

Finite-Range Liquid-Drop Model

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁶ O	-4.150	²⁵ Na	-8.270	⁴⁶ Al	76.340	⁵⁷ P	120.510	⁶⁰ Cl	88.700	⁵⁷ K	14.800
¹⁷ O	0.590	²⁶ Na	-5.220	⁴⁷ Al	85.780			⁶¹ Cl	96.750	⁵⁸ K	22.640
¹⁸ O	-1.790	²⁷ Na	-4.410	⁴⁸ Al	96.300	²⁴ S	53.680	⁶² Cl	106.990	⁵⁹ K	27.310
¹⁹ O	3.330	²⁸ Na	-0.120	⁴⁹ Al	105.430	²⁵ S	41.850	⁶³ Cl	115.560	⁶⁰ K	36.330
²⁰ O	3.390	²⁹ Na	3.240	⁵⁰ Al	115.460	²⁶ S	26.630			⁶¹ K	42.960
²¹ O	8.970	³⁰ Na	8.550	⁵¹ Al	124.710	²⁷ S	16.710	²⁷ Ar	64.170	⁶² K	51.640
²² O	11.060	³¹ Na	12.500			²⁸ S	3.810	²⁸ Ar	45.740	⁶³ K	58.580
²³ O	18.260	³² Na	19.240	²² Si	31.890	²⁹ S	-2.760	²⁹ Ar	34.720	⁶⁴ K	66.740
²⁴ O	22.670	³³ Na	23.840	²³ Si	23.110	³⁰ S	-12.350	³⁰ Ar	19.520	⁶⁵ K	73.700
²⁵ O	31.260	³⁴ Na	30.900	²⁴ Si	9.810	³¹ S	-16.490	³¹ Ar	10.320	⁶⁶ K	82.990
²⁶ O	36.880	³⁵ Na	36.940	²⁵ Si	3.280	³² S	-23.530	³² Ar	-2.360	⁶⁷ K	90.530
²⁷ O	46.570	³⁶ Na	45.550	²⁶ Si	-7.920	³³ S	-24.060	³³ Ar	-8.010	⁶⁸ K	100.010
²⁸ O	53.600	³⁷ Na	52.410	²⁷ Si	-12.190	³⁴ S	-27.950	³⁴ Ar	-17.110	⁶⁹ K	107.630
²⁹ O	64.760	³⁸ Na	61.490	²⁸ Si	-20.250	³⁵ S	-27.160	³⁵ Ar	-22.280	⁷⁰ K	118.120
³⁰ O	72.450	³⁹ Na	69.110	²⁹ Si	-19.840	³⁶ S	-29.520	³⁶ Ar	-29.400		
³¹ O	83.240	⁴⁰ Na	79.900	³⁰ Si	-22.030	³⁷ S	-26.820	³⁷ Ar	-30.720	³⁰ Ca	70.570
³² O	91.780	⁴¹ Na	88.220	³¹ Si	-20.020	³⁸ S	-27.340	³⁸ Ar	-35.090	³¹ Ca	56.860
³³ O	103.820	⁴² Na	100.030	³² Si	-21.810	³⁹ S	-23.810	³⁹ Ar	-34.430	³² Ca	39.330
³⁴ O	112.750	⁴³ Na	108.980	³³ Si	-18.800	⁴⁰ S	-23.350	⁴⁰ Ar	-36.160	³³ Ca	27.620
		⁴⁴ Na	120.110	³⁴ Si	-19.040	⁴¹ S	-18.670	⁴¹ Ar	-34.010	³⁴ Ca	12.790
¹⁷ F	2.360			³⁵ Si	-14.320	⁴² S	-17.160	⁴² Ar	-35.230	³⁵ Ca	4.270
¹⁸ F	1.800	²⁰ Mg	15.660	³⁶ Si	-12.970	⁴³ S	-11.680	⁴³ Ar	-32.480	³⁶ Ca	-6.930
¹⁹ F	-2.130	²¹ Mg	9.770	³⁷ Si	-7.250	⁴⁴ S	-9.090	⁴⁴ Ar	-32.910	³⁷ Ca	-13.390
²⁰ F	0.930	²² Mg	-1.070	³⁸ Si	-5.120	⁴⁵ S	-2.290	⁴⁵ Ar	-29.550	³⁸ Ca	-22.990
²¹ F	0.160	²³ Mg	-5.470	³⁹ Si	1.280	⁴⁶ S	2.170	⁴⁶ Ar	-28.620	³⁹ Ca	-27.990
²² F	3.840	²⁴ Mg	-13.520	⁴⁰ Si	6.340	⁴⁷ S	9.720	⁴⁷ Ar	-23.550	⁴⁰ Ca	-35.340
²³ F	5.030	²⁵ Mg	-11.940	⁴¹ Si	11.070	⁴⁸ S	14.710	⁴⁸ Ar	-20.670	⁴¹ Ca	-36.480
²⁴ F	9.980	²⁶ Mg	-15.530	⁴² Si	14.950	⁴⁹ S	23.190	⁴⁹ Ar	-14.240	⁴² Ca	-40.630
²⁵ F	14.020	²⁷ Mg	-11.980	⁴³ Si	23.550	⁵⁰ S	28.950	⁵⁰ Ar	-10.710	⁴³ Ca	-40.120
²⁶ F	20.470	²⁸ Mg	-13.600	⁴⁴ Si	29.610	⁵¹ S	38.590	⁵¹ Ar	-3.620	⁴⁴ Ca	-43.170
²⁷ F	25.750	²⁹ Mg	-8.800	⁴⁵ Si	38.780	⁵² S	45.330	⁵² Ar	0.760	⁴⁵ Ca	-42.140
²⁸ F	33.420	³⁰ Mg	-8.350	⁴⁶ Si	46.850	⁵³ S	54.620	⁵³ Ar	8.500	⁴⁶ Ca	-44.360
²⁹ F	39.980	³¹ Mg	-3.120	⁴⁷ Si	55.460	⁵⁴ S	61.630	⁵⁴ Ar	13.720	⁴⁷ Ca	-42.710
³⁰ F	49.420	³² Mg	-1.050	⁴⁸ Si	63.360	⁵⁵ S	71.900	⁵⁵ Ar	21.100	⁴⁸ Ca	-43.430
³¹ F	55.650	³³ Mg	5.660	⁴⁹ Si	73.770	⁵⁶ S	79.240	⁵⁶ Ar	26.330	⁴⁹ Ca	-39.950
³² F	65.200	³⁴ Mg	8.540	⁵⁰ Si	81.620	⁵⁷ S	88.800	⁵⁷ Ar	35.530	⁵⁰ Ca	-38.300
³³ F	73.240	³⁵ Mg	15.490	⁵¹ Si	92.620	⁵⁸ S	97.140	⁵⁸ Ar	41.980	⁵¹ Ca	-33.210
³⁴ F	83.670	³⁶ Mg	19.670	⁵² Si	100.500	⁵⁹ S	109.640	⁵⁹ Ar	51.180	⁵² Ca	-30.730
³⁵ F	92.450	³⁷ Mg	27.820	⁵³ Si	111.460	⁶⁰ S	118.440	⁶⁰ Ar	58.040	⁵³ Ca	-25.060
³⁶ F	103.250	³⁸ Mg	33.030	⁵⁴ Si	120.470			⁶¹ Ar	67.580	⁵⁴ Ca	-22.130
³⁷ F	111.630	³⁹ Mg	41.730			²⁵ Cl	67.570	⁶² Ar	74.810	⁵⁵ Ca	-15.930
³⁸ F	124.250	⁴⁰ Mg	47.650	²³ P	43.990	²⁶ Cl	53.420	⁶³ Ar	84.810	⁵⁶ Ca	-12.490
		⁴¹ Mg	58.420	²⁴ P	32.580	²⁷ Cl	37.860	⁶⁴ Ar	92.500	⁵⁷ Ca	-4.910
¹⁸ Ne	3.480	⁴² Mg	65.440	²⁵ P	19.720	²⁸ Cl	27.220	⁶⁵ Ar	102.780	⁵⁸ Ca	-1.570
¹⁹ Ne	1.150	⁴³ Mg	76.320	²⁶ P	10.970	²⁹ Cl	14.110	⁶⁶ Ar	109.690	⁵⁹ Ca	6.020
²⁰ Ne	-6.460	⁴⁴ Mg	84.610	²⁷ P	0.820	³⁰ Cl	4.520	⁶⁷ Ar	120.210	⁶⁰ Ca	10.800
²¹ Ne	-4.980	⁴⁵ Mg	96.070	²⁸ P	-6.470	³¹ Cl	-5.620			⁶¹ Ca	18.390
²² Ne	-7.660	⁴⁶ Mg	103.990	²⁹ P	-15.620	³² Cl	-11.530	²⁹ K	59.570	⁶² Ca	23.460
²³ Ne	-4.150	⁴⁷ Mg	115.950	³⁰ P	-17.170	³³ Cl	-18.930	³⁰ K	46.470	⁶³ Ca	32.330
²⁴ Ne	-5.040			³¹ P	-21.590	³⁴ Cl	-22.870	³¹ K	30.910	⁶⁴ Ca	37.940
²⁵ Ne	-0.420	²¹ Al	25.700	³² P	-21.340	³⁵ Cl	-27.680	³² K	19.690	⁶⁵ Ca	46.860
²⁶ Ne	1.510	²² Al	17.600	³³ P	-23.560	³⁶ Cl	-28.070	³³ K	6.740	⁶⁶ Ca	52.900
²⁷ Ne	7.650	²³ Al	6.350	³⁴ P	-22.320	³⁷ Cl	-30.820	³⁴ K	-1.420	⁶⁷ Ca	62.000
²⁸ Ne	10.870	²⁴ Al	0.480	³⁵ P	-23.000	³⁸ Cl	-29.870	³⁵ K	-10.930	⁶⁸ Ca	68.540
²⁹ Ne	18.030	²⁵ Al	-8.150	³⁶ P	-19.960	³⁹ Cl	-30.710	³⁶ K	-17.000	⁶⁹ Ca	77.880
³⁰ Ne	22.520	²⁶ Al	-10.370	³⁷ P	-19.000	⁴⁰ Cl	-28.240	³⁷ K	-24.900	⁷⁰ Ca	84.280
³¹ Ne	30.840	²⁷ Al	-16.080	³⁸ P	-14.670	⁴¹ Cl	-28.110	³⁸ K	-28.740	⁷¹ Ca	95.290
³² Ne	35.960	²⁸ Al	-14.920	³⁹ P	-12.920	⁴² Cl	-24.800	³⁹ K	-34.190	⁷² Ca	103.770
³³ Ne	44.900	²⁹ Al	-15.920	⁴⁰ P	-7.910	⁴³ Cl	-23.530	⁴⁰ K	-35.100	⁷³ Ca	114.510
³⁴ Ne	51.250	³⁰ Al	-13.880	⁴¹ P	-4.980	⁴⁴ Cl	-19.490	⁴¹ K	-37.470		
³⁵ Ne	61.420	³¹ Al	-13.700	⁴² P	0.960	⁴⁵ Cl	-17.910	⁴² K	-36.630	³² Sc	68.990
³⁶ Ne	68.680	³² Al	-10.270	⁴³ P	4.130	⁴⁶ Cl	-12.210	⁴³ K	-38.190	³³ Sc	52.470
³⁷ Ne	79.370	³³ Al	-8.630	⁴⁴ P	11.870	⁴⁷ Cl	-8.150	⁴⁴ K	-36.950	³⁴ Sc	38.980
³⁸ Ne	86.930	³⁴ Al	-3.790	⁴⁵ P	17.430	⁴⁸ Cl	-1.520	⁴⁵ K	-37.680	³⁵ Sc	23.970
³⁹ Ne	99.070	³⁵ Al	-0.840	⁴⁶ P	25.110	⁴⁹ Cl	3.230	⁴⁶ K	-35.330	³⁶ Sc	13.850
⁴⁰ Ne	107.810	³⁶ Al	5.060	⁴⁷ P	32.570	⁵⁰ Cl	10.580	⁴⁷ K	-35.070	³⁷ Sc	2.310
⁴¹ Ne	120.750	³⁷ Al	8.880	⁴⁸ P	40.170	⁵¹ Cl	16.140	⁴⁸ K	-31.240	³⁸ Sc	-5.870
		³⁸ Al	15.480	⁴⁹ P	47.060	⁵² Cl	24.370	⁴⁹ K	-28.490	³⁹ Sc	-15.700
¹⁹ Na	11.490	³⁹ Al	20.360	⁵⁰ P	57.190	⁵³ Cl	31.130	⁵⁰ K	-23.140	⁴⁰ Sc	-22.330
²⁰ Na	6.400	⁴⁰ Al	28.260	⁵¹ P	64.920	⁵⁴ Cl	39.790	⁵¹ K	-19.410	⁴¹ Sc	-29.910
²¹ Na	-2.240	⁴¹ Al	32.800	⁵² P	74.590	⁵⁵ Cl	46.630	⁵² K	-13.370	⁴² Sc	-33.510
²² Na	-4.390	⁴² Al	41.650	⁵³ P	82.710	⁵⁶ Cl	55.460	⁵³ K	-8.660	⁴³ Sc	-38.550
²³ Na	-9.160	⁴³ Al	49.460	⁵⁴ P	92.380	⁵⁷ Cl	62.770	⁵⁴ K	-1.750	⁴⁴ Sc	-39.630
²⁴ Na	-6.770	⁴⁴ Al	58.370	⁵⁵ P	100.890	⁵⁸ Cl	71.100	⁵⁵ K	3.480	⁴⁵ Sc	-43.040
		⁴⁵ Al	67.050	⁵⁶ P	111.340	⁵⁹ Cl	78.870	⁵⁶ K	9.510	⁴⁶ Sc	-43.500

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
⁴⁷ Sc	-46.130	⁷⁹ Ti	115.590	⁶² Cr	-40.630	⁴² Fe	48.270	⁶⁸ Co	-52.330	⁹² Ni	65.640		
⁴⁸ Sc	-45.340	⁸⁰ Ti	124.260	⁶³ Cr	-35.490	⁴³ Fe	36.930	⁶⁹ Co	-51.180	⁹³ Ni	74.920		
⁴⁹ Sc	-46.560			⁶⁴ Cr	-34.620	⁴⁴ Fe	22.640	⁷⁰ Co	-47.100	⁹⁴ Ni	82.280		
⁵⁰ Sc	-44.200	³⁶ V	61.320	⁶⁵ Cr	-28.380	⁴⁵ Fe	12.130	⁷¹ Co	-45.210	⁹⁵ Ni	91.920		
⁵¹ Sc	-43.060	³⁷ V	44.760	⁶⁶ Cr	-25.970	⁴⁶ Fe	-0.640	⁷² Co	-40.880	⁹⁶ Ni	99.450		
⁵² Sc	-39.020	³⁸ V	32.810	⁶⁷ Cr	-19.980	⁴⁷ Fe	-8.600	⁷³ Co	-38.490	⁹⁷ Ni	109.470		
⁵³ Sc	-36.490	³⁹ V	19.010	⁶⁸ Cr	-16.660	⁴⁸ Fe	-19.290	⁷⁴ Co	-33.640	⁹⁸ Ni	117.750		
⁵⁴ Sc	-31.670	⁴⁰ V	9.510	⁶⁹ Cr	-10.360	⁴⁹ Fe	-25.330	⁷⁵ Co	-30.740	⁹⁹ Ni	127.580		
⁵⁵ Sc	-28.820	⁴¹ V	-1.440	⁷⁰ Cr	-6.510	⁵⁰ Fe	-34.770	⁷⁶ Co	-25.640				
⁵⁶ Sc	-23.490	⁴² V	-9.820	⁷¹ Cr	0.220	⁵¹ Fe	-40.880	⁷⁷ Co	-22.050	⁴⁸ Cu	43.850		
⁵⁷ Sc	-20.090	⁴³ V	-19.460	⁷² Cr	4.710	⁵² Fe	-48.380	⁷⁸ Co	-14.890	⁴⁹ Cu	28.740		
⁵⁸ Sc	-14.220	⁴⁴ V	-25.420	⁷³ Cr	11.780	⁵³ Fe	-51.900	⁷⁹ Co	-9.040	⁵⁰ Cu	18.350		
⁵⁹ Sc	-10.620	⁴⁵ V	-33.010	⁷⁴ Cr	16.580	⁵⁴ Fe	-57.010	⁸⁰ Co	-1.470	⁵¹ Cu	5.300		
⁶⁰ Sc	-4.400	⁴⁶ V	-36.400	⁷⁵ Cr	25.450	⁵⁵ Fe	-58.020	⁸¹ Co	4.800	⁵² Cu	-3.280		
⁶¹ Sc	-0.480	⁴⁷ V	-42.270	⁷⁶ Cr	32.370	⁵⁶ Fe	-60.590	⁸² Co	13.160	⁵³ Cu	-14.680		
⁶² Sc	7.360	⁴⁸ V	-45.400	⁷⁷ Cr	41.740	⁵⁷ Fe	-59.820	⁸³ Co	19.740	⁵⁴ Cu	-22.280		
⁶³ Sc	12.110	⁴⁹ V	-48.660	⁷⁸ Cr	48.750	⁵⁸ Fe	-61.750	⁸⁴ Co	28.610	⁵⁵ Cu	-32.430		
⁶⁴ Sc	19.660	⁵⁰ V	-50.260	⁷⁹ Cr	58.560	⁵⁹ Fe	-59.920	⁸⁵ Co	35.850	⁵⁶ Cu	-38.830		
⁶⁵ Sc	25.050	⁵¹ V	-52.600	⁸⁰ Cr	67.410	⁶⁰ Fe	-61.170	⁸⁶ Co	44.350	⁵⁷ Cu	-47.860		
⁶⁶ Sc	32.880	⁵² V	-51.880	⁸¹ Cr	76.990	⁶¹ Fe	-58.820	⁸⁷ Co	51.370	⁵⁸ Cu	-50.940		
⁶⁷ Sc	38.580	⁵³ V	-51.980	⁸² Cr	84.510	⁶² Fe	-59.060	⁸⁸ Co	59.920	⁵⁹ Cu	-56.160		
⁶⁸ Sc	46.630	⁵⁴ V	-49.390	⁸³ Cr	94.720	⁶³ Fe	-55.750	⁸⁹ Co	67.290	⁶⁰ Cu	-57.620		
⁶⁹ Sc	52.990	⁵⁵ V	-48.850	⁸⁴ Cr	102.930	⁶⁴ Fe	-55.720	⁹⁰ Co	76.520	⁶¹ Cu	-61.160		
⁷⁰ Sc	61.380	⁵⁶ V	-45.420	⁸⁵ Cr	113.170	⁶⁵ Fe	-52.150	⁹¹ Co	84.510	⁶² Cu	-61.880		
⁷¹ Sc	68.280	⁵⁷ V	-44.080	⁸⁶ Cr	121.480	⁶⁶ Fe	-51.250	⁹² Co	93.930	⁶³ Cu	-64.530		
⁷² Sc	77.920	⁵⁸ V	-39.940			⁶⁷ Fe	-46.240	⁹³ Co	102.040	⁶⁴ Cu	-64.320		
⁷³ Sc	86.500	⁵⁹ V	-38.130	⁴⁰ Mn	54.530	⁶⁸ Fe	-45.060	⁹⁴ Co	111.820	⁶⁵ Cu	-66.380		
⁷⁴ Sc	96.500	⁶⁰ V	-33.180	⁴¹ Mn	38.910	⁶⁹ Fe	-39.920	⁹⁵ Co	120.150	⁶⁶ Cu	-65.430		
⁷⁵ Sc	105.260	⁶¹ V	-30.790	⁴² Mn	27.820	⁷⁰ Fe	-37.910	⁹⁶ Co	130.240	⁶⁷ Cu	-66.790		
⁷⁶ Sc	116.150	⁶² V	-25.830	⁴³ Mn	14.210	⁷¹ Fe	-32.660			⁶⁸ Cu	-65.090		
		⁶³ V	-22.940	⁴⁴ Mn	4.810	⁷² Fe	-30.140	⁴⁶ Ni	43.500	⁶⁹ Cu	-65.570		
		⁶⁴ V	-16.510	⁴⁵ Mn	-6.420	⁷³ Fe	-24.290	⁴⁷ Ni	31.180	⁷⁰ Cu	-63.080		
³⁴ Ti	61.750	⁶⁵ V	-13.110	⁴⁶ Mn	-14.170	⁷⁴ Fe	-21.040	⁴⁸ Ni	16.750	⁷¹ Cu	-63.030		
³⁵ Ti	48.690	⁶⁶ V	-6.950	⁴⁷ Mn	-23.410	⁷⁵ Fe	-15.120	⁴⁹ Ni	7.140	⁷² Cu	-60.150		
³⁶ Ti	32.230	⁶⁷ V	-2.170	⁴⁸ Mn	-30.150	⁷⁶ Fe	-11.500	⁵⁰ Ni	-5.210	⁷³ Cu	-59.490		
³⁷ Ti	21.610	⁶⁸ V	4.190	⁴⁹ Mn	-38.610	⁷⁷ Fe	-3.420	⁵¹ Ni	-12.810	⁷⁴ Cu	-56.200		
³⁸ Ti	8.430	⁶⁹ V	8.840	⁵⁰ Mn	-42.720	⁷⁸ Fe	2.600	⁵² Ni	-23.900	⁷⁵ Cu	-54.940		
³⁹ Ti	0.010	⁷⁰ V	15.760	⁵¹ Mn	-49.040	⁷⁹ Fe	10.760	⁵³ Ni	-30.650	⁷⁶ Cu	-51.220		
⁴⁰ Ti	-10.810	⁷¹ V	21.040	⁵² Mn	-51.380	⁸⁰ Fe	17.320	⁵⁴ Ni	-40.580	⁷⁷ Cu	-49.380		
⁴¹ Ti	-17.740	⁷² V	28.200	⁵³ Mn	-55.290	⁸¹ Fe	26.410	⁵⁵ Ni	-46.510	⁷⁸ Cu	-45.220		
⁴² Ti	-27.030	⁷³ V	33.920	⁵⁴ Mn	-55.990	⁸² Fe	33.220	⁵⁶ Ni	-54.460	⁷⁹ Cu	-42.610		
⁴³ Ti	-31.550	⁷⁴ V	42.960	⁵⁵ Mn	-57.470	⁸³ Fe	42.350	⁵⁷ Ni	-56.900	⁸⁰ Cu	-36.370		
⁴⁴ Ti	-38.780	⁷⁵ V	50.690	⁵⁶ Mn	-56.330	⁸⁴ Fe	49.920	⁵⁸ Ni	-60.810	⁸¹ Cu	-31.540		
⁴⁵ Ti	-40.140	⁷⁶ V	60.110	⁵⁷ Mn	-57.150	⁸⁵ Fe	59.210	⁵⁹ Ni	-61.250	⁸² Cu	-24.660		
⁴⁶ Ti	-44.930	⁷⁷ V	67.990	⁵⁸ Mn	-55.210	⁸⁶ Fe	66.200	⁶⁰ Ni	-64.570	⁸³ Cu	-19.620		
⁴⁷ Ti	-45.650	⁷⁸ V	77.780	⁵⁹ Mn	-55.240	⁸⁷ Fe	75.570	⁶¹ Ni	-64.060	⁸⁴ Cu	-12.240		
⁴⁸ Ti	-49.640	⁷⁹ V	87.430	⁶⁰ Mn	-52.610	⁸⁸ Fe	83.120	⁶² Ni	-66.310	⁸⁵ Cu	-6.580		
⁴⁹ Ti	-49.860	⁸⁰ V	97.180	⁶¹ Mn	-51.780	⁸⁹ Fe	92.980	⁶³ Ni	-65.110	⁸⁶ Cu	1.250		
⁵⁰ Ti	-52.010	⁸¹ V	105.550	⁶² Mn	-47.950	⁹⁰ Fe	101.110	⁶⁴ Ni	-66.810	⁸⁷ Cu	7.700		
⁵¹ Ti	-50.040	⁸² V	115.890	⁶³ Mn	-46.710	⁹¹ Fe	111.300	⁶⁵ Ni	-65.060	⁸⁸ Cu	15.430		
⁵² Ti	-49.900	⁸³ V	124.950	⁶⁴ Mn	-42.520	⁹² Fe	119.850	⁶⁶ Ni	-66.100	⁸⁹ Cu	21.330		
⁵³ Ti	-46.240			⁶⁵ Mn	-40.490			⁶⁷ Ni	-63.940	⁹⁰ Cu	29.080		
⁵⁴ Ti	-45.200	³⁸ Cr	54.420	⁶⁶ Mn	-35.820	⁴⁴ Co	49.240	⁶⁸ Ni	-64.120	⁹¹ Cu	35.630		
⁵⁵ Ti	-40.850	³⁹ Cr	42.030	⁶⁷ Mn	-34.150	⁴⁵ Co	33.700	⁶⁹ Ni	-60.200	⁹² Cu	43.990		
⁵⁶ Ti	-39.210	⁴⁰ Cr	27.000	⁶⁸ Mn	-28.840	⁴⁶ Co	22.440	⁷⁰ Ni	-60.250	⁹³ Cu	51.090		
⁵⁷ Ti	-33.870	⁴¹ Cr	16.830	⁶⁹ Mn	-25.910	⁴⁷ Co	8.850	⁷¹ Ni	-56.090	⁹⁴ Cu	59.850		
⁵⁸ Ti	-31.760	⁴² Cr	4.740	⁷⁰ Mn	-20.400	⁴⁸ Co	-0.320	⁷² Ni	-54.940	⁹⁵ Cu	67.170		
⁵⁹ Ti	-26.090	⁴³ Cr	-4.010	⁷¹ Mn	-16.860	⁴⁹ Co	-11.670	⁷³ Ni	-50.830	⁹⁶ Cu	76.180		
⁶⁰ Ti	-23.570	⁴⁴ Cr	-15.040	⁷² Mn	-11.030	⁵⁰ Co	-19.060	⁷⁴ Ni	-49.230	⁹⁷ Cu	83.660		
⁶¹ Ti	-17.650	⁴⁵ Cr	-21.340	⁷³ Mn	-6.840	⁵¹ Co	-28.930	⁷⁵ Ni	-44.830	⁹⁸ Cu	92.960		
⁶² Ti	-14.330	⁴⁶ Cr	-30.270	⁷⁴ Mn	-0.760	⁵² Co	-35.240	⁷⁶ Ni	-42.790	⁹⁹ Cu	101.060		
⁶³ Ti	-7.080	⁴⁷ Cr	-34.710	⁷⁵ Mn	3.900	⁵³ Co	-43.880	⁷⁷ Ni	-37.770	¹⁰⁰ Cu	110.570		
⁶⁴ Ti	-3.690	⁴⁸ Cr	-42.510	⁷⁶ Mn	12.010	⁵⁴ Co	-48.250	⁷⁸ Ni	-35.660	¹⁰¹ Cu	118.900		
⁶⁵ Ti	4.030	⁴⁹ Cr	-46.160	⁷⁷ Mn	18.830	⁵⁵ Co	-54.920	⁷⁹ Ni	-28.070	¹⁰² Cu	128.950		
⁶⁶ Ti	8.930	⁵⁰ Cr	-50.480	⁷⁸ Mn	27.360	⁵⁶ Co	-56.510	⁸⁰ Ni	-23.670				
⁶⁷ Ti	16.400	⁵¹ Cr	-52.600	⁷⁹ Mn	34.350	⁵⁷ Co	-59.720	⁸¹ Ni	-15.700	⁵¹ Zn	28.170		
⁶⁸ Ti	21.160	⁵² Cr	-56.160	⁸⁰ Mn	43.400	⁵⁸ Co	-59.780	⁸² Ni	-10.630	⁵² Zn	14.460		
⁶⁹ Ti	28.930	⁵³ Cr	-55.780	⁸¹ Mn	50.920	⁵⁹ Co	-61.820	⁸³ Ni	-1.790	⁵³ Zn	5.660		
⁷⁰ Ti	34.280	⁵⁴ Cr	-57.180	⁸² Mn	60.510	⁶⁰ Co	-61.220	⁸⁴ Ni	4.170	⁵⁴ Zn	-7.140		
⁷¹ Ti	42.420	⁵⁵ Cr	-54.860	⁸³ Mn	68.500	⁶¹ Co	-62.490	⁸⁵ Ni	12.880	⁵⁵ Zn	-14.980		
⁷² Ti	48.090	⁵⁶ Cr	-55.480	⁸⁴ Mn	77.880	⁶² Co	-60.950	⁸⁶ Ni	19.500	⁵⁶ Zn	-26.230		
