.350±4.700
¹⁴¹ Sb	-40.450±2.300	¹³⁰ I	-87.410±0.100	¹²³ Cs	-80.980±0.100	¹²⁷ La	-77.080±0.160	¹²⁶ Pr	-58.130±0.920 †	¹²⁵ Pm	-34.050±6.090 †
¹⁴² Sb	-33.680±3.210	¹³¹ I	-88.570±0.250	¹²⁴ Cs	-81.530±0.100	¹²⁸ La	-78.300±0.180	¹²⁷ Pr	-62.060±0.680	¹²⁶ Pm	-36.080±4.840 †
¹⁴³ Sb	-28.430±4.460	¹³² I	-86.740±0.200	¹²⁵ Cs	-84.010±0.120	¹²⁹ La	-81.190±0.190	¹²⁸ Pr	-63.660±0.500	¹²⁸ Pm	-44.220±2.340 †
¹⁴⁴ Sb	-24.560±6.050	¹³³ I	-86.540±0.180	¹²⁶ Cs	-84.200±0.090	¹³⁰ La	-81.700±0.210	¹²⁹ Pr	-67.070±0.370	¹²⁹ Pm	-48.960±1.680
¹⁰³ Te	-48.450±4.800	¹³⁴ I	-83.930±0.210	¹²⁷ Cs	-86.200±0.080	¹³¹ La	-83.010±0.410	¹³⁰ Pr	-69.510±0.390	¹³⁰ Pm	-51.360±1.230
¹⁰⁴ Te	-52.110±2.660	¹³⁵ I	-82.650±0.200	¹²⁸ Cs	-85.940±0.090	¹³² La	-83.590±0.280	¹³¹ Pr	-72.220±1.000	¹³¹ Pm	-56.550±3.790
¹⁰⁵ Te	-54.580±1.460	¹³⁶ I	-79.180±0.190	¹²⁹ Cs	-87.570±0.100	¹³³ La	-85.810±0.200	¹³² Pr	-73.650±0.640	¹³² Pm	-59.630±2.890
¹⁰⁶ Te	-59.850±1.000	¹³⁷ I	-77.330±0.200	¹³⁰ Cs	-87.050±0.140	¹³⁴ La	-85.640±0.200	¹³³ Pr	-77.390±0.420	¹³³ Pm	-64.220±2.160
¹⁰⁷ Te	-62.650±0.690	¹³⁸ I	-73.130±0.260	¹³¹ Cs	-88.270±0.260	¹³⁵ La	-87.340±0.220	¹³⁴ Pr	-78.600±0.330	¹³⁴ Pm	-66.360±1.570
¹⁰⁸ Te	-67.410±0.470	¹³⁹ I	-70.350±0.360	¹³² Cs	-87.490±0.250	¹³⁶ La	-86.540±0.190	¹³⁵ Pr	-81.010±0.260	¹³⁵ Pm	-69.820±1.010
¹⁰⁹ Te	-69.410±0.170	¹⁴⁰ I	-64.330±0.360	¹³³ Cs	-88.720±0.190	¹³⁷ La	-87.410±0.180	¹³⁶ Pr	-81.510±0.230	¹³⁶ Pm	-71.460±0.680
¹¹⁰ Te	-73.670±0.150	¹⁴¹ I	-61.430±0.380	¹³⁴ Cs	-87.490±0.190	¹³⁸ La	-85.990±0.230	¹³⁷ Pr	-83.500±0.210	¹³⁷ Pm	-74.720±0.420
¹¹¹ Te	-73.710±0.210	¹⁴² I	-56.040±0.410	¹³⁵ Cs	-87.830±0.200	¹³⁹ La	-85.680±0.260	¹³⁸ Pr	-83.100±0.230	¹³⁸ Pm	-75.670±0.310
¹¹² Te	-77.500±0.160	¹⁴³ I	-52.350±0.540	¹³⁶ Cs	-85.950±0.180	¹⁴⁰ La	-84.120±0.300	¹³⁹ Pr	-84.290±0.290	¹³⁹ Pm	-77.990±0.410
¹¹³ Te	-78.830±0.140	¹⁴⁴ I	-46.490±0.740	¹³⁷ Cs	-85.340±0.160	¹⁴¹ La	-83.220±0.220	¹⁴⁰ Pr	-84.230±0.230	¹⁴⁰ Pm	-79.430±0.280
¹¹⁴ Te	-82.100±0.140	¹⁴⁵ I	-43.350±1.010	¹³⁸ Cs	-82.360±0.200	¹⁴² La	-80.150±0.180	¹⁴¹ Pr	-84.990±0.150	¹⁴¹ Pm	-81.260±0.190
¹¹⁵ Te	-82.780±0.130	¹⁴⁶ I	-36.590±2.030	¹³⁹ Cs	-80.970±0.300	¹⁴³ La	-78.770±0.150	¹⁴² Pr	-83.510±0.150	¹⁴² Pm	-80.840±0.140
¹¹⁶ Te	-85.560±0.110	¹⁴⁷ I	-31.940±2.650	¹⁴⁰ Cs	-76.320±0.260	¹⁴⁴ La	-75.230±0.160	¹⁴³ Pr	-83.260±0.130	¹⁴³ Pm	-82.060±0.120
¹¹⁷ Te	-85.790±0.090	¹⁴⁸ I	-25.080±3.450	¹⁴¹ Cs	-74.590±0.200	¹⁴⁵ La	-73.370±0.190	¹⁴⁴ Pr	-80.830±0.160	¹⁴⁴ Pm	-81.060±0.130
¹¹⁸ Te	-87.950±0.100	¹⁴⁹ I	-19.770±4.460	¹⁴² Cs	-70.670±0.160	¹⁴⁶ La	-69.350±0.190	¹⁴⁵ Pr	-80.090±0.200	¹⁴⁵ Pm	-81.450±0.140
¹¹⁹ Te	-87.750±0.130	¹⁵⁰ I	-11.290±6.730 †	¹⁴³ Cs	-68.400±0.170	¹⁴⁷ La	-66.980±0.200	¹⁴⁶ Pr	-77.250±0.150	¹⁴⁶ Pm	-79.710±0.140
¹²⁰ Te	-88.720±0.130	¹⁰⁷ Xe	-44.130±4.880	¹⁴⁴ Cs	-63.670±0.180	¹⁴⁸ La	-62.450±0.240	¹⁴⁷ Pr	-76.000±0.130	¹⁴⁷ Pm	-79.570±0.130
¹²¹ Te	-88.530±0.090	¹⁰⁸ Xe	-48.810±3.400	¹⁴⁵ Cs	-61.190±0.260	¹⁴⁹ La	-59.530±0.300	¹⁴⁸ Pr	-72.720±0.140	¹⁴⁸ Pm	-77.230±0.140
¹²² Te	-90.480±0.090	¹⁰⁹ Xe	-51.510±2.370	¹⁴⁶ Cs	-56.160±0.260	¹⁵⁰ La	-54.420±0.410	¹⁴⁹ Pr	-71.090±0.190	¹⁴⁹ Pm	-76.490±0.190
¹²³ Te	-89.360±0.070	¹¹⁰ Xe	-56.460±1.660	¹⁴⁷ Cs	-52.710±0.290	¹⁵¹ La	-54.160±2.090	¹⁵⁰ Pr	-67.330±0.280	¹⁵⁰ Pm	-73.910±0.180
¹²⁴ Te	-90.120±0.080	¹¹¹ Xe	-59.670±0.410	¹⁴⁸ Cs	-46.970±0.510	¹⁵² La	-49.710±2.550	¹⁵¹ Pr	-67.360±0.250	¹⁵¹ Pm	-73.680±0.100
¹²⁵ Te	-88.640±0.110	¹¹² Xe	-62.460±0.270	¹⁴⁹ Cs	-43.270±0.690	¹⁵³ La	-46.680±3.310	¹⁵² Pr	-63.910±0.540	¹⁵² Pm	-71.390±0.090
¹²⁶ Te	-89.700±0.080	¹¹⁴ Xe	-67.110±0.200	¹⁵⁰ Cs	-37.020±1.070	¹⁵⁴ La	-41.480±4.280	¹⁵³ Pr	-62.300±0.730	¹⁵³ Pm	-70.800±0.080
¹²⁷ Te	-88.690±0.070	¹¹⁵ Xe	-68.490±0.330	¹¹⁵ Ba	-46.990±0.860 ‡	¹¹⁵ Ce	-18.160±3.140	¹⁵⁴ Pr	-58.620±0.970	¹⁵⁴ Pm	-68.120±0.140
¹²⁸ Te	-89.060±0.070	¹¹⁶ Xe	-72.660±0.240	¹¹⁶ Ba	-52.730±0.610	¹²⁰ Ce	-47.860±3.400	¹⁵⁵ Pr	-56.610±1.290	¹⁵⁵ Pm	-67.140±0.190
¹²⁹ Te	-87.220±0.090	¹¹⁷ Xe	-74.400±0.160	¹¹⁷ Ba	-55.480±0.400	¹²¹ Ce	-50.500±2.530	¹⁵⁶ Pr	-52.170±1.980	¹⁵⁶ Pm	-64.140±0.310
¹³⁰ Te	-87.290±0.130	¹¹⁸ Xe	-78.000±0.150	¹¹⁸ Ba	-60.200±0.330	¹²² Ce	-55.070±1.870	¹⁵⁷ Pr	-49.680±2.450	¹⁵⁷ Pm	-62.760±0.500
¹³¹ Te	-86.490±0.340	¹¹⁹ Xe	-78.760±0.210	¹¹⁹ Ba	-62.590±0.300	¹²³ Ce	-57.410±1.370	¹⁵⁸ Pr	-45.110±3.020	¹⁵⁸ Pm	-59.280±0.780
¹³² Te	-85.900±0.240	¹²⁰ Xe	-82.110±0.190	¹²⁰ Ba	-67.820±0.720	¹²⁴ Ce	-62.200±0.810	¹⁵⁹ Pr	-41.740±4.050	¹⁵⁹ Pm	-57.490±1.080
¹³³ Te	-82.900±0.200	¹²¹ Xe	-82.680±0.130	¹²¹ Ba	-69.710±0.480	¹²⁵ Ce	-65.740±0.630	¹²³ Nd	-42.240±6.330	¹⁶⁰ Pm	-51.570±1.470
¹³⁴ Te	-81.660±0.240	¹²² Xe	-85.140±0.090	¹²² Ba	-73.530±0.280	¹²⁶ Ce	-69.230±0.470	¹²⁴ Nd	-43.600±4.690	¹⁶¹ Pm	-49.230±1.950