⁷³ Ti	57.930	⁵⁷ Cr	-52.310	⁸⁵ Mn	85.740	⁶³ Co	-61.580	⁸⁷ Ni	28.060	⁵⁷ Zn	-33.120		
⁷⁴ Ti	66.180	⁵⁸ Cr	-52.120	⁸⁶ Mn	95.270	⁶⁴ Co	-59.280	⁸⁸ Ni	34.340	⁵⁸ Zn	-42.650		
⁷⁵ Ti	76.260	⁵⁹ Cr	-48.320	⁸⁷ Mn	103.460	⁶⁵ Co	-59.400	⁸⁹ Ni	42.800	⁵⁹ Zn	-46.910		
⁷⁶ Ti	84.290	⁶⁰ Cr	-47.550	⁸⁸ Mn	113.510	⁶⁶ Co	-56.700	⁹⁰ Ni	49.330	⁶⁰ Zn	-53.650		
⁷⁷ Ti	95.130	⁶¹ Cr	-42.160	⁸⁹ Mn	122.500	⁶⁷ Co	-56.000	⁹¹ Ni	58.440	⁶¹ Zn	-55.540		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
⁶² Zn	-60.290	⁸⁴ Ga	-43.090	¹⁰⁵ Ge	74.760	⁶⁶ Se	-41.270	⁸³ Br	-79.430	⁹⁹ Kr	-39.840
⁶³ Zn	-61.220	⁸⁵ Ga	-39.030	¹⁰⁶ Ge	82.030	⁶⁷ Se	-46.110	⁸⁴ Br	-77.850	¹⁰⁰ Kr	-36.170
⁶⁴ Zn	-64.990	⁸⁶ Ga	-32.720	¹⁰⁷ Ge	90.730	⁶⁸ Se	-53.560	⁸⁵ Br	-78.210	¹⁰¹ Kr	-30.110
⁶⁵ Zn	-65.160	⁸⁷ Ga	-28.080	¹⁰⁸ Ge	97.880	⁶⁹ Se	-56.280	⁸⁶ Br	-75.070	¹⁰² Kr	-26.110
⁶⁶ Zn	-68.190	⁸⁸ Ga	-21.490	¹⁰⁹ Ge	107.000	⁷⁰ Se	-61.780	⁸⁷ Br	-73.460	¹⁰³ Kr	-19.780
⁶⁷ Zn	-67.600	⁸⁹ Ga	-16.460	¹¹⁰ Ge	114.370	⁷¹ Se	-63.370	⁸⁸ Br	-69.550	¹⁰⁴ Kr	-15.500
⁶⁸ Zn	-69.820	⁹⁰ Ga	-9.140	¹¹¹ Ge	123.630	⁷² Se	-67.710	⁸⁹ Br	-67.110	¹⁰⁵ Kr	-8.810
⁶⁹ Zn	-68.220	⁹¹ Ga	-4.120	¹¹² Ge	131.310	⁷³ Se	-68.470	⁹⁰ Br	-62.840	¹⁰⁶ Kr	-3.830
⁷⁰ Zn	-69.810	⁹² Ga	2.890			⁷⁴ Se	-72.270	⁹¹ Br	-60.280	¹⁰⁷ Kr	3.230
⁷¹ Zn	-67.430	⁹³ Ga	8.470	⁵⁷ As	25.360	⁷⁵ Se	-72.460	⁹² Br	-55.560	¹⁰⁸ Kr	8.830
⁷² Zn	-68.400	⁹⁴ Ga	15.900	⁵⁸ As	14.940	⁷⁶ Se	-75.420	⁹³ Br	-52.520	¹⁰⁹ Kr	16.630
⁷³ Zn	-65.730	⁹⁵ Ga	22.130	⁵⁹ As	2.450	⁷⁷ Se	-74.840	⁹⁴ Br	-47.600	¹¹⁰ Kr	22.930
⁷⁴ Zn	-66.350	⁹⁶ Ga	30.240	⁶⁰ As	-6.610	⁷⁸ Se	-77.440	⁹⁵ Br	-44.150	¹¹¹ Kr	30.950
⁷⁵ Zn	-63.150	⁹⁷ Ga	36.680	⁶¹ As	-17.540	⁷⁹ Se	-76.480	⁹⁶ Br	-38.990	¹¹² Kr	37.030
⁷⁶ Zn	-62.860	⁹⁸ Ga	44.870	⁶² As	-24.300	⁸⁰ Se	-78.400	⁹⁷ Br	-35.170	¹¹³ Kr	43.340
⁷⁷ Zn	-59.170	⁹⁹ Ga	51.550	⁶³ As	-32.900	⁸¹ Se	-76.940	⁹⁸ Br	-29.280	¹¹⁴ Kr	49.190
⁷⁸ Zn	-58.270	¹⁰⁰ Ga	59.940	⁶⁴ As	-38.500	⁸² Se	-77.990	⁹⁹ Br	-24.850	¹¹⁵ Kr	56.980
⁷⁹ Zn	-54.030	¹⁰¹ Ga	67.100	⁶⁵ As	-45.970	⁸³ Se	-62.660	¹⁰⁰ Br	-18.650	¹¹⁶ Kr	62.830
⁸⁰ Zn	-52.360	¹⁰² Ga	75.860	⁶⁶ As	-50.040	⁸⁴ Se	-75.620	¹⁰¹ Br	-13.870	¹¹⁷ Kr	69.020
⁸¹ Zn	-46.350	¹⁰³ Ga	83.410	⁶⁷ As	-55.970	⁸⁵ Se	-71.700	¹⁰² Br	-7.430	¹¹⁸ Kr	75.290
⁸² Zn	-42.160	¹⁰⁴ Ga	92.680	⁶⁸ As	-58.440	⁸⁶ Se	-70.070	¹⁰³ Br	-2.460	¹¹⁹ Kr	85.040
⁸³ Zn	-35.570	¹⁰⁵ Ga	100.520	⁶⁹ As	-62.960	⁸⁷ Se	-65.260	¹⁰⁴ Br	4.370	¹²⁰ Kr	93.350
⁸⁴ Zn	-31.370	¹⁰⁶ Ga	109.270	⁷⁰ As	-64.300	⁸⁸ Se	-62.970	¹⁰⁵ Br	9.970	¹²¹ Kr	104.010
⁸⁵ Zn	-24.290	¹⁰⁷ Ga	117.060	⁷¹ As	-67.720	⁸⁹ Se	-57.860	¹⁰⁶ Br	17.140	¹²² Kr	112.890
⁸⁶ Zn	-19.440	¹⁰⁸ Ga	126.260	⁷² As	-68.540	⁹⁰ Se	-55.030	¹⁰⁷ Br	23.140	¹²³ Kr	123.560
⁸⁷ Zn	-11.830			⁷³ As	-71.160	⁹¹ Se	-49.460	¹⁰⁸ Br	31.130	¹²⁴ Kr	133.100
⁸⁸ Zn	-6.480	⁵⁵ Ge	26.770	⁷⁴ As	-71.180	⁹² Se	-46.340	¹⁰⁹ Br	37.900	⁶⁶ Rb	13.340
⁸⁹ Zn	1.350	⁵⁶ Ge	12.770	⁷⁵ As	-73.130	⁹³ Se	-40.350	¹¹⁰ Br	45.870	⁶⁷ Rb	1.940
⁹⁰ Zn	6.590	⁵⁷ Ge	3.530	⁷⁶ As	-72.390	⁹⁴ Se	-36.800	¹¹¹ Br	52.560	⁶⁸ Rb	-6.010
⁹¹ Zn	14.500	⁵⁸ Ge	-8.760	⁷⁷ As	-74.300	⁹⁵ Se	-30.840	¹¹² Br	59.050	⁶⁹ Rb	-16.090
⁹² Zn	20.250	⁵⁹ Ge	-16.930	⁷⁸ As	-73.170	⁹⁶ Se	-26.870	¹¹³ Br	65.520	⁷⁰ Rb	-23.470
⁹³ Zn	28.250	⁶⁰ Ge	-27.650	⁷⁹ As	-74.180	⁹⁷ Se	-20.270	¹¹⁴ Br	73.510	⁷¹ Rb	-32.500
⁹⁴ Zn	34.400	⁶¹ Ge	-33.420	⁸⁰ As	-72.520	⁹⁸ Se	-15.710	¹¹⁵ Br	80.310	⁷² Rb	-38.350
⁹⁵ Zn	43.130	⁶² Ge	-41.490	⁸¹ As	-72.530	⁹⁹ Se	-8.890	¹¹⁶ Br	86.100	⁷³ Rb	-46.470
⁹⁶ Zn	49.780	⁶³ Ge	-45.970	⁸² As	-70.400	¹⁰⁰ Se	-4.070	¹¹⁷ Br	93.150	⁷⁴ Rb	-51.220
⁹⁷ Zn	58.700	⁶⁴ Ge	-53.090	⁸³ As	-69.470	¹⁰¹ Se	3.110	¹¹⁸ Br	102.900	⁷⁵ Rb	-57.810
⁹⁸ Zn	65.430	⁶⁵ Ge	-55.610	⁸⁴ As	-65.540	¹⁰² Se	8.280	¹¹⁹ Br	111.790	⁷⁶ Rb	-61.060
⁹⁹ Zn	74.540	⁶⁶ Ge	-60.760	⁸⁵ As	-62.880	¹⁰³ Se	15.680	¹²⁰ Br	122.630	⁷⁷ Rb	-65.680
¹⁰⁰ Zn	81.910	⁶⁷ Ge	-62.020	⁸⁶ As	-57.990	¹⁰⁴ Se	21.360	¹²¹ Br	132.070	⁷⁸ Rb	-67.680
¹⁰¹ Zn	91.390	⁶⁸ Ge	-66.360	⁸⁷ As	-54.860	¹⁰⁵ Se	29.230	⁶³ Kr	23.420	⁷⁹ Rb	-70.750
¹⁰² Zn	99.140	⁶⁹ Ge	-66.760	⁸⁸ As	-49.530	¹⁰⁶ Se	35.380	⁶⁴ Kr	10.050	⁸⁰ Rb	-72.260
¹⁰³ Zn	109.090	⁷⁰ Ge	-70.070	⁸⁹ As	-45.890	¹⁰⁷ Se	43.870	⁶⁵ Kr	1.500	⁸¹ Rb	-75.320
¹⁰⁴ Zn	116.600	⁷¹ Ge	-69.870	⁹⁰ As	-40.270	¹⁰⁸ Se	50.400	⁶⁶ Kr	-9.480	⁸² Rb	-76.440
¹⁰⁵ Zn	126.450	⁷² Ge	-72.400	⁹¹ As	-36.310	¹⁰⁹ Se	58.710	⁶⁷ Kr	-16.540	⁸³ Rb	-79.700
		⁷³ Ge	-71.380	⁹² As	-29.970	¹¹⁰ Se	65.170	⁶⁸ Kr	-26.400	⁸⁴ Rb	-80.310
⁵³ Ga	27.100	⁷⁴ Ge	-73.190	⁹³ As	-25.610	¹¹¹ Se	73.420	⁶⁹ Kr	-32.600	⁸⁵ Rb	-82.720
⁵⁴ Ga	17.010	⁷⁵ Ge	-71.640	⁹⁴ As	-19.520	¹¹² Se	79.840	⁷⁰ Kr	-41.450	⁸⁶ Rb	-82.500
⁵⁵ Ga	4.150	⁷⁶ Ge	-73.500	⁹⁵ As	-14.850	¹¹³ Se	88.550	⁷¹ Kr	-46.380	⁸⁷ Rb	-83.970
⁵⁶ Ga	-4.850	⁷⁷ Ge	-71.420	⁹⁶ As	-8.160	¹¹⁴ Se	95.450	⁷² Kr	-53.960	⁸⁸ Rb	-81.710
⁵⁷ Ga	-16.090	⁷⁸ Ge	-72.220	⁹⁷ As	-2.920	¹¹⁵ Se	102.040	⁷³ Kr	-56.880	⁸⁹ Rb	-80.910
⁵⁸ Ga	-24.120	⁷⁹ Ge	-69.640	⁹⁸ As	4.130	¹¹⁶ Se	109.260	⁷⁴ Kr	-62.820	⁹⁰ Rb	-77.740
⁵⁹ Ga	-34.010	⁸⁰ Ge	-69.640	⁹⁹ As	9.710	¹¹⁷ Se	119.490	⁷⁵ Kr	-64.810	⁹¹ Rb	-76.310
⁶⁰ Ga	-39.200	⁸¹ Ge	-66.320	¹⁰⁰ As	17.040	¹¹⁸ Se	128.450	⁷⁶ Kr	-69.490	⁹² Rb	-73.060
⁶¹ Ga	-46.310	⁸² Ge	-65.330	¹⁰¹ As	22.910			⁷⁷ Kr	-69.990	⁹³ Rb	-71.490
⁶² Ga	-49.910	⁸³ Ge	-60.570	¹⁰² As	30.480	⁶¹ Br	23.630	⁷⁸ Kr	-74.160	⁹⁴ Rb	-67.780
⁶³ Ga	-55.450	⁸⁴ Ge	-57.790	¹⁰³ As	36.720	⁶² Br	13.790	⁷⁹ Kr	-74.770	⁹⁵ Rb	-65.810
⁶⁴ Ga	-57.660	⁸⁵ Ge	-52.150	¹⁰⁴ As	44.760	⁶³ Br	1.380	⁸⁰ Kr	-77.560	⁹⁶ Rb	-62.020
⁶⁵ Ga	-61.710	⁸⁶ Ge	-48.960	¹⁰⁵ As	51.420	⁶⁴ Br	-6.820	⁸¹ Kr	-77.890	⁹⁷ Rb	-59.590
⁶⁶ Ga	-62.860	⁸⁷ Ge	-42.820	¹⁰⁶ As	60.120	⁶⁵ Br	-16.810	⁸² Kr	-80.930	⁹⁸ Rb	-55.270
⁶⁷ Ga	-65.850	⁸⁸ Ge	-38.950	¹⁰⁷ As	67.300	⁶⁶ Br	-23.710	⁸³ Kr	-80.950	⁹⁹ Rb	-52.250
⁶⁸ Ga	-66.290	⁸⁹ Ge	-32.580	¹⁰⁸ As	75.530	⁶⁷ Br	-32.510	⁸⁴ Kr	-82.900	¹⁰⁰ Rb	-47.280
⁶⁹ Ga	-68.650	⁹⁰ Ge	-28.460	¹⁰⁹ As	82.490	⁶⁸ Br	-38.500	⁸⁵ Kr	-81.720	¹⁰¹ Rb	-43.690
⁷⁰ Ga	-68.250	⁹¹ Ge	-21.070	¹¹⁰ As	90.730	⁶⁹ Br	-46.350	⁸⁶ Kr	-83.030	¹⁰² Rb	-38.370
⁷¹ Ga	-69.810	⁹² Ge	-16.650	¹¹¹ As	98.180	⁷⁰ Br	-50.600	⁸⁷ Kr	-79.940	¹⁰³ Rb	-34.450
⁷² Ga	-68.490	⁹³ Ge	-9.990	¹¹² As	106.850	⁷¹ Br	-56.750	⁸⁸ Kr	-79.110	¹⁰⁴ Rb	-28.780
⁷³ Ga	-69.610	⁹⁴ Ge	-5.180	¹¹³ As	114.400	⁷² Br	-59.450	⁸⁹ Kr	-75.220	¹⁰⁵ Rb	-24.600
⁷⁴ Ga	-68.230	⁹⁵ Ge	2.240	¹¹⁴ As	121.040	⁷³ Br	-63.780	⁹⁰ Kr	-73.640	¹⁰⁶ Rb	-18.610
⁷⁵ Ga	-68.690	⁹⁶ Ge	7.680	¹¹⁵ As	128.620	⁷⁴ Br	-65.900	⁹¹ Kr	-69.490	¹⁰⁷ Rb	-13.750
⁷⁶ Ga	-66.430	⁹⁷ Ge	15.480			⁷⁵ Br	-69.380	⁹² Kr	-67.760	¹⁰⁸ Rb	-7.340
⁷⁷ Ga	-66.290	⁹⁸ Ge	21.150	⁵⁹ Se	24.540	⁷⁶ Br	-70.620	⁹³ Kr	-63.150	¹⁰⁹ Rb	-1.820
⁷⁸ Ga	-63.560	⁹⁹ Ge	29.200	⁶⁰ Se	10.990	⁷⁷ Br	-73.700	⁹⁴ Kr	-61.000	¹¹⁰ Rb	5.450
⁷⁹ Ga	-62.750	¹⁰⁰ Ge	35.090	⁶¹ Se	1.660	⁷⁸ Br	-74.100	⁹⁵ Kr	-56.350	¹¹¹ Rb	11.830
⁸⁰ Ga	-59.540	¹⁰¹ Ge	43.400	⁶² Se	-10.030	⁷⁹ Br	-76.230	⁹⁶ Kr	-53.720	¹¹² Rb	19.240
⁸¹ Ga	-57.690	¹⁰² Ge	49.890	⁶³ Se	-17.210	⁸⁰ Br	-76.500	⁹⁷ Kr	-48.670	¹¹³ Rb	23.770
⁸² Ga	-52.800	¹⁰³ Ge	58.530	⁶⁴ Se	-26.850	⁸¹ Br	-78.670	⁹⁸ Kr	-45.570	¹¹⁴ Rb	30.830
⁸³ Ga	-48.750	¹⁰⁴ Ge	65.400	⁶⁵ Se	-32.730	⁸² Br	-78.140				

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹¹⁵ Rb	36.490	¹²⁹ Sr	127.760	⁷⁸ Zr	-41.840	⁸⁹ Nb	-81.170	¹⁰⁰ Mo	-86.090	¹⁰⁸ Tc	-73.690
¹¹⁶ Rb	43.660	¹³⁰ Sr	135.920	⁷⁹ Zr	-47.240	⁹⁰ Nb	-83.020	¹⁰¹ Mo	-83.790	¹¹⁰ Tc	-70.400
¹¹⁷ Rb	49.330	¹³¹ Sr	145.650	⁸⁰ Zr	-54.850	⁹¹ Nb	-86.770	¹⁰² Mo	-83.830	¹¹¹ Tc	-68.730
¹¹⁸ Rb	54.970			⁸¹ Zr	-58.050	⁹² Nb	-86.220	¹⁰³ Mo	-81.270	¹¹² Tc	-65.020
¹¹⁹ Rb	61.010	⁷⁰ Y	13.500	⁸² Zr	-61.840	⁹³ Nb	-87.120	¹⁰⁴ Mo	-80.760	¹¹³ Tc	-62.800
¹²⁰ Rb	70.280	⁷¹ Y	2.320	⁸³ Zr	-64.710	⁹⁴ Nb	-85.690	¹⁰⁵ Mo	-77.620	¹¹⁴ Tc	-58.610
¹²¹ Rb	78.430	⁷² Y	-5.970	⁸⁴ Zr	-70.640	⁹⁵ Nb	-85.960	¹⁰⁶ Mo	-76.460	¹¹⁵ Tc	-55.980
¹²² Rb	88.580	⁷³ Y	-16.130	⁸⁵ Zr	-72.930	⁹⁶ Nb	-84.400	¹⁰⁷ Mo	-72.820	¹¹⁶ Tc	-51.590
¹²³ Rb	97.240	⁷⁴ Y	-23.490	⁸⁶ Zr	-78.080	⁹⁷ Nb	-84.550	¹⁰⁸ Mo	-71.180	¹¹⁷ Tc	-48.570
¹²⁴ Rb	107.530	⁷⁵ Y	-32.850	⁸⁷ Zr	-79.850	⁹⁸ Nb	-82.520	¹⁰⁹ Mo	-67.210	¹¹⁸ Tc	-44.020
¹²⁵ Rb	117.070	⁷⁶ Y	-39.280	⁸⁸ Zr	-84.320	⁹⁹ Nb	-82.460	¹¹⁰ Mo	-65.280	¹¹⁹ Tc	-40.730
¹²⁶ Rb	127.930	⁷⁷ Y	-47.480	⁸⁹ Zr	-85.370	¹⁰⁰ Nb	-80.200	¹¹¹ Mo	-60.920	¹²⁰ Tc	-35.960
¹²⁷ Rb	136.650	⁷⁸ Y	-52.200	⁹⁰ Zr	-89.110	¹⁰¹ Nb	-79.710	¹¹² Mo	-58.240	¹²¹ Tc	-32.430
¹²⁸ Rb	146.320	⁷⁹ Y	-58.540	⁹¹ Zr	-87.470	¹⁰² Nb	-77.030	¹¹³ Mo	-52.750	¹²² Tc	-27.330
		⁸⁰ Y	-61.520	⁹² Zr	-88.300	¹⁰³ Nb	-75.840	¹¹⁴ Mo	-50.050	¹²³ Tc	-23.270
⁶⁸ Sr	10.340	⁸¹ Y	-66.160	⁹³ Zr	-86.090	¹⁰⁴ Nb	-72.520	¹¹⁵ Mo	-45.050	¹²⁴ Tc	-19.940
⁶⁹ Sr	2.190	⁸² Y	-66.890	⁹⁴ Zr	-86.140	¹⁰⁵ Nb	-70.620	¹¹⁶ Mo	-41.970	¹²⁵ Tc	-16.100
⁷⁰ Sr	-8.880	⁸³ Y	-71.920	⁹⁵ Zr	-83.700	¹⁰⁶ Nb	-66.880	¹¹⁷ Mo	-36.750	¹²⁶ Tc	-8.670
⁷¹ Sr	-15.980	⁸⁴ Y	-74.040	⁹⁶ Zr	-83.740	¹⁰⁷ Nb	-64.550	¹¹⁸ Mo	-33.370	¹²⁷ Tc	-2.300
⁷² Sr	-26.130	⁸⁵ Y	-78.330	⁹⁷ Zr	-81.120	¹⁰⁸ Nb	-60.480	¹¹⁹ Mo	-28.020	¹²⁸ Tc	5.680
⁷³ Sr	-32.460	⁸⁶ Y	-79.930	⁹⁸ Zr	-81.020	¹⁰⁹ Nb	-57.830	¹²⁰ Mo	-24.380	¹²⁹ Tc	13.060
⁷⁴ Sr	-41.650	⁸⁷ Y	-83.530	⁹⁹ Zr	-78.130	¹¹⁰ Nb	-53.440	¹²¹ Mo	-18.710	¹³⁰ Tc	22.020
⁷⁵ Sr	-47.090	⁸⁸ Y	-84.310	¹⁰⁰ Zr	-77.440	¹¹¹ Nb	-50.090	¹²² Mo	-14.550	¹³¹ Tc	28.960
⁷⁶ Sr	-54.960	⁸⁹ Y	-87.250	¹⁰¹ Zr	-74.020	¹¹² Nb	-45.050	¹²³ Mo	-10.580	¹³² Tc	37.520
⁷⁷ Sr	-58.380	⁹⁰ Y	-85.530	¹⁰² Zr	-72.690	¹¹³ Nb	-40.580	¹²⁴ Mo	-6.640	¹³³ Tc	44.610
⁷⁸ Sr	-64.040	⁹¹ Y	-85.530	¹⁰³ Zr	-68.650	¹¹⁴ Nb	-35.330	¹²⁵ Mo	1.360	¹³⁴ Tc	52.800
⁷⁹ Sr	-66.160	⁹² Y	-83.190	¹⁰⁴ Zr	-66.670	¹¹⁵ Nb	-31.580	¹²⁶ Mo	7.820	¹³⁵ Tc	59.650
⁸⁰ Sr	-68.930	⁹³ Y	-82.660	¹⁰⁵ Zr	-62.250	¹¹⁶ Nb	-26.230	¹²⁷ Mo	16.310	¹³⁶ Tc	67.940
⁸¹ Sr	-70.750	⁹⁴ Y	-79.970	¹⁰⁶ Zr	-59.810	¹¹⁷ Nb	-22.230	¹²⁸ Mo	23.190	¹³⁷ Tc	74.970
⁸² Sr	-75.600	⁹⁵ Y	-79.410	¹⁰⁷ Zr	-55.150	¹¹⁸ Nb	-16.810	¹²⁹ Mo	33.460	¹³⁸ Tc	83.510
⁸³ Sr	-76.870	⁹⁶ Y	-76.780	¹⁰⁸ Zr	-52.390	¹¹⁹ Nb	-12.530	¹³⁰ Mo	40.500	¹³⁹ Tc	90.850
⁸⁴ Sr	-80.980	⁹⁷ Y	-75.990	¹⁰⁹ Zr	-47.260	¹²⁰ Nb	-6.790	¹³¹ Mo	49.700	¹⁴⁰ Tc	99.550
⁸⁵ Sr	-81.710	⁹⁸ Y	-73.010	¹¹⁰ Zr	-43.720	¹²¹ Nb	-1.930	¹³² Mo	56.820	¹⁴¹ Tc	107.170
⁸⁶ Sr	-85.120	⁹⁹ Y	-71.570	¹¹¹ Zr	-38.000	¹²² Nb	2.060	¹³³ Mo	65.460	¹⁴² Tc	115.960
⁸⁷ Sr	-85.110	¹⁰⁰ Y	-68.020	¹¹² Zr	-34.020	¹²³ Nb	6.820	¹³⁴ Mo	72.600	¹⁴³ Tc	123.620
⁸⁸ Sr	-87.640	¹⁰¹ Y	-65.920	¹¹³ Zr	-27.250	¹²⁴ Nb	14.890	¹³⁵ Mo	81.260	¹⁴⁴ Tc	132.680
⁸⁹ Sr	-85.300	¹⁰² Y	-61.800	¹¹⁴ Zr	-23.600	¹²⁵ Nb	21.780	¹³⁶ Mo	88.230	¹⁴⁵ Tc	140.740
⁹⁰ Sr	-85.210	¹⁰³ Y	-59.070	¹¹⁵ Zr	-17.480	¹²⁶ Nb	30.540	¹³⁷ Mo	97.310	¹⁴⁶ Tc	150.120
⁹¹ Sr	-82.130	¹⁰⁴ Y	-54.600	¹¹⁶ Zr	-13.500	¹²⁷ Nb	37.850	¹³⁸ Mo	104.740	¹⁴⁷ Tc	158.810
⁹² Sr	-81.300	¹⁰⁵ Y	-51.480	¹¹⁷ Zr	-7.350	¹²⁸ Nb	47.680	¹³⁹ Mo	113.940	⁸¹ Ru	4.940
⁹³ Sr	-77.990	¹⁰⁶ Y	-46.650	¹¹⁸ Zr	-3.010	¹²⁹ Nb	55.620	¹⁴⁰ Mo	121.490	⁸² Ru	-6.110
⁹⁴ Sr	-77.490	¹⁰⁷ Y	-43.240	¹¹⁹ Zr	3.390	¹³⁰ Nb	64.870	¹⁴¹ Mo	130.790	⁸³ Ru	-12.170
⁹⁵ Sr	-74.110	¹⁰⁸ Y	-38.000	¹²⁰ Zr	8.210	¹³¹ Nb	72.420	¹⁴² Mo	138.550	⁸⁴ Ru	-22.390
⁹⁶ Sr	-72.840	¹⁰⁹ Y	-33.920	¹²¹ Zr	13.120	¹³² Nb	81.060	¹⁴³ Mo	148.080	⁸⁵ Ru	-28.890
⁹⁷ Sr	-69.130	¹¹⁰ Y	-27.980	¹²² Zr	17.620	¹³³ Nb	88.600	¹⁴⁴ Mo	156.120	⁸⁶ Ru	-38.430
⁹⁸ Sr	-67.470	¹¹¹ Y	-23.310	¹²³ Zr	26.390	¹³⁴ Nb	97.270	⁷⁹ Tc	4.190	⁸⁷ Ru	-44.100
⁹⁹ Sr	-63.210	¹¹² Y	-16.430	¹²⁴ Zr	33.350	¹³⁵ Nb	104.910	⁸⁰ Tc	-3.900	⁸⁸ Ru	-52.800
¹⁰⁰ Sr	-61.000	¹¹³ Y	-11.700	¹²⁵ Zr	42.560	¹³⁶ Nb	113.910	⁸¹ Tc	-14.060	⁸⁹ Ru	-57.130
¹⁰¹ Sr	-56.170	¹¹⁴ Y	-5.380	¹²⁶ Zr	50.160	¹³⁷ Nb	121.890	⁸² Tc	-21.220	⁹⁰ Ru	-64.340
¹⁰² Sr	-53.330	¹¹⁵ Y	-0.740	¹²⁷ Zr	60.350	¹³⁸ Nb	130.990	⁸³ Tc	-30.600	⁹¹ Ru	-68.080
¹⁰³ Sr	-48.130	¹¹⁶ Y	5.460	¹²⁸ Zr	68.590	¹³⁹ Nb	139.050	⁸⁴ Tc	-36.940	⁹² Ru	-74.570
¹⁰⁴ Sr	-44.930	¹¹⁷ Y	10.480	¹²⁹ Zr	78.420	¹⁴⁰ Nb	148.410	⁸⁵ Tc	-43.920	⁹³ Ru	-77.510
¹⁰⁵ Sr	-39.420	¹¹⁸ Y	16.960	¹³⁰ Zr	86.020	⁷⁷ Mo	3.560	⁸⁶ Tc	-49.060	⁹⁴ Ru	-83.210
¹⁰⁶ Sr	-35.880	¹¹⁹ Y	22.390	¹³¹ Zr	95.140	⁷⁸ Mo	-7.040	⁸⁷ Tc	-56.590	⁹⁵ Ru	-83.470
¹⁰⁷ Sr	-29.930	¹²⁰ Y	27.290	¹³² Zr	102.790	⁷⁹ Mo	-14.110	⁸⁸ Tc	-60.720	⁹⁶ Ru	-86.140
¹⁰⁸ Sr	-25.670	¹²¹ Y	32.440	¹³³ Zr	111.860	⁸⁰ Mo	-25.380	⁸⁹ Tc	-67.100	⁹⁷ Ru	-85.720
¹⁰⁹ Sr	-19.210	¹²² Y	41.220	¹³⁴ Zr	119.540	⁸¹ Mo	-31.810	⁹⁰ Tc	-70.700	⁹⁸ Ru	-88.050
¹¹⁰ Sr	-14.240	¹²³ Y	48.780	¹³⁵ Zr	129.190	⁸² Mo	-39.580	⁹¹ Tc	-76.330	⁹⁹ Ru	-87.290
¹¹¹ Sr	-7.220	¹²⁴ Y	57.970	¹³⁶ Zr	137.170	⁸³ Mo	-45.010	⁹² Tc	-79.130	¹⁰⁰ Ru	-88.850
¹¹² Sr	-1.730	¹²⁵ Y	66.260	¹³⁷ Zr	146.820	⁸⁴ Mo	-51.900	⁹³ Tc	-84.030	¹⁰¹ Ru	-87.700
¹¹³ Sr	4.810	¹²⁶ Y	75.860			⁸⁵ Mo	-55.820	⁹⁴ Tc	-84.220	¹⁰² Ru	-88.810
¹¹⁴ Sr	9.540	¹²⁷ Y	84.900	⁷⁴ Nb	14.280	⁸⁶ Mo	-62.810	⁹⁵ Tc	-86.100	¹⁰³ Ru	-87.240
¹¹⁵ Sr	16.510	¹²⁸ Y	94.850	⁷⁵ Nb	3.330	⁸⁷ Mo	-66.120	⁹⁶ Tc	-85.560	¹⁰⁴ Ru	-87.970
¹¹⁶ Sr	21.560	¹²⁹ Y	102.900	⁷⁶ Nb	-5.130	⁸⁸ Mo	-72.310	⁹⁷ Tc	-87.120	¹⁰⁵ Ru	-85.940
¹¹⁷ Sr	28.660	¹³⁰ Y	112.110	⁷⁷ Nb	-15.560	⁸⁹ Mo	-75.080	⁹⁸ Tc	-86.210	¹⁰⁶ Ru	-86.150
¹¹⁸ Sr	33.850	¹³¹ Y	120.310	⁷⁸ Nb	-23.060	⁹⁰ Mo	-80.570	⁹⁹ Tc	-87.070	¹⁰⁷ Ru	-83.720
¹¹⁹ Sr	39.250	¹³² Y	129.420	⁷⁹ Nb	-32.470	⁹¹ Mo	-82.560	¹⁰⁰ Tc	-85.810	¹⁰⁸ Ru	-83.390
¹²⁰ Sr	44.780	¹³³ Y	137.630	⁸⁰ Nb	-38.810	⁹² Mo	-85.600	¹⁰¹ Tc	-86.250	¹⁰⁹ Ru	-80.550
¹²¹ Sr	54.060	¹³⁴ Y	147.300	⁸¹ Nb	-46.600	⁹³ Mo	-86.750	¹⁰² Tc	-84.670	¹¹⁰ Ru	-79.470
¹²² Sr	61.700	⁷² Zr	11.220	⁸² Nb	-51.110	⁹⁴ Mo	-88.510	¹⁰³ Tc	-84.860	¹¹¹ Ru	-76.310
¹²³ Sr	71.370	⁷³ Zr	2.860	⁸³ Nb	-56.930	⁹⁵ Mo	-87.200	¹⁰⁴ Tc	-82.840	¹¹² Ru	-75.290
¹²⁴ Sr	79.570	⁷⁴ Zr	-8.360	⁸⁴ Nb	-59.340	⁹⁶ Mo	-88.370	¹⁰⁵ Tc	-82.420	¹¹³ Ru	-71.700
¹²⁵ Sr	89.840	⁷⁵ Zr	-15.920	⁸⁵ Nb	-65.450	⁹⁷ Mo	-86.790	¹⁰⁶ Tc	-79.890	¹¹⁴ Ru	-70.170
¹²⁶ Sr	99.390	⁷⁶ Zr	-26.110	⁸⁶ Nb	-68.610	⁹⁸ Mo	-87.580	¹⁰⁷ Tc	-78.930	¹¹⁵ Ru	-66.070
¹²⁷ Sr	109.850	⁷⁷ Zr	-32.750	⁸⁷ Nb	-73.910	⁹⁹ Mo	-85.610	¹⁰⁸ Tc	-75.960	¹¹⁶ Ru	-64.080
¹²⁸ Sr	117.940			⁸⁸ Nb	-76.530						

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹¹⁷ Ru	-59.790	¹²⁴ Rh	-45.280	¹³¹ Pd	-27.740	¹³⁷ Ag	-3.260	¹⁴¹ Cd	5.820	¹⁴⁴ In	9.160		
¹¹⁸ Ru	-57.470	¹²⁵ Rh	-43.090	¹³² Pd	-22.170	¹³⁸ Ag	4.610	¹⁴² Cd	11.160	¹⁴⁵ In	14.740		
¹¹⁹ Ru	-52.940	¹²⁶ Rh	-39.440	¹³³ Pd	-13.440	¹³⁹ Ag	10.550	¹⁴³ Cd	18.710	¹⁴⁶ In	21.900		
¹²⁰ Ru	-50.350	¹²⁷ Rh	-36.350	¹³⁴ Pd	-7.430	¹⁴⁰ Ag	17.640	¹⁴⁴ Cd	24.430	¹⁴⁷ In	27.860		
¹²¹ Ru	-45.700	¹²⁸ Rh	-29.420	¹³⁵ Pd	0.650	¹⁴¹ Ag	23.530	¹⁴⁵ Cd	32.040	¹⁴⁸ In	35.030		
¹²² Ru	-42.830	¹²⁹ Rh	-23.770	¹³⁶ Pd	6.510	¹⁴² Ag	31.090	¹⁴⁶ Cd	37.970	¹⁴⁹ In	41.100		
¹²³ Ru	-37.880	¹³⁰ Rh	-16.440	¹³⁷ Pd	14.600	¹⁴³ Ag	37.320	¹⁴⁷ Cd	45.650	¹⁵⁰ In	48.600		
¹²⁴ Ru	-35.630	¹³¹ Rh	-9.610	¹³⁸ Pd	20.420	¹⁴⁴ Ag	45.010	¹⁴⁸ Cd	51.770	¹⁵¹ In	54.890		
¹²⁵ Ru	-31.400	¹³² Rh	-1.440	¹³⁹ Pd	28.040	¹⁴⁵ Ag	51.380	¹⁴⁹ Cd	59.700	¹⁵² In	62.740		
¹²⁶ Ru	-28.160	¹³³ Rh	4.990	¹⁴⁰ Pd	34.010	¹⁴⁶ Ag	59.160	¹⁵⁰ Cd	66.060	¹⁵³ In	69.500		
¹²⁷ Ru	-20.750	¹³⁴ Rh	12.940	¹⁴¹ Pd	42.050	¹⁴⁷ Ag	65.720	¹⁵¹ Cd	74.450	¹⁵⁴ In	77.520		
¹²⁸ Ru	-14.960	¹³⁵ Rh	19.460	¹⁴² Pd	48.310	¹⁴⁸ Ag	73.810	¹⁵² Cd	81.270	¹⁵⁵ In	84.390		
¹²⁹ Ru	-7.050	¹³⁶ Rh	27.420	¹⁴³ Pd	56.460	¹⁴⁹ Ag	80.720	¹⁵³ Cd	89.890	¹⁵⁶ In	92.740		
¹³⁰ Ru	-0.860	¹³⁷ Rh	33.680	¹⁴⁴ Pd	62.980	¹⁵⁰ Ag	89.040	¹⁵⁴ Cd	96.960	¹⁵⁷ In	99.840		
¹³¹ Ru	8.560	¹³⁸ Rh	41.330	¹⁴⁵ Pd	71.220	¹⁵¹ Ag	96.320	¹⁵⁵ Cd	105.810	¹⁵⁸ In	108.310		
¹³² Ru	15.120	¹³⁹ Rh	47.890	¹⁴⁶ Pd	77.900	¹⁵² Ag	105.070	¹⁵⁶ Cd	112.960	¹⁵⁹ In	115.330		
¹³³ Ru	23.650	¹⁴⁰ Rh	55.850	¹⁴⁷ Pd	86.520	¹⁵³ Ag	112.590	¹⁵⁷ Cd	121.780	¹⁶⁰ In	123.960		
¹³⁴ Ru	30.350	¹⁴¹ Rh	62.660	¹⁴⁸ Pd	93.490	¹⁵⁴ Ag	121.480	¹⁵⁸ Cd	129.000	¹⁶¹ In	131.430		
¹³⁵ Ru	38.610	¹⁴² Rh	70.820	¹⁴⁹ Pd	102.350	¹⁵⁵ Ag	129.150	¹⁵⁹ Cd	138.080	¹⁶² In	140.140		
¹³⁶ Ru	44.990	¹⁴³ Rh	77.870	¹⁵⁰ Pd	109.750	¹⁵⁶ Ag	138.070	¹⁶⁰ Cd	145.530	¹⁶³ In	147.630		
¹³⁷ Ru	53.260	¹⁴⁴ Rh	86.080	¹⁵¹ Pd	118.930	¹⁵⁷ Ag	145.740	¹⁶¹ Cd	154.720	¹⁶⁴ In	156.510		
¹³⁸ Ru	59.770	¹⁴⁵ Rh	93.240	¹⁵² Pd	126.590	¹⁵⁸ Ag	154.850	¹⁶² Cd	162.360	¹⁶⁵ In	164.320		
¹³⁹ Ru	68.280	¹⁴⁶ Rh	101.850	¹⁵³ Pd	136.010	¹⁵⁹ Ag	162.900	¹⁶³ Cd	171.690	¹⁶⁶ In	172.620		
¹⁴⁰ Ru	75.100	¹⁴⁷ Rh	109.390	¹⁵⁴ Pd	143.810	¹⁶⁰ Ag	172.110	⁹² In	-3.020	⁹⁴ Sn	-6.260		
¹⁴¹ Ru	83.820	¹⁴⁸ Rh	118.240	¹⁵⁵ Pd	153.220	⁹⁰ Cd	-5.110	⁹³ In	-13.980	⁹⁵ Sn	-14.130		
¹⁴² Ru	90.870	¹⁴⁹ Rh	126.250	¹⁵⁶ Pd	161.100	⁹¹ Cd	-12.740	⁹⁴ In	-21.700	⁹⁶ Sn	-24.980		
¹⁴³ Ru	99.650	¹⁵⁰ Rh	135.440	⁸⁸ Ag	-2.260	⁹² Cd	-23.480	⁹⁵ In	-31.740	⁹⁷ Sn	-32.210		
¹⁴⁴ Ru	106.880	¹⁵¹ Rh	143.580	⁸⁹ Ag	-13.010	⁹³ Cd	-30.410	⁹⁶ In	-38.800	⁹⁸ Sn	-42.320		
¹⁴⁵ Ru	115.960	¹⁵² Rh	153.030	⁹⁰ Ag	-20.470	⁹⁴ Cd	-40.270	⁹⁷ In	-48.050	⁹⁹ Sn	-48.510		
¹⁴⁶ Ru	123.490	¹⁵³ Rh	161.360	⁹¹ Ag	-30.380	⁹⁵ Cd	-46.550	⁹⁸ In	-53.990	¹⁰⁰ Sn	-57.690		
¹⁴⁷ Ru	132.870	⁸⁶ Pd	-4.790	⁹² Ag	-37.080	⁹⁶ Cd	-55.760	⁹⁹ In	-62.070	¹⁰¹ Sn	-60.860		
¹⁴⁸ Ru	140.890	⁸⁷ Pd	-12.200	⁹³ Ag	-46.150	⁹⁷ Cd	-60.460	¹⁰⁰ In	-64.900	¹⁰² Sn	-66.290		
¹⁴⁹ Ru	150.690	⁸⁸ Pd	-22.760	⁹⁴ Ag	-51.950	⁹⁸ Cd	-68.140	¹⁰¹ In	-69.510	¹⁰³ Sn	-68.280		
¹⁵⁰ Ru	158.840	⁸⁹ Pd	-29.400	⁹⁵ Ag	-59.910	⁹⁹ Cd	-70.190	¹⁰² In	-71.540	¹⁰⁴ Sn	-72.680		
⁸³ Rh	5.100	⁹⁰ Pd	-39.150	⁹⁶ Ag	-64.550	¹⁰⁰ Cd	-74.930	¹⁰³ In	-75.260	¹⁰⁵ Sn	-74.220		
⁸⁴ Rh	-2.260	⁹¹ Pd	-45.100	⁹⁷ Ag	-71.160	¹⁰¹ Cd	-76.020	¹⁰⁴ In	-76.820	¹⁰⁶ Sn	-78.050		
⁸⁵ Rh	-12.610	⁹² Pd	-54.000	⁹⁸ Ag	-73.420	¹⁰² Cd	-79.610	¹⁰⁵ In	-79.900	¹⁰⁷ Sn	-78.940		
⁸⁶ Rh	-19.840	⁹³ Pd	-58.670	⁹⁹ Ag	-77.160	¹⁰³ Cd	-80.710	¹⁰⁶ In	-81.060	¹⁰⁸ Sn	-82.330		
⁸⁷ Rh	-29.590	⁹⁴ Pd	-66.290	¹⁰⁰ Ag	-78.420	¹⁰⁴ Cd	-83.780	¹⁰⁷ In	-83.770	¹⁰⁹ Sn	-82.880		
⁸⁸ Rh	-36.060	⁹⁵ Pd	-70.020	¹⁰¹ Ag	-81.460	¹⁰⁵ Cd	-84.300	¹⁰⁸ In	-84.370	¹¹⁰ Sn	-86.010		
⁸⁹ Rh	-44.970	⁹⁶ Pd	-76.760	¹⁰² Ag	-82.430	¹⁰⁶ Cd	-86.920	¹⁰⁹ In	-86.570	¹¹¹ Sn	-86.160		
⁹⁰ Rh	-50.420	⁹⁷ Pd	-77.930	¹⁰³ Ag	-84.830	¹⁰⁷ Cd	-86.850	¹¹⁰ In	-86.550	¹¹² Sn	-88.740		
⁹¹ Rh	-58.150	⁹⁸ Pd	-81.660	¹⁰⁴ Ag	-85.040	¹⁰⁸ Cd	-88.980	¹¹¹ In	-88.340	¹¹³ Sn	-88.300		
⁹² Rh	-62.620	⁹⁹ Pd	-81.970	¹⁰⁵ Ag	-87.030	¹⁰⁹ Cd	-88.440	¹¹² In	-87.910	¹¹⁴ Sn	-90.590		
⁹³ Rh	-69.260	¹⁰⁰ Pd	-85.040	¹⁰⁶ Ag	-86.770	¹¹⁰ Cd	-90.080	¹¹³ In	-89.330	¹¹⁵ Sn	-89.870		
⁹⁴ Rh	-72.950	¹⁰¹ Pd	-85.190	¹⁰⁷ Ag	-88.160	¹¹¹ Cd	-89.040	¹¹⁴ In	-88.510	¹¹⁶ Sn	-91.580		
⁹⁵ Rh	-78.780	¹⁰² Pd	-87.610	¹⁰⁸ Ag	-87.470	¹¹² Cd	-90.340	¹¹⁵ In	-89.520	¹¹⁷ Sn	-90.520		
⁹⁶ Rh	-79.950	¹⁰³ Pd	-87.200	¹⁰⁹ Ag	-88.470	¹¹³ Cd	-88.940	¹¹⁶ In	-88.270	¹¹⁸ Sn	-91.780		
⁹⁷ Rh	-82.850	¹⁰⁴ Pd	-89.090	¹¹⁰ Ag	-87.420	¹¹⁴ Cd	-89.880	¹¹⁷ In	-89.000	¹¹⁹ Sn	-90.270		
⁹⁸ Rh	-83.380	¹⁰⁵ Pd	-88.170	¹¹¹ Ag	-88.060	¹¹⁵ Cd	-88.060	¹¹⁸ In	-87.460	¹²⁰ Sn	-91.290		
⁹⁹ Rh	-85.490	¹⁰⁶ Pd	-89.540	¹¹² Ag	-86.420	¹¹⁶ Cd	-88.530	¹¹⁹ In	-87.860	¹²¹ Sn	-89.690		
¹⁰⁰ Rh	-85.520	¹⁰⁷ Pd	-88.290	¹¹³ Ag	-86.780	¹¹⁷ Cd	-86.320	¹²⁰ In	-86.030	¹²² Sn	-90.400		
¹⁰¹ Rh	-87.170	¹⁰⁸ Pd	-89.190	¹¹⁴ Ag	-85.100	¹¹⁸ Cd	-86.440	¹²¹ In	-86.120	¹²³ Sn	-88.390		
¹⁰² Rh	-86.730	¹⁰⁹ Pd	-87.630	¹¹⁵ Ag	-85.000	¹¹⁹ Cd	-83.690	¹²² In	-83.920	¹²⁴ Sn	-88.870		
¹⁰³ Rh	-87.930	¹¹⁰ Pd	-88.140	¹¹⁶ Ag	-82.730	¹²⁰ Cd	-83.910	¹²³ In	-83.770	¹²⁵ Sn	-86.570		
¹⁰⁴ Rh	-86.900	¹¹¹ Pd	-85.670	¹¹⁷ Ag	-82.160	¹²¹ Cd	-81.110	¹²⁴ In	-81.300	¹²⁶ Sn	-86.740		
¹⁰⁵ Rh	-87.570	¹¹² Pd	-85.980	¹¹⁸ Ag	-79.350	¹²² Cd	-80.680	¹²⁵ In	-80.950	¹²⁷ Sn	-84.210		
¹⁰⁶ Rh	-86.390	¹¹³ Pd	-83.610	¹¹⁹ Ag	-78.420	¹²³ Cd	-77.500	¹²⁶ In	-78.300	¹²⁸ Sn	-84.060		
¹⁰⁷ Rh	-86.560	¹¹⁴ Pd	-83.390	¹²⁰ Ag	-75.420	¹²⁴ Cd	-77.230	¹²⁷ In	-77.710	¹²⁹ Sn	-81.260		
¹⁰⁸ Rh	-84.940	¹¹⁵ Pd	-80.490	¹²¹ Ag	-74.160	¹²⁵ Cd	-74.110	¹²⁸ In	-74.880	¹³⁰ Sn	-80.880		
¹⁰⁹ Rh	-84.190	¹¹⁶ Pd	-79.800	¹²² Ag	-70.940	¹²⁶ Cd	-73.020	¹²⁹ In	-73.890	¹³¹ Sn	-77.870		
¹¹⁰ Rh	-82.100	¹¹⁷ Pd	-76.370	¹²³ Ag	-69.740	¹²⁷ Cd	-69.650	¹³⁰ In	-70.790	¹³² Sn	-76.700		
¹¹¹ Rh	-81.710	¹¹⁸ Pd	-75.220	¹²⁴ Ag	-66.360	¹²⁸ Cd	-68.490	¹³¹ In	-68.900	¹³³ Sn	-71.250		
¹¹² Rh	-79.240	¹¹⁹ Pd	-71.640	¹²⁵ Ag	-65.070	¹²⁹ Cd	-65.200	¹³² In	-63.500	¹³⁴ Sn	-67.440		
¹¹³ Rh	-78.340	¹²⁰ Pd	-70.210	¹²⁶ Ag	-61.650	¹³⁰ Cd	-63.260	¹³³ In	-59.190	¹³⁵ Sn	-61.210		
¹¹⁴ Rh	-75.390	¹²¹ Pd	-66.450	¹²⁷ Ag	-59.780	¹³¹ Cd	-57.190	¹³⁴ In	-52.860	¹³⁶ Sn	-56.850		
¹¹⁵ Rh	-73.980	¹²² Pd	-64.720	¹²⁸ Ag	-56.400	¹³² Cd	-52.750	¹³⁵ In	-48.010	¹³⁷ Sn	-50.360		
¹¹⁶ Rh	-70.510	¹²³ Pd	-60.700	¹²⁹ Ag	-53.870	¹³³ Cd	-45.970	¹³⁶ In	-41.390	¹³⁸ Sn	-45.820		
¹¹⁷ Rh	-68.650	¹²⁴ Pd	-59.130	¹³⁰ Ag	-47.750	¹³⁴ Cd	-41.000	¹³⁷ In	-36.240	¹³⁹ Sn	-39.000		
¹¹⁸ Rh	-64.960	¹²⁵ Pd	-55.220	¹³¹ Ag	-42.750	¹³⁵ Cd	-33.910	¹³⁸ In	-28.700	¹⁴⁰ Sn	-34.240		
¹¹⁹ Rh	-62.720	¹²⁶ Pd	-53.400	¹³² Ag	-35.980	¹³⁶ Cd	-28.750	¹³⁹ In	-23.580	¹⁴¹ Sn	-26.670		
¹²⁰ Rh	-58.850	¹²⁷ Pd	-49.440	¹³³ Ag	-30.520	¹³⁷ Cd	-20.470	¹⁴⁰ In	-16.400	¹⁴² Sn	-21.750		
¹²¹ Rh	-56.380	¹²⁸ Pd	-46.790	¹³⁴ Ag	-22.260	¹³⁸ Cd	-15.110	¹⁴¹ In	-9.850	¹⁴³ Sn	-13.650		
¹²² Rh	-52.370	¹²⁹ Pd	-40.130	¹³⁵ Ag	-16.610	¹³⁹ Cd	-6.730	¹⁴² In	-3.260	¹⁴⁴ Sn	-8.880		
¹²³ Rh	-49.650	¹³⁰ Pd	-35.070	¹³⁶ Ag	-8.870	¹⁴⁰ Cd	-1.240	¹⁴³ In	2.080	¹⁴⁵ Sn	-1.920		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁴⁶ Sn	3.230	¹⁴⁶ Sb	1.530	¹⁴⁹ Te	-8.580	¹⁴⁸ I	-26.070	¹⁴⁶ Xe	-48.400	¹⁴⁴ Cs	-63.460
¹⁴⁷ Sn	10.350	¹⁴⁹ Sb	6.850	¹⁵⁰ Te	-3.760	¹⁴⁹ I	-21.600	¹⁴⁷ Xe	-43.180	¹⁴⁵ Cs	-60.360
¹⁴⁸ Sn	15.810	¹⁵⁰ Sb	13.640	¹⁵¹ Te	3.060	¹⁵⁰ I	-15.550	¹⁴⁸ Xe	-39.640	¹⁴⁶ Cs	-55.480
¹⁴⁹ Sn	22.980	¹⁵¹ Sb	19.150	¹⁵² Te	8.080	¹⁵¹ I	-10.880	¹⁴⁹ Xe	-34.000	¹⁴⁷ Cs	-52.380
¹⁵⁰ Sn	28.550	¹⁵² Sb	26.150	¹⁵³ Te	14.960	¹⁵² I	-4.720	¹⁵⁰ Xe	-30.020	¹⁴⁸ Cs	-47.700
¹⁵¹ Sn	36.040	¹⁵³ Sb	31.930	¹⁵⁴ Te	20.270	¹⁵³ I	0.270	¹⁵¹ Xe	-24.180	¹⁴⁹ Cs	-44.090
¹⁵² Sn	41.880	¹⁵⁴ Sb	39.330	¹⁵⁵ Te	27.520	¹⁵⁴ I	6.620	¹⁵² Xe	-19.970	¹⁵⁰ Cs	-39.080
¹⁵³ Sn	49.690	¹⁵⁵ Sb	45.520	¹⁵⁶ Te	33.260	¹⁵⁵ I	11.860	¹⁵³ Xe	-13.920	¹⁵¹ Cs	-35.280
¹⁵⁴ Sn	55.950	¹⁵⁶ Sb	53.010	¹⁵⁷ Te	40.730	¹⁵⁶ I	18.530	¹⁵⁴ Xe	-9.510	¹⁵² Cs	-30.060
¹⁵⁵ Sn	63.990	¹⁵⁷ Sb	59.410	¹⁵⁸ Te	46.670	¹⁵⁷ I	24.170	¹⁵⁵ Xe	-3.220	¹⁵³ Cs	-25.940
¹⁵⁶ Sn	70.420	¹⁵⁸ Sb	67.260	¹⁵⁹ Te	54.490	¹⁵⁸ I	31.180	¹⁵⁶ Xe	1.510	¹⁵⁴ Cs	-20.380
¹⁵⁷ Sn	78.700	¹⁵⁹ Sb	74.030	¹⁶⁰ Te	60.790	¹⁵⁹ I	37.070	¹⁵⁷ Xe	8.160	¹⁵⁵ Cs	-16.060
¹⁵⁸ Sn	85.520	¹⁶⁰ Sb	81.880	¹⁶¹ Te	68.650	¹⁶⁰ I	44.370	¹⁵⁸ Xe	13.310	¹⁵⁶ Cs	-10.310
¹⁵⁹ Sn	93.830	¹⁶¹ Sb	88.750	¹⁶² Te	75.070	¹⁶¹ I	50.560	¹⁵⁹ Xe	20.260	¹⁵⁷ Cs	-5.640
¹⁶⁰ Sn	100.590	¹⁶² Sb	96.490	¹⁶³ Te	83.140	¹⁶² I	58.010	¹⁶⁰ Xe	25.670	¹⁵⁸ Cs	0.470
¹⁶¹ Sn	108.920	¹⁶³ Sb	103.290	¹⁶⁴ Te	89.200	¹⁶³ I	64.250	¹⁶¹ Xe	32.930	¹⁵⁹ Cs	5.580
¹⁶² Sn	115.680	¹⁶⁴ Sb	111.490	¹⁶⁵ Te	97.480	¹⁶⁴ I	72.000	¹⁶² Xe	38.650	¹⁶⁰ Cs	12.100
¹⁶³ Sn	124.380	¹⁶⁵ Sb	118.520	¹⁶⁶ Te	103.930	¹⁶⁵ I	78.170	¹⁶³ Xe	46.070	¹⁶¹ Cs	17.410
¹⁶⁴ Sn	131.380	¹⁶⁶ Sb	126.910	¹⁶⁷ Te	112.400	¹⁶⁶ I	85.950	¹⁶⁴ Xe	51.950	¹⁶² Cs	24.220
¹⁶⁵ Sn	140.150	¹⁶⁷ Sb	133.490	¹⁶⁸ Te	118.910	¹⁶⁷ I	92.500	¹⁶⁵ Xe	59.630	¹⁶³ Cs	29.870
¹⁶⁶ Sn	146.820	¹⁶⁸ Sb	141.890	¹⁶⁹ Te	126.840	¹⁶⁸ I	100.280	¹⁶⁶ Xe	65.320	¹⁶⁴ Cs	36.830
¹⁶⁷ Sn	155.650	¹⁶⁹ Sb	149.200	¹⁷⁰ Te	133.790	¹⁶⁹ I	106.960	¹⁶⁷ Xe	73.140	¹⁶⁵ Cs	42.690
¹⁶⁸ Sn	163.030	¹⁷⁰ Sb	157.560	¹⁷¹ Te	142.310	¹⁷⁰ I	114.890	¹⁶⁸ Xe	79.320	¹⁶⁶ Cs	49.900
¹⁶⁹ Sn	171.760	¹⁷¹ Sb	165.240	¹⁷² Te	149.350	¹⁷¹ I	121.380	¹⁶⁹ Xe	87.300	¹⁶⁷ Cs	55.580
		¹⁷² Sb	173.550	¹⁷³ Te	157.650	¹⁷² I	129.540	¹⁷⁰ Xe	93.340	¹⁶⁸ Cs	62.930
⁹⁷ Sb	-11.860			¹⁷⁴ Te	164.420	¹⁷³ I	136.470	¹⁷¹ Xe	101.330	¹⁶⁹ Cs	69.110
⁹⁸ Sb	-19.820	⁹⁹ Te	-9.500	¹⁷⁵ Te	172.650	¹⁷⁴ I	144.610	¹⁷² Xe	107.720	¹⁷⁰ Cs	76.610
⁹⁹ Sb	-29.930	¹⁰⁰ Te	-20.620	¹⁷⁶ Te	179.700	¹⁷⁵ I	151.510	¹⁷³ Xe	115.570	¹⁷¹ Cs	82.870
¹⁰⁰ Sb	-37.010	¹⁰¹ Te	-27.500			¹⁷⁶ I	159.210	¹⁷⁴ Xe	122.150	¹⁷² Cs	90.200
¹⁰¹ Sb	-46.330	¹⁰² Te	-37.660	¹⁰¹ I	-7.470	¹⁷⁷ I	166.210	¹⁷⁵ Xe	130.190	¹⁷³ Cs	96.590
¹⁰² Sb	-50.440	¹⁰³ Te	-42.090	¹⁰² I	-15.300	¹⁷⁸ I	174.010	¹⁷⁶ Xe	136.560	¹⁷⁴ Cs	103.980
¹⁰³ Sb	-56.310	¹⁰⁴ Te	-49.060	¹⁰³ I	-25.110	¹⁷⁹ I	181.370	¹⁷⁷ Xe	144.460	¹⁷⁵ Cs	110.760
¹⁰⁴ Sb	-59.210	¹⁰⁵ Te	-52.030	¹⁰⁴ I	-30.800			¹⁷⁸ Xe	151.100	¹⁷⁶ Cs	118.370
¹⁰⁵ Sb	-63.820	¹⁰⁶ Te	-57.760	¹⁰⁵ I	-38.060	¹⁰³ Xe	-4.620	¹⁷⁹ Xe	158.750	¹⁷⁷ Cs	124.750
¹⁰⁶ Sb	-66.280	¹⁰⁷ Te	-60.230	¹⁰⁶ I	-42.130	¹⁰⁴ Xe	-15.260	¹⁸⁰ Xe	165.820	¹⁷⁸ Cs	132.190
¹⁰⁷ Sb	-70.300	¹⁰⁸ Te	-65.160	¹⁰⁷ I	-48.240	¹⁰⁵ Xe	-20.970	¹⁸¹ Xe	176.320	¹⁷⁹ Cs	138.800