¹³⁵ Te	-77.220±0.350	¹²³ Xe	-85.370±0.080	¹²³ Ba	-74.950±0.210	¹²⁷ Ce	-70.440±0.340	¹²⁵ Nd	-44.490±3.490	¹⁶² Pm	-44.940±2.580
¹³⁶ Te	-75.020±0.330	¹²⁴ Xe	-87.590±0.090	¹²⁴ Ba	-78.150±0.170	¹²⁸ Ce	-73.510±0.250	¹²⁶ Nd	-49.290±2.380	¹⁶³ Pm	-42.370±3.390
¹³⁷ Te	-70.460±0.330	¹²⁵ Xe	-87.410±0.080	¹²⁵ Ba	-79.340±0.150	¹²⁹ Ce	-75.330±0.280	¹²⁷ Nd	-51.800±1.640	¹⁶⁴ Pm	-37.960±4.430
¹³⁸ Te	-66.990±0.570	¹²⁶ Xe	-89.000±0.080	¹²⁶ Ba	-81.930±0.110	¹³⁰ Ce	-78.780±0.310	¹²⁸ Nd	-56.090±1.150	¹²⁷ Sm	-29.190±6.630 ‡
¹³⁹ Te	-61.560±0.720	¹²⁷ Xe	-88.390±0.070	¹²⁷ Ba	-82.590±0.100	¹³¹ Ce	-77.500±0.510	¹²⁹ Nd	-58.060±0.810	¹²⁸ Sm	-34.700±4.590 ‡
¹⁴⁰ Te	-57.880±0.820	¹²⁸ Xe	-89.740±0.070	¹²⁸ Ba	-84.990±0.100	¹³² Ce	-81.020±0.340	¹³⁰ Nd	-61.810±0.590	¹²⁹ Sm	-38.080±3.240
¹⁴¹ Te	-52.030±1.070	¹²⁹ Xe	-88.990±0.090	¹²⁹ Ba	-85.080±0.110	¹³³ Ce	-82.050±0.270	¹³¹ Nd	-65.390±2.030	¹³⁰ Sm	-43.270±2.350
¹⁴² Te	-47.840±										

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁴³ Sm	-79.420±0.170	¹⁴⁷ Gd	-74.710±0.160	¹⁴⁶ Dy	-62.790±0.540	¹⁸² Ho	-12.320±3.290	¹⁷⁶ Tm	-49.230±0.220	¹⁷¹ Lu	-58.010±0.120
¹⁴⁴ Sm	-80.870±0.170	¹⁴⁸ Gd	-76.280±0.140	¹⁴⁷ Dy	-63.970±0.340	¹⁸³ Ho	-8.530±4.140	¹⁷⁷ Tm	-47.690±0.320	¹⁷² Lu	-56.730±0.080
¹⁴⁵ Sm	-80.100±0.190	¹⁴⁹ Gd	-75.620±0.190	¹⁴⁸ Dy	-66.700±0.230	¹⁸⁴ Ho	-2.840±4.790	¹⁷⁸ Tm	-44.180±0.470	¹⁷³ Lu	-57.020±0.060
¹⁴⁶ Sm	-80.860±0.160	¹⁵⁰ Gd	-76.550±0.250	¹⁴⁹ Dy	-67.150±0.230			¹⁷⁹ Tm	-42.150±0.670	¹⁷⁴ Lu	-55.300±0.060
¹⁴⁷ Sm	-79.380±0.150	¹⁵¹ Gd	-73.540±0.130	¹⁵⁰ Dy	-69.500±0.290	¹⁴⁵ Er	-40.450±6.210	¹⁸⁰ Tm	-36.700±0.360	¹⁷⁵ Lu	-55.200±0.090
¹⁴⁸ Sm	-79.500±0.160	¹⁵² Gd	-74.420±0.090	¹⁵¹ Dy	-67.970±0.110	¹⁴⁶ Er	-45.220±4.860	¹⁸¹ Tm	-34.180±0.670	¹⁷⁶ Lu	-53.200±0.070
¹⁴⁹ Sm	-77.420±0.200	¹⁵³ Gd	-73.270±0.070	¹⁵² Dy	-69.520±0.090	¹⁴⁷ Er	-47.640±3.170	¹⁸² Tm	-29.800±0.870	¹⁷⁷ Lu	-52.720±0.070
¹⁵⁰ Sm	-76.930±0.270	¹⁵⁴ Gd	-73.690±0.080	¹⁵³ Dy	-69.060±0.080	¹⁴⁸ Er	-51.700±2.070	¹⁸³ Tm	-26.930±1.110	¹⁷⁸ Lu	-50.330±0.080
¹⁵¹ Sm	-74.980±0.110	¹⁵⁵ Gd	-72.120±0.100	¹⁵⁴ Dy	-70.330±0.080	¹⁴⁹ Er	-53.560±1.340	¹⁸⁴ Tm	-22.180±1.420	¹⁷⁹ Lu	-49.520±0.110
¹⁵² Sm	-74.950±0.090	¹⁵⁶ Gd	-72.370±0.080	¹⁵⁵ Dy	-69.600±0.090	¹⁵⁰ Er	-56.980±0.870	¹⁸⁵ Tm	-18.950±2.050	¹⁸⁰ Lu	-45.920±0.060
¹⁵³ Sm	-72.900±0.090	¹⁵⁷ Gd	-70.580±0.080	¹⁵⁶ Dy	-70.530±0.080	¹⁵¹ Er	-57.380±0.180	¹⁸⁶ Tm	-13.870±2.490	¹⁸¹ Lu	-44.500±0.070
¹⁵⁴ Sm	-72.560±0.080	¹⁵⁸ Gd	-70.420±0.090	¹⁵⁷ Dy	-69.470±0.080	¹⁵² Er	-59.860±0.120	¹⁸⁷ Tm	-10.320±3.000	¹⁸² Lu	-41.140±0.110
¹⁵⁵ Sm	-70.180±0.100	¹⁵⁹ Gd	-68.280±0.120	¹⁵⁸ Dy	-70.140±0.090	¹⁵³ Er	-60.300±0.090	¹⁸⁸ Tm	-4.920±3.900	¹⁸³ Lu	-39.300±0.210
¹⁵⁶ Sm	-69.480±0.120	¹⁶⁰ Gd	-68.000±0.060	¹⁵⁹ Dy	-68.820±0.110	¹⁵⁴ Er	-62.310±0.100			¹⁸⁴ Lu	-35.600±0.270
¹⁵⁷ Sm	-66.760±0.190	¹⁶¹ Gd	-65.370±0.060	¹⁶⁰ Dy	-69.760±0.060	¹⁵⁵ Er	-62.280±0.120	¹⁴⁹ Yb	-34.050±6.530	¹⁸⁵ Lu	-33.380±0.410
¹⁵⁸ Sm	-65.700±0.300	¹⁶² Gd	-64.310±0.070	¹⁶¹ Dy	-68.170±0.050	¹⁵⁶ Er	-64.060±0.090	¹⁵⁰ Yb	-38.780±4.380	¹⁸⁶ Lu	-29.270±0.610
¹⁵⁹ Sm	-62.580±0.490	¹⁶³ Gd	-61.220±0.160	¹⁶² Dy	-68.220±0.050	¹⁵⁷ Er	-63.850±0.090	¹⁵¹ Yb	-42.040±1.650	¹⁸⁷ Lu	-26.660±0.890
¹⁶⁰ Sm	-59.700±0.280	¹⁶⁴ Gd	-59.820±0.230	¹⁶³ Dy	-66.270±0.050	¹⁵⁸ Er	-65.190±0.100	¹⁵² Yb	-45.470±1.120	¹⁸⁸ Lu	-22.200±1.180
¹⁶¹ Sm	-56.010±0.720	¹⁶⁵ Gd	-56.430±0.320	¹⁶⁴ Dy	-65.910±0.050	¹⁵⁹ Er	-64.540±0.130	¹⁵³ Yb	-46.800±0.750	¹⁸⁹ Lu	-19.250±1.560
¹⁶² Sm	-53.920±0.970	¹⁶⁶ Gd	-54.540±0.530	¹⁶⁵ Dy	-63.530±0.050	¹⁶⁰ Er	-65.880±0.060	¹⁵⁴ Yb	-49.800±0.500	¹⁹⁰ Lu	-15.990±2.460
¹⁶³ Sm	-49.810±1.300	¹⁶⁷ Gd	-50.690±0.860	¹⁶⁶ Dy	-62.780±0.070	¹⁶¹ Er	-65.290±0.050	¹⁵⁵ Yb	-50.740±0.330	¹⁹¹ Lu	-13.230±3.000
¹⁶⁴ Sm	-47.330±1.720	¹⁶⁸ Gd	-48.540±1.390	¹⁶⁷ Dy	-60.020±0.110	¹⁶² Er	-66.340±0.040	¹⁵⁶ Yb	-53.320±0.180	¹⁹² Lu	-8.760±3.950
¹⁶⁵ Sm	-42.890±2.270	¹⁶⁹ Gd	-44.440±1.730	¹⁶⁸ Dy	-58.840±0.190	¹⁶³ Er	-65.290±0.040	¹⁵⁷ Yb	-53.860±0.110		
¹⁶⁶ Sm	-40.620±3.590	¹⁷⁰ Gd	-41.970±2.380	¹⁶⁹ Dy	-55.680±0.320	¹⁶⁴ Er	-65.930±0.050	¹⁵⁸ Yb	-56.070±0.110	¹⁵³ Hf	-28.060±3.170
¹⁶⁷ Sm	-36.060±4.440	¹⁷¹ Gd	-33.870±2.260 †	¹⁷⁰ Dy	-54.110±0.530	¹⁶⁵ Er	-64.640±0.060	¹⁵⁹ Yb	-56.290±0.130	¹⁵⁴ Hf	-32.110±2.180
		¹⁷² Gd	-30.390±2.680	¹⁷¹ Dy	-49.670±0.460	¹⁶⁶ Er	-64.930±0.040	¹⁶⁰ Yb	-57.900±0.080	¹⁵⁵ Hf	-33.900±1.490
¹³⁵ Eu	-52.740±4.310	¹⁷³ Gd	-24.590±3.340	¹⁷² Dy	-47.240±0.760	¹⁶⁷ Er	-63.210±0.040	¹⁶¹ Yb	-57.870±0.070	¹⁵⁶ Hf	-37.500±1.140
¹³⁶ Eu	-55.580±3.360	¹⁷⁴ Gd	-20.200±4.140	¹⁷³ Dy	-43.080±0.970	¹⁶⁸ Er	-63.120±0.040	¹⁶² Yb	-59.590±0.060	¹⁵⁷ Hf	-39.040±0.860