¹⁰⁸ Sb	-72.170	¹⁰⁹ Te	-67.220	¹⁰⁸ I	-51.740	¹⁰⁶ Xe	-28.990	¹⁸² Xe	185.750	¹⁸⁰ Cs	146.050
¹⁰⁹ Sb	-75.740	¹¹⁰ Te	-71.530	¹⁰⁹ I	-56.840	¹⁰⁷ Xe	-33.810			¹⁸¹ Cs	153.010
¹¹⁰ Sb	-77.180	¹¹¹ Te	-73.080	¹¹⁰ I	-59.750	¹⁰⁸ Xe	-40.990	¹⁰⁶ Cs	-8.730	¹⁸² Cs	163.110
¹¹¹ Sb	-80.210	¹¹² Te	-76.870	¹¹¹ I	-64.240	¹⁰⁹ Xe	-44.700	¹⁰⁷ Cs	-17.050	¹⁸³ Cs	172.210
¹¹² Sb	-81.090	¹¹³ Te	-78.040	¹¹² I	-66.670	¹¹⁰ Xe	-50.640	¹⁰⁸ Cs	-22.790	¹⁸⁴ Cs	182.760
¹¹³ Sb	-83.710	¹¹⁴ Te	-81.290	¹¹³ I	-70.560	¹¹¹ Xe	-53.650	¹⁰⁹ Cs	-30.190	¹⁸⁵ Cs	192.040
¹¹⁴ Sb	-84.170	¹¹⁵ Te	-82.130	¹¹⁴ I	-72.590	¹¹² Xe	-59.030	¹¹⁰ Cs	-35.330		
¹¹⁵ Sb	-86.500	¹¹⁶ Te	-84.920	¹¹⁵ I	-75.940	¹¹³ Xe	-61.640	¹¹¹ Cs	-41.820	¹⁰⁸ Ba	-7.220
¹¹⁶ Sb	-86.600	¹¹⁷ Te	-84.850	¹¹⁶ I	-77.420	¹¹⁴ Xe	-66.390	¹¹² Cs	-45.510	¹⁰⁹ Ba	-13.120
¹¹⁷ Sb	-88.550	¹¹⁸ Te	-87.450	¹¹⁷ I	-80.330	¹¹⁵ Xe	-68.510	¹¹³ Cs	-50.900	¹¹⁰ Ba	-21.580
¹¹⁸ Sb	-88.210	¹¹⁹ Te	-87.250	¹¹⁸ I	-81.270	¹¹⁶ Xe	-72.630	¹¹⁴ Cs	-54.240	¹¹¹ Ba	-26.970
¹¹⁹ Sb	-89.670	¹²⁰ Te	-89.370	¹¹⁹ I	-83.740	¹¹⁷ Xe	-74.140	¹¹⁵ Cs	-59.330	¹¹² Ba	-34.190
¹²⁰ Sb	-88.900	¹²¹ Te	-88.750	¹²⁰ I	-84.240	¹¹⁸ Xe	-77.770	¹¹⁶ Cs	-62.100	¹¹³ Ba	-38.150
¹²¹ Sb	-89.970	¹²² Te	-90.360	¹²¹ I	-86.050	¹¹⁹ Xe	-78.800	¹¹⁷ Cs	-66.360	¹¹⁴ Ba	-44.560
¹²² Sb	-88.790	¹²³ Te	-89.290	¹²² I	-86.060	¹²⁰ Xe	-81.960	¹¹⁸ Cs	-68.540	¹¹⁵ Ba	-48.190
¹²³ Sb	-89.570	¹²⁴ Te	-90.670	¹²³ I	-87.730	¹²¹ Xe	-82.510	¹¹⁹ Cs	-72.250	¹¹⁶ Ba	-54.110
¹²⁴ Sb	-88.100	¹²⁵ Te	-89.260	¹²⁴ I	-87.250	¹²² Xe	-85.190	¹²⁰ Cs	-73.960	¹¹⁷ Ba	-57.040
¹²⁵ Sb	-88.660	¹²⁶ Te	-90.360	¹²⁵ I	-88.570	¹²³ Xe	-85.300	¹²¹ Cs	-77.220	¹¹⁸ Ba	-61.980
¹²⁶ Sb	-86.840	¹²⁷ Te	-88.650	¹²⁶ I	-87.800	¹²⁴ Xe	-87.390	¹²² Cs	-78.480	¹¹⁹ Ba	-64.270
¹²⁷ Sb	-87.250	¹²⁸ Te	-89.660	¹²⁷ I	-88.810	¹²⁵ Xe	-87.090	¹²³ Cs	-81.180	¹²⁰ Ba	-68.630
¹²⁸ Sb	-85.250	¹²⁹ Te	-87.970	¹²⁸ I	-87.790	¹²⁶ Xe	-88.760	¹²⁴ Cs	-81.970	¹²¹ Ba	-70.420
¹²⁹ Sb	-85.520	¹³⁰ Te	-88.460	¹²⁹ I	-88.610	¹²⁷ Xe	-88.020	¹²⁵ Cs	-83.980	¹²² Ba	-74.350
¹³⁰ Sb	-83.220	¹³¹ Te	-86.320	¹³⁰ I	-87.300	¹²⁸ Xe	-89.470	¹²⁶ Cs	-84.280	¹²³ Ba	-75.700
¹³¹ Sb	-83.020	¹³² Te	-86.690	¹³¹ I	-87.990	¹²⁹ Xe	-88.430	¹²⁷ Cs	-86.000	¹²⁴ Ba	-79.070
¹³² Sb	-80.490	¹³³ Te	-84.270	¹³² I	-86.520	¹³⁰ Xe	-89.660	¹²⁸ Cs	-85.830	¹²⁵ Ba	-79.920
¹³³ Sb	-79.320	¹³⁴ Te	-83.710	¹³³ I	-87.030	¹³¹ Xe	-88.410	¹²⁹ Cs	-87.250	¹²⁶ Ba	-82.680
¹³⁴ Sb	-74.620	¹³⁵ Te	-79.020	¹³⁴ I	-85.130	¹³² Xe	-89.660	¹³⁰ Cs	-86.770	¹²⁷ Ba	-82.980
¹³⁵ Sb	-70.750	¹³⁶ Te	-75.880	¹³⁵ I	-84.720	¹³³ Xe	-88.390	¹³¹ Cs	-87.840	¹²⁸ Ba	-85.160
¹³⁶ Sb	-65.130	¹³⁷ Te	-70.320	¹³⁶ I	-80.640	¹³⁴ Xe	-89.220	¹³² Cs	-87.030	¹²⁹ Ba	-85.050
¹³⁷ Sb	-60.780	¹³⁸ Te	-66.650	¹³⁷ I	-77.570	¹³⁵ Xe	-87.470	¹³³ Cs	-88.110	¹³⁰ Ba	-86.910
¹³⁸ Sb	-54.130	¹³⁹ Te	-60.030	¹³⁸ I	-71.720	¹³⁶ Xe	-87.640	¹³⁴ Cs	-87.190	¹³¹ Ba	-86.440
¹³⁹ Sb	-49.880	¹⁴⁰ Te	-56.260	¹³⁹ I	-68.460	¹³⁷ Xe	-83.700	¹³⁵ Cs	-88.430	¹³² Ba	-88.020
¹⁴⁰ Sb	-43.690	¹⁴¹ Te	-50.050	¹⁴⁰ I	-63.350	¹³⁸ Xe	-81.070	¹³⁶ Cs	-87.290	¹³³ Ba	-87.220
¹⁴¹ Sb	-39.150	¹⁴² Te	-46.240	¹⁴¹ I	-59.780	¹³⁹ Xe	-75.820	¹³⁷ Cs	-87.520	¹³⁴ Ba	-88.800
¹⁴² Sb	-32.070	¹⁴³ Te	-40.150	¹⁴² I	-54.360	¹⁴⁰ Xe	-73.060	¹³⁸ Cs	-84.240	¹³⁵ Ba	-87.880
¹⁴³ Sb	-27.510	¹⁴⁴ Te	-36.210	¹⁴³ I	-50.790	¹⁴¹ Xe	-68.210	¹³⁹ Cs	-81.600	¹³⁶ Ba	-89.660
¹⁴⁴ Sb	-21.230	¹⁴⁵ Te	-30.070	¹⁴⁴ I	-45.240	¹⁴² Xe	-65.390	¹⁴⁰ Cs	-76.950	¹³⁷ Ba	-88.580
¹⁴⁵ Sb	-16.480	¹⁴⁶ Te	-25.840	¹⁴⁵ I	-41.260	¹⁴³ Xe	-60.230	¹⁴¹ Cs	-74.530	¹³⁸ Ba	-89.420
¹⁴⁶ Sb	-10.180	¹⁴⁷ Te	-19.590	¹⁴⁶ I	-35.840	¹⁴⁴ Xe	-57.080	¹⁴² Cs	-70.520	¹³⁹ Ba	-86.110
¹⁴⁷ Sb	-5.160	¹⁴⁸ Te	-15.090	¹⁴⁷ I	-31.730	¹⁴⁵ Xe	-51.690	¹⁴³ Cs	-67.820	¹⁴⁰ Ba	-84.280

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁴¹ Ba	-79.690	¹³⁶ La	-85.990	¹³¹ Ce	-79.630	¹²⁵ Pr	-58.220	¹¹⁹ Nd	-15.870	¹⁹⁴ Nd	159.120
¹⁴² Ba	-77.960	¹³⁷ La	-87.850	¹³² Ce	-82.120	¹²⁶ Pr	-60.810	¹²⁰ Nd	-24.080	¹⁹⁵ Nd	167.980
¹⁴³ Ba	-74.140	¹³⁸ La	-87.320	¹³³ Ce	-82.240	¹²⁷ Pr	-64.860	¹²¹ Nd	-28.750	¹⁹⁶ Nd	175.360
¹⁴⁴ Ba	-72.150	¹³⁹ La	-88.280	¹³⁴ Ce	-84.330	¹²⁸ Pr	-66.880	¹²² Nd	-35.300	¹⁹⁷ Nd	184.120
¹⁴⁵ Ba	-67.840	¹⁴⁰ La	-85.430	¹³⁵ Ce	-84.100	¹²⁹ Pr	-70.280	¹²³ Nd	-39.060	¹⁹⁸ Nd	191.680
¹⁴⁶ Ba	-65.330	¹⁴¹ La	-83.790	¹³⁶ Ce	-86.040	¹³⁰ Pr	-71.680	¹²⁴ Nd	-44.840	¹⁹⁹ Nd	200.830
¹⁴⁷ Ba	-60.840	¹⁴² La	-79.740	¹³⁷ Ce	-85.700	¹³¹ Pr	-74.460	¹²⁵ Nd	-47.990	²⁰⁰ Nd	208.700
¹⁴⁸ Ba	-58.290	¹⁴³ La	-78.240	¹³⁸ Ce	-88.060	¹³² Pr	-75.410	¹²⁶ Nd	-53.210	²⁰¹ Nd	217.810
¹⁴⁹ Ba	-53.810	¹⁴⁴ La	-75.110	¹³⁹ Ce	-87.620	¹³³ Pr	-77.820	¹²⁷ Nd	-55.890		
¹⁵⁰ Ba	-50.840	¹⁴⁵ La	-73.330	¹⁴⁰ Ce	-89.160	¹³⁴ Pr	-78.320	¹²⁸ Nd	-60.540	¹²⁰ Pm	-4.980
¹⁵¹ Ba	-45.960	¹⁴⁶ La	-69.510	¹⁴¹ Ce	-86.380	¹³⁵ Pr	-80.390	¹²⁹ Nd	-62.670	¹²¹ Pm	-13.360
¹⁵² Ba	-42.570	¹⁴⁷ La	-67.200	¹⁴² Ce	-85.290	¹³⁶ Pr	-80.760	¹³⁰ Nd	-66.670	¹²² Pm	-18.980
¹⁵³ Ba	-37.400	¹⁴⁸ La	-63.590	¹⁴³ Ce	-81.480	¹³⁷ Pr	-82.680	¹³¹ Nd	-68.140	¹²³ Pm	-25.900
¹⁵⁴ Ba	-33.840	¹⁴⁹ La	-61.210	¹⁴⁴ Ce	-80.630	¹³⁸ Pr	-82.890	¹³² Nd	-71.490	¹²⁴ Pm	-30.310
¹⁵⁵ Ba	-28.420	¹⁵⁰ La	-57.360	¹⁴⁵ Ce	-77.570	¹³⁹ Pr	-85.230	¹³³ Nd	-72.260	¹²⁵ Pm	-36.200
¹⁵⁶ Ba	-24.560	¹⁵¹ La	-54.470	¹⁴⁶ Ce	-76.320	¹⁴⁰ Pr	-85.310	¹³⁴ Nd	-75.230	¹²⁶ Pm	-40.010
¹⁵⁷ Ba	-18.900	¹⁵² La	-50.130	¹⁴⁷ Ce	-72.660	¹⁴¹ Pr	-86.990	¹³⁵ Nd	-75.880	¹²⁷ Pm	-45.300
¹⁵⁸ Ba	-14.710	¹⁵³ La	-46.870	¹⁴⁸ Ce	-71.100	¹⁴² Pr	-84.780	¹³⁶ Nd	-78.510	¹²⁸ Pm	-48.570
¹⁵⁹ Ba	-8.650	¹⁵⁴ La	-42.210	¹⁴⁹ Ce	-67.710	¹⁴³ Pr	-83.780	¹³⁷ Nd	-78.850	¹²⁹ Pm	-53.300
¹⁶⁰ Ba	-4.040	¹⁵⁵ La	-38.700	¹⁵⁰ Ce	-65.970	¹⁴⁴ Pr	-80.680	¹³⁸ Nd	-81.270	¹³⁰ Pm	-56.050
¹⁶¹ Ba	2.380	¹⁵⁶ La	-33.750	¹⁵¹ Ce	-62.220	¹⁴⁵ Pr	-79.830	¹³⁹ Nd	-81.590	¹³¹ Pm	-60.120
¹⁶² Ba	7.270	¹⁵⁷ La	-29.930	¹⁵² Ce	-59.960	¹⁴⁶ Pr	-77.380	¹⁴⁰ Nd	-84.460	¹³² Pm	-62.270
¹⁶³ Ba	14.050	¹⁵⁸ La	-24.810	¹⁵³ Ce	-55.740	¹⁴⁷ Pr	-76.130	¹⁴¹ Nd	-84.680	¹³³ Pm	-65.650
¹⁶⁴ Ba	19.260	¹⁵⁹ La	-20.700	¹⁵⁴ Ce	-53.050	¹⁴⁸ Pr	-73.330	¹⁴² Nd	-86.890	¹³⁴ Pm	-67.060
¹⁶⁵ Ba	26.160	¹⁶⁰ La	-15.120	¹⁵⁵ Ce	-48.530	¹⁴⁹ Pr	-72.180	¹⁴³ Nd	-84.780	¹³⁵ Pm	-69.900
¹⁶⁶ Ba	31.600	¹⁶¹ La	-10.560	¹⁵⁶ Ce	-45.510	¹⁵⁰ Pr	-69.370	¹⁴⁴ Nd	-84.290	¹³⁶ Pm	-71.150
¹⁶⁷ Ba	38.750	¹⁶² La	-4.550	¹⁵⁷ Ce	-40.650	¹⁵¹ Pr	-67.700	¹⁴⁵ Nd	-81.270	¹³⁷ Pm	-73.720
¹⁶⁸ Ba	44.290	¹⁶³ La	0.340	¹⁵⁸ Ce	-37.330	¹⁵² Pr	-64.570	¹⁴⁶ Nd	-80.940	¹³⁸ Pm	-74.450
¹⁶⁹ Ba	51.350	¹⁶⁴ La	6.600	¹⁵⁹ Ce	-32.270	¹⁵³ Pr	-62.410	¹⁴⁷ Nd	-78.630	¹³⁹ Pm	-76.920
¹⁷⁰ Ba	57.120	¹⁶⁵ La	11.770	¹⁶⁰ Ce	-28.620	¹⁵⁴ Pr	-58.760	¹⁴⁸ Nd	-78.100	¹⁴⁰ Pm	-77.720
¹⁷¹ Ba	64.620	¹⁶⁶ La	18.330	¹⁶¹ Ce	-23.110	¹⁵⁵ Pr	-56.160	¹⁴⁹ Nd	-75.540	¹⁴¹ Pm	-80.600
¹⁷² Ba	70.560	¹⁶⁷ La	23.700	¹⁶² Ce	-18.940	¹⁵⁶ Pr	-52.150	¹⁵⁰ Nd	-75.030	¹⁴² Pm	-81.340
¹⁷³ Ba	77.780	¹⁶⁸ La	30.350	¹⁶³ Ce	-13.020	¹⁵⁷ Pr	-49.200	¹⁵¹ Nd	-72.340	¹⁴³ Pm	-83.700
¹⁷⁴ Ba	83.820	¹⁶⁹ La	35.860	¹⁶⁴ Ce	-8.590	¹⁵⁸ Pr	-44.830	¹⁵² Nd	-71.260	¹⁴⁴ Pm	-82.140
¹⁷⁵ Ba	91.170	¹⁷⁰ La	42.520	¹⁶⁵ Ce	-2.360	¹⁵⁹ Pr	-41.670	¹⁵³ Nd	-68.160	¹⁴⁵ Pm	-81.740
¹⁷⁶ Ba	97.590	¹⁷¹ La	48.320	¹⁶⁶ Ce	2.370	¹⁶⁰ Pr	-37.040	¹⁵⁴ Nd	-66.650	¹⁴⁶ Pm	-79.330
¹⁷⁷ Ba	105.040	¹⁷² La	55.310	¹⁶⁷ Ce	8.830	¹⁶¹ Pr	-33.410	¹⁵⁵ Nd	-63.070	¹⁴⁷ Pm	-79.210
¹⁷⁸ Ba	111.180	¹⁷³ La	61.230	¹⁶⁸ Ce	13.750	¹⁶² Pr	-28.400	¹⁵⁶ Nd	-61.070	¹⁴⁸ Pm	-77.510
¹⁷⁹ Ba	118.610	¹⁷⁴ La	67.930	¹⁶⁹ Ce	20.470	¹⁶³ Pr	-24.370	¹⁵⁷ Nd	-57.150	¹⁴⁹ Pm	-77.180
¹⁸⁰ Ba	124.800	¹⁷⁵ La	73.960	¹⁷⁰ Ce	25.630	¹⁶⁴ Pr	-18.820	¹⁵⁸ Nd	-54.780	¹⁵⁰ Pm	-75.180
¹⁸¹ Ba	131.970	¹⁷⁶ La	80.970	¹⁷¹ Ce	32.240	¹⁶⁵ Pr	-14.470	¹⁵⁹ Nd	-50.500	¹⁵¹ Pm	-74.790
¹⁸² Ba	138.690	¹⁷⁷ La	87.530	¹⁷² Ce	37.490	¹⁶⁶ Pr	-8.680	¹⁶⁰ Nd	-47.830	¹⁵² Pm	-72.650
¹⁸³ Ba	148.700	¹⁷⁸ La	94.430	¹⁷³ Ce	44.570	¹⁶⁷ Pr	-3.970	¹⁶¹ Nd	-43.330	¹⁵³ Pm	-71.700
¹⁸⁴ Ba	157.130	¹⁷⁹ La	100.540	¹⁷⁴ Ce	49.990	¹⁶⁸ Pr	2.080	¹⁶² Nd	-40.250	¹⁵⁴ Pm	-69.200
¹⁸⁵ Ba	167.750	¹⁸⁰ La	107.470	¹⁷⁵ Ce	56.790	¹⁶⁹ Pr	6.980	¹⁶³ Nd	-35.300	¹⁵⁵ Pm	-67.770
¹⁸⁶ Ba	176.660	¹⁸¹ La	113.690	¹⁷⁶ Ce	62.380	¹⁷⁰ Pr	13.290	¹⁶⁴ Nd	-31.680	¹⁵⁶ Pm	-64.740
¹⁸⁷ Ba	186.620	¹⁸² La	120.550	¹⁷⁷ Ce	69.650	¹⁷¹ Pr	18.450	¹⁶⁵ Nd	-26.140	¹⁵⁷ Pm	-62.890
¹⁸⁸ Ba	195.230	¹⁸³ La	127.140	¹⁷⁸ Ce	75.540	¹⁷² Pr	24.820	¹⁶⁶ Nd	-22.140	¹⁵⁸ Pm	-59.540
¹⁸⁹ Ba	205.010	¹⁸⁴ La	136.510	¹⁷⁹ Ce	82.490	¹⁷³ Pr	29.860	¹⁶⁷ Nd	-16.430	¹⁵⁹ Pm	-57.290
		¹⁸⁵ La	145.100	¹⁸⁰ Ce	88.140	¹⁷⁴ Pr	36.490	¹⁶⁸ Nd	-12.180	¹⁶⁰ Pm	-53.580
¹¹⁰ La	-1.280	¹⁸⁶ La	155.290	¹⁸¹ Ce	95.150	¹⁷⁵ Pr	41.910	¹⁶⁹ Nd	-6.150	¹⁶¹ Pm	-50.980
¹¹¹ La	-9.860	¹⁸⁷ La	164.070	¹⁸² Ce	100.770	¹⁷⁶ Pr	48.290	¹⁷⁰ Nd	-1.690	¹⁶² Pm	-46.960
¹¹² La	-15.780	¹⁸⁸ La	173.540	¹⁸³ Ce	107.650	¹⁷⁷ Pr	53.820	¹⁷¹ Nd	4.520	¹⁶³ Pm	-43.930
¹¹³ La	-23.730	¹⁸⁹ La	182.160	¹⁸⁴ Ce	113.800	¹⁷⁸ Pr	60.660	¹⁷² Nd	9.200	¹⁶⁴ Pm	-39.480
¹¹⁴ La	-28.870	¹⁹⁰ La	191.740	¹⁸⁵ Ce	123.340	¹⁷⁹ Pr	66.460	¹⁷³ Nd	15.560	¹⁶⁵ Pm	-35.950
¹¹⁵ La	-35.670	¹⁹¹ La	200.570	¹⁸⁶ Ce	131.190	¹⁸⁰ Pr	73.030	¹⁷⁴ Nd	20.180	¹⁶⁶ Pm	-30.880
¹¹⁶ La	-40.140	¹⁹² La	210.090	¹⁸⁷ Ce	141.570	¹⁸¹ Pr	78.760	¹⁷⁵ Nd	26.820	¹⁶⁷ Pm	-26.930
¹¹⁷ La	-46.240			¹⁸⁸ Ce	149.830	¹⁸² Pr	85.230	¹⁷⁶ Nd	31.800	¹⁶⁸ Pm	-21.580
¹¹⁸ La	-49.830	¹¹³ Ce	-6.360	¹⁸⁹ Ce	159.220	¹⁸³ Pr	90.860	¹⁷⁷ Nd	38.370	¹⁶⁹ Pm	-17.430
¹¹⁹ La	-54.920	¹¹⁴ Ce	-14.790	¹⁹⁰ Ce	167.370	¹⁸⁴ Pr	97.380	¹⁷⁸ Nd	43.300	¹⁷⁰ Pm	-11.880
¹²⁰ La	-57.770	¹¹⁵ Ce	-20.550	¹⁹¹ Ce	176.990	¹⁸⁵ Pr	103.480	¹⁷⁹ Nd	50.460	¹⁷¹ Pm	-7.420
¹²¹ La	-62.190	¹¹⁶ Ce	-28.590	¹⁹² Ce	185.640	¹⁸⁶ Pr	112.530	¹⁸⁰ Nd	55.600	¹⁷² Pm	-1.550
¹²² La	-64.630	¹¹⁷ Ce	-33.280	¹⁹³ Ce	194.810	¹⁸⁷ Pr	120.500	¹⁸¹ Nd	62.240	¹⁷³ Pm	3.120
¹²³ La	-68.620	¹¹⁸ Ce	-40.080	¹⁹⁴ Ce	202.750	¹⁸⁸ Pr	130.380	¹⁸² Nd	67.490	¹⁷⁴ Pm	9.050
¹²⁴ La	-70.550	¹¹⁹ Ce	-43.870	¹⁹⁵ Ce	212.050	¹⁸⁹ Pr	138.440	¹⁸³ Nd	73.950	¹⁷⁵ Pm	13.650
¹²⁵ La	-73.970	¹²⁰ Ce	-49.660			¹⁹⁰ Pr	147.310	¹⁸⁴ Nd	79.130	¹⁷⁶ Pm	19.870
¹²⁶ La	-75.400	¹²¹ Ce	-52.680	¹¹⁵ Pr	-3.520	¹⁹¹ Pr	155.440	¹⁸⁵ Nd	85.580	¹⁷⁷ Pm	24.820
¹²⁷ La	-78.170	¹²² Ce	-57.760	¹¹⁶ Pr	-10.080	¹⁹² Pr	165.120	¹⁸⁶ Nd	91.350	¹⁷⁸ Pm	31.010
¹²⁸ La	-79.040	¹²³ Ce	-60.260	¹¹⁷ Pr	-18.380	¹⁹³ Pr	173.190	¹⁸⁷ Nd	100.360	¹⁷⁹ Pm	35.880
¹²⁹ La	-81.230	¹²⁴ Ce	-64.820	¹¹⁸ Pr	-24.050	¹⁹⁴ Pr	181.910	¹⁸⁸ Nd	107.780	¹⁸⁰ Pm	42.550
¹³⁰ La	-81.650	¹²⁵ Ce	-66.820	¹¹⁹ Pr	-31.280	¹⁹⁵ Pr	189.770	¹⁸⁹ Nd	117.690	¹⁸¹ Pm	47.660
¹³¹ La	-83.500	¹²⁶ Ce	-70.800	¹²⁰ Pr	-35.830	¹⁹⁶ Pr	198.670	¹⁹⁰ Nd	125.250	¹⁸² Pm	53.840
¹³² La	-83.570	¹²⁷ Ce	-72.290	¹²¹ Pr	-41.740	¹⁹⁷ Pr	206.640	¹⁹¹ Nd	134.260	¹⁸³ Pm	59.150
¹³³ La	-85.200	¹²⁸ Ce	-75.610	¹²² Pr	-45.390	¹⁹⁸ Pr	215.870	¹⁹² Nd	142.000	¹⁸⁴ Pm	65.260
¹³⁴ La	-84.950	¹²⁹ Ce	-76.510	¹²³ Pr	-50.520			¹⁹³ Nd	151.560	¹⁸⁵ Pm	70.350
¹³⁵ La	-86.390	¹³⁰ Ce	-79.320	¹²⁴ Pr	-53.620					¹⁸⁶ Pm	76.380

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
¹⁸⁷ Pm	82.100	¹⁷⁹ Sm	22.000	¹⁷⁰ Eu	-32.160	¹⁶¹ Gd	-65.950	¹⁵¹ Tb	-71.990	¹⁴⁰ Dy	-42.850		
¹⁸⁸ Pm	90.720	¹⁸⁰ Sm	26.470	¹⁷¹ Eu	-28.590	¹⁶² Gd	-64.960	¹⁵² Tb	-71.400	¹⁴¹ Dy	-45.310		
¹⁸⁹ Pm	98.140	¹⁸¹ Sm	33.140	¹⁷² Eu	-23.550	¹⁶³ Gd	-61.990	¹⁵³ Tb	-72.360	¹⁴² Dy	-49.810		
¹⁹⁰ Pm	107.390	¹⁸² Sm	37.810	¹⁷³ Eu	-19.600	¹⁶⁴ Gd	-60.600	¹⁵⁴ Tb	-71.490	¹⁴³ Dy	-50.880		
¹⁹¹ Pm	114.890	¹⁸³ Sm	44.080	¹⁷⁴ Eu	-14.260	¹⁶⁵ Gd	-57.270	¹⁵⁵ Tb	-72.320	¹⁴⁴ Dy	-55.690		
¹⁹² Pm	123.640	¹⁸⁴ Sm	48.910	¹⁷⁵ Eu	-10.050	¹⁶⁶ Gd	-55.380	¹⁵⁶ Tb	-71.290	¹⁴⁵ Dy	-57.800		
¹⁹³ Pm	131.300	¹⁸⁵ Sm	55.030	¹⁷⁶ Eu	-4.570	¹⁶⁷ Gd	-51.620	¹⁵⁷ Tb	-71.600	¹⁴⁶ Dy	-62.010		
¹⁹⁴ Pm	140.380	¹⁸⁶ Sm	59.710	¹⁷⁷ Eu	-0.350	¹⁶⁸ Gd	-49.210	¹⁵⁸ Tb	-70.190	¹⁴⁷ Dy	-64.110		
¹⁹⁵ Pm	147.850	¹⁸⁷ Sm	65.780	¹⁷⁸ Eu	5.250	¹⁶⁹ Gd	-44.870	¹⁵⁹ Tb	-70.080	¹⁴⁸ Dy	-68.240		
¹⁹⁶ Pm	156.160	¹⁸⁸ Sm	71.080	¹⁷⁹ Eu	9.810	¹⁷⁰ Gd	-42.170	¹⁶⁰ Tb	-68.290	¹⁴⁹ Dy	-67.950		
¹⁹⁷ Pm	163.550	¹⁸⁹ Sm	79.660	¹⁸⁰ Eu	15.600	¹⁷¹ Gd	-37.570	¹⁶¹ Tb	-67.820	¹⁵⁰ Dy	-69.480		
¹⁹⁸ Pm	171.910	¹⁹⁰ Sm	86.610	¹⁸¹ Eu	20.100	¹⁷² Gd	-34.500	¹⁶² Tb	-65.710	¹⁵¹ Dy	-68.500		
¹⁹⁹ Pm	179.420	¹⁹¹ Sm	95.870	¹⁸² Eu	26.250	¹⁷³ Gd	-29.540	¹⁶³ Tb	-64.890	¹⁵² Dy	-70.070		
²⁰⁰ Pm	188.120	¹⁹² Sm	102.940	¹⁸³ Eu	30.880	¹⁷⁴ Gd	-26.130	¹⁶⁴ Tb	-62.420	¹⁵³ Dy	-69.460		
²⁰¹ Pm	195.960	¹⁹³ Sm	111.750	¹⁸⁴ Eu	36.740	¹⁷⁵ Gd	-20.860	¹⁶⁵ Tb	-61.110	¹⁵⁴ Dy	-70.940		
²⁰² Pm	204.700	¹⁹⁴ Sm	119.030	¹⁸⁵ Eu	41.600	¹⁷⁶ Gd	-17.130	¹⁶⁶ Tb	-58.290	¹⁵⁵ Dy	-70.110		
²⁰³ Pm	212.320	¹⁹⁵ Sm	127.980	¹⁸⁶ Eu	47.320	¹⁷⁷ Gd	-11.630	¹⁶⁷ Tb	-56.560	¹⁵⁶ Dy	-71.400		
²⁰⁴ Pm	221.270	¹⁹⁶ Sm	135.100	¹⁸⁷ Eu	52.120	¹⁷⁸ Gd	-7.890	¹⁶⁸ Tb	-53.290	¹⁵⁷ Dy	-70.410		
²⁰⁵ Pm	229.260	¹⁹⁷ Sm	143.340	¹⁸⁸ Eu	57.670	¹⁷⁹ Gd	-2.280	¹⁶⁹ Tb	-51.010	¹⁵⁸ Dy	-71.250		
		¹⁹⁸ Sm	150.280	¹⁸⁹ Eu	62.940	¹⁸⁰ Gd	1.850	¹⁷⁰ Tb	-47.250	¹⁵⁹ Dy	-69.860		
¹²³ Sm	-10.130	¹⁹⁹ Sm	158.600	¹⁹⁰ Eu	71.120	¹⁸¹ Gd	7.600	¹⁷¹ Tb	-44.650	¹⁶⁰ Dy	-70.300		
¹²⁴ Sm	-17.960	²⁰⁰ Sm	165.680	¹⁹¹ Eu	78.060	¹⁸² Gd	11.790	¹⁷² Tb	-40.540	¹⁶¹ Dy	-68.600		
¹²⁵ Sm	-22.500	²⁰¹ Sm	174.390	¹⁹² Eu	86.740	¹⁸³ Gd	17.880	¹⁷³ Tb	-37.520	¹⁶² Dy	-68.690		
¹²⁶ Sm	-28.950	²⁰² Sm	181.790	¹⁹³ Eu	93.750	¹⁸⁴ Gd	22.070	¹⁷⁴ Tb	-33.080	¹⁶³ Dy	-66.650		
¹²⁷ Sm	-32.900	²⁰³ Sm	190.450	¹⁹⁴ Eu	102.400	¹⁸⁵ Gd	27.930	¹⁷⁵ Tb	-29.710	¹⁶⁴ Dy	-66.380		
¹²⁸ Sm	-38.860	²⁰⁴ Sm	197.970	¹⁹⁵ Eu	109.480	¹⁸⁶ Gd	32.390	¹⁷⁶ Tb	-24.880	¹⁶⁵ Dy	-64.010		
¹²⁹ Sm	-42.200	²⁰⁵ Sm	206.550	¹⁹⁶ Eu	118.000	¹⁸⁷ Gd	38.150	¹⁷⁷ Tb	-21.090	¹⁶⁶ Dy	-63.260		
¹³⁰ Sm	-47.610	²⁰⁶ Sm	214.110	¹⁹⁷ Eu	125.010	¹⁸⁸ Gd	42.580	¹⁷⁸ Tb	-16.220	¹⁶⁷ Dy	-60.530		
¹³¹ Sm	-50.420	²⁰⁷ Sm	223.150	¹⁹⁸ Eu	132.810	¹⁸⁹ Gd	48.110	¹⁷⁹ Tb	-12.390	¹⁶⁸ Dy	-59.340		
¹³² Sm	-55.250	²⁰⁸ Sm	231.090	¹⁹⁹ Eu	139.740	¹⁹⁰ Gd	52.980	¹⁸⁰ Tb	-7.260	¹⁶⁹ Dy	-56.220		
¹³³ Sm	-57.380			²⁰⁰ Eu	147.710	¹⁹¹ Gd	61.130	¹⁸¹ Tb	-3.130	¹⁷⁰ Dy	-54.440		
¹³⁴ Sm	-61.400	¹²⁵ Eu	-6.550	²⁰¹ Eu	154.710	¹⁹² Gd	67.630	¹⁸² Tb	2.240	¹⁷¹ Dy	-50.810		
¹³⁵ Sm	-62.940	¹²⁶ Eu	-11.880	²⁰² Eu	162.950	¹⁹³ Gd	76.340	¹⁸³ Tb	6.450	¹⁷² Dy	-48.710		
¹³⁶ Sm	-66.430	¹²⁷ Eu	-18.840	²⁰³ Eu	170.230	¹⁹⁴ Gd	82.980	¹⁸⁴ Tb	12.060	¹⁷³ Dy	-44.730		
¹³⁷ Sm	-67.710	¹²⁸ Eu	-23.470	²⁰⁴ Eu	178.590	¹⁹⁵ Gd	91.460	¹⁸⁵ Tb	16.220	¹⁷⁴ Dy	-42.290		
¹³⁸ Sm	-70.840	¹²⁹ Eu	-29.600	²⁰⁵ Eu	185.760	¹⁹⁶ Gd	98.130	¹⁸⁶ Tb	21.630	¹⁷⁵ Dy	-37.900		
¹³⁹ Sm	-71.620	¹³⁰ Eu	-33.610	²⁰⁶ Eu	194.260	¹⁹⁷ Gd	106.520	¹⁸⁷ Tb	26.100	¹⁷⁶ Dy	-35.040		
¹⁴⁰ Sm	-74.620	¹³¹ Eu	-39.200	²⁰⁷ Eu	201.810	¹⁹⁸ Gd	113.250	¹⁸⁸ Tb	31.570	¹⁷⁷ Dy	-30.310		
¹⁴¹ Sm	-75.500	¹³² Eu	-42.690	²⁰⁸ Eu	210.440	¹⁹⁹ Gd	121.160	¹⁸⁹ Tb	35.990	¹⁷⁸ Dy	-27.110		
¹⁴² Sm	-78.880	¹³³ Eu	-47.610	²⁰⁹ Eu	218.310	²⁰⁰ Gd	127.630	¹⁹⁰ Tb	41.300	¹⁷⁹ Dy	-21.990		
¹⁴³ Sm	-79.710	¹³⁴ Eu	-50.330	²¹⁰ Eu	227.230	²⁰¹ Gd	135.630	¹⁹¹ Tb	45.950	¹⁸⁰ Dy	-18.770		
¹⁴⁴ Sm	-82.620	¹³⁵ Eu	-54.440	²¹¹ Eu	235.320	²⁰² Gd	142.200	¹⁹² Tb	53.800	¹⁸¹ Dy	-13.660		
¹⁴⁵ Sm	-81.130	¹³⁶ Eu	-56.520			²⁰³ Gd	150.410	¹⁹³ Tb	60.340	¹⁸² Dy	-9.990		
¹⁴⁶ Sm	-81.280	¹³⁷ Eu	-60.050	¹²⁸ Gd	-10.300	²⁰⁴ Gd	157.250	¹⁹⁴ Tb	68.500	¹⁸³ Dy	-4.660		
¹⁴⁷ Sm	-78.990	¹³⁸ Eu	-61.890	¹²⁹ Gd	-15.110	²⁰⁵ Gd	165.600	¹⁹⁵ Tb	75.140	¹⁸⁴ Dy	-0.810		
¹⁴⁸ Sm	-79.320	¹³⁹ Eu	-65.190	¹³⁰ Gd	-21.930	²⁰⁶ Gd	172.380	¹⁹⁶ Tb	83.060	¹⁸⁵ Dy	4.730		
¹⁴⁹ Sm	-77.630	¹⁴⁰ Eu	-66.380	¹³¹ Gd	-26.100	²⁰⁷ Gd	180.850	¹⁹⁷ Tb	89.660	¹⁸⁶ Dy	8.430		
¹⁵⁰ Sm	-77.870	¹⁴¹ Eu	-69.330	¹³² Gd	-32.420	²⁰⁸ Gd	187.970	¹⁹⁸ Tb	97.630	¹⁸⁷ Dy	13.880		
¹⁵¹ Sm	-75.910	¹⁴² Eu	-70.720	¹³³ Gd	-36.050	²⁰⁹ Gd	196.580	¹⁹⁹ Tb	106.020	¹⁸⁸ Dy	17.930		
¹⁵² Sm	-76.150	¹⁴³ Eu	-74.100	¹³⁴ Gd	-41.620	²¹⁰ Gd	204.010	²⁰⁰ Tb	111.810	¹⁸⁹ Dy	23.340		
¹⁵³ Sm	-74.090	¹⁴⁴ Eu	-75.380	¹³⁵ Gd	-44.450	²¹¹ Gd	212.800	²⁰¹ Tb	118.250	¹⁹⁰ Dy	27.380		
¹⁵⁴ Sm	-73.700	¹⁴⁵ Eu	-78.420	¹³⁶ Gd	-49.150	²¹² Gd	220.460	²⁰² Tb	125.780	¹⁹¹ Dy	32.600		
¹⁵⁵ Sm	-71.260	¹⁴⁶ Eu	-77.390	¹³⁷ Gd	-51.340	²¹³ Gd	229.620	²⁰³ Tb	132.380	¹⁹² Dy	36.960		
¹⁵⁶ Sm	-70.430	¹⁴⁷ Eu	-77.730	¹³⁸ Gd	-55.670	²¹⁴ Gd	237.580	²⁰⁴ Tb	140.150	¹⁹³ Dy	44.780		
¹⁵⁷ Sm	-67.500	¹⁴⁸ Eu	-76.100	¹³⁹ Gd	-57.420			²⁰⁵ Tb	146.980	¹⁹⁴ Dy	50.690		
¹⁵⁸ Sm	-66.170	¹⁴⁹ Eu	-76.650	¹⁴⁰ Gd	-61.360	¹³⁰ Tb	-4.490	²⁰⁶ Tb	154.890	¹⁹⁵ Dy	58.970		
¹⁵⁹ Sm	-62.950	¹⁵⁰ Eu	-75.460	¹⁴¹ Gd	-61.890	¹³¹ Tb	-11.710	²⁰⁷ Tb	161.920	¹⁹⁶ Dy	65.410		
¹⁶⁰ Sm	-61.270	¹⁵¹ Eu	-75.810	¹⁴² Gd	-66.130	¹³² Tb	-16.590	²⁰⁸ Tb	169.710	¹⁹⁷ Dy	73.320		
¹⁶¹ Sm	-57.700	¹⁵² Eu	-74.440	¹⁴³ Gd	-67.610	¹³³ Tb	-23.030	²⁰⁹ Tb	176.770	¹⁹⁸ Dy	79.500		
¹⁶² Sm	-55.620	¹⁵³ Eu	-74.670	¹⁴⁴ Gd	-71.360	¹³⁴ Tb	-27.340	²¹⁰ Tb	184.970	¹⁹⁹ Dy	87.390		
¹⁶³ Sm	-51.680	¹⁵⁴ Eu	-73.110	¹⁴⁵ Gd	-72.860	¹³⁵ Tb	-33.050	²¹¹ Tb	192.370	²⁰⁰ Dy	93.680		
¹⁶⁴ Sm	-49.180	¹⁵⁵ Eu	-72.850	¹⁴⁶ Gd	-76.390	¹³⁶ Tb	-36.490	²¹² Tb	200.860	²⁰¹ Dy	101.250		
¹⁶⁵ Sm	-44.790	¹⁵⁶ Eu	-70.880	¹⁴⁷ Gd	-75.430	¹³⁷ Tb	-41.230	²¹³ Tb	208.490	²⁰² Dy	107.290		
¹⁶⁶ Sm	-41.650	¹⁵⁷ Eu	-70.110	¹⁴⁸ Gd	-76.310	¹³⁸ Tb	-44.000	²¹⁴ Tb	217.270	²⁰³ Dy	114.810		
¹⁶⁷ Sm	-36.670	¹⁵⁸ Eu	-67.760	¹⁴⁹ Gd	-74.750	¹³⁹ Tb	-48.220	²¹⁵ Tb	225.170	²⁰⁴ Dy	121.010		
¹⁶⁸ Sm	-33.330	¹⁵⁹ Eu	-66.570	¹⁵⁰ Gd	-75.720	¹⁴⁰ Tb	-50.760	²¹⁶ Tb	234.040	²⁰⁵ Dy	128.800		
¹⁶⁹ Sm	-28.110	¹⁶⁰ Eu	-63.890	¹⁵¹ Gd	-74.550	¹⁴¹ Tb	-54.670	²¹⁷ Tb	242.190	²⁰⁶ Dy	135.160		
¹⁷⁰ Sm	-24.460	¹⁶¹ Eu	-62.350	¹⁵² Gd	-75.440	¹⁴² Tb	-55.720	²¹⁸ Tb	251.380	²⁰⁷ Dy	143.140		
¹⁷¹ Sm	-18.960	¹⁶² Eu	-59.270	¹⁵³ Gd	-74.040	¹⁴³ Tb	-59.900			²⁰⁸ Dy	149.640		
¹⁷² Sm	-14.970	¹⁶³ Eu	-57.320	¹⁵⁴ Gd	-74.830	¹⁴⁴ Tb	-61.920	¹³³ Dy	-8.240	²⁰⁹ Dy	157.740		
¹⁷³ Sm	-9.230	¹⁶⁴ Eu	-53.890	¹⁵⁵ Gd	-73.310	¹⁴⁵ Tb	-65.660	¹³⁴ Dy	-15.350	²¹⁰ Dy	164.210		
¹⁷⁴ Sm	-5.020	¹⁶⁵ Eu	-51.510	¹⁵⁶ Gd	-73.560	¹⁴⁶ Tb	-67.480	¹³⁵ Dy	-19.750	²¹¹ Dy	172.360		
¹⁷⁵ Sm	0.870	¹⁶⁶ Eu	-47.640	¹⁵⁷ Gd	-71.650	¹⁴⁷ Tb	-71.220	¹³⁶ Dy	-26.130	²¹² Dy	179.280		
¹⁷⁶ Sm	5.100	¹⁶⁷ Eu	-44.710	¹⁵⁸ Gd	-71.430	¹⁴⁸ Tb	-70.650	¹³⁷ Dy	-29.680	²¹³ Dy	187.720		
¹⁷⁷ Sm	11.210	¹⁶⁸ Eu	-40.280	¹⁵⁹ Gd	-69.180	¹⁴⁹ Tb	-71.740	¹³⁸ Dy	-35.040	²¹⁴ Dy	194.950		
¹⁷⁸ Sm	15.770	¹⁶⁹ Eu	-36.890	¹⁶⁰ Gd	-68.550	¹⁵⁰ Tb	-70.850	¹³⁹ Dy	-37.960				

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²¹⁵ Dy	203.640	²⁰⁴ Ho	106.090	¹⁹² Er	14.040	¹⁸⁰ Tm	-39.450	¹⁶⁷ Yb	-61.310	¹⁵³ Lu	-38.000		
²¹⁶ Dy	211.120	²⁰⁵ Ho	112.270	¹⁹³ Er	18.880	¹⁸¹ Tm	-36.780	¹⁶⁸ Yb	-62.290	¹⁵⁴ Lu	-39.400		
²¹⁷ Dy	219.940	²⁰⁶ Ho	119.610	¹⁹⁴ Er	22.850	¹⁸² Tm	-32.850	¹⁶⁹ Yb	-61.140	¹⁵⁵ Lu	-42.380		
²¹⁸ Dy	227.680	²⁰⁷ Ho	125.930	¹⁹⁵ Er	30.230	¹⁸³ Tm	-29.970	¹⁷⁰ Yb	-61.640	¹⁵⁶ Lu	-43.220		
²¹⁹ Dy	236.970	²⁰⁸ Ho	133.510	¹⁹⁶ Er	35.660	¹⁸⁴ Tm	-25.840	¹⁷¹ Yb	-60.120	¹⁵⁷ Lu	-46.090		
²²⁰ Dy	244.930	²⁰⁹ Ho	140.140	¹⁹⁷ Er	43.700	¹⁸⁵ Tm	-22.700	¹⁷² Yb	-60.190	¹⁵⁸ Lu	-47.080		
²²¹ Dy	254.290	²¹⁰ Ho	147.700	¹⁹⁸ Er	49.590	¹⁸⁶ Tm	-18.270	¹⁷³ Yb	-58.240	¹⁵⁹ Lu	-49.580		
¹³⁶ Ho	-10.150	²¹¹ Ho	154.180	¹⁹⁹ Er	57.110	¹⁸⁷ Tm	-14.770	¹⁷⁴ Yb	-57.770	¹⁶⁰ Lu	-50.260		
¹³⁷ Ho	-16.660	²¹² Ho	161.960	²⁰⁰ Er	62.820	¹⁸⁸ Tm	-10.100	¹⁷⁵ Yb	-55.510	¹⁶¹ Lu	-52.520		
¹³⁸ Ho	-20.800	²¹³ Ho	168.900	²⁰¹ Er	70.280	¹⁸⁹ Tm	-6.950	¹⁷⁶ Yb	-54.720	¹⁶² Lu	-52.920		
¹³⁹ Ho	-26.270	²¹⁴ Ho	176.920	²⁰² Er	76.060	¹⁹⁰ Tm	-2.300	¹⁷⁷ Yb	-52.090	¹⁶³ Lu	-54.840		
¹⁴⁰ Ho	-29.720	²¹⁵ Ho	184.070	²⁰³ Er	83.350	¹⁹¹ Tm	1.280	¹⁷⁸ Yb	-50.890	¹⁶⁴ Lu	-55.040		
¹⁴¹ Ho	-34.540	²¹⁶ Ho	192.340	²⁰⁴ Er	89.000	¹⁹² Tm	5.740	¹⁷⁹ Yb	-47.680	¹⁶⁵ Lu	-56.830		
¹⁴² Ho	-37.760	²¹⁷ Ho	199.750	²⁰⁵ Er	96.200	¹⁹³ Tm	9.350	¹⁸⁰ Yb	-45.970	¹⁶⁶ Lu	-56.760		
¹⁴³ Ho	-42.250	²¹⁸ Ho	208.150	²⁰⁶ Er	101.980	¹⁹⁴ Tm	13.790	¹⁸¹ Yb	-42.380	¹⁶⁷ Lu	-58.060		
¹⁴⁴ Ho	-43.710	²¹⁹ Ho	215.810	²⁰⁷ Er	109.320	¹⁹⁵ Tm	17.670	¹⁸² Yb	-40.300	¹⁶⁸ Lu	-57.670		
¹⁴⁵ Ho	-48.530	²²⁰ Ho	224.590	²⁰⁸ Er	115.260	¹⁹⁶ Tm	24.690	¹⁸³ Yb	-36.300	¹⁶⁹ Lu	-58.730		
¹⁴⁶ Ho	-51.180	²²¹ Ho	232.590	²⁰⁹ Er	122.790	¹⁹⁷ Tm	30.090	¹⁸⁴ Yb	-34.000	¹⁷⁰ Lu	-58.020		
¹⁴⁷ Ho	-55.440	²²² Ho	241.590	²¹⁰ Er	129.000	¹⁹⁸ Tm	37.720	¹⁸⁵ Yb	-29.990	¹⁷¹ Lu	-58.590		
¹⁴⁸ Ho	-57.740	²²³ Ho	249.700	²¹¹ Er	136.700	¹⁹⁹ Tm	43.740	¹⁸⁶ Yb	-27.250	¹⁷² Lu	-57.570		
¹⁴⁹ Ho	-61.980	²²⁴ Ho	258.830	²¹² Er	142.940	²⁰⁰ Tm	50.590	¹⁸⁷ Yb	-22.910	¹⁷³ Lu	-57.670		
¹⁵⁰ Ho	-62.110	¹³⁸ Er	-8.600	²¹³ Er	150.510	²⁰¹ Tm	56.330	¹⁸⁸ Yb	-19.970	¹⁷⁴ Lu	-56.290		
¹⁵¹ Ho	-63.890	¹³⁹ Er	-12.900	²¹⁴ Er	156.970	²⁰² Tm	63.380	¹⁸⁹ Yb	-15.300	¹⁷⁵ Lu	-55.910		
¹⁵² Ho	-63.620	¹⁴⁰ Er	-18.890	²¹⁵ Er	165.010	²⁰³ Tm	69.180	¹⁹⁰ Yb	-12.600	¹⁷⁶ Lu	-54.130		
¹⁵³ Ho	-65.290	¹⁴¹ Er	-22.500	²¹⁶ Er	171.720	²⁰⁴ Tm	76.050	¹⁹¹ Yb	-8.020	¹⁷⁷ Lu	-53.540		
¹⁵⁴ Ho	-65.180	¹⁴² Er	-27.930	²¹⁷ Er	179.920	²⁰⁵ Tm	81.690	¹⁹² Yb	-4.930	¹⁷⁸ Lu	-51.420		
¹⁵⁵ Ho	-66.790	¹⁴³ Er	-31.100	²¹⁸ Er	186.910	²⁰⁶ Tm	88.510	¹⁹³ Yb	-0.500	¹⁷⁹ Lu	-50.310		
¹⁵⁶ Ho	-66.490	¹⁴⁴ Er	-36.130	²¹⁹ Er	195.270	²⁰⁷ Tm	94.250	¹⁹⁴ Yb	2.660	¹⁸⁰ Lu	-47.600		
¹⁵⁷ Ho	-67.820	¹⁴⁵ Er	-37.810	²²⁰ Er	202.550	²⁰⁸ Tm	101.200	¹⁹⁵ Yb	7.060	¹⁸¹ Lu	-46.000		
¹⁵⁸ Ho	-67.310	¹⁴⁶ Er	-43.210	²²¹ Er	211.340	²⁰⁹ Tm	107.120	¹⁹⁶ Yb	10.580	¹⁸² Lu	-42.960		
¹⁵⁹ Ho	-68.170	¹⁴⁷ Er	-45.950	²²² Er	218.850	²¹⁰ Tm	114.260	¹⁹⁷ Yb	17.390	¹⁸³ Lu	-40.850		
¹⁶⁰ Ho	-67.330	¹⁴⁸ Er	-50.750	²²³ Er	227.800	²¹¹ Tm	120.440	¹⁹⁸ Yb	22.500	¹⁸⁴ Lu	-37.660		
¹⁶¹ Ho	-67.850	¹⁴⁹ Er	-53.170	²²⁴ Er	235.500	²¹² Tm	127.740	¹⁹⁹ Yb	30.170	¹⁸⁵ Lu	-35.250		
¹⁶² Ho	-66.680	¹⁵⁰ Er	-57.930	²²⁵ Er	244.570	²¹³ Tm	133.950	²⁰⁰ Yb	35.740	¹⁸⁶ Lu	-31.710		
¹⁶³ Ho	-66.870	¹⁵¹ Er	-58.150	²²⁶ Er	252.370	²¹⁴ Tm	141.440	²⁰¹ Yb	42.710	¹⁸⁷ Lu	-29.150		
¹⁶⁴ Ho	-65.360	¹⁵² Er	-60.470	²²⁷ Er	261.500	²¹⁵ Tm	147.660	²⁰² Yb	48.040	¹⁸⁸ Lu	-25.290		
¹⁶⁵ Ho	-65.190	¹⁵³ Er	-60.340	¹⁴¹ Tm	-9.100	²¹⁶ Tm	155.220	²⁰³ Yb	55.000	¹⁸⁹ Lu	-22.380		
¹⁶⁶ Ho	-63.380	¹⁵⁴ Er	-62.380	¹⁴² Tm	-13.220	²¹⁷ Tm	161.910	²⁰⁴ Yb	60.520	¹⁹⁰ Lu	-17.980		
¹⁶⁷ Ho	-62.690	¹⁵⁵ Er	-62.230	¹⁴³ Tm	-18.680	²¹⁸ Tm	169.710	²⁰⁵ Yb	67.570	¹⁹¹ Lu	-15.350		
¹⁶⁸ Ho	-60.510	¹⁵⁶ Er	-64.260	¹⁴⁴ Tm	-22.590	²¹⁹ Tm	176.660	²⁰⁶ Yb	72.750	¹⁹² Lu	-11.220		
¹⁶⁹ Ho	-59.470	¹⁵⁷ Er	-63.960	¹⁴⁵ Tm	-27.680	²²⁰ Tm	184.620	²⁰⁷ Yb	79.670	¹⁹³ Lu	-8.170		
¹⁷⁰ Ho	-56.830	¹⁵⁸ Er	-65.700	¹⁴⁶ Tm	-29.760	²²¹ Tm	191.810	²⁰⁸ Yb	85.020	¹⁹⁴ Lu	-4.210		
¹⁷¹ Ho	-55.170	¹⁵⁹ Er	-65.260	¹⁴⁷ Tm	-35.210	²²² Tm	200.220	²⁰⁹ Yb	92.010	¹⁹⁵ Lu	-1.080		
¹⁷² Ho	-52.080	¹⁶⁰ Er	-66.700	¹⁴⁸ Tm	-38.520	²²³ Tm	207.680	²¹⁰ Yb	97.490	¹⁹⁶ Lu	2.960		
¹⁷³ Ho	-50.140	¹⁶¹ Er	-65.890	¹⁴⁹ Tm	-43.390	²²⁴ Tm	216.240	²¹¹ Yb	104.640	¹⁹⁷ Lu	6.480		
¹⁷⁴ Ho	-46.700	¹⁶² Er	-66.950	¹⁵⁰ Tm	-46.060	²²⁵ Tm	223.900	²¹² Yb	110.400	¹⁹⁸ Lu	12.760		
¹⁷⁵ Ho	-44.300	¹⁶³ Er	-65.840	¹⁵¹ Tm	-50.800	²²⁶ Tm	232.560	²¹³ Yb	117.680	¹⁹⁹ Lu	17.840		
¹⁷⁶ Ho	-40.420	¹⁶⁴ Er	-66.560	¹⁵² Tm	-51.600	²²⁷ Tm	240.340	²¹⁴ Yb	123.610	²⁰⁰ Lu	24.970		
¹⁷⁷ Ho	-37.570	¹⁶⁵ Er	-65.170	¹⁵³ Tm	-53.970	²²⁸ Tm	249.010	²¹⁵ Yb	130.970	²⁰¹ Lu	30.600		
¹⁷⁸ Ho	-33.320	¹⁶⁶ Er	-65.520	¹⁵⁴ Tm	-54.490	²²⁹ Tm	256.890	²¹⁶ Yb	136.840	²⁰² Lu	37.170		
¹⁷⁹ Ho	-30.140	¹⁶⁷ Er	-63.790	¹⁵⁵ Tm	-56.620	²³⁰ Tm	265.760	²¹⁷ Yb	144.460	²⁰³ Lu	42.540		
¹⁸⁰ Ho	-25.520	¹⁶⁸ Er	-63.680	¹⁵⁶ Tm	-57.030	¹⁴³ Yb	-4.900	²¹⁸ Yb	150.750	²⁰⁴ Lu	49.080		
¹⁸¹ Ho	-22.300	¹⁶⁹ Er	-61.600	¹⁵⁷ Tm	-59.110	¹⁴⁴ Yb	-10.950	²¹⁹ Yb	158.430	²⁰⁵ Lu	54.530		
¹⁸² Ho	-17.620	¹⁷⁰ Er	-61.030	¹⁵⁸ Tm	-59.300	¹⁴⁵ Yb	-14.890	²²⁰ Yb	164.950	²⁰⁶ Lu	61.210		
¹⁸³ Ho	-14.030	¹⁷¹ Er	-58.520	¹⁵⁹ Tm	-61.090	¹⁴⁶ Yb	-19.020	²²¹ Yb	172.870	²⁰⁷ Lu	66.490		
¹⁸⁴ Ho	-9.110	¹⁷² Er	-57.400	¹⁶⁰ Tm	-61.020	¹⁴⁷ Yb	-22.880	²²² Yb	179.700	²⁰⁸ Lu	73.080		
¹⁸⁵ Ho	-5.130	¹⁷³ Er	-54.440	¹⁶¹ Tm	-62.560	¹⁴⁸ Yb	-28.950	²²³ Yb	188.040	²⁰⁹ Lu	78.310		
¹⁸⁶ Ho	-0.080	¹⁷⁴ Er	-53.000	¹⁶² Tm	-62.270	¹⁴⁹ Yb	-32.320	²²⁴ Yb	195.110	²¹⁰ Lu	84.900		
¹⁸⁷ Ho	3.590	¹⁷⁵ Er	-49.710	¹⁶³ Tm	-63.360	¹⁵⁰ Yb	-37.810	²²⁵ Yb	203.630	²¹¹ Lu	90.420		
¹⁸⁸ Ho	8.680	¹⁷⁶ Er	-47.860	¹⁶⁴ Tm	-62.830	¹⁵¹ Yb	-40.540	²²⁶ Yb	210.950	²¹² Lu	97.140		
¹⁸⁹ Ho	12.680	¹⁷⁷ Er	-44.060	¹⁶⁵ Tm	-63.590	¹⁵² Yb	-45.880	²²⁷ Yb	219.560	²¹³ Lu	102.900		
¹⁹⁰ Ho	17.660	¹⁷⁸ Er	-41.690	¹⁶⁶ Tm	-62.720	¹⁵³ Yb	-46.720	²²⁸ Yb	226.870	²¹⁴ Lu	109.760		
¹⁹¹ Ho	21.690	¹⁷⁹ Er	-37.540	¹⁶⁷ Tm	-63.170	¹⁵⁴ Yb	-49.630	²²⁹ Yb	235.510	²¹⁵ Lu	115.660		
¹⁹² Ho	26.650	¹⁸⁰ Er	-34.730	¹⁶⁸ Tm	-61.990	¹⁵⁵ Yb	-49.840	²³⁰ Yb	242.960	²¹⁶ Lu	122.650		
¹⁹³ Ho	30.900	¹⁸¹ Er	-30.460	¹⁶⁹ Tm	-61.940	¹⁵⁶ Yb	-52.700	²³¹ Yb	251.790	²¹⁷ Lu	128.740		