¹³⁷ Eu	-60.290±2.380	¹⁷⁵ Gd	-14.160±4.770	¹⁷⁴ Dy	-40.430±1.230	¹⁶⁹ Er	-61.070±0.060	¹⁶³ Yb	-59.380±0.050	¹⁵⁸ Hf	-42.190±0.480
¹³⁸ Eu	-62.480±1.690			¹⁷⁵ Dy	-35.780±1.550	¹⁷⁰ Er	-60.620±0.070	¹⁶⁴ Yb	-60.870±0.050	¹⁵⁹ Hf	-43.230±0.270
¹³⁹ Eu	-66.170±1.190	¹³⁸ Tb	-44.050±6.220	¹⁷⁶ Dy	-32.230±2.150	¹⁷¹ Er	-57.500±0.100	¹⁶⁵ Yb	-60.190±0.040	¹⁶⁰ Hf	-45.780±0.060
¹⁴⁰ Eu	-68.090±0.530	¹³⁹ Tb	-49.370±4.520	¹⁷⁷ Dy	-27.080±2.580	¹⁷² Er	-56.490±0.100	¹⁶⁶ Yb	-61.350±0.040	¹⁶¹ Hf	-46.670±0.060
¹⁴¹ Eu	-71.720±0.350	¹⁴⁰ Tb	-49.930±2.950 †	¹⁷⁸ Dy	-23.390±3.100	¹⁷³ Er	-53.480±0.150	¹⁶⁷ Yb	-60.580±0.040	¹⁶² Hf	-49.010±0.070
¹⁴² Eu	-72.510±0.210	¹⁴¹ Tb	-54.750±2.120	¹⁷⁹ Dy	-17.260±3.940	¹⁷⁴ Er	-51.970±0.260	¹⁶⁸ Yb	-61.430±0.040	¹⁶³ Hf	-49.370±0.070
¹⁴³ Eu	-74.940±0.170	¹⁴² Tb	-57.300±1.500	¹⁸⁰ Dy	-12.900±3.740	¹⁷⁵ Er	-48.600±0.340	¹⁶⁹ Yb	-60.320±0.050	¹⁶⁴ Hf	-51.410±0.070
¹⁴⁴ Eu	-75.150±0.160	¹⁴³ Tb	-61.460±1.040	¹⁸¹ Dy	-7.210±4.430	¹⁷⁶ Er	-46.700±0.490	¹⁷⁰ Yb	-60.750±0.050	¹⁶⁵ Hf	-51.570±0.070
¹⁴⁵ Eu	-77.210±0.140	¹⁴⁴ Tb	-62.930±0.500			¹⁷⁷ Er	-42.790±0.710	¹⁷¹ Yb	-59.280±0.090	¹⁶⁶ Hf	-53.540±0.060
¹⁴⁶ Eu	-76.720±0.160	¹⁴⁵ Tb	-66.780±0.370	¹⁴³ Ho	-46.020±6.580	¹⁷⁸ Er	-40.330±1.000	¹⁷² Yb	-59.260±0.080	¹⁶⁷ Hf	-53.360±0.060
¹⁴⁷ Eu	-77.890±0.130	¹⁴⁶ Tb	-67.670±0.250	¹⁴⁴ Ho	-47.130±4.690	¹⁷⁹ Er	-35.960±1.300	¹⁷³ Yb	-57.280±0.070	¹⁶⁸ Hf	-54.870±0.060
¹⁴⁸ Eu	-76.830±0.130	¹⁴⁷ Tb	-70.090±0.170	¹⁴⁵ Ho	-50.730±3.350	¹⁸⁰ Er	-31.410±1.190	¹⁷⁴ Yb	-56.890±0.080	¹⁶⁹ Hf	-54.510±0.060
¹⁴⁹ Eu	-77.360±0.150	¹⁴⁸ Tb	-70.240±0.180	¹⁴⁶ Ho	-52.800±2.140	¹⁸¹ Er	-26.690±1.520	¹⁷⁵ Yb	-54.590±0.090	¹⁷⁰ Hf	-55.820±0.060
¹⁵⁰ Eu	-75.690±0.180	¹⁴⁹ Tb	-72.210±0.200	¹⁴⁷ Ho	-56.480±1.350	¹⁸² Er	-23.510±1.940	¹⁷⁶ Yb	-53.740±0.070	¹⁷¹ Hf	-55.620±0.120
¹⁵¹ Eu	-74.850±0.100	¹⁵⁰ Tb	-71.980±0.270	¹⁴⁸ Ho	-57.930±0.840	¹⁸³ Er	-18.440±2.450	¹⁷⁷ Yb	-51.040±0.090	¹⁷² Hf	-56.490±0.100
¹⁵² Eu	-73.450±0.080	¹⁵¹ Tb	-71.280±0.100	¹⁴⁹ Ho	-60.920±0.530	¹⁸⁴ Er	-14.920±3.090	¹⁷⁸ Yb	-49.890±0.130	¹⁷³ Hf	-55.440±0.080
¹⁵³ Eu	-73.670±0.070	¹⁵² Tb	-70.600±0.080	¹⁵⁰ Ho	-61.670±0.400	¹⁸⁵ Er	-9.540±3.730	¹⁷⁹ Yb	-48.820±0.190	¹⁷⁴ Hf	-55.990±0.070
¹⁵⁴ Eu	-71.890±0.080	¹⁵³ Tb	-71.670±0.070	¹⁵¹ Ho	-63.200±0.100	¹⁸⁶ Er	-5.700±4.490	¹⁸⁰ Yb	-43.860±0.120	¹⁷⁵ Hf	-54.500±0.060
¹⁵⁵ Eu	-71.840±0.100	¹⁵⁴ Tb	-70.730±0.070	¹⁵² Ho	-63.430±0.090			¹⁸¹ Yb	-40.150±0.200	¹⁷⁶ Hf	-54.700±0.060
¹⁵⁶ Eu	-69.760±0.080	¹⁵⁵ Tb	-71.370±0.080	¹⁵³ Ho	-65.210±0.090	¹⁴⁷ Tm	-37.380±6.950 †	¹⁸² Yb	-37.960±0.370	¹⁷⁷ Hf	-52.980±0.060
¹⁵⁷ Eu	-69.360±0.080	¹⁵⁶ Tb	-70.110±0.070	¹⁵⁴ Ho	-64.960±0.080	¹⁴⁸ Tm	-40.100±4.590 †	¹⁸³ Yb	-33.920±0.490	¹⁷⁸ Hf	-52.800±0.080
¹⁵⁸ Eu	-66.960±0.100	¹⁵⁷ Tb	-70.570±0.070	¹⁵⁵ Ho	-66.450±0.080	¹⁴⁹ Tm	-44.520±3.050	¹⁸⁴ Yb	-31.400±0.640	¹⁷⁹ Hf	-50.680±0.090
¹⁵⁹ Eu	-66.260±0.130	¹⁵⁸ Tb	-69.030±0.080	¹⁵⁶ Ho	-66.030±0.080	¹⁵⁰ Tm	-46.780±2.040	¹⁸⁵ Yb	-26.940±0.930	¹⁸⁰ Hf	-49.890±0.060
¹⁶⁰ Eu	-62.970±0.090	¹⁵⁹ Tb	-69.080±0.090	¹⁵⁷ Ho	-67.170±0.080	¹⁵¹ Tm	-50.380±0.520	¹⁸⁶ Yb	-24.010±1.360	¹⁸¹ Hf	-47.280±0.050
¹⁶¹ Eu	-61.500±0.140	¹⁶⁰ Tb	-67.720±0.050	¹⁵⁸ Ho	-66.330±0.090	¹⁵² Tm	-51.420±0.340	¹⁸⁷ Yb	-19.250±1.650	¹⁸² Hf	-46.180±0.050
¹⁶² Eu	-58.070±0.350	¹⁶¹ Tb	-67.500±0.050	¹⁵⁹ Ho	-67.220±0.100	¹⁵³ Tm	-54.150±0.220	¹⁸⁸ Yb	-15.980±2.160	¹⁸³ Hf	-43.160±0.060
¹⁶³ Eu	-56.310±0.480	¹⁶² Tb	-65.230±0.040	¹⁶⁰ Ho	-66.660±0.050	¹⁵⁴ Tm	-54.830±0.150	¹⁸⁹ Yb	-10.870±2.820	¹⁸⁴ Hf	-41.650±0.110
¹⁶⁴ Eu	-52.540±0.640	¹⁶³ Tb	-64.540±0.040	¹⁶¹ Ho	-67.430±0.050	¹⁵⁵ Tm	-57.130±0.120	¹⁹⁰ Yb	-9.340±4.580	¹⁸⁵ Hf	-38.250±0.170
¹⁶⁵ Eu	-50.380±0.860	¹⁶⁴ Tb	-61.820±0.080	¹⁶² Ho	-66.130±0.040	¹⁵⁶ Tm	-57.400±0.110			¹⁸⁶ Hf	-36.370±0.260
¹⁶⁶ Eu	-46.230±1.400	¹⁶⁵ Tb	-60.770±0.110	¹⁶³ Ho	-66.500±0.040	¹⁵⁷ Tm	-59.390±0.100	¹⁵² Lu	-34.370±2.300 †	¹⁸⁷ Hf	-32.580±0.390
¹⁶⁷ Eu	-43.910±2.230	¹⁶⁶ Tb	-57.680±0.190	¹⁶⁴ Ho	-64.890±0.040	¹⁵⁸ Tm	-59.380±0.110	¹⁵³ Lu	-38.100±1.570 †	¹⁸⁸ Hf	-30.300±0.590
¹⁶⁸ Eu	-39.530±2.770	¹⁶⁷ Tb	-56.160±0.320	¹⁶⁵ Ho	-64.880±0.050	¹⁵⁹ Tm	-60.940±0.130	¹⁵⁴ Lu	-39.720±1.070	¹⁸⁹ Hf	-26.170±0.780
¹⁶⁹ Eu	-36.800±3.430	¹⁶⁸ Tb	-52.650±0.530	¹⁶⁶ Ho	-62.820±0.040	¹⁶⁰ Tm	-60.390±0.080	¹⁵⁵ Lu	-42.940±0.720	¹⁹⁰ Hf	-24.620±1.210
¹⁷⁰ Eu	-32.410±4.680	¹⁶⁹ Tb	-50.770±0.860	¹⁶⁷ Ho	-62.400±0.040	¹⁶¹ Tm	-61.990±0.060	¹⁵⁶ Lu	-44.210±0.540	¹⁹¹ Hf	-20.690±1.610
¹⁷¹ Eu	-22.940±3.750 †	¹⁷⁰ Tb	-46.950±1.200	¹⁶⁸ Ho	-60.000±0.050	¹⁶² Tm	-61.630±0.050	¹⁵⁷ Lu	-47.070±0.290	¹⁹² Hf	-18.290±2.140
¹⁷² Eu	-16.850±4.420	¹⁷¹ Tb	-42.590±1.270	¹⁶⁹ Ho	-59.170±0.070	¹⁶³ Tm	-62.920±0.040	¹⁵⁸ Lu	-47.850±0.160	¹⁹³ Hf	-14.080±2.820
		¹⁷² Tb	-37.930±1.610	¹⁷⁰ Ho	-56.330±0.090	¹⁶⁴ Tm	-62.070±0.040	¹⁵⁹ Lu	-50.290±0.120	¹⁹⁴ Hf	-11.

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁶⁵ Ta	-45.660±0.090	¹⁹⁸ W	-12.350±2.400	¹⁹² Os	-35.820±0.070	¹⁸⁷ Pt	-36.880±0.070	¹⁸³ Hg	-23.360±0.410	²²⁰ Tl	35.590±2.920
¹⁶⁶ Ta	-46.130±0.080	²⁰⁰ W	14.290±5.390 ‡	¹⁹³ Os	-33.390±0.070	¹⁸⁸ Pt	-37.610±0.070	¹⁸⁴ Hg	-25.500±0.380	²²¹ Tl	39.670±4.070
¹⁶⁷ Ta	-48.270±0.070	²⁰¹ W	22.230±6.900	¹⁹⁴ Os	-32.480±0.090	¹⁸⁹ Pt	-36.510±0.060	¹⁸⁵ Hg	-25.730±0.360	²²² Tl	45.290±4.870
¹⁶⁸ Ta	-48.260±0.070			¹⁹⁵ Os	-29.690±0.120	¹⁹⁰ Pt	-37.130±0.100	¹⁸⁶ Hg	-27.560±0.310		
¹⁶⁹ Ta	-49.930±0.080	¹⁶² Re	-22.420±0.750 †	¹⁹⁶ Os	-28.410±0.190	¹⁹¹ Pt	-36.030±0.070	¹⁸⁷ Hg	-27.590±0.260	¹⁸² Pb	-6.870±0.160
¹⁷⁰ Ta	-49.750±0.080	¹⁶³ Re	-26.200±0.520 †	¹⁹⁷ Os	-25.350±0.310	¹⁹² Pt	-36.450±0.060	¹⁸⁸ Hg	-29.180±0.220	¹⁸³ Pb	-7.400±0.290
¹⁷¹ Ta	-52.230±0.150	¹⁶⁴ Re	-27.890±0.350 †	¹⁹⁸ Os	-23.780±0.510	¹⁹³ Pt	-34.870±0.060	¹⁸⁹ Hg	-28.870±0.170	¹⁸⁴ Pb	-9.740±0.420
¹⁷² Ta	-51.670±0.130	¹⁶⁵ Re	-31.350±0.110	¹⁹⁹ Os	-16.220±0.690	¹⁹⁴ Pt	-34.780±0.100	¹⁹⁰ Hg	-30.420±0.210	¹⁸⁵ Pb	-10.730±0.430
¹⁷³ Ta	-52.740±0.110	¹⁶⁶ Re	-32.410±0.080	²⁰⁰ Os	-12.880±1.260	¹⁹⁵ Pt	-32.980±0.060	¹⁹¹ Hg	-30.290±0.120	¹⁸⁶ Pb	-13.330±0.430
¹⁷⁴ Ta	-51.920±0.090	¹⁶⁷ Re	-35.120±0.070	²⁰¹ Os	-7.850±1.650	¹⁹⁶ Pt	-32.680±0.060	¹⁹² Hg	-31.630±0.080	¹⁸⁷ Pb	-13.790±0.470
¹⁷⁵ Ta	-52.700±0.090	¹⁶⁸ Re	-35.920±0.070	²⁰² Os	-4.000±2.160	¹⁹⁷ Pt	-30.410±0.070	¹⁹³ Hg	-31.110±0.070	¹⁸⁸ Pb	-15.930±0.450
¹⁷⁶ Ta	-51.530±0.080	¹⁶⁹ Re	-38.390±0.080	²⁰³ Os	2.410±2.810	¹⁹⁸ Pt	-29.640±0.100	¹⁹⁴ Hg	-32.080±0.080	¹⁸⁹ Pb	-16.490±0.400
¹⁷⁷ Ta	-51.950±0.080	¹⁷⁰ Re	-38.780±0.110	²⁰⁴ Os	7.590±4.190	¹⁹⁹ Pt	-27.740±0.190	¹⁹⁵ Hg	-31.150±0.070	¹⁹⁰ Pb	-17.520±1.130
¹⁷⁸ Ta	-50.480±0.090	¹⁷¹ Re	-41.520±0.260	²⁰⁵ Os	14.630±5.140	²⁰⁰ Pt	-26.560±0.170	¹⁹⁶ Hg	-31.710±0.070	¹⁹¹ Pb	-18.530±0.850
¹⁷⁹ Ta	-50.580±0.110	¹⁷² Re	-41.850±0.220	²⁰⁶ Os	20.590±6.280	²⁰¹ Pt	-23.420±0.190	¹⁹⁷ Hg	-30.440±0.070	¹⁹² Pb	-21.010±0.640
¹⁸⁰ Ta	-48.950±0.060	¹⁷³ Re	-43.800±0.190			²⁰² Pt	-21.550±0.350	¹⁹⁸ Hg	-30.660±0.090	¹⁹³ Pb	-21.510±0.310
¹⁸¹ Ta	-48.560±0.050	¹⁷⁴ Re	-43.650±0.180	¹⁶⁷ Ir	-17.060±0.640 †	²⁰³ Pt	-17.730±0.480	¹⁹⁹ Hg	-29.610±0.140	¹⁹⁴ Pb	-23.440±0.170
¹⁸² Ta	-46.280±0.040	¹⁷⁵ Re	-45.130±0.180	¹⁶⁸ Ir	-18.990±0.360 †	²⁰⁴ Pt	-15.170±0.730	²⁰⁰ Hg	-29.620±0.120	¹⁹⁵ Pb	-23.590±0.120
¹⁸³ Ta	-45.530±0.050	¹⁷⁶ Re	-44.860±0.140	¹⁶⁹ Ir	-22.340±0.190 †	²⁰⁵ Pt	-10.590±1.130	²⁰¹ Hg	-27.980±0.100	¹⁹⁶ Pb	-25.210±0.090
¹⁸⁴ Ta	-42.850±0.070	¹⁷⁷ Re	-46.170±0.120	¹⁷⁰ Ir	-23.660±0.100 †	²⁰⁶ Pt	-7.190±1.720	²⁰² Hg	-27.720±0.130	¹⁹⁷ Pb	-24.850±0.100
¹⁸⁵ Ta	-41.650±0.040	¹⁷⁸ Re	-45.450±0.120	¹⁷¹ Ir	-27.150±0.110	²⁰⁷ Pt	-1.770±2.330	²⁰³ Hg	-25.600±0.180	¹⁹⁸ Pb	-25.950±0.120
¹⁸⁶ Ta	-38.600±0.060	¹⁷⁹ Re	-46.340±0.130	¹⁷² Ir	-28.070±0.150	²⁰⁸ Pt	-9.150±3.880	²⁰⁴ Hg	-24.780±0.110	¹⁹⁹ Pb	-24.950±0.180
¹⁸⁷ Ta	-37.050±0.090	¹⁸⁰ Re	-45.990±0.070	¹⁷³ Ir	-30.640±0.190	²⁰⁹ Pt	-3.230±5.200	²⁰⁵ Hg	-22.060±0.110	²⁰⁰ Pb	-25.830±0.120
¹⁸⁸ Ta	-33.600±0.130	¹⁸¹ Re	-46.660±0.050	¹⁷⁴ Ir	-31.340±0.210	²¹⁰ Pt	1.280±6.940	²⁰⁶ Hg	-20.660±0.150	²⁰¹ Pb	-24.970±0.090
¹⁸⁹ Ta	-31.610±0.290	¹⁸² Re	-45.410±0.040	¹⁷⁵ Ir	-33.660±0.210			²⁰⁷ Hg	-17.350±0.230	²⁰² Pb	-25.610±0.090
¹⁹⁰ Ta	-28.310±0.270	¹⁸³ Re	-45.670±0.040	¹⁷⁶ Ir	-34.020±0.210	¹⁷³ Au	-13.360±0.340 †	²⁰⁸ Hg	-16.220±0.380	²⁰³ Pb	-24.570±0.110
¹⁹¹ Ta	-26.620±0.590	¹⁸⁴ Re	-43.990±0.050	¹⁷⁷ Ir	-35.990±0.200	¹⁷⁴ Au	-14.640±0.130 †	²⁰⁹ Hg	-12.000±0.380	²⁰⁴ Pb	-24.950±0.100
¹⁹² Ta	-22.950±0.790	¹⁸⁵ Re	-43.870±0.040	¹⁷⁸ Ir	-36.100±0.190	¹⁷⁵ Au	-17.480±0.140 †	²¹⁰ Hg	-9.060±0.790	²⁰⁵ Pb	-23.550±0.090
¹⁹³ Ta	-20.820±1.060	¹⁸⁶ Re	-41.850±0.040	¹⁷⁹ Ir	-37.810±0.180	¹⁷⁶ Au	-18.700±0.160 †	²¹¹ Hg	-3.690±1.090	²⁰⁶ Pb	-23.580±0.130
¹⁹⁴ Ta	-16.880±1.400	¹⁸⁷ Re	-41.310±0.040	¹⁸⁰ Ir	-37.900±0.250	¹⁷⁷ Au	-21.530±0.180	²¹² Hg	0.270±1.510	²⁰⁷ Pb	-21.640±0.150
¹⁹⁵ Ta	-14.560±2.260	¹⁸⁸ Re	-38.900±0.050	¹⁸¹ Ir	-39.490±0.200	¹⁷⁸ Au	-22.280±0.240	²¹³ Hg	4.530±2.110	²⁰⁸ Pb	-19.880±0.180
¹⁹⁶ Ta	-10.290±2.820	¹⁸⁹ Re	-37.980±0.050	¹⁸² Ir	-39.060±0.150	¹⁷⁹ Au	-24.620±0.260	²¹⁴ Hg	8.800±3.470	²⁰⁹ Pb	-16.460±0.150
¹⁹⁷ Ta	-7.550±3.500	¹⁹⁰ Re	-35.270±0.080	¹⁸³ Ir	-40.220±0.110	¹⁸⁰ Au	-25.250±0.490	²¹⁵ Hg	14.990±5.750	²¹⁰ Pb	-14.350±0.140
¹⁹⁸ Ta	-3.100±4.830	¹⁹¹ Re	-34.400±0.070	¹⁸⁴ Ir	-39.530±0.070	¹⁸¹ Au	-27.510±0.440	²¹⁹ Hg	38.530±4.870	²¹¹ Pb	-10.360±0.140
		¹⁹² Re	-31.710±0.090	¹⁸⁵ Ir	-40.380±0.060	¹⁸² Au	-27.950±0.390			²¹² Pb	-7.650±0.180
¹⁵⁷ W	-18.630±3.470 ‡	¹⁹³ Re	-30.540±0.150	¹⁸⁶ Ir	-39.300±0.040	¹⁸³ Au	-29.970±0.340	¹⁷⁸ Tl	-4.530±0.280 †	²¹³ Pb	-3.200±0.230
¹⁵⁸ W	-22.960±2.670	¹⁹⁴ Re	-27.390±0.210	¹⁸⁷ Ir	-39.760±0.050	¹⁸⁴ Au	-29.880±0.310	¹⁷⁹ Tl	-7.750±0.190 †	²¹⁴ Pb	0.070±0.390
¹⁵⁹ W	-25.170±2.060	¹⁹⁵ Re	-25.870±0.330	¹⁸⁸ Ir	-38.350±0.050	¹⁸⁵ Au	-31.590±0.250	¹⁸¹ Tl	-12.680±0.230 †	²¹⁵ Pb	5.250±0.670