¹⁹⁴ Ho	38.300	¹⁸² Er	-27.550	¹⁷⁰ Tm	-60.380	¹⁵⁷ Yb	-53.180	²³² Yb	259.530	²¹⁸ Lu	136.000		
¹⁹⁵ Ho	44.280	¹⁸³ Er	-22.910	¹⁷¹ Tm	-59.930	¹⁵⁸ Yb	-55.600	²³³ Yb	268.890	²¹⁹ Lu	141.960		
¹⁹⁶ Ho	52.270	¹⁸⁴ Er	-19.770	¹⁷² Tm	-57.900	¹⁵⁹ Yb	-55.800	²³⁴ Yb	277.150	²²⁰ Lu	149.350		
¹⁹⁷ Ho	58.530	¹⁸⁵ Er	-14.890	¹⁷³ Tm	-56.920	¹⁶⁰ Yb	-58.070	¹⁴⁶ Lu	-5.000	²²¹ Lu	155.810		
¹⁹⁸ Ho	65.960	¹⁸⁶ Er	-11.370	¹⁷⁴ Tm	-54.450	¹⁶¹ Yb	-58.000	¹⁴⁷ Lu	-9.450	²²² Lu	163.340		
¹⁹⁹ Ho	72.090	¹⁸⁷ Er	-6.390	¹⁷⁵ Tm	-53.170	¹⁶² Yb	-59.940	¹⁴⁸ Lu	-13.820	²²³ Lu	170.130		
²⁰⁰ Ho	79.520	¹⁸⁸ Er	-3.140	¹⁷⁶ Tm	-50.460	¹⁶³ Yb	-59.740	¹⁴⁹ Lu	-19.970	²²⁴ Lu	178.090		
²⁰¹ Ho	85.720	¹⁸⁹ Er	1.920	¹⁷⁷ Tm	-48.660	¹⁶⁴ Yb	-61.390	¹⁵⁰ Lu	-23.840	²²⁵ Lu	185.100		
²⁰² Ho	92.880	¹⁹⁰ Er	5.470	¹⁷⁸ Tm	-45.380	¹⁶⁵ Yb	-60.850	¹⁵¹ Lu	-29.350	²²⁶ Lu	193.240		
²⁰³ Ho	98.880	¹⁹¹ Er	10.430	¹⁷⁹ Tm	-43.130	¹⁶⁶ Yb	-62.180	¹⁵² Lu	-32.600	²²⁷ Lu	200.460		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²²⁶ Lu	208.680	²¹⁴ Hf	93.930	¹⁹⁹ Ta	-2.910	¹⁸⁴ W	-46.660	¹⁶⁷ Re	-34.350	²⁴² Re	242.720		
²²⁹ Lu	216.000	²¹⁵ Hf	100.760	²⁰⁰ Ta	2.910	¹⁸⁵ W	-44.290	¹⁶⁸ Re	-35.510	²⁴³ Re	250.150		
²³⁰ Lu	224.240	²¹⁶ Hf	106.250	²⁰¹ Ta	7.490	¹⁸⁶ W	-43.560	¹⁶⁹ Re	-38.100	²⁴⁴ Re	258.620		
²³¹ Lu	231.600	²¹⁷ Hf	113.250	²⁰² Ta	14.050	¹⁸⁷ W	-40.930	¹⁷⁰ Re	-38.910	²⁴⁵ Re	266.440		
²³² Lu	240.040	²¹⁸ Hf	118.940	²⁰³ Ta	19.140	¹⁸⁸ W	-39.830	¹⁷¹ Re	-41.270	²⁴⁶ Re	275.930		
²³³ Lu	247.730	²¹⁹ Hf	126.190	²⁰⁴ Ta	25.590	¹⁸⁹ W	-36.910	¹⁷² Re	-41.830	²⁴⁷ Re	283.420		
²³⁴ Lu	256.760	²²⁰ Hf	132.030	²⁰⁵ Ta	30.610	¹⁹⁰ W	-35.460	¹⁷³ Re	-43.780	²⁴⁸ Re	292.620		
²³⁵ Lu	264.870	²²¹ Hf	139.160	²⁰⁶ Ta	36.830	¹⁹¹ W	-32.570	¹⁷⁴ Re	-44.080	²⁴⁹ Re	300.250		
²³⁶ Lu	274.250	²²² Hf	145.210	²⁰⁷ Ta	41.750	¹⁹² W	-30.930	¹⁷⁵ Re	-45.700	²⁵⁰ Re	308.980		
²³⁷ Lu	282.610	²²³ Hf	152.810	²⁰⁸ Ta	48.230	¹⁹³ W	-26.820	¹⁷⁶ Re	-45.650	¹⁵⁹ Os	-2.490		
¹⁴⁹ Hf	-5.770	²²⁴ Hf	159.140	²⁰⁹ Ta	53.190	¹⁹⁴ W	-25.190	¹⁷⁷ Re	-46.920	¹⁶⁰ Os	-7.340		
¹⁵⁰ Hf	-12.570	²²⁵ Hf	167.130	²¹⁰ Ta	59.420	¹⁹⁵ W	-21.740	¹⁷⁸ Re	-46.540	¹⁶¹ Os	-9.100		
¹⁵¹ Hf	-16.560	²²⁶ Hf	173.730	²¹¹ Ta	64.440	¹⁹⁶ W	-19.960	¹⁷⁹ Re	-47.500	¹⁶² Os	-13.190		
¹⁵² Hf	-22.690	²²⁷ Hf	182.110	²¹² Ta	70.600	¹⁹⁷ W	-16.410	¹⁸⁰ Re	-46.770	¹⁶³ Os	-15.020		
¹⁵³ Hf	-26.140	²²⁸ Hf	188.860	²¹³ Ta	75.690	¹⁹⁸ W	-14.340	¹⁸¹ Re	-47.410	¹⁶⁴ Os	-18.960		
¹⁵⁴ Hf	-32.220	²²⁹ Hf	197.010	²¹⁴ Ta	82.060	¹⁹⁹ W	-10.810	¹⁸² Re	-46.390	¹⁶⁵ Os	-20.670		
¹⁵⁵ Hf	-33.590	²³⁰ Hf	203.740	²¹⁵ Ta	87.390	²⁰⁰ W	-8.150	¹⁸³ Re	-46.550	¹⁶⁶ Os	-24.350		
¹⁵⁶ Hf	-37.140	²³¹ Hf	211.920	²¹⁶ Ta	93.920	²⁰¹ W	-2.340	¹⁸⁴ Re	-44.990	¹⁶⁷ Os	-25.790		
¹⁵⁷ Hf	-38.060	²³² Hf	218.890	²¹⁷ Ta	99.370	²⁰² W	1.750	¹⁸⁵ Re	-44.580	¹⁶⁸ Os	-29.130		
¹⁵⁸ Hf	-41.130	²³³ Hf	227.270	²¹⁸ Ta	106.070	²⁰³ W	8.140	¹⁸⁶ Re	-42.700	¹⁶⁹ Os	-30.170		
¹⁵⁹ Hf	-42.250	²³⁴ Hf	234.550	²¹⁹ Ta	111.730	²⁰⁴ W	12.830	¹⁸⁷ Re	-41.960	¹⁷⁰ Os	-33.270		
¹⁶⁰ Hf	-45.240	²³⁵ Hf	243.500	²²⁰ Ta	118.530	²⁰⁵ W	19.530	¹⁸⁸ Re	-39.840	¹⁷¹ Os	-34.140		
¹⁶¹ Hf	-45.900	²³⁶ Hf	251.310	²²¹ Ta	124.350	²⁰⁶ W	24.160	¹⁸⁹ Re	-38.780	¹⁷² Os	-36.900		
¹⁶² Hf	-48.630	²³⁷ Hf	260.540	²²² Ta	131.330	²⁰⁷ W	30.640	¹⁹⁰ Re	-36.410	¹⁷³ Os	-37.460		
¹⁶³ Hf	-49.050	²³⁸ Hf	268.540	²²³ Ta	137.380	²⁰⁸ W	35.120	¹⁹¹ Re	-35.330	¹⁷⁴ Os	-39.950		
¹⁶⁴ Hf	-51.420	²³⁹ Hf	277.790	²²⁴ Ta	144.630	²⁰⁹ W	41.430	¹⁹² Re	-32.870	¹⁷⁵ Os	-40.040		
¹⁶⁵ Hf	-51.590	²⁴⁰ Hf	286.410	²²⁵ Ta	150.670	²¹⁰ W	46.200	¹⁹³ Re	-31.300	¹⁷⁶ Os	-42.190		
¹⁶⁶ Hf	-53.740	¹⁵¹ Ta	-2.700	²²⁶ Ta	158.510	²¹¹ W	52.580	¹⁹⁴ Re	-28.110	¹⁷⁷ Os	-42.120		
¹⁶⁷ Hf	-53.730	¹⁵² Ta	-7.270	²²⁷ Ta	165.020	²¹² W	57.170	¹⁹⁵ Re	-26.050	¹⁷⁸ Os	-43.910		
¹⁶⁸ Hf	-55.580	¹⁵³ Ta	-13.500	²²⁸ Ta	172.850	²¹³ W	63.460	¹⁹⁶ Re	-23.020	¹⁷⁹ Os	-43.500		
¹⁶⁹ Hf	-55.210	¹⁵⁴ Ta	-17.440	²²⁹ Ta	179.540	²¹⁴ W	68.180	¹⁹⁷ Re	-21.380	¹⁸⁰ Os	-45.040		
¹⁷⁰ Hf	-56.710	¹⁵⁵ Ta	-23.630	²³⁰ Ta	187.280	²¹⁵ W	74.570	¹⁹⁸ Re	-18.250	¹⁸¹ Os	-44.290		
¹⁷¹ Hf	-56.040	¹⁵⁶ Ta	-25.490	²³¹ Ta	194.050	²¹⁶ W	79.500	¹⁹⁹ Re	-16.220	¹⁸² Os	-45.450		
¹⁷² Hf	-57.100	¹⁵⁷ Ta	-29.170	²³² Ta	201.760	²¹⁷ W	85.990	²⁰⁰ Re	-12.920	¹⁸³ Os	-44.430		
¹⁷³ Hf	-56.080	¹⁵⁸ Ta	-30.500	²³³ Ta	208.670	²¹⁸ W	91.030	²⁰¹ Re	-10.330	¹⁸⁴ Os	-45.150		
¹⁷⁴ Hf	-56.750	¹⁵⁹ Ta	-33.760	²³⁴ Ta	216.670	²¹⁹ W	97.680	²⁰² Re	-5.000	¹⁸⁵ Os	-43.620		
¹⁷⁵ Hf	-55.410	¹⁶⁰ Ta	-35.330	²³⁵ Ta	223.860	²²⁰ W	102.980	²⁰³ Re	-0.810	¹⁸⁶ Os	-43.740		
¹⁷⁶ Hf	-55.580	¹⁶¹ Ta	-38.300	²³⁶ Ta	232.410	²²¹ W	109.790	²⁰⁴ Re	5.240	¹⁸⁷ Os	-41.910		
¹⁷⁷ Hf	-53.910	¹⁶² Ta	-39.510	²³⁷ Ta	240.210	²²² W	115.240	²⁰⁵ Re	9.750	¹⁸⁸ Os	-41.590		
¹⁷⁸ Hf	-53.790	¹⁶³ Ta	-42.240	²³⁸ Ta	249.030	²²³ W	122.200	²⁰⁶ Re	15.790	¹⁸⁹ Os	-39.530		
¹⁷⁹ Hf	-51.770	¹⁶⁴ Ta	-43.130	²³⁹ Ta	256.980	²²⁴ W	127.870	²⁰⁷ Re	20.430	¹⁹⁰ Os	-39.010		
¹⁸⁰ Hf	-51.110	¹⁶⁵ Ta	-45.530	²⁴⁰ Ta	265.930	²²⁵ W	135.100	²⁰⁸ Re	26.460	¹⁹¹ Os	-36.880		
¹⁸¹ Hf	-48.470	¹⁶⁶ Ta	-46.150	²⁴¹ Ta	274.320	²²⁶ W	141.080	²⁰⁹ Re	31.030	¹⁹² Os	-36.380		
¹⁸² Hf	-47.430	¹⁶⁷ Ta	-48.310	²⁴² Ta	283.390	²²⁷ W	148.580	²¹⁰ Re	36.970	¹⁹³ Os	-33.990		
¹⁸³ Hf	-44.460	¹⁶⁸ Ta	-48.670	²⁴³ Ta	291.350	²²⁸ W	154.840	²¹¹ Re	41.750	¹⁹⁴ Os	-33.010		
¹⁸⁴ Hf	-42.960	¹⁶⁹ Ta	-50.590	¹⁵⁴ W	-5.990	²²⁹ W	162.510	²¹² Re	47.760	¹⁹⁵ Os	-30.110		
¹⁸⁵ Hf	-39.550	¹⁷⁰ Ta	-50.680	¹⁵⁵ W	-10.130	²³⁰ W	168.820	²¹³ Re	52.380	¹⁹⁶ Os	-28.570		
¹⁸⁶ Hf	-37.940	¹⁷¹ Ta	-52.230	¹⁵⁶ W	-16.700	²³¹ W	176.550	²¹⁴ Re	58.310	¹⁹⁷ Os	-25.750		
¹⁸⁷ Hf	-34.560	¹⁷² Ta	-51.990	¹⁵⁷ W	-18.810	²³² W	182.950	²¹⁵ Re	63.060	¹⁹⁸ Os	-24.590		
¹⁸⁸ Hf	-32.510	¹⁷³ Ta	-53.100	¹⁵⁸ W	-23.020	²³³ W	190.700	²¹⁶ Re	69.050	¹⁹⁹ Os	-21.550		
¹⁸⁹ Hf	-28.650	¹⁷⁴ Ta	-52.500	¹⁵⁹ W	-24.260	²³⁴ W	197.160	²¹⁷ Re	74.020	²⁰⁰ Os	-20.000		
¹⁹⁰ Hf	-26.470	¹⁷⁵ Ta	-53.250	¹⁶⁰ W	-27.980	²³⁵ W	205.120	²¹⁸ Re	80.140	²⁰¹ Os	-16.920		
¹⁹¹ Hf	-22.110	¹⁷⁶ Ta	-52.400	¹⁶¹ W	-29.480	²³⁶ W	211.870	²¹⁹ Re	85.160	²⁰² Os	-14.700		
¹⁹² Hf	-19.930	¹⁷⁷ Ta	-52.660	¹⁶² W	-32.980	²³⁷ W	220.410	²²⁰ Re	91.430	²⁰³ Os	-9.440		
¹⁹³ Hf	-15.900	¹⁷⁸ Ta	-51.450	¹⁶³ W	-34.230	²³⁸ W	227.760	²²¹ Re	96.680	²⁰⁴ Os	-5.700		
¹⁹⁴ Hf	-13.500	¹⁷⁹ Ta	-51.520	¹⁶⁴ W	-37.430	²³⁹ W	236.550	²²² Re	103.120	²⁰⁵ Os	0.290		
¹⁹⁵ Hf	-9.460	¹⁸⁰ Ta	-49.920	¹⁶⁵ W	-38.360	²⁴⁰ W	244.120	²²³ Re	108.560	²⁰⁶ Os	4.430		
¹⁹⁶ Hf	-6.790	¹⁸¹ Ta	-49.420	¹⁶⁶ W	-41.220	²⁴¹ W	253.050	²²⁴ Re	115.150	²⁰⁷ Os	10.590		
¹⁹⁷ Hf	-2.770	¹⁸² Ta	-47.330	¹⁶⁷ W	-41.870	²⁴² W	261.100	²²⁵ Re	120.850	²⁰⁸ Os	14.850		
¹⁹⁸ Hf	0.300	¹⁸³ Ta	-46.270	¹⁶⁸ W	-44.470	²⁴³ W	269.900	²²⁶ Re	127.650	²⁰⁹ Os	21.100		
¹⁹⁹ Hf	6.550	¹⁸⁴ Ta	-43.910	¹⁶⁹ W	-44.830	²⁴⁴ W	277.460	²²⁷ Re	133.600	²¹⁰ Os	25.320		
²⁰⁰ Hf	11.190	¹⁸⁵ Ta	-42.530	¹⁷⁰ W	-47.170	²⁴⁵ W	287.620	²²⁸ Re	140.780	²¹¹ Os	31.270		
²⁰¹ Hf	18.070	¹⁸⁶ Ta	-39.790	¹⁷¹ W	-47.240	²⁴⁶ W	295.050	²²⁹ Re	146.910	²¹² Os	35.590		
²⁰² Hf	23.310	¹⁸⁷ Ta	-38.290	¹⁷² W	-49.210	²⁴⁷ W	304.790	²³⁰ Re	154.210	²¹³ Os	41.730		
²⁰³ Hf	30.260	¹⁸⁸ Ta	-35.190	¹⁷³ W	-48.990	¹⁵⁶ Re	-0.650	²³¹ Re	160.510	²¹⁴ Os	46.060		
²⁰⁴ Hf	35.220	¹⁸⁹ Ta	-33.280	¹⁷⁴ W	-50.560	¹⁵⁷ Re	-7.360	²³² Re	167.880	²¹⁵ Os	52.080		
²⁰⁵ Hf	41.920	¹⁹⁰ Ta	-29.920	¹⁷⁵ W	-49.970	¹⁵⁸ Re	-9.900	²³³ Re	174.240	²¹⁶ Os	56.440		
²⁰⁶ Hf	46.780	¹⁹¹ Ta	-27.910	¹⁷⁶ W	-51.250	¹⁵⁹ Re	-14.230	²³⁴ Re	181.650	²¹⁷ Os	62.550		
²⁰⁷ Hf	53.690	¹⁹² Ta	-23.790	¹⁷⁷ W	-50.380	¹⁶⁰ Re	-16.100	²³⁵ Re	188.090	²¹⁸ Os	67.100		
²⁰⁸ Hf	58.590	¹⁹³ Ta	-21.680	¹⁷⁸ W	-51.240	¹⁶¹ Re	-19.760	²³⁶ Re	195.670	²¹⁹ Os	73.270		
²⁰⁹ Hf	65.150	¹⁹⁴ Ta	-18.140	¹⁷⁹ W	-50.060	¹⁶² Re	-21.800	²³⁷ Re	202.440	²²⁰ Os	77.880		
²¹⁰ Hf	70.120	¹⁹⁵ Ta	-15.800	¹⁸⁰ W	-50.650	¹⁶³ Re	-25.260	²³⁸ Re	210.500	²²¹ Os	84.140		
²¹¹ Hf	76.710	¹⁹⁶ Ta	-12.200	¹⁸¹ W	-49.130	¹⁶⁴ Re	-26.930	²³⁹ Re	217.850	²²² Os	89.030		
²¹² Hf	81.820	¹⁹⁷ Ta	-9.580	¹⁸² W	-49.100	¹⁶⁵ Re	-30.160	²⁴⁰ Re	226.230	²²³ Os	95.460		
²¹³ Hf	88.580	¹⁹⁸ Ta	-5.960	¹⁸³ W	-47.110								

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²²⁵ Os	107.080	²⁰⁸ Ir	7.840	¹⁹¹ Pt	-35.320	¹⁷² Au	-8.100	²⁴⁷ Au	210.400	²²⁸ Hg	77.470		
²²⁶ Os	112.350	²⁰⁹ Ir	12.080	¹⁹² Pt	-35.820	¹⁷³ Au	-11.520	²⁴⁸ Au	218.090	²²⁹ Hg	83.320		
²²⁷ Os	119.180	²¹⁰ Ir	17.930	¹⁹³ Pt	-34.200	¹⁷⁴ Au	-13.050	²⁴⁹ Au	224.510	²³⁰ Hg	87.860		
²²⁸ Os	124.780	²¹¹ Ir	22.160	¹⁹⁴ Pt	-34.500	¹⁷⁵ Au	-16.190	²⁵⁰ Au	230.830	²³¹ Hg	93.960		
²²⁹ Os	131.930	²¹² Ir	27.750	¹⁹⁵ Pt	-32.680	¹⁷⁶ Au	-17.470	²⁵¹ Au	237.530	²³² Hg	98.790		
²³⁰ Os	137.680	²¹³ Ir	32.040	¹⁹⁶ Pt	-32.700	¹⁷⁷ Au	-20.360	²⁵² Au	245.260	²³³ Hg	105.280		
²³¹ Os	144.980	²¹⁴ Ir	37.880	¹⁹⁷ Pt	-30.480	¹⁷⁸ Au	-21.410	²⁵³ Au	253.280	²³⁴ Hg	110.370		
²³² Os	150.940	²¹⁵ Ir	42.220	¹⁹⁸ Pt	-30.130	¹⁷⁹ Au	-24.040	²⁵⁴ Au	261.200	²³⁵ Hg	117.020		
²³³ Os	158.370	²¹⁶ Ir	47.960	¹⁹⁹ Pt	-28.050	¹⁸⁰ Au	-24.850	²⁵⁵ Au	267.080	²³⁶ Hg	122.200		
²³⁴ Os	164.360	²¹⁷ Ir	52.320	²⁰⁰ Pt	-27.320	¹⁸¹ Au	-27.200	²⁵⁶ Au	275.140	²³⁷ Hg	128.930		
²³⁵ Os	171.770	²¹⁸ Ir	58.010	²⁰¹ Pt	-24.760	¹⁸² Au	-27.720	²⁵⁷ Au	282.440	²³⁸ Hg	134.230		
²³⁶ Os	177.840	²¹⁹ Ir	62.600	²⁰² Pt	-23.690	¹⁸³ Au	-29.800	²⁵⁸ Au	291.270	²³⁹ Hg	141.010		
²³⁷ Os	185.460	²²⁰ Ir	68.370	²⁰³ Pt	-21.050	¹⁸⁴ Au	-30.000	²⁵⁹ Au	298.660	²⁴⁰ Hg	146.320		
²³⁸ Os	191.740	²²¹ Ir	73.090	²⁰⁴ Pt	-19.270	¹⁸⁵ Au	-31.710	²⁶⁰ Au	307.150	²⁴¹ Hg	153.270		
²³⁹ Os	199.840	²²² Ir	78.980	²⁰⁵ Pt	-14.450	¹⁸⁶ Au	-31.590	²⁶¹ Au	314.850	²⁴² Hg	158.890		
²⁴⁰ Os	206.890	²²³ Ir	83.870	²⁰⁶ Pt	-11.190	¹⁸⁷ Au	-32.960	²⁶² Au	323.420	²⁴³ Hg	166.220		
²⁴¹ Os	215.340	²²⁴ Ir	89.880	²⁰⁷ Pt	-5.580	¹⁸⁸ Au	-32.450	²⁶³ Au	331.580	²⁴⁴ Hg	173.850		
²⁴² Os	222.750	²²⁵ Ir	94.910	²⁰⁸ Pt	-1.910	¹⁸⁹ Au	-33.530			²⁴⁵ Hg	181.120		
²⁴³ Os	231.100	²²⁶ Ir	101.110	²⁰⁹ Pt	3.720	¹⁹⁰ Au	-32.820	¹⁷⁰ Hg	6.900	²⁴⁶ Hg	186.630		
²⁴⁴ Os	238.280	²²⁷ Ir	106.360	²¹⁰ Pt	7.620	¹⁹¹ Au	-33.620	¹⁷¹ Hg	4.820	²⁴⁷ Hg	193.710		
²⁴⁵ Os	247.770	²²⁸ Ir	112.820	²¹¹ Pt	13.460	¹⁹² Au	-32.670	¹⁷² Hg	0.650	²⁴⁸ Hg	199.290		
²⁴⁶ Os	255.470	²²⁹ Ir	118.400	²¹² Pt	17.420	¹⁹³ Au	-33.270	¹⁷³ Hg	-1.180	²⁴⁹ Hg	206.550		
²⁴⁷ Os	263.040	²³⁰ Ir	125.210	²¹³ Pt	23.120	¹⁹⁴ Au	-32.080	¹⁷⁴ Hg	-5.050	²⁵⁰ Hg	212.620		
²⁴⁸ Os	270.140	²³¹ Ir	131.040	²¹⁴ Pt	27.120	¹⁹⁵ Au	-32.450	¹⁷⁵ Hg	-6.630	²⁵¹ Hg	220.230		
²⁴⁹ Os	279.550	²³² Ir	138.100	²¹⁵ Pt	32.820	¹⁹⁶ Au	-31.070	¹⁷⁶ Hg	-10.230	²⁵² Hg	226.510		
²⁵⁰ Os	286.770	²³³ Ir	144.010	²¹⁶ Pt	36.800	¹⁹⁷ Au	-31.170	¹⁷⁷ Hg	-11.520	²⁵³ Hg	234.280		
²⁵¹ Os	295.430	²³⁴ Ir	151.170	²¹⁷ Pt	42.670	¹⁹⁸ Au	-29.500	¹⁷⁸ Hg	-14.830	²⁵⁴ Hg	240.840		
²⁵² Os	303.070	²³⁵ Ir	157.130	²¹⁸ Pt	46.740	¹⁹⁹ Au	-29.150	¹⁷⁹ Hg	-15.910	²⁵⁵ Hg	248.660		
²⁵³ Os	310.830	²³⁶ Ir	164.210	²¹⁹ Pt	52.470	²⁰⁰ Au	-27.530	¹⁸⁰ Hg	-18.960	²⁵⁶ Hg	255.340		
		²³⁷ Ir	170.240	²²⁰ Pt	56.700	²⁰¹ Au	-26.830	¹⁸¹ Hg	-19.790	²⁵⁷ Hg	263.400		
¹⁶² Ir	-0.340	²³⁸ Ir	177.430	²²¹ Pt	62.490	²⁰² Au	-24.690	¹⁸² Hg	-22.600	²⁵⁸ Hg	270.350		
¹⁶³ Ir	-4.380	²³⁹ Ir	183.720	²²² Pt	66.790	²⁰³ Au	-23.710	¹⁸³ Hg	-23.150	²⁵⁹ Hg	279.000		
¹⁶⁴ Ir	-6.540	²⁴⁰ Ir	191.470	²²³ Pt	72.710	²⁰⁴ Au	-21.500	¹⁸⁴ Hg	-25.690	²⁶⁰ Hg	286.100		
¹⁶⁵ Ir	-10.360	²⁴¹ Ir	198.460	²²⁴ Pt	77.230	²⁰⁵ Au	-19.860	¹⁸⁵ Hg	-25.970	²⁶¹ Hg	294.600		
¹⁶⁶ Ir	-12.420	²⁴² Ir	206.740	²²⁵ Pt	83.290	²⁰⁶ Au	-15.310	¹⁸⁶ Hg	-28.100	²⁶² Hg	301.870		
¹⁶⁷ Ir	-16.070	²⁴³ Ir	213.690	²²⁶ Pt	87.950	²⁰⁷ Au	-12.190	¹⁸⁷ Hg	-28.070	²⁶³ Hg	310.460		
¹⁶⁸ Ir	-17.950	²⁴⁴ Ir	221.710	²²⁷ Pt	94.170	²⁰⁸ Au	-7.130	¹⁸⁸ Hg	-29.930	²⁶⁴ Hg	318.290		
¹⁶⁹ Ir	-21.240	²⁴⁵ Ir	229.710	²²⁸ Pt	99.060	²⁰⁹ Au	-3.360	¹⁸⁹ Hg	-29.550	²⁶⁵ Hg	328.470		
¹⁷⁰ Ir	-22.770	²⁴⁶ Ir	237.900	²²⁹ Pt	105.490	²¹⁰ Au	1.910	¹⁹⁰ Hg	-31.130	²⁶⁶ Hg	336.980		
¹⁷¹ Ir	-25.790	²⁴⁷ Ir	245.320	²³⁰ Pt	110.710	²¹¹ Au	5.760	¹⁹¹ Hg	-30.500				
¹⁷² Ir	-27.000	²⁴⁸ Ir	252.260	²³¹ Pt	117.540	²¹² Au	11.020	¹⁹² Hg	-31.820	¹⁷³ Tl	10.090		
¹⁷³ Ir	-29.670	²⁴⁹ Ir	259.330	²³² Pt	122.980	²¹³ Au	14.970	¹⁹³ Hg	-30.920	¹⁷⁴ Tl	7.890		
¹⁷⁴ Ir	-30.650	²⁵⁰ Ir	268.400	²³³ Pt	129.920	²¹⁴ Au	20.480	¹⁹⁴ Hg	-31.970	¹⁷⁵ Tl	3.980		
¹⁷⁵ Ir	-33.090	²⁵¹ Ir	275.770	²³⁴ Pt	135.560	²¹⁵ Au	24.460	¹⁹⁵ Hg	-30.890	¹⁷⁶ Tl	2.040		