¹⁶⁰ W	-28.850±0.540	¹⁹⁶ Re	-22.540±0.520	¹⁸⁹ Ir	-38.410±0.060	¹⁸⁶ Au	-31.440±0.190	¹⁸² Tl	-13.270±0.360 †	²¹⁶ Pb	9.180±1.160
¹⁶¹ W	-30.600±0.360	¹⁹⁷ Re	-20.740±0.840	¹⁹⁰ Ir	-36.800±0.080	¹⁸⁷ Au	-32.820±0.150	¹⁸³ Tl	-15.630±0.430	²¹⁷ Pb	15.020±2.000
¹⁶² W	-33.960±0.240	¹⁹⁸ Re	-17.080±1.180	¹⁹¹ Ir	-36.950±0.070	¹⁸⁸ Au	-32.210±0.110	¹⁸⁴ Tl	-16.270±0.440	²¹⁸ Pb	19.360±2.880
¹⁶³ W	-35.300±0.160	¹⁹⁹ Re	-5.230±2.350 †	¹⁹² Ir	-35.090±0.060	¹⁸⁹ Au	-33.250±0.080	¹⁸⁵ Tl	-18.740±0.420	²¹⁹ Pb	23.410±1.130
¹⁶⁴ W	-38.240±0.070	²⁰⁰ Re	0.610±3.050 ‡	¹⁹³ Ir	-34.750±0.060	¹⁹⁰ Au	-32.800±0.130	¹⁸⁶ Tl	-19.110±0.420	²²⁰ Pb	26.720±1.420
¹⁶⁵ W	-38.990±0.100	²⁰¹ Re	5.330±3.940	¹⁹⁴ Ir	-32.580±0.080	¹⁹¹ Au	-33.840±0.090	¹⁸⁷ Tl	-21.130±0.380	²²¹ Pb	31.890±1.980
¹⁶⁶ W	-41.500±0.090	²⁰² Re	12.220±5.060	¹⁹⁵ Ir	-32.030±0.060	¹⁹² Au	-33.030±0.070	¹⁸⁸ Tl	-21.370±0.330	²²² Pb	35.680±2.750
¹⁶⁷ W	-42.120±0.080	²⁰³ Re	18.730±6.510	¹⁹⁶ Ir	-29.500±0.070	¹⁹³ Au	-33.720±0.060	¹⁸⁹ Tl	-23.260±0.280	²²³ Pb	41.010±3.300
¹⁶⁸ W	-44.420±0.080			¹⁹⁷ Ir	-28.480±0.100	¹⁹⁴ Au	-32.420±0.070	¹⁹⁰ Tl	-23.000±0.490	²²⁴ Pb	45.100±4.230
¹⁶⁹ W	-44.580±0.090	¹⁶⁰ Os	-1.570±4.330	¹⁹⁸ Ir	-25.670±0.140	¹⁹⁵ Au	-32.700±0.060	¹⁹¹ Tl	-25.170±0.360	¹⁸³ Bi	0.760±0.390 †
¹⁷⁰ W	-46.360±0.100	¹⁶⁴ Os	-19.340±1.040 ‡	¹⁹⁹ Ir	-23.470±0.350	¹⁹⁶ Au	-31.160±0.060	¹⁹² Tl	-25.350±0.180	¹⁸⁴ Bi	0.540±0.190 †
¹⁷¹ W	-47.380±0.200	¹⁶⁵ Os	-21.530±0.720	²⁰⁰ Ir	-19.710±0.390	¹⁹⁷ Au	-31.130±0.060	¹⁹³ Tl	-26.980±0.100	¹⁸⁵ Bi	-2.220±0.270 †
¹⁷² W	-49.120±0.170	¹⁶⁶ Os	-25.280±0.410	²⁰¹ Ir	-17.160±0.660	¹⁹⁸ Au	-29.120±0.080	¹⁹⁴ Tl	-26.760±0.080	¹⁸⁶ Bi	-3.260±0.340 †
¹⁷³ W	-48.770±0.150	¹⁶⁷ Os	-26.840±0.220	²⁰² Ir	-12.850±0.900	¹⁹⁹ Au	-29.440±0.200	¹⁹⁵ Tl	-28.100±0.070	¹⁸⁷ Bi	-5.950±0.380 †
¹⁷⁴ W	-50.060±0.130	¹⁶⁸ Os	-29.910±0.120	²⁰³ Ir	-9.470±1.210	²⁰⁰ Au	-27.420±0.150	¹⁹⁶ Tl	-27.450±0.070	¹⁸⁸ Bi	-6.430±0.500 †
¹⁷⁵ W	-49.480±0.110	¹⁶⁹ Os	-30.990±0.070	²⁰⁴ Ir	-4.130±1.790	²⁰¹ Au	-26.760±0.120	¹⁹⁷ Tl	-28.280±0.080	¹⁸⁹ Bi	-8.890±0.480
¹⁷⁶ W	-50.560±0.090	¹⁷⁰ Os	-33.680±0.070	²⁰⁵ Ir	0.100±2.690	²⁰² Au	-24.190±0.130	¹⁹⁸ Tl	-27.290±0.080	¹⁹⁰ Bi	-7.180±2.580 †
¹⁷⁷ W	-49.620±0.080	¹⁷¹ Os	-34.760±0.260	²⁰⁶ Ir	6.290±3.320	²⁰³ Au	-22.920±0.210	¹⁹⁹ Tl	-27.980±0.190	¹⁹¹ Bi	-10.440±1.950
¹⁷⁸ W	-50.290±0.080	¹⁷² Os	-37.160±0.250	²⁰⁷ Ir	11.400±4.430	²⁰⁴ Au	-19.720±0.300	²⁰⁰ Tl	-26.870±0.110	¹⁹² Bi	-11.790±1.470
¹⁷⁹ W	-49.100±0.090	¹⁷³ Os	-37.670±0.230			²⁰⁵ Au	-17.790±0.460	²⁰¹ Tl	-27.230±0.090	¹⁹³ Bi	-14.590±1.110
¹⁸⁰ W	-49.910±0.080	¹⁷⁴ Os	-39.810±0.210	¹⁶⁸ Pt	-10.020±0.980 ‡	²⁰⁶ Au	-13.900±0.720	²⁰² Tl	-25.900±0.100	¹⁹⁴ Bi	-15.430±0.540
¹⁸¹ W	-48.340±0.050	¹⁷⁵ Os	-39.860±0.220	¹⁶⁹ Pt	-12.410±0.560	²⁰⁷ Au	-11.230±1.110	²⁰³ Tl	-25.980±0.140	¹⁹⁵ Bi	-17.740±0.370
¹⁸² W	-48.290±0.040	¹⁷⁶ Os	-41.650±0.190	¹⁷⁰ Pt	-16.100±0.320	²⁰⁸ Au	-11.580±0.720	²⁰⁴ Tl	-24.240±0.110	¹⁹⁶ Bi	-18.190±0.250
¹⁸³ W	-46.320±0.040	¹⁷⁷ Os	-41.560±0.160	¹⁷² Pt	-21.330±0.160	²⁰⁹ Au	-8.490±1.770	²⁰⁵ Tl	-23.880±0.110	¹⁹⁷ Bi	-20.100±0.170
¹⁸⁴ W	-45.900±0.050	¹⁷⁸ Os	-43.080±0.150	¹⁷³ Pt	-22.430±0.110	²¹⁰ Au	-2.850±2.390	²⁰⁶ Tl	-21.580±0.110	¹⁹⁸ Bi	-20.050±0.140
¹⁸⁵ W	-43.530±0.040	¹⁷⁹ Os	-42.550±0.140	¹⁷⁴ Pt	-25.170±0.170	²¹¹ Au	1.370±3.230	²⁰⁷ Tl	-20.620±0.180	¹⁹⁹ Bi	-20.620±0.200
¹⁸⁶ W	-42.660±0.040	¹⁸⁰ Os	-44.410±0.150	¹⁷⁵ Pt	-26.040±0.200	²¹² Au	7.380±4.340	²⁰⁸ Tl	-16.780±0.270	²⁰⁰ Bi	-20.190±0.140

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²¹¹ Bi	-12.340±0.140	²⁰⁵ At	-13.120±0.120	²⁰³ Fr	-0.080±0.780	²³⁹ Ra	64.530±2.640	²³² Th	35.480±0.050	²³² U	34.520±0.070
²¹² Bi	-8.410±0.160	²⁰⁶ At	-12.590±0.120	²⁰⁴ Fr	0.150±0.450	²⁴⁰ Ra	66.880±3.540	²³³ Th	38.750±0.050	²³³ U	37.020±0.050
²¹³ Bi	-5.780±0.180	²⁰⁷ At	-13.550±0.180	²⁰⁵ Fr	-1.250±0.260	²⁴¹ Ra	71.120±4.190	²³⁴ Th	40.640±0.070	²³⁴ U	38.140±0.040
²¹⁴ Bi	-1.330±0.190	²⁰⁸ At	-12.660±0.210	²⁰⁶ Fr	-1.030±0.180			²³⁵ Th	44.170±0.110	²³⁵ U	40.920±0.050
²¹⁵ Bi	1.830±0.240	²⁰⁹ At	-13.310±0.130	²⁰⁷ Fr	-2.420±0.210	²⁰² Ac	17.750±6.470 †	²³⁶ Th	46.310±0.210	²³⁶ U	42.330±0.080
²¹⁶ Bi	6.890±0.390	²¹⁰ At	-11.980±0.130	²⁰⁸ Fr	-2.810±0.310	²⁰³ Ac	12.870±3.340	²³⁷ Th	50.440±0.120	²³⁷ U	45.560±0.050
²¹⁷ Bi	10.690±0.680	²¹¹ At	-11.010±0.120	²⁰⁹ Fr	-4.120±0.210	²⁰⁴ Ac	13.520±2.570	²³⁸ Th	52.590±0.320	²³⁸ U	47.350±0.040
²¹⁸ Bi	16.380±1.190	²¹² At	-8.270±0.150	²¹⁰ Fr	-3.590±0.150	²⁰⁵ Ac	12.430±1.950	²³⁹ Th	56.510±0.440	²³⁹ U	50.750±0.040
²¹⁹ Bi	17.970±0.480	²¹³ At	-6.920±0.200	²¹¹ Fr	-4.400±0.120	²⁰⁶ Ac	12.710±1.260	²⁴⁰ Th	59.000±0.600	²⁴⁰ U	52.720±0.060
²²⁰ Bi	22.480±0.680	²¹⁴ At	-3.770±0.140	²¹² Fr	-3.310±0.130	²⁰⁷ Ac	11.420±0.880 †	²⁴¹ Th	63.030±0.810	²⁴¹ U	56.320±0.090
²²¹ Bi	25.600±0.950	²¹⁵ At	-1.780±0.120	²¹³ Fr	-2.710±0.140	²⁰⁸ Ac	11.930±0.630 †	²⁴² Th	65.260±1.420	²⁴² U	58.510±0.160
²²² Bi	30.450±1.330	²¹⁶ At	1.830±0.130	²¹⁴ Fr	-0.710±0.130	²⁰⁹ Ac	8.460±0.410 †	²⁴³ Th	69.350±1.800	²⁴³ U	62.230±0.270
²²³ Bi	33.930±1.860	²¹⁷ At	4.130±0.180	²¹⁵ Fr	0.050±0.110	²¹⁰ Ac	8.540±0.220 †	²⁴⁴ Th	71.950±2.260	²⁴⁴ U	64.480±0.470
²²⁴ Bi	39.060±2.390	²¹⁸ At	8.260±0.260	²¹⁶ Fr	2.760±0.120	²¹¹ Ac	7.120±0.170 †	²⁴⁵ Th	75.660±3.240	²⁴⁵ U	68.320±0.690
²²⁵ Bi	42.830±3.080	²¹⁹ At	10.680±0.100	²¹⁷ Fr	4.270±0.180	²¹² Ac	7.420±0.150			²⁴⁶ U	72.400±1.610
²²⁶ Bi	48.320±3.940	²²⁰ At	14.410±0.090	²¹⁸ Fr	7.220±0.170	²¹³ Ac	5.870±0.140	²⁰⁶ Pa	27.320±5.750 †	²⁴⁷ U	76.680±2.130
		²²¹ At	16.760±0.100	²¹⁹ Fr	8.820±0.080	²¹⁴ Ac	6.540±0.160	²⁰⁷ Pa	26.310±4.500 †	²⁴⁸ U	79.560±2.810
¹⁸⁴ Po	7.170±0.880	²²² At	20.660±0.140	²²⁰ Fr	11.670±0.070	²¹⁵ Ac	6.250±0.120	²¹² Pa	23.000±0.730 †	²⁴⁹ U	83.970±3.700
¹⁸⁵ Po	6.310±0.480	²²³ At	23.170±0.190	²²¹ Fr	13.120±0.060	²¹⁶ Ac	7.770±0.120	²¹³ Pa	20.060±0.520	²⁵⁰ U	86.970±4.860
¹⁸⁶ Po	3.650±0.230	²²⁴ At	27.510±0.300	²²² Fr	16.290±0.060	²¹⁷ Ac	7.980±0.130	²¹⁴ Pa	19.640±0.350		
¹⁸⁷ Po	2.640±0.190	²²⁵ At	30.490±0.540	²²³ Fr	18.070±0.060	²¹⁸ Ac	10.060±0.170	²¹⁵ Pa	17.970±0.230	²¹³ Np	35.360±5.210
¹⁸⁸ Po	-0.070±0.260	²²⁶ At	34.980±0.710	²²⁴ Fr	21.510±0.060	²¹⁹ Ac	11.480±0.090	²¹⁶ Pa	18.240±0.210	²¹⁴ Np	34.770±3.440
¹⁸⁹ Po	-0.850±0.360	²²⁷ At	38.240±1.060	²²⁵ Fr	23.570±0.070	²²⁰ Ac	13.560±0.060	²¹⁷ Pa	17.410±0.210	²¹⁵ Np	32.720±2.270
¹⁹¹ Po	-0.760±4.420 †	²²⁸ At	43.300±1.350	²²⁶ Fr	27.330±0.090	²²¹ Ac	14.270±0.050	²¹⁸ Pa	18.280±0.270	²¹⁶ Np	32.410±1.500
¹⁹² Po	-4.390±3.350	²²⁹ At	46.300±1.680	²²⁷ Fr	29.730±0.160	²²² Ac	16.560±0.050	²¹⁹ Pa	19.320±0.670 †	²¹⁷ Np	30.730±1.000
¹⁹³ Po	-6.090±2.530	²³⁰ At	50.860±2.310	²²⁸ Fr	34.020±0.120	²²³ Ac	17.470±0.090	²²⁰ Pa	20.480±0.400	²¹⁸ Np	30.880±0.720
¹⁹⁴ Po	-9.230±1.920	²³¹ At	53.930±3.170	²²⁹ Fr	36.290±0.240	²²⁴ Ac	20.170±0.060	²²¹ Pa	20.280±0.240	²¹⁹ Np	31.770±2.700 †
¹⁹⁵ Po	-10.440±1.310	²³² At	58.760±3.770	²³⁰ Fr	40.270±0.340	²²⁵ Ac	21.490±0.050	²²² Pa	21.820±0.140	²²⁰ Np	32.130±2.140
¹⁹⁶ Po	-13.080±0.900	²³³ At	62.060±4.790	²³¹ Fr	42.850±0.470	²²⁶ Ac	24.380±0.070	²²³ Pa	21.980±0.090	²²¹ Np	31.120±1.690
¹⁹⁷ Po	-13.850±0.610			²³² Fr	47.070±0.650	²²⁷ Ac	25.890±0.100	²²⁴ Pa	23.810±0.060	²²² Np	31.700±1.030
¹⁹⁸ Po	-16.060±0.420	¹⁹⁵ Rn	8.920±4.780 †	²³³ Fr	49.760±1.200	²²⁸ Ac	29.050±0.050	²²⁵ Pa	24.260±0.060	²²³ Np	30.930±0.630
¹⁹⁹ Po	-16.030±0.280	¹⁹⁶ Rn	5.080±3.900	²³⁴ Fr	54.180±1.540	²²⁹ Ac	30.630±0.050	²²⁶ Pa	26.430±0.070	²²⁴ Np	32.000±0.460
²⁰⁰ Po	-17.130±0.160	¹⁹⁷ Rn	3.170±2.690	²³⁵ Fr	57.190±1.960	²³⁰ Ac	33.870±0.040	²²⁷ Pa	27.220±0.080	²²⁵ Np	31.700±0.340
²⁰¹ Po	-16.780±0.130	¹⁹⁸ Rn	-0.120±1.870	²³⁶ Fr	61.670±2.880	²³¹ Ac	35.720±0.050	²²⁸ Pa	28.920±0.050	²²⁶ Np	32.970±0.150
²⁰² Po	-17.980±0.120	¹⁹⁹ Rn	-5.150±1.200	²³⁷ Fr	62.380±3.100	²³² Ac	39.240±0.080	²²⁹ Pa	29.680±0.050	²²⁷ Np	32.890±0.120
²⁰³ Po	-17.360±0.120	²⁰⁰ Rn	-6.280±0.830	²³⁸ Fr	66.560±3.780	²³³ Ac	41.360±0.120	²³⁰ Pa	32.120±0.040	²²⁸ Np	33.730±0.120
²⁰⁴ Po	-18.460±0.120	²⁰¹ Rn	-5.820±0.550			²³⁴ Ac	45.120±0.210	²³¹ Pa	33.190±0.040	²²⁹ Np	33.630±0.080
²⁰⁵ Po	-17.800±0.100	²⁰² Rn	-7.010±0.350	²⁰⁰ Ra	11.020±6.910	²³⁵ Ac	47.470±0.370	²³² Pa	35.940±0.040	²³⁰ Np	35.230±0.060
²⁰⁶ Po	-18.630±0.110	²⁰³ Rn	-6.560±0.290	²⁰¹ Ra	9.360±4.410	²³⁶ Ac	51.460±0.550	²³³ Pa	37.300±0.040	²³¹ Np	35.470±0.040
²⁰⁷ Po	-17.740±0.130	²⁰⁴ Rn	-7.860±0.200	²⁰² Ra	7.010±2.860	²³⁷ Ac	53.710±0.740	²³⁴ Pa	40.330±0.040	²³² Np	37.380±0.080
²⁰⁸ Po	-18.210±0.170	²⁰⁵ Rn	-7.550±0.140	²⁰³ Ra	6.370±1.710	²³⁸ Ac	57.690±1.000	²³⁵ Pa	41.990±0.060	²³³ Np	37.940±0.050
²⁰⁹ Po	-16.690±0.180	²⁰⁶ Rn	-8.850±0.150	²⁰⁴ Ra	5.200±1.250	²³⁹ Ac	60.180±1.360	²³⁶ Pa	45.300±0.100	²³⁴ Np	40.170±0.040
²¹⁰ Po	-15.430±0.130	²⁰⁷ Rn	-8.440±0.200	²⁰⁵ Ra	5.470±0.780	²⁴⁰ Ac	64.150±1.840	²³⁷ Pa	47.530±0.070	²³⁵ Np	41.050±0.050
²¹¹ Po	-12.380±0.120	²⁰⁸ Rn	-9.520±0.300	²⁰⁶ Ra	4.130±0.510	²⁴¹ Ac	66.580±2.470	²³⁸ Pa	51.110±0.070	²³⁶ Np	43.560±0.060
²¹² Po	-10.680±0.130	²⁰⁹ Rn	-8.990±0.200	²⁰⁷ Ra	4.390±0.360	²⁴² Ac	70.600±3.110	²³⁹ Pa	53.220±0.140	²³⁷ Np	44.720±0.060
²¹³ Po	-7.150±0.160	²¹⁰ Rn	-9.740±0.130	²⁰⁸ Ra	0.550±0.340	²⁴³ Ac	73.090±3.910	²⁴⁰ Pa	57.000±0.200	²³⁸ Np	47.640±0.050
²¹⁴ Po	-4.860±0.140	²¹¹ Rn	-8.560±0.120	²⁰⁹ Ra	0.810±0.250	²⁴⁴ Ac	76.990±4.900	²⁴¹ Pa	59.380±0.280	²³⁹ Np	49.200±0.040
²¹⁵ Po	-0.840±0.140	²¹² Rn	-7.800±0.140	²¹⁰ Ra	-0.380±0.200			²⁴² Pa	63.210±0.470	²⁴⁰ Np	52.380±0.040
²¹⁶ Po	1.870±0.170	²¹³ Rn	-5.320±0.190	²¹¹ Ra	0.210±0.180	²⁰³ Th	19.530±6.270	²⁴³ Pa	65.500±0.820	²⁴¹ Np	54.170±0.040
²¹⁷ Po	6.450±0.230	²¹⁴ Rn	-4.400±0.140	²¹² Ra	-0.570±0.180	²⁰⁴ Th	18.710±4.930	²⁴⁴ Pa	69.540±1.050	²⁴² Np	57.570±0.050
²¹⁸ Po	9.770±0.330	²¹⁵ Rn	-1.500±0.120	²¹³ Ra	0.500±0.190	²⁰⁵ Th	19.410±3.850	²⁴⁵ Pa	71.950±1.500	²⁴³ Np	59.570±0.080