¹⁷⁶ Ir	-34.050	²⁵² Ir	284.050	²³⁵ Pt	142.680	²¹⁶ Au	29.970	¹⁹⁶ Hg	-31.810	¹⁷⁷ Tl	-1.610		
¹⁷⁷ Ir	-35.920	²⁵³ Ir	291.510	²³⁶ Pt	148.340	²¹⁷ Au	33.970	¹⁹⁷ Hg	-30.370	¹⁷⁸ Tl	-3.350		
¹⁷⁸ Ir	-36.490	²⁵⁴ Ir	299.040	²³⁷ Pt	155.410	²¹⁸ Au	39.490	¹⁹⁸ Hg	-31.010	¹⁷⁹ Tl	-6.750		
¹⁷⁹ Ir	-38.440	²⁵⁵ Ir	306.770	²³⁸ Pt	161.100	²¹⁹ Au	43.590	¹⁹⁹ Hg	-29.420	¹⁸⁰ Tl	-8.190		
¹⁸⁰ Ir	-38.450	²⁵⁶ Ir	316.040	²³⁹ Pt	168.290	²²⁰ Au	48.990	²⁰⁰ Hg	-29.640	¹⁸¹ Tl	-11.350		
¹⁸¹ Ir	-40.030			²⁴⁰ Pt	174.220	²²¹ Au	53.260	²⁰¹ Hg	-27.830	¹⁸² Tl	-12.530		
¹⁸² Ir	-39.600	¹⁶⁵ Pt	1.080	²⁴¹ Pt	181.950	²²² Au	58.710	²⁰² Hg	-27.700	¹⁸³ Tl	-15.420		
¹⁸³ Ir	-40.880	¹⁶⁶ Pt	-3.240	²⁴² Pt	188.580	²²³ Au	63.000	²⁰³ Hg	-25.650	¹⁸⁴ Tl	-16.330		
¹⁸⁴ Ir	-40.270	¹⁶⁷ Pt	-5.120	²⁴³ Pt	196.780	²²⁴ Au	68.560	²⁰⁴ Hg	-25.160	¹⁸⁵ Tl	-18.900		
¹⁸⁵ Ir	-41.150	¹⁶⁸ Pt	-9.090	²⁴⁴ Pt	203.380	²²⁵ Au	73.060	²⁰⁵ Hg	-23.090	¹⁸⁶ Tl	-19.610		
¹⁸⁶ Ir	-40.070	¹⁶⁹ Pt	-11.100	²⁴⁵ Pt	213.090	²²⁶ Au	78.800	²⁰⁶ Hg	-21.810	¹⁸⁷ Tl	-21.840		
¹⁸⁷ Ir	-40.060	¹⁷⁰ Pt	-14.790	²⁴⁶ Pt	218.850	²²⁷ Au	83.450	²⁰⁷ Hg	-17.410	¹⁸⁸ Tl	-22.290		
¹⁸⁸ Ir	-38.610	¹⁷¹ Pt	-16.310	²⁴⁷ Pt	227.110	²²⁸ Au	89.330	²⁰⁸ Hg	-14.660	¹⁸⁹ Tl	-24.250		
¹⁸⁹ Ir	-38.520	¹⁷² Pt	-19.800	²⁴⁸ Pt	233.970	²²⁹ Au	94.180	²⁰⁹ Hg	-9.630	¹⁹⁰ Tl	-24.410		
¹⁹⁰ Ir	-37.090	¹⁷³ Pt	-21.160	²⁴⁹ Pt	241.920	²³⁰ Au	100.300	²¹⁰ Hg	-6.300	¹⁹¹ Tl	-26.130		
¹⁹¹ Ir	-36.840	¹⁷⁴ Pt	-24.320	²⁵⁰ Pt	248.400	²³¹ Au	105.480	²¹¹ Hg	-1.060	¹⁹² Tl	-26.020		
¹⁹² Ir	-35.150	¹⁷⁵ Pt	-25.420	²⁵¹ Pt	256.540	²³² Au	111.970	²¹² Hg	2.380	¹⁹³ Tl	-27.500		
¹⁹³ Ir	-34.790	¹⁷⁶ Pt	-28.250	²⁵² Pt	263.380	²³³ Au	117.390	²¹³ Hg	7.730	¹⁹⁴ Tl	-27.040		
¹⁹⁴ Ir	-32.800	¹⁷⁷ Pt	-28.930	²⁵³ Pt	271.670	²³⁴ Au	123.970	²¹⁴ Hg	11.230	¹⁹⁵ Tl	-28.340		
¹⁹⁵ Ir	-32.100	¹⁷⁸ Pt	-31.600	²⁵⁴ Pt	278.750	²³⁵ Au	129.570	²¹⁵ Hg	16.840	¹⁹⁶ Tl	-27.730		
¹⁹⁶ Ir	-29.710	¹⁷⁹ Pt	-31.920	²⁵⁵ Pt	285.950	²³⁶ Au	136.320	²¹⁶ Hg	20.540	¹⁹⁷ Tl	-28.630		
¹⁹⁷ Ir	-28.480	¹⁸⁰ Pt	-34.150	²⁵⁶ Pt	293.310	²³⁷ Au	141.940	²¹⁷ Hg	26.190	¹⁹⁸ Tl	-27.780		
¹⁹⁸ Ir	-26.390	¹⁸¹ Pt	-34.290	²⁵⁷ Pt	302.550	²³⁸ Au	148.880	²¹⁸ Hg	29.880	¹⁹⁹ Tl	-28.380		
¹⁹⁹ Ir	-25.170	¹⁸² Pt	-36.180	²⁵⁸ Pt	309.930	²³⁹ Au	154.420	²¹⁹ Hg	35.560	²⁰⁰ Tl	-27.310		
²⁰⁰ Ir	-22.560	¹⁸³ Pt	-35.980	²⁵⁹ Pt	318.760	²⁴⁰ Au	161.300	²²⁰ Hg	39.250	²⁰¹ Tl	-27.580		
²⁰¹ Ir	-21.080	¹⁸⁴ Pt	-37.600	²⁶⁰ Pt	326.410	²⁴¹ Au	167.250	²²¹ Hg	44.510	²⁰² Tl	-26.340		
²⁰² Ir	-18.370	¹⁸⁵ Pt	-37.030			²⁴² Au	174.660	²²² Hg	48.390	²⁰³ Tl	-26.250		
²⁰³ Ir	-16.190	¹⁸⁶ Pt	-38.140			²⁴³ Au	181.480	²²³ Hg	53.850	²⁰⁴ Tl	-24.580		
²⁰⁴ Ir	-11.210	¹⁸⁷ Pt	-37.220			²⁴⁴ Au	190.940	²²⁴ Hg	57.740	²⁰⁵ Tl	-24.220		
²⁰⁵ Ir	-7.680	¹⁸⁸ Pt	-37.230			²⁴⁵ Au	197.120	²²⁵ Hg	63.320	²⁰⁶ Tl	-22.410		
²⁰⁶ Ir	-2.060	¹⁸⁹ Pt	-36.020			²⁴⁶ Au	204.460	²²⁶ Hg	67.470	²⁰⁷ Tl	-21.230		
²⁰⁷ Ir	1.980	¹											

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²⁰⁹ Tl	-14.490	¹⁸⁹ Pb	-17.730	²⁶⁴ Pb	279.940	²⁴³ Bi	130.010	²²² Po	23.220	²⁰¹ At	-9.990		
²¹⁰ Tl	-9.810	¹⁹⁰ Pb	-20.170	²⁶⁵ Pb	288.380	²⁴⁴ Bi	136.390	²²³ Po	27.590	²⁰² At	-10.110		
²¹¹ Tl	-6.630	¹⁹¹ Pb	-20.270	²⁶⁶ Pb	295.890	²⁴⁵ Bi	141.350	²²⁴ Po	30.430	²⁰³ At	-11.620		
²¹² Tl	-1.910	¹⁹² Pb	-22.550	²⁶⁷ Pb	305.770	²⁴⁶ Bi	147.760	²²⁵ Po	34.870	²⁰⁴ At	-11.660		
²¹³ Tl	1.540	¹⁹³ Pb	-22.380	²⁶⁸ Pb	313.920	²⁴⁷ Bi	153.000	²²⁶ Po	37.980	²⁰⁵ At	-12.640		
²¹⁴ Tl	6.470	¹⁹⁴ Pb	-24.410	²⁶⁹ Pb	324.290	²⁴⁸ Bi	159.480	²²⁷ Po	42.600	²⁰⁶ At	-12.520		
²¹⁵ Tl	10.030	¹⁹⁵ Pb	-23.990	²⁷⁰ Pb	332.850	²⁴⁹ Bi	164.980	²²⁸ Po	45.690	²⁰⁷ At	-13.390		
²¹⁶ Tl	15.210	¹⁹⁶ Pb	-25.720	²⁷¹ Pb	342.800	²⁵⁰ Bi	171.460	²²⁹ Po	50.430	²⁰⁸ At	-12.650		
²¹⁷ Tl	18.800	¹⁹⁷ Pb	-25.090	²⁷² Pb	351.260	²⁵¹ Bi	176.960	²³⁰ Po	53.810	²⁰⁹ At	-13.230		
²¹⁸ Tl	23.780	¹⁹⁸ Pb	-26.500	²⁷³ Pb	361.060	²⁵² Bi	183.820	²³¹ Po	58.690	²¹⁰ At	-12.280		
²¹⁹ Tl	27.540	¹⁹⁹ Pb	-25.640	¹⁷⁸ Bi	20.600	²⁵³ Bi	189.600	²³² Po	62.250	²¹¹ At	-11.930		
²²⁰ Tl	32.990	²⁰⁰ Pb	-26.730	¹⁷⁹ Bi	16.430	²⁵⁴ Bi	196.520	²³³ Po	67.320	²¹² At	-8.870		
²²¹ Tl	37.110	²⁰¹ Pb	-25.690	¹⁸⁰ Bi	14.140	²⁵⁵ Bi	202.360	²³⁴ Po	71.110	²¹³ At	-7.160		
²²² Tl	42.040	²⁰² Pb	-26.440	¹⁸¹ Bi	10.460	²⁵⁶ Bi	209.520	²³⁵ Po	76.400	²¹⁴ At	-3.460		
²²³ Tl	45.960	²⁰³ Pb	-25.180	¹⁸² Bi	8.230	²⁵⁷ Bi	215.680	²³⁶ Po	80.530	²¹⁵ At	-1.240		
²²⁴ Tl	51.050	²⁰⁴ Pb	-25.680	¹⁸³ Bi	4.720	²⁵⁸ Bi	222.940	²³⁷ Po	86.300	²¹⁶ At	2.630		
²²⁵ Tl	54.960	²⁰⁵ Pb	-24.180	¹⁸⁴ Bi	2.980	²⁵⁹ Bi	228.880	²³⁸ Po	90.700	²¹⁷ At	4.640		
²²⁶ Tl	60.180	²⁰⁶ Pb	-24.320	¹⁸⁵ Bi	-0.450	²⁶⁰ Bi	236.370	²³⁹ Po	96.660	²¹⁸ At	8.240		
²²⁷ Tl	64.350	²⁰⁷ Pb	-22.410	¹⁸⁶ Bi	-1.920	²⁶¹ Bi	242.800	²⁴⁰ Po	101.200	²¹⁹ At	10.720		
²²⁸ Tl	69.680	²⁰⁸ Pb	-21.580	¹⁸⁷ Bi	-5.010	²⁶² Bi	250.140	²⁴¹ Po	107.210	²²⁰ At	14.360		
²²⁹ Tl	73.960	²⁰⁹ Pb	-17.640	¹⁸⁸ Bi	-6.170	²⁶³ Bi	256.810	²⁴² Po	111.820	²²¹ At	16.930		
²³⁰ Tl	79.440	²¹⁰ Pb	-15.310	¹⁸⁹ Bi	-8.970	²⁶⁴ Bi	264.600	²⁴³ Po	117.900	²²² At	21.090		
²³¹ Tl	83.950	²¹¹ Pb	-10.700	¹⁹⁰ Bi	-9.890	²⁶⁵ Bi	271.580	²⁴⁴ Po	122.600	²²³ At	23.850		
²³² Tl	89.700	²¹² Pb	-7.980	¹⁹¹ Bi	-12.410	²⁶⁶ Bi	279.700	²⁴⁵ Po	128.870	²²⁴ At	27.730		
²³³ Tl	94.520	²¹³ Pb	-3.110	¹⁹² Bi	-13.050	²⁶⁷ Bi	287.240	²⁴⁶ Po	133.870	²²⁵ At	30.510		
²³⁴ Tl	100.650	²¹⁴ Pb	-0.210	¹⁹³ Bi	-15.320	²⁶⁸ Bi	296.800	²⁴⁷ Po	141.330	²²⁶ At	34.530		
²³⁵ Tl	105.750	²¹⁵ Pb	4.710	¹⁹⁴ Bi	-15.680	²⁶⁹ Bi	304.920	²⁴⁸ Po	146.050	²²⁷ At	37.530		
²³⁶ Tl	112.020	²¹⁶ Pb	7.720	¹⁹⁵ Bi	-17.690	²⁷⁰ Bi	314.970	²⁴⁹ Po	152.650	²²⁸ At	41.760		
²³⁷ Tl	117.220	²¹⁷ Pb	12.670	¹⁹⁶ Bi	-17.750	²⁷¹ Bi	323.500	²⁵⁰ Po	157.820	²²⁹ At	44.840		
²³⁸ Tl	123.570	²¹⁸ Pb	15.850	¹⁹⁷ Bi	-19.530	²⁷² Bi	333.160	²⁵¹ Po	164.270	²³⁰ At	49.190		
²³⁹ Tl	128.860	²¹⁹ Pb	20.940	¹⁹⁸ Bi	-19.420	²⁷³ Bi	341.640	²⁵² Po	169.440	²³¹ At	52.540		
²⁴⁰ Tl	135.260	²²⁰ Pb	24.330	¹⁹⁹ Bi	-20.880	²⁷⁴ Bi	351.100	²⁵³ Po	176.320	²³² At	57.010		
²⁴¹ Tl	142.280	²²¹ Pb	30.480	²⁰⁰ Bi	-20.480	²⁷⁵ Bi	359.740	²⁵⁴ Po	181.760	²³³ At	60.570		
²⁴² Tl	148.940	²²² Pb	33.810	²⁰¹ Bi	-21.600	²⁷⁶ Bi	372.470	²⁵⁵ Po	188.670	²³⁴ At	65.300		
²⁴³ Tl	154.290	²²³ Pb	38.690	²⁰² Bi	-21.000	¹⁸¹ Po	22.290	²⁵⁶ Po	193.680	²³⁵ At	69.070		
²⁴⁴ Tl	161.110	²²⁴ Pb	42.090	²⁰³ Bi	-21.810	¹⁸² Po	17.670	²⁵⁷ Po	201.320	²³⁶ At	74.000		
²⁴⁵ Tl	166.640	²²⁵ Pb	47.260	²⁰⁴ Bi	-20.960	¹⁸³ Po	15.220	²⁵⁸ Po	207.150	²³⁷ At	77.960		
²⁴⁶ Tl	173.630	²²⁶ Pb	50.750	²⁰⁵ Bi	-21.420	¹⁸⁴ Po	11.000	²⁵⁹ Po	214.310	²³⁸ At	83.580		
²⁴⁷ Tl	179.430	²²⁷ Pb	55.960	²⁰⁶ Bi	-20.280	¹⁸⁵ Po	8.950	²⁶⁰ Po	220.110	²³⁹ At	87.930		
²⁴⁸ Tl	186.350	²²⁸ Pb	59.700	²⁰⁷ Bi	-20.420	¹⁸⁶ Po	5.280	²⁶¹ Po	227.520	²⁴⁰ At	93.610		
²⁴⁹ Tl	192.150	²²⁹ Pb	65.000	²⁰⁸ Bi	-19.010	¹⁸⁷ Po	3.750	²⁶² Po	233.630	²⁴¹ At	98.100		
²⁵⁰ Tl	199.360	²³⁰ Pb	68.940	²⁰⁹ Bi	-18.310	¹⁸⁸ Po	0.680	²⁶³ Po	240.980	²⁴² At	103.770		
²⁵¹ Tl	205.490	²³¹ Pb	74.390	²¹⁰ Bi	-14.790	¹⁸⁹ Po	-0.320	²⁶⁴ Po	247.260	²⁴³ At	108.350		
²⁵² Tl	212.800	²³² Pb	78.550	²¹¹ Bi	-12.470	¹⁹⁰ Po	-3.170	²⁶⁵ Po	255.050	²⁴⁴ At	114.100		
²⁵³ Tl	218.910	²³³ Pb	84.240	²¹² Bi	-8.320	¹⁹¹ Po	-3.910	²⁶⁶ Po	261.710	²⁴⁵ At	118.780		
²⁵⁴ Tl	226.400	²³⁴ Pb	88.750	²¹³ Bi	-5.670	¹⁹² Po	-6.970	²⁶⁷ Po	269.830	²⁴⁶ At	124.740		
²⁵⁵ Tl	232.880	²³⁵ Pb	94.890	²¹⁴ Bi	-1.170	¹⁹³ Po	-7.580	²⁶⁸ Po	277.040	²⁴⁷ At	129.710		
²⁵⁶ Tl	240.430	²³⁶ Pb	99.620	²¹⁵ Bi	1.580	¹⁹⁴ Po	-9.910	²⁶⁹ Po	286.590	²⁴⁸ At	136.850		
²⁵⁷ Tl	246.470	²³⁷ Pb	105.930	²¹⁶ Bi	6.100	¹⁹⁵ Po	-10.350	²⁷⁰ Po	294.390	²⁴⁹ At	141.770		
²⁵⁸ Tl	254.370	²³⁸ Pb	110.790	²¹⁷ Bi	8.990	¹⁹⁶ Po	-12.640	²⁷¹ Po	304.330	²⁵⁰ At	148.040		
²⁵⁹ Tl	261.190	²³⁹ Pb	117.140	²¹⁸ Bi	13.440	¹⁹⁷ Po	-12.870	²⁷² Po	312.540	²⁵¹ At	153.120		
²⁶⁰ Tl	268.940	²⁴⁰ Pb	122.090	²¹⁹ Bi	16.650	¹⁹⁸ Po	-14.940	²⁷³ Po	322.060	²⁵² At	159.330		
²⁶¹ Tl	275.950	²⁴¹ Pb	128.520	²²⁰ Bi	21.320	¹⁹⁹ Po	-14.800	²⁷⁴ Po	330.180	²⁵³ At	164.400		
²⁶² Tl	284.040	²⁴² Pb	134.750	²²¹ Bi	24.550	²⁰⁰ Po	-16.730	²⁷⁵ Po	339.600	²⁵⁴ At	170.890		
²⁶³ Tl	291.320	²⁴³ Pb	141.380	²²² Bi	29.410	²⁰¹ Po	-16.330	²⁷⁶ Po	351.050	²⁵⁵ At	176.340		
²⁶⁴ Tl	299.750	²⁴⁴ Pb	146.370	²²³ Bi	32.690	²⁰² Po	-17.920	²⁷⁷ Po	360.130	²⁵⁶ At	182.930		
²⁶⁵ Tl	307.580	²⁴⁵ Pb	153.160	²²⁴ Bi	37.220	²⁰³ Po	-17.340	²⁷⁸ Po	367.950	²⁵⁷ At	187.710		
²⁶⁶ Tl	317.460	²⁴⁶ Pb	158.150	²²⁵ Bi	40.770	²⁰⁴ Po	-18.580	²⁷⁹ Po	377.200	²⁵⁸ At	195.280		
²⁶⁷ Tl	325.940	²⁴⁷ Pb	165.290	²²⁶ Bi	45.470	²⁰⁵ Po	-17.770	¹⁸⁴ At	24.870	²⁵⁹ At	201.070		
²⁶⁸ Tl	336.350	²⁴⁸ Pb	170.730	²²⁷ Bi	48.940	²⁰⁶ Po	-18.800	¹⁸⁵ At	20.430	²⁶⁰ At	207.980		
²⁶⁹ Tl	345.240	²⁴⁹ Pb	177.630	²²⁸ Bi	53.730	²⁰⁷ Po	-17.740	¹⁸⁶ At	17.940	²⁶¹ At	213.670		
¹⁷⁵ Pb	15.970	²⁵⁰ Pb	183.110	²²⁹ Bi	57.520	²⁰⁸ Po	-18.320	¹⁸⁷ At	14.210	²⁶² At	220.780		
¹⁷⁶ Pb	11.550	²⁵¹ Pb	190.310	²³⁰ Bi	62.480	²⁰⁹ Po	-16.930	¹⁸⁸ At	12.320	²⁶³ At	226.920		
¹⁷⁷ Pb	9.460	²⁵² Pb	196.050	²³¹ Bi	66.400	²¹⁰ Po	-16.530	¹⁸⁹ At	9.080	²⁶⁴ At	234.140		
¹⁷⁸ Pb	5.330	²⁵³ Pb	203.340	²³² Bi	71.500	²¹¹ Po	-13.090	¹⁹⁰ At	7.700	²⁶⁵ At	240.430		
¹⁷⁹ Pb	3.550	²⁵⁴ Pb	209.250	²³³ Bi	75.630	²¹² Po	-11.240	¹⁹¹ At	5.100	²⁶⁶ At	247.880		
¹⁸⁰ Pb	-0.360	²⁵⁵ Pb	216.720	²³⁴ Bi	80.990	²¹³ Po	-7.120	¹⁹² At	3.660	²⁶⁷ At	254.570		
¹⁸¹ Pb	-1.870	²⁵⁶ Pb	222.850	²³⁵ Bi	85.460	²¹⁴ Po	-4.850	¹⁹³ At	0.830	²⁶⁸ At	262.330		
¹⁸² Pb	-5.480	²⁵⁷ Pb	230.420	²³⁶ Bi	91.240	²¹⁵ Po	-0.470	¹⁹⁴ At	-0.230	²⁶⁹ At	269.570		
¹⁸³ Pb	-6.730	²⁵⁸ Pb	236.570	²³⁷ Bi	95.960	²¹⁶ Po	1.890	¹⁹⁵ At	-2.660	²⁷⁰ At	278.800		
¹⁸⁴ Pb	-9.990	²⁵⁹ Pb	244.110	²³⁸ Bi	101.880	²¹⁷ Po	6.000	¹⁹⁶ At	-3.280	²⁷¹ At	286.530		
¹⁸⁵ Pb	-10.940	²⁶⁰ Pb	250.430	²³⁹ Bi	106.720	²¹⁸ Po	8.470	¹⁹⁷ At	-5.430	²⁷² At	296.230		
¹⁸⁶ Pb	-13.940	²⁶¹ Pb	258.180	²⁴⁰ Bi	112.740	²¹⁹ Po	13.110	¹⁹⁸ At	-5.840	²⁷³ At	304.410		
¹⁸⁷ Pb	-14.560	²⁶² Pb	264.910	²⁴¹ Bi	117.670	²²⁰ Po	15.890	¹⁹⁹ At	-7.840	²⁷⁴ At	313.730		
¹⁸⁸ Pb	-17.310	²⁶³ Pb	272.95										

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²⁷⁶ At	333.440	²⁵⁴ Rn	157.940	²³¹ Fr	42.440	²⁰⁸ Ra	2.290	²⁸³ Ra	334.930	²⁶⁰ Ac	161.360
²⁷⁷ At	341.240	²⁵⁵ Rn	164.370	²³² Fr	46.330	²⁰⁹ Ra	2.410	²⁸⁴ Ra	342.300	²⁶¹ Ac	165.270
²⁷⁸ At	349.940	²⁵⁶ Rn	169.510	²³³ Fr	49.280	²¹⁰ Ra	0.890	²⁸⁵ Ra	351.410	²⁶² Ac	172.400
²⁷⁹ At	357.850	²⁵⁷ Rn	176.080	²³⁴ Fr	53.370	²¹¹ Ra	1.190	²⁸⁶ Ra	358.940	²⁶³ Ac	177.600
²⁸⁰ At	366.660	²⁵⁸ Rn	180.510	²³⁵ Fr	56.540	²¹² Ra	-0.230	²⁸⁷ Ra	367.890	²⁶⁴ Ac	183.840
²⁸¹ At	374.710	²⁵⁹ Rn	188.130	²³⁶ Fr	60.890	²¹³ Ra	0.330	²⁸⁸ Ra	375.370	²⁶⁵ Ac	188.620
²⁸² At	383.830	²⁶⁰ Rn	193.630	²³⁷ Fr	64.300	²¹⁴ Ra	-0.190	²⁸⁹ Ra	384.840	²⁶⁶ Ac	195.090
¹⁸⁶ Rn	28.330	²⁶¹ Rn	200.530	²³⁸ Fr	68.820	²¹⁵ Ra	2.290	²⁹⁰ Ra	392.600	²⁶⁷ Ac	200.800
¹⁸⁷ Rn	25.760	²⁶² Rn	205.710	²³⁹ Fr	72.370	²¹⁶ Ra	3.140	²⁹¹ Ra	401.510	²⁶⁸ Ac	207.600
¹⁸⁸ Rn	21.590	²⁶³ Rn	212.810	²⁴⁰ Fr	77.570	²¹⁷ Ra	6.300	²⁹² Ra	409.660	²⁶⁹ Ac	213.340
¹⁸⁹ Rn	19.600	²⁶⁴ Rn	218.820	²⁴¹ Fr	81.700	²¹⁸ Ra	7.550	¹⁹⁵ Ac	37.360	²⁷⁰ Ac	220.220
¹⁹⁰ Rn	15.960	²⁶⁵ Rn	226.000	²⁴² Fr	86.990	²¹⁹ Ra	9.590	¹⁹⁶ Ac	35.320	²⁷¹ Ac	226.350
¹⁹¹ Rn	14.620	²⁶⁶ Rn	232.040	²⁴³ Fr	91.170	²²⁰ Ra	10.690	¹⁹⁷ Ac	31.870	²⁷² Ac	233.440
¹⁹² Rn	11.430	²⁶⁷ Rn	239.550	²⁴⁴ Fr	96.560	²²¹ Ra	13.300	¹⁹⁸ Ac	30.200	²⁷³ Ac	240.050
¹⁹³ Rn	10.320	²⁶⁸ Rn	245.950	²⁴⁵ Fr	100.860	²²² Ra	14.510	¹⁹⁹ Ac	27.400	²⁷⁴ Ac	248.600
¹⁹⁴ Rn	7.290	²⁶⁹ Rn	253.700	²⁴⁶ Fr	106.210	²²³ Ra	17.910	²⁰⁰ Ac	26.300	²⁷⁵ Ac	255.610
¹⁹⁵ Rn	6.170	²⁷⁰ Rn	260.620	²⁴⁷ Fr	110.550	²²⁴ Ra	19.520	²⁰¹ Ac	23.290	²⁷⁶ Ac	264.560
¹⁹⁶ Rn	3.270	²⁷¹ Rn	269.850	²⁴⁸ Fr	116.100	²²⁵ Ra	22.540	²⁰² Ac	21.940	²⁷⁷ Ac	272.060
¹⁹⁷ Rn	2.520	²⁷² Rn	277.230	²⁴⁹ Fr	120.750	²²⁶ Ra	24.270	²⁰³ Ac	19.200	²⁷⁸ Ac	280.810
¹⁹⁸ Rn	0.030	²⁷³ Rn	286.870	²⁵⁰ Fr	126.550	²²⁷ Ra	27.650	²⁰⁴ Ac	18.100	²⁷⁹ Ac	287.680
¹⁹⁹ Rn	-0.460	²⁷⁴ Rn	294.610	²⁵¹ Fr	132.460	²²⁸ Ra	29.540	²⁰⁵ Ac	15.530	²⁸⁰ Ac	295.840
²⁰⁰ Rn	-2.670	²⁷⁵ Rn	303.820	²⁵² Fr	138.430	²²⁹ Ra	32.980	²⁰⁶ Ac	14.660	²⁸¹ Ac	302.830
²⁰¹ Rn	-2.930	²⁷⁶ Rn	311.560	²⁵³ Fr	143.150	²³⁰ Ra	34.960	²⁰⁷ Ac	12.310	²⁸² Ac	310.830