²¹⁹ Po	13.590±0.150	²¹⁶ Rn	0.240±0.130	²¹⁴ Ra	0.570±0.150	²⁰⁶ Th	18.370±2.980	²⁴⁶ Pa	78.540±3.260	²⁴⁴ Np	63.140±0.150
²²⁰ Po	16.250±0.200	²¹⁷ Rn	3.500±0.140	²¹⁵ Ra	2.510±0.140	²⁰⁷ Th	18.650±1.920	²⁴⁷ Pa	81.620±3.950	²⁴⁵ Np	65.280±0.270
²²¹ Po	20.450±0.280	²¹⁸ Rn	5.410±0.210	²¹⁶ Ra	3.180±0.150	²⁰⁹ Th	18.440±1.160			²⁴⁶ Np	70.180±0.320
²²² Po	23.250±0.380	²¹⁹ Rn	9.110±0.070	²¹⁷ Ra	5.750±0.190	²¹⁰ Th	14.930±0.790	²¹⁰ U	34.780±5.290	²⁴⁷ Np	72.660±0.770
²²³ Po	27.770±0.520	²²⁰ Rn	10.830±0.060	²¹⁸ Ra	7.100±0.260	²¹¹ Th	14.910±0.400	²¹¹ U	32.870±3.890	²⁴⁸ Np	76.810±1.030
²²⁴ Po	31.080±1.000	²²¹ Rn	14.270±0.060	²¹⁹ Ra	9.500±0.060	²¹² Th	13.330±0.320	²¹² U	29.520±2.850 †	²⁴⁹ Np	79.560±1.370
²²⁵ Po	35.880±1.290	²²² Rn	16.340±0.060	²²⁰ Ra	10.480±0.060	²¹³ Th	12.540±0.290	²¹³ U	27.870±1.300	²⁵⁰ Np	83.840±1.810
²²⁶ Po	39.310±1.660	²²³ Rn	19.960±0.090	²²¹ Ra	13.040±0.050	²¹⁴ Th	10.990±0.170	²¹⁴ U	25.650±0.880	²⁵¹ Np	86.640±2.940
²²⁷ Po	44.630±2.500	²²⁴ Rn	22.290±0.110	²²² Ra	14.220±0.050	²¹⁵ Th	11.430±0.160	²¹⁵ U	25.250±0.590	²⁵² Np	91.080±3.650
²²⁸ Po	47.970±2.730	²²⁵ Rn	26.340±0.170	²²³ Ra	17.110±0.050	²¹⁶ Th	10.840±0.140	²¹⁶ U	23.540±0.410	²⁵³ Np	94.130±4.520
²²⁹ Po	52.780±3.370	²²⁶ Rn	29.020±0.290	²²⁴ Ra	18.710±0.050	²¹⁷ Th	12.000±0.180	²¹⁷ U	23.710±0.350		
²³⁰ Po	55.940±4.620	²²⁷ Rn	33.340±0.440	²²⁵ Ra	21.870±0.050	²¹⁸ Th	11.820±0.220	²¹⁸ U	22.720±0.360	²¹⁵ Pu	41.620±5.120
		²²⁸ Rn	36.550±0.600	²²⁶ Ra	23.650±0.080	²¹⁹ Th	14.730±0.110	²¹⁹ U	24.870±1.360	²¹⁶ Pu	39.370±3.420
		²²⁹ Rn	40.740±0.830	²²⁷ Ra	27.120±0.120	²²⁰ Th	14.810±0.080	²²⁰ U	24.160±1.070	²¹⁷ Pu	38.800±2.300
¹⁹³ At	4.010±4.440 †	²³⁰ Rn	43.500±1.150	²²⁸ Ra	29.420±0.070	²²¹ Th	16.630±0.060	²²¹ U	25.040±0		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²³⁰ Pu	37.110±0.290	²⁴² Cm	54.700±0.040	²⁵⁸ Cf	96.330±2.320	²⁵⁰ Md	78.650±0.090	²⁵⁸ Rf	98.310±0.090	²⁶⁶ Mt	127.970±0.190
²³¹ Pu	38.450±0.180	²⁴³ Cm	57.220±0.040	²⁶⁰ Cf	98.620±2.970	²⁵¹ Md	79.000±0.070	²⁶⁰ Rf	98.990±0.060	²⁶⁷ Mt	128.140±0.160
²³² Pu	38.430±0.110	²⁴⁴ Cm	58.400±0.040	²⁶¹ Cf	102.350±3.790	²⁵² Md	80.860±0.070	²⁶¹ Rf	101.210±0.060	²⁵⁹ 110	128.850±4.900
²³³ Pu	40.090±0.060	²⁴⁵ Cm	61.120±0.050	²⁶² Cf	104.600±4.830	²⁵³ Md	81.460±0.070	²⁶² Rf	102.150±0.080	²⁶⁰ 110	129.010±3.720
²³⁴ Pu	40.390±0.050	²⁴⁶ Cm	62.570±0.080	²³⁴ Es	68.420±4.510 †	²⁵⁴ Md	83.710±0.070	²⁶³ Rf	104.610±0.120	²⁶¹ 110	130.380±2.840
²³⁵ Pu	42.370±0.050	²⁴⁷ Cm	65.720±0.070	²³⁵ Es	66.850±3.400 †	²⁵⁵ Md	84.950±0.050	²⁶⁴ Rf	105.810±0.120	²⁶² 110	130.190±2.170
²³⁶ Pu	42.990±0.060	²⁴⁸ Cm	67.520±0.060	²³⁶ Es	66.940±2.570 †	²⁵⁶ Md	87.560±0.040	²⁶⁵ Rf	108.520±0.120	²⁶³ 110	131.350±1.660
²³⁷ Pu	44.910±0.050	²⁴⁹ Cm	70.910±0.070	²³⁷ Es	63.720±1.870	²⁵⁷ Md	88.860±0.040	²⁶⁶ Rf	109.950±0.150	²⁶⁴ 110	131.230±1.160
²³⁸ Pu	46.000±0.040	²⁵⁰ Cm	72.930±0.100	²³⁸ Es	64.280±1.470	²⁵⁸ Md	91.720±0.050	²⁶⁷ Rf	112.900±0.180	²⁶⁵ 110	132.460±0.810
²³⁹ Pu	48.690±0.040	²⁵¹ Cm	76.520±0.150	²³⁹ Es	63.520±1.160	²⁵⁹ Md	93.280±0.070	²⁵³ Ha	102.810±1.430 †	²⁶⁶ 110	132.260±0.570
²⁴⁰ Pu	50.030±0.040	²⁵² Cm	78.760±0.240	²⁴⁰ Es	64.370±0.690	²⁶⁰ Md	96.370±0.110	²⁵⁴ Ha	102.950±0.980 †	²⁶⁷ 110	133.500±0.410
²⁴¹ Pu	53.030±0.050	²⁵³ Cm	82.540±0.400	²⁴¹ Es	63.830±0.410	²⁶¹ Md	98.140±0.210	²⁵⁵ Ha	98.790±0.220	²⁶¹ 111	136.610±4.980 †
²⁴² Pu	54.620±0.040	²⁵⁴ Cm	84.950±0.650	²⁴² Es	65.010±0.300	²⁶² Md	101.390±0.400	²⁵⁶ Ha	100.140±0.150	²⁶² 111	138.140±3.790 †
²⁴³ Pu	57.820±0.040	²⁵⁵ Cm	89.090±2.860	²⁴³ Es	64.870±0.220	²⁶³ Md	103.340±0.600	²⁵⁷ Ha	100.150±0.100	²⁶³ 111	138.030±2.900 †
²⁴⁴ Pu	59.680±0.060	²⁵⁶ Cm	91.560±3.540	²⁴⁴ Es	66.290±0.110	²⁶⁴ Md	106.780±0.900	²⁵⁸ Ha	101.700±0.070	²⁶⁴ 111	138.970±2.380 †
²⁴⁵ Pu	63.140±0.090	²⁵⁷ Cm	95.070±4.900	²⁴⁵ Es	66.370±0.090	²⁶⁵ Md	108.810±1.340	²⁵⁹ Ha	102.070±0.080	²⁶⁵ 111	138.930±1.660 †
²⁴⁶ Pu	65.740±0.120	²²⁹ Bk	56.070±4.510 †	²⁴⁶ Es	67.510±0.150	²⁴¹ No	83.840±4.900	²⁶⁰ Ha	103.820±0.060	²⁶⁶ 111	140.160±1.170 †
²⁴⁷ Pu	69.490±0.170	²³⁰ Bk	56.000±3.610 †	²⁴⁷ Es	68.040±0.100	²⁴² No	82.450±4.100	²⁶¹ Ha	104.270±0.060	²⁶⁷ 111	139.900±0.830 †
²⁴⁸ Pu	71.840±0.370	²³¹ Bk	54.570±2.880	²⁴⁸ Es	70.210±0.070	²⁴³ No	82.710±3.030	²⁶² Ha	106.280±0.060	²⁶⁴ 112	144.190±4.150
²⁴⁹ Pu	75.830±0.500	²³² Bk	54.870±1.800	²⁴⁹ Es	71.070±0.050	²⁴⁴ No	81.570±2.240	²⁶³ Ha	107.040±0.090	²⁶⁵ 112	145.210±3.410
²⁵⁰ Pu	78.450±0.670	²³³ Bk	53.750±1.350	²⁵⁰ Es	73.440±0.060	²⁴⁵ No	82.030±1.660	²⁶⁴ Ha	109.290±0.100	²⁶⁶ 112	145.360±2.380
²⁵¹ Pu	82.520±1.090	²³⁴ Bk	54.320±1.020	²⁵¹ Es	74.610±0.060	²⁴⁶ No	81.950±1.080	²⁶⁵ Ha	110.250±0.110	²⁶⁷ 112	146.660±1.680
²⁵² Pu	85.200±1.780	²³⁵ Bk	53.530±0.760	²⁵² Es	77.370±0.050	²⁴⁷ No	82.390±0.810	²⁶⁶ Ha	112.750±0.130	²⁶⁶ 113	152.760±4.880 †
²⁵³ Pu	89.520±2.220	²³⁶ Bk	54.430±0.340	²⁵³ Es	78.790±0.060	²⁴⁸ No	81.600±0.610	²⁶⁷ Ha	113.980±0.150	²⁶⁷ 113	153.250±3.390 †
²⁵⁴ Pu	92.380±3.080	²³⁷ Bk	52.750±0.440	²⁵⁴ Es	81.760±0.070	²⁴⁹ No	82.230±0.290	²⁵⁴ Sg	110.030±2.090 †		
		²³⁸ Bk	54.090±0.260	²⁵⁵ Es	84.090±0.080	²⁵⁰ No	81.690±0.190	²⁵⁵ Sg	103.670±0.960		
²²³ Am	45.230±4.100 †	²³⁹ Bk	54.080±0.160	²⁵⁶ Es	87.260±0.240	²⁵¹ No	83.020±0.140	²⁵⁶ Sg	103.630±0.630		
²²⁴ Am	45.300±3.050 †	²⁴⁰ Bk	55.740±0.100	²⁵⁷ Es	89.220±0.330	²⁵² No	83.070±0.110	²⁵⁷ Sg	105.000±0.410		
²²⁵ Am	44.030±2.270 †	²⁴¹ Bk	56.070±0.070	²⁵⁸ Es	92.710±0.470	²⁵³ No	84.590±0.110	²⁵⁸ Sg	104.950±0.270		
²²⁶ Am	44.520±1.690 †	²⁴² Bk	58.020±0.050	²⁵⁹ Es	94.870±0.660	²⁵⁴ No	84.900±0.100	²⁵⁹ Sg	106.400±0.180		
²²⁷ Am	43.660±1.260	²⁴³ Bk	58.630±0.040	²⁶⁰ Es	98.260±1.290	²⁵⁵ No	86.910±0.070	²⁶⁰ Sg	106.560±0.100		
²²⁸ Am	43.410±1.500	²⁴⁴ Bk	60.890±0.050	²⁶¹ Es	100.540±1.650	²⁵⁶ No	87.760±0.050	²⁶¹ Sg	108.200±0.060		
²²⁹ Am	42.480±1.200	²⁴⁵ Bk	61.820±0.060	²⁶² Es	104.300±2.120	²⁵⁷ No	90.170±0.040	²⁶² Sg	108.500±0.060		
²³⁰ Am	43.240±0.740	²⁴⁶ Bk	64.040±0.080	²⁶³ Es	106.340±3.140	²⁵⁸ No	91.270±0.040	²⁶³ Sg	110.340±0.070		
²³¹ Am	42.630±0.460	²⁴⁷ Bk	65.370±0.060	²³⁶ Fm	73.400±4.590	²⁵⁹ No	93.920±0.050	²⁶⁴ Sg	110.880±0.080		
²³² Am	43.710±0.290	²⁴⁸ Bk	68.300±0.050	²³⁷ Fm	70.850±3.790	²⁶⁰ No	95.270±0.060	²⁶⁵ Sg	112.950±0.100		
²³³ Am	43.440±0.210	²⁴⁹ Bk	69.900±0.060	²³⁸ Fm	69.550±2.990	²⁶¹ No	98.160±0.080	²⁶⁶ Sg	113.720±0.110		
²³⁴ Am	44.830±0.100	²⁵⁰ Bk	73.100±0.100	²³⁹ Fm	69.900±2.360	²⁶² No	99.740±0.130	²⁶⁷ Sg	116.030±0.130		
²³⁵ Am	44.880±0.070	²⁵¹ Bk	74.910±0.060	²⁴⁰ Fm	68.910±1.860	²⁶³ No	102.830±0.230	²⁵⁵ Ns	109.630±1.800		
²³⁶ Am	46.590±0.070	²⁵² Bk	78.330±0.080	²⁴¹ Fm	69.560±1.100	²⁶⁴ No	104.620±0.340	²⁵⁶ Ns	110.660±1.450		
²³⁷ Am	46.230±0.070	²⁵³ Bk	80.400±0.110	²⁴² Fm	68.820±0.810	²⁶⁵ No	107.920±0.510	²⁵⁷ Ns	110.630±0.950		
²³⁸ Am	48.450±0.050	²⁵⁴ Bk	84.030±0.160	²⁴³ Fm	69.740±0.600	²⁶⁶ No	109.870±0.750	²⁵⁸ Ns	111.940±0.630		
²³⁹ Am	49.300±0.040	²⁵⁵ Bk	86.670±1.410	²⁴⁴ Fm	69.340±0.440	²⁶⁷ No	113.280±1.120	²⁵⁹ Ns	111.790±0.420		
²⁴⁰ Am	51.720±0.040	²⁵⁶ Bk	90.470±1.760	²⁴⁵ Fm	70.520±0.190	²⁴⁴ Lr	90.720±4.160 †	²⁶⁰ Ns	113.020±0.310		
²⁴¹ Am	52.800±0.070	²⁵⁷ Bk	92.720±2.440	²⁴⁶ Fm	70.080±0.180	²⁴⁵ Lr	89.400±3.080 †	²⁶¹ Ns	113.070±0.170		
²⁴² Am	55.590±0.040	²⁵⁸ Bk	96.340±3.370	²⁴⁷ Fm	71.490±0.110	²⁴⁸ Lr	90.390±1.500 †	²⁶² Ns	114.560±0.110		
²⁴³ Am	56.990±0.040	²⁵⁹ Bk	98.850±4.020	²⁴⁸ Fm	71.660±0.080	²⁴⁹ Lr	89.190±1.130 †	²⁶³ Ns	114.680±0.090		
²⁴⁴ Am	59.970±0.050	²³² Cf	60.570±4.430	²⁴⁹ Fm	73.500±0.070	²⁵⁰ Lr	89.330±0.530	²⁶⁴ Ns	116.300±0.080		
²⁴⁵ Am	61.600±0.070	²³³ Cf	60.610±3.330	²⁵⁰ Fm	74.070±0.070	²⁵¹ Lr	88.580±0.370	²⁶⁵ Ns	116.670±0.100		
²⁴⁶ Am	65.090±0.080	²³⁴ Cf	59.280±2.500	²⁵¹ Fm	76.220±0.060	²⁵² Lr	89.540±0.260	²⁶⁶ Ns	118.530±0.120		
²⁴⁷ Am	67.110±0.080	²³⁵ Cf	59.610±1.880	²⁵² Fm	77.100±0.060	²⁵³ Lr	89.260±0.190	²⁶⁷ Ns	119.100±0.140		
²⁴⁸ Am	70.690±0.090	²³⁶ Cf	58.590±1.420	²⁵³ Fm	79.590±0.060	²⁵⁴ Lr	90.380±0.180	²⁵⁵ Hs	115.660±3.350		
²⁴⁹ Am	72.890±0.180	²³⁷ Cf	57.640±0.910	²⁵⁴ Fm	80.780±0.080	²⁵⁵ Lr	89.950±0.070	²⁵⁶ Hs	115.280±2.700		
²⁵⁰ Am	76.700±0.250	²³⁸ Cf	57.130±0.720	²⁵⁵ Fm	83.950±0.070	²⁵⁶ Lr	91.890±0.050	²⁵⁷ Hs	116.330±2.180		
²⁵¹ Am	79.110±0.400	²³⁹ Cf	58.210±0.420	²⁵⁶ Fm	85.490±0.050	²⁵⁷ Lr	92.540±0.040	²⁵⁸ Hs	116.430±1.420		
²⁵² Am	83.050±0.660	²⁴⁰ Cf	57.940±0.260	²⁵⁷ Fm	88.540±0.090	²⁵⁸ Lr	94.730±0.040	²⁵⁹ Hs	117.750±0.940		
²⁵³ Am	85.600±1.080	²⁴¹ Cf	59.330±0.160	²⁵⁸ Fm	90.310±0.130	²⁵⁹ Lr	95.620±0.060	²⁶⁰ Hs	117.380±0.720		
²⁵⁴ Am	89.710±1.500	²⁴² Cf	59.450±0.110	²⁵⁹ Fm	93.620±0.190	²⁶⁰ Lr	98.050±0.050	²⁶¹ Hs	118.500±0.550		
²²⁵ Cm	51.990±4.150 †	²⁴³ Cf	61.140±0.060	²⁶⁰ Fm	95.560±0.370	²⁶¹ Lr	99.200±0.070	²⁶² Hs	118.520±0.290		
²²⁶ Cm	50.430±3.100	²⁴⁴ Cf	61.490±0.050	²⁶¹ Fm	98.940±0.710	²⁶² Lr	101.900±0.100	²⁶³ Hs	119.890±0.180		
²²⁷ Cm	50.620±2.320	²⁴⁵ Cf	63.500±0.060	²⁶² Fm	101.100±0.920	²⁶³ Lr	103.310±0.140	²⁶⁴ Hs	119.800±0.140		
²²⁸ Cm	48.530±2.930	²⁴⁶ Cf	63.650±0.100	²⁶³ Fm	104.650±1.380	²⁶⁴ Lr	106.180±0.120	²⁶⁵ Hs	121.240±0.110		
²²⁹ Cm	48.700±2.330	²⁴⁷ Cf	66.100±0.070	²⁶⁴ Fm	106.740±2.050	²⁶⁵ Lr	107.810±0.150	²⁶⁶ Hs	121.480±0.120		
²³⁰ Cm	47.510±1.860	²⁴⁸ Cf	67.210±0.060	²³⁹ Md	77.170±4.770 †	²⁶⁶ Lr	110.980±0.190	²⁶⁷ Hs	123.150±0.150		
²³¹ Cm	48.040±1.160	²⁴⁹ Cf	69.880±0.070	²⁴⁰ Md	77.370±3.770 †	²⁶⁷ Lr	112.840±0.250	²⁵⁷ Mt	122.260±4.050		
²³² Cm	47.170±0.730	²⁵⁰ Cf	71.260±0.100	²⁴¹ Md	76.200±2.970 †	²⁵⁰ Rf	96.120±2.070	²⁵⁸ Mt	123.420±3.270		
²³³ Cm	47.990±0.550	²⁵¹ Cf	74.250±0.060	²⁴² Md	76.640±2.190	²⁵¹ Rf	96.050±1.410	²⁵⁹ Mt	123.790±2.120 †		
²³⁴ Cm	47.470±0.410	²⁵² Cf	75.890±0.050	²⁴³ Md	75.720±1.620	²⁵² Rf	94.840±0.960	²⁶⁰ Mt	124.890±1.620		
²³⁵ Cm	48.610±0.190	²⁵³ Cf	79.090±0.070	²⁴⁴ Md	76.410±1.190	²⁵					