²⁰² Rn	-5.270	²⁷⁷ Rn	322.550	²⁵⁴ Fr	149.030	²³¹ Ra	38.620	²⁰⁸ Ac	11.700	²⁸³ Ac	318.070
²⁰³ Rn	-5.390	²⁷⁸ Rn	330.070	²⁵⁵ Fr	153.750	²³² Ra	40.860	²⁰⁹ Ac	9.480	²⁸⁴ Ac	326.210
²⁰⁴ Rn	-7.400	²⁷⁹ Rn	338.720	²⁵⁶ Fr	159.900	²³³ Ra	44.730	²¹⁰ Ac	9.280	²⁸⁵ Ac	333.700
²⁰⁵ Rn	-7.330	²⁸⁰ Rn	346.210	²⁵⁷ Fr	164.970	²³⁴ Ra	47.300	²¹¹ Ac	7.820	²⁸⁶ Ac	342.230
²⁰⁶ Rn	-8.770	²⁸¹ Rn	355.050	²⁵⁸ Fr	171.190	²³⁵ Ra	51.290	²¹² Ac	7.800	²⁸⁷ Ac	349.750
²⁰⁷ Rn	-8.500	²⁸² Rn	362.830	²⁵⁹ Fr	175.720	²³⁶ Ra	54.080	²¹³ Ac	6.390	²⁸⁸ Ac	358.370
²⁰⁸ Rn	-9.700	²⁸³ Rn	371.880	²⁶⁰ Fr	182.960	²³⁷ Ra	58.380	²¹⁴ Ac	6.510	²⁸⁹ Ac	366.210
²⁰⁹ Rn	-9.010	²⁸⁴ Rn	379.780	²⁶¹ Fr	188.530	²³⁸ Ra	61.420	²¹⁵ Ac	5.900	²⁹⁰ Ac	375.210
²¹⁰ Rn	-10.060	²⁸⁵ Rn	389.130	²⁶² Fr	195.070	²³⁹ Ra	66.030	²¹⁶ Ac	8.030	²⁹¹ Ac	382.940
²¹¹ Rn	-9.130	²⁸⁶ Rn	397.240	²⁶³ Fr	200.170	²⁴⁰ Ra	69.230	²¹⁷ Ac	8.810	²⁹² Ac	391.720
²¹² Rn	-9.180	¹⁸⁹ Fr	31.410	²⁶⁴ Fr	206.970	²⁴¹ Ra	74.420	²¹⁸ Ac	11.320	²⁹³ Ac	399.720
²¹³ Rn	-6.150	¹⁹⁰ Fr	28.980	²⁶⁵ Fr	213.100	²⁴² Ra	78.230	²¹⁹ Ac	12.600	²⁹⁴ Ac	408.660
²¹⁴ Rn	-4.810	¹⁹¹ Fr	25.260	²⁶⁶ Fr	219.980	²⁴³ Ra	83.510	²²⁰ Ac	13.830	²⁹⁵ Ac	416.830
²¹⁵ Rn	-1.120	¹⁹² Fr	23.280	²⁶⁷ Fr	226.060	²⁴⁴ Ra	87.300	²²¹ Ac	14.700	¹⁹⁸ Th	39.790
²¹⁶ Rn	0.550	¹⁹³ Fr	20.050	²⁶⁸ Fr	233.210	²⁴⁵ Ra	92.670	²²² Ac	16.860	¹⁹⁹ Th	38.010
²¹⁷ Rn	4.040	¹⁹⁴ Fr	18.760	²⁶⁹ Fr	239.630	²⁴⁶ Ra	96.650	²²³ Ac	18.260	²⁰⁰ Th	34.580
²¹⁸ Rn	5.790	¹⁹⁵ Fr	15.650	²⁷⁰ Fr	247.020	²⁴⁷ Ra	102.020	²²⁴ Ac	20.970	²⁰¹ Th	33.540
²¹⁹ Rn	9.120	¹⁹⁶ Fr	14.670	²⁷¹ Fr	253.950	²⁴⁸ Ra	106.070	²²⁵ Ac	22.280	²⁰² Th	30.560
²²⁰ Rn	10.990	¹⁹⁷ Fr	11.720	²⁷² Fr	262.850	²⁴⁹ Ra	111.590	²²⁶ Ac	24.900	²⁰³ Th	29.180
²²¹ Rn	14.490	¹⁹⁸ Fr	10.500	²⁷³ Fr	270.210	²⁵⁰ Ra	115.820	²²⁷ Ac	26.530	²⁰⁴ Th	26.060
²²² Rn	16.820	¹⁹⁹ Fr	7.900	²⁷⁴ Fr	279.560	²⁵¹ Ra	121.710	²²⁸ Ac	29.450	²⁰⁵ Th	24.910
²²³ Rn	20.800	²⁰⁰ Fr	7.050	²⁷⁵ Fr	287.330	²⁵² Ra	126.360	²²⁹ Ac	31.290	²⁰⁶ Th	21.920
²²⁴ Rn	23.070	²⁰¹ Fr	4.740	²⁷⁶ Fr	298.010	²⁵³ Ra	133.380	²³⁰ Ac	34.270	²⁰⁷ Th	20.960
²²⁵ Rn	26.850	²⁰² Fr	4.120	²⁷⁷ Fr	305.260	²⁵⁴ Ra	137.900	²³¹ Ac	36.190	²⁰⁸ Th	18.130
²²⁶ Rn	29.170	²⁰³ Fr	2.020	²⁷⁸ Fr	313.650	²⁵⁵ Ra	143.650	²³² Ac	39.490	²⁰⁹ Th	17.460
²²⁷ Rn	33.090	²⁰⁴ Fr	1.600	²⁷⁹ Fr	321.120	²⁵⁶ Ra	148.120	²³³ Ac	41.690	²¹⁰ Th	15.030
²²⁸ Rn	35.630	²⁰⁵ Fr	-0.590	²⁸⁰ Fr	329.470	²⁵⁷ Ra	154.160	²³⁴ Ac	45.190	²¹¹ Th	14.770
²²⁹ Rn	39.760	²⁰⁶ Fr	-0.910	²⁸¹ Fr	336.930	²⁵⁸ Ra	158.950	²³⁵ Ac	47.740	²¹² Th	12.940
²³⁰ Rn	42.450	²⁰⁷ Fr	-2.480	²⁸² Fr	345.500	²⁵⁹ Ra	165.170	²³⁶ Ac	51.360	²¹³ Th	12.850
²³¹ Rn	46.720	²⁰⁸ Fr	-2.340	²⁸³ Fr	353.240	²⁶⁰ Ra	169.190	²³⁷ Ac	54.140	²¹⁴ Th	11.130
²³² Rn	49.680	²⁰⁹ Fr	-3.550	²⁸⁴ Fr	362.180	²⁶¹ Ra	176.640	²³⁸ Ac	58.060	²¹⁵ Th	11.210
²³³ Rn	54.150	²¹⁰ Fr	-3.200	²⁸⁵ Fr	370.240	²⁶² Ra	181.880	²³⁹ Ac	61.100	²¹⁶ Th	10.250
²³⁴ Rn	57.330	²¹¹ Fr	-4.240	²⁸⁶ Fr	378.990	²⁶³ Ra	188.430	²⁴⁰ Ac	65.150	²¹⁷ Th	12.260
²³⁵ Rn	62.040	²¹² Fr	-3.710	²⁸⁷ Fr	387.010	²⁶⁴ Ra	193.110	²⁴¹ Ac	68.510	²¹⁸ Th	12.630
²³⁶ Rn	65.460	²¹³ Fr	-3.760	²⁸⁸ Fr	396.520	²⁶⁵ Ra	200.010	²⁴² Ac	73.360	²¹⁹ Th	15.020
²³⁷ Rn	70.350	²¹⁴ Fr	-1.170	²⁸⁹ Fr	404.600	²⁶⁶ Ra	205.730	²⁴³ Ac	77.030	²²⁰ Th	15.660
²³⁸ Rn	73.960	²¹⁵ Fr	0.050	¹⁹² Ra	33.180	²⁶⁷ Ra	212.770	²⁴⁴ Ac	82.100	²²¹ Th	16.950
²³⁹ Rn	79.580	²¹⁶ Fr	3.310	¹⁹³ Ra	31.310	²⁶⁸ Ra	218.510	²⁴⁵ Ac	85.920	²²² Th	17.380
²⁴⁰ Rn	83.570	²¹⁷ Fr	4.990	¹⁹⁴ Ra	27.650	²⁶⁹ Ra	225.720	²⁴⁶ Ac	90.970	²²³ Th	19.520
²⁴¹ Rn	89.190	²¹⁸ Fr	7.500	¹⁹⁵ Ra	26.180	²⁷⁰ Ra	231.780	²⁴⁷ Ac	94.910	²²⁴ Th	20.700
²⁴² Rn	93.410	²¹⁹ Fr	8.910	¹⁹⁶ Ra	22.750	²⁷¹ Ra	239.230	²⁴⁸ Ac	99.950	²²⁵ Th	22.940
²⁴³ Rn	99.110	²²⁰ Fr	11.770	¹⁹⁷ Ra	21.350	²⁷² Ra	245.840	²⁴⁹ Ac	103.960	²²⁶ Th	24.140
²⁴⁴ Rn	103.360	²²¹ Fr	13.440	¹⁹⁸ Ra	18.600	²⁷³ Ra	254.730	²⁵⁰ Ac	109.190	²²⁷ Th	26.520
²⁴⁵ Rn	109.120	²²² Fr	16.760	¹⁹⁹ Ra	17.330	²⁷⁴ Ra	261.750	²⁵¹ Ac	113.450	²²⁸ Th	27.570
²⁴⁶ Rn	113.470	²²³ Fr	18.800	²⁰⁰ Ra	14.390	²⁷⁵ Ra	271.040	²⁵² Ac	118.930	²²⁹ Th	30.230
²⁴⁷ Rn	119.350	²²⁴ Fr	22.230	²⁰¹ Ra	13.440	²⁷⁶ Ra	278.490	²⁵³ Ac	123.570	²³⁰ Th	31.520
²⁴⁸ Rn	124.000	²²⁵ Fr	24.320	²⁰² Ra	10.780	²⁷⁷ Ra	288.320	²⁵⁴ Ac	130.420	²³¹ Th	34.440
²⁴⁹ Rn	130.150	²²⁶ Fr	27.760	²⁰³ Ra	10.110	²⁷⁸ Ra	295.320	²⁵⁵ Ac	135.040	²³² Th	35.960
²⁵⁰ Rn	135.910	²²⁷ Fr	30.070	²⁰⁴ Ra	7.570	²⁷⁹ Ra	303.580	²⁵⁶ Ac	140.580	²³³ Th	39.180
²⁵¹ Rn	142.350	²²⁸ Fr	33.630	²⁰⁵ Ra	7.090	²⁸⁰ Ra	310.690	²⁵⁷ Ac	144.890	²³⁴ Th	41.030
²⁵² Rn	147.060	²²⁹ Fr	36.080	²⁰⁶ Ra	4.550	²⁸¹ Ra	319.140	²⁵⁸ Ac	150.690	²³⁵ Th	44.510
²⁵³ Rn	153.150	²³⁰ Fr	39.800	²⁰⁷ Ra	4.250	²⁸² Ra	326.300	²⁵⁹ Ac	155.400	²³⁶ Th	46.670

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²³⁷ Th	50.240	²¹² Pa	22.450	²⁸⁷ Pa	316.140	²⁶² U	142.940	²³⁷ Np	45.640	²¹² Pu	49.620		
²³⁸ Th	52.640	²¹³ Pa	20.590	²⁸⁸ Pa	324.190	²⁶³ U	148.560	²³⁸ Np	48.340	²¹³ Pu	48.190		
²³⁹ Th	56.560	²¹⁴ Pa	20.160	²⁸⁹ Pa	331.580	²⁶⁴ U	152.110	²³⁹ Np	49.920	²¹⁴ Pu	44.960		
²⁴⁰ Th	59.220	²¹⁵ Pa	18.420	²⁹⁰ Pa	339.890	²⁶⁵ U	158.680	²⁴⁰ Np	52.810	²¹⁵ Pu	43.890		
²⁴¹ Th	63.250	²¹⁶ Pa	18.160	²⁹¹ Pa	347.420	²⁶⁶ U	163.290	²⁴¹ Np	54.780	²¹⁶ Pu	41.360		
²⁴² Th	66.230	²¹⁷ Pa	17.130	²⁹² Pa	355.620	²⁶⁷ U	169.230	²⁴² Np	57.940	²¹⁷ Pu	40.510		
²⁴³ Th	71.070	²¹⁸ Pa	18.790	²⁹³ Pa	363.020	²⁶⁸ U	173.500	²⁴³ Np	60.160	²¹⁸ Pu	38.060		
²⁴⁴ Th	74.380	²¹⁹ Pa	19.080	²⁹⁴ Pa	371.480	²⁶⁹ U	179.650	²⁴⁴ Np	63.610	²¹⁹ Pu	37.370		
²⁴⁵ Th	79.460	²²⁰ Pa	21.490	²⁹⁵ Pa	379.540	²⁷⁰ U	184.640	²⁴⁵ Np	65.940	²²⁰ Pu	35.530		
²⁴⁶ Th	82.930	²²¹ Pa	22.180	²⁹⁶ Pa	388.090	²⁷¹ U	191.240	²⁴⁶ Np	69.850	²²¹ Pu	36.750		
²⁴⁷ Th	87.890	²²² Pa	22.000	²⁹⁷ Pa	395.940	²⁷² U	196.350	²⁴⁷ Np	72.970	²²² Pu	36.050		
²⁴⁸ Th	91.560	²²³ Pa	22.490	²⁹⁸ Pa	404.750	²⁷³ U	202.910	²⁴⁸ Np	77.180	²²³ Pu	36.670		
²⁴⁹ Th	96.580	²²⁴ Pa	24.350	²⁹⁹ Pa	412.860	²⁷⁴ U	208.400	²⁴⁹ Np	80.460	²²⁴ Pu	35.950		
²⁵⁰ Th	100.250	²²⁵ Pa	25.010	³⁰⁰ Pa	422.080	²⁷⁵ U	215.250	²⁵⁰ Np	84.730	²²⁵ Pu	36.970		
²⁵¹ Th	105.460	²²⁶ Pa	27.200	³⁰¹ Pa	427.650	²⁷⁶ U	221.230	²⁵¹ Np	87.980	²²⁶ Pu	36.550		
²⁵² Th	109.350	²²⁷ Pa	27.700	³⁰² Pa	436.690	²⁷⁷ U	229.480	²⁵² Np	92.320	²²⁷ Pu	37.730		
²⁵³ Th	114.930	²²⁸ Pa	29.680			²⁷⁸ U	235.780	²⁵³ Np	95.640	²²⁸ Pu	37.070		
²⁵⁴ Th	119.280	²²⁹ Pa	30.680	²⁰³ U	50.980	²⁷⁹ U	244.310	²⁵⁴ Np	100.130	²²⁹ Pu	38.200		
²⁵⁵ Th	125.150	²³⁰ Pa	32.920	²⁰⁴ U	47.380	²⁸⁰ U	250.570	²⁵⁵ Np	103.670	²³⁰ Pu	37.830		
²⁵⁶ Th	130.330	²³¹ Pa	34.150	²⁰⁵ U	45.740	²⁸¹ U	258.080	²⁵⁶ Np	108.580	²³¹ Pu	39.250		
²⁵⁷ Th	135.860	²³² Pa	36.680	²⁰⁶ U	42.440	²⁸² U	264.270	²⁵⁷ Np	112.590	²³² Pu	39.260		
²⁵⁸ Th	140.000	²³³ Pa	38.170	²⁰⁷ U	40.820	²⁸³ U	271.950	²⁵⁸ Np	117.650	²³³ Pu	40.920		
²⁵⁹ Th	145.590	²³⁴ Pa	40.950	²⁰⁸ U	37.660	²⁸⁴ U	278.450	²⁵⁹ Np	122.010	²³⁴ Pu	41.170		
²⁶⁰ Th	150.140	²³⁵ Pa	42.770	²⁰⁹ U	36.440	²⁸⁵ U	286.100	²⁶⁰ Np	127.110	²³⁵ Pu	43.130		
²⁶¹ Th	156.010	²³⁶ Pa	45.860	²¹⁰ U	33.170	²⁸⁶ U	292.620	²⁶¹ Np	131.320	²³⁶ Pu	43.710		
²⁶² Th	159.800	²³⁷ Pa	48.020	²¹¹ U	32.080	²⁸⁷ U	300.360	²⁶² Np	136.630	²³⁷ Pu	46.040		
²⁶³ Th	166.840	²³⁸ Pa	51.180	²¹² U	29.240	²⁸⁸ U	307.180	²⁶³ Np	141.010	²³⁸ Pu	47.020		
²⁶⁴ Th	171.770	²³⁹ Pa	53.560	²¹³ U	28.600	²⁸⁹ U	315.260	²⁶⁴ Np	146.240	²³⁹ Pu	49.510		
²⁶⁵ Th	178.000	²⁴⁰ Pa	57.120	²¹⁴ U	26.440	²⁹⁰ U	322.390	²⁶⁵ Np	149.880	²⁴⁰ Pu	50.810		
²⁶⁶ Th	182.510	²⁴¹ Pa	59.760	²¹⁵ U	25.970	²⁹¹ U	330.610	²⁶⁶ Np	156.140	²⁴¹ Pu	53.670		
²⁶⁷ Th	188.970	²⁴² Pa	63.610	²¹⁶ U	23.860	²⁹² U	337.610	²⁶⁷ Np	160.780	²⁴² Pu	55.230		
²⁶⁸ Th	194.330	²⁴³ Pa	66.340	²¹⁷ U	23.550	²⁹³ U	345.750	²⁶⁸ Np	166.400	²⁴³ Pu	58.310		
²⁶⁹ Th	201.200	²⁴⁴ Pa	70.640	²¹⁸ U	22.150	²⁹⁴ U	352.780	²⁶⁹ Np	170.650	²⁴⁴ Pu	60.120		
²⁷⁰ Th	206.610	²⁴⁵ Pa	74.150	²¹⁹ U	23.830	²⁹⁵ U	361.180	²⁷⁰ Np	176.490	²⁴⁵ Pu	63.280		
²⁷¹ Th	213.510	²⁴⁶ Pa	78.930	²²⁰ U	23.600	²⁹⁶ U	368.510	²⁷¹ Np	181.490	²⁴⁶ Pu	65.440		
²⁷² Th	219.260	²⁴⁷ Pa	82.350	²²¹ U	25.030	²⁹⁷ U	377.340	²⁷² Np	187.840	²⁴⁷ Pu	69.310		
²⁷³ Th	226.430	²⁴⁸ Pa	86.980	²²² U	25.100	²⁹⁸ U	385.410	²⁷³ Np	193.020	²⁴⁸ Pu	72.080		
²⁷⁴ Th	232.730	²⁴⁹ Pa	90.580	²²³ U	26.070	²⁹⁹ U	394.240	²⁷⁴ Np	199.320	²⁴⁹ Pu	76.280		
²⁷⁵ Th	241.290	²⁵⁰ Pa	95.310	²²⁴ U	26.150	³⁰⁰ U	402.030	²⁷⁵ Np	204.850	²⁵⁰ Pu	79.140		
²⁷⁶ Th	247.940	²⁵¹ Pa	98.970	²²⁵ U	28.010	³⁰¹ U	408.600	²⁷⁶ Np	211.300	²⁵¹ Pu	83.370		
²⁷⁷ Th	256.910	²⁵² Pa	103.830	²²⁶ U	28.240	³⁰² U	416.260	²⁷⁷ Np	217.270	²⁵² Pu	86.240		
²⁷⁸ Th	263.830	²⁵³ Pa	107.770	²²⁷ U	29.810	³⁰³ U	425.290	²⁷⁸ Np	225.190	²⁵³ Pu	90.580		
²⁷⁹ Th	272.200	²⁵⁴ Pa	112.950	²²⁸ U	29.950	³⁰⁴ U	435.570	²⁷⁹ Np	231.570	²⁵⁴ Pu	93.530		
²⁸⁰ Th	278.750	²⁵⁵ Pa	117.300	²²⁹ U	31.820	³⁰⁵ U	442.450	²⁸⁰ Np	238.920	²⁵⁵ Pu	98.000		
²⁸¹ Th	286.900	²⁵⁶ Pa	123.010	²³⁰ U	32.380			²⁸¹ Np	245.050	²⁵⁶ Pu	101.190		
²⁸² Th	293.720	²⁵⁷ Pa	127.220	²³¹ U	34.530	²⁰⁶ Np	55.250	²⁸² Np	252.240	²⁵⁷ Pu	106.090		
²⁸³ Th	301.670	²⁵⁸ Pa	133.350	²³² U	35.310	²⁰⁷ Np	51.910	²⁸³ Np	258.420	²⁵⁸ Pu	109.790		
²⁸⁴ Th	308.440	²⁵⁹ Pa	137.490	²³³ U	37.740	²⁰⁸ Np	50.160	²⁸⁴ Np	265.930	²⁵⁹ Pu	114.920		
²⁸⁵ Th	316.670	²⁶⁰ Pa	142.980	²³⁴ U	38.810	²⁰⁹ Np	46.940	²⁸⁵ Np	272.240	²⁶⁰ Pu	118.960		
²⁸⁶ Th	323.730	²⁶¹ Pa	147.370	²³⁵ U	41.580	²¹⁰ Np	45.360	²⁸⁶ Np	279.580	²⁶¹ Pu	124.080		
²⁸⁷ Th	332.240	²⁶² Pa	153.000	²³⁶ U	43.030	²¹¹ Np	42.300	²⁸⁷ Np	286.070	²⁶² Pu	127.770		
²⁸⁸ Th	339.430	²⁶³ Pa	156.770	²³⁷ U	46.080	²¹² Np	40.810	²⁸⁸ Np	293.610	²⁶³ Pu	133.340		
²⁸⁹ Th	348.140	²⁶⁴ Pa	163.510	²³⁸ U	47.860	²¹³ Np	37.980	²⁸⁹ Np	300.470	²⁶⁴ Pu	137.390		
²⁹⁰ Th	355.870	²⁶⁵ Pa	168.430	²³⁹ U	51.010	²¹⁴ Np	36.930	²⁹⁰ Np	308.520	²⁶⁵ Pu	142.600		
²⁹¹ Th	364.440	²⁶⁶ Pa	174.410	²⁴⁰ U	53.000	²¹⁵ Np	34.800	²⁹¹ Np	315.380	²⁶⁶ Pu	145.990		
²⁹² Th	371.820	²⁶⁷ Pa	178.850	²⁴¹ U	56.530	²¹⁶ Np	33.990	²⁹² Np	323.240	²⁶⁷ Pu	152.150		
²⁹³ Th	380.760	²⁶⁸ Pa	185.000	²⁴² U	58.780	²¹⁷ Np	31.950	²⁹³ Np	330.010	²⁶⁸ Pu	156.420		
²⁹⁴ Th	388.460	²⁶⁹ Pa	190.350	²⁴³ U	62.590	²¹⁸ Np	31.370	²⁹⁴ Np	337.870	²⁶⁹ Pu	162.060		
²⁹⁵ Th	397.380	²⁷⁰ Pa	196.900	²⁴⁴ U	64.980	²¹⁹ Np	29.830	²⁹⁵ Np	344.940	²⁷⁰ Pu	165.960		
²⁹⁶ Th	405.240	²⁷¹ Pa	202.320	²⁴⁵ U	69.230	²²⁰ Np	31.140	²⁹⁶ Np	352.940	²⁷¹ Pu	171.880		
²⁹⁷ Th	414.440	²⁷² Pa	208.910	²⁴⁶ U	72.390	²²¹ Np	30.810	²⁹⁷ Np	360.250	²⁷² Pu	176.540		
²⁹⁸ Th	422.450	²⁷³ Pa	214.680	²⁴⁷ U	77.120	²²² Np	32.740	²⁹⁸ Np	368.510	²⁷³ Pu	182.890		
²⁹⁹ Th	429.620	²⁷⁴ Pa	221.550	²⁴⁸ U	80.180	²²³ Np	31.020	²⁹⁹ Np	376.020	²⁷⁴ Pu	187.730		
		²⁷⁵ Pa	227.840	²⁴⁹ U	84.820	²²⁴ Np	32.250	³⁰⁰ Np	383.670	²⁷⁵ Pu	193.960		
²⁰⁰ Pa	47.700	²⁷⁶ Pa	236.080	²⁵⁰ U	88.070	²²⁵ Np	32.330	³⁰¹ Np	391.060	²⁷⁶ Pu	199.160		
²⁰¹ Pa	44.250	²⁷⁷ Pa	242.710	²⁵¹ U	92.740	²²⁶ Np	33.490	³⁰² Np	399.490	²⁷⁷ Pu	205.720		
²⁰² Pa	42.830	²⁷⁸ Pa	251.230	²⁵² U	96.050	²²⁷ Np	33.280	³⁰³ Np	407.130	²⁷⁸ Pu	211.370		
²⁰³ Pa	39.680	²⁷⁹ Pa	258.150	²⁵³ U	100.890	²²⁸ Np	34.450	³⁰⁴ Np	415.880	²⁷⁹ Pu	219.270		
²⁰⁴ Pa	38.030	²⁸⁰ Pa	265.730	²⁵⁴ U	104.490	²²⁹ Np	34.510	³⁰⁵ Np	426.150	²⁸⁰ Pu	225.250		
²⁰⁵ Pa	35.050	²⁸¹ Pa	272.370	²⁵⁵ U	109.690	²³⁰ Np	35.980	³⁰⁶ Np	432.760	²⁸¹ Pu	233.060		
²⁰⁶ Pa	33.490	²⁸² Pa	280.070	²⁵⁶ U	113.790	²³¹ Np	36.440	³⁰⁷ Np	440.820	²⁸² Pu	238.470		
²⁰⁷ Pa	30.690	²⁸³ Pa	286.740	²⁵⁷ U	119.100	²³² Np	38.150	³⁰⁸ Np	449.990	²⁸³ Pu	245.510		
²⁰⁸ Pa	29.300	²⁸⁴ Pa	294.350	²⁵⁸ U	123.380	²³³ Np	38.830			²⁸⁴ Pu	251.460		
²⁰⁹ Pa	26.470	²⁸⁵ Pa	301.210	²⁵⁹ U	128.790	²³⁴ Np	40.870			²⁸⁵ Pu	258.730		
²¹⁰ Pa													

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²⁸⁷ Pu	272.170	²⁶¹ Am	118.350	²³⁵ Cm	49.290	³¹⁰ Cm	410.740	²⁸⁴ Bk	220.070	²⁵⁸ Cf	93.530		
²⁸⁸ Pu	278.460	²⁶² Am	123.110	²³⁶ Cm	49.030	³¹¹ Cm	419.390	²⁸⁵ Bk	225.530	²⁵⁹ Cf	97.250		
²⁸⁹ Pu	286.340	²⁶³ Am	126.860	²³⁷ Cm	50.580	³¹² Cm	426.910	²⁸⁶ Bk	231.870	²⁶⁰ Cf	99.640		
²⁹⁰ Pu	292.770	²⁶⁴ Am	131.970	²³⁸ Cm	50.640	³¹³ Cm	435.590	²⁸⁷ Bk	237.150	²⁶¹ Cf	103.730		
²⁹¹ Pu	300.520	²⁶⁵ Am	136.260	²³⁹ Cm	52.510	³¹⁴ Cm	443.160	²⁸⁸ Bk	243.650	²⁶² Cf	106.790		
²⁹² Pu	306.800	²⁶⁶ Am	141.140	²⁴⁰ Cm	52.860	³¹⁵ Cm	452.170	²⁸⁹ Bk	249.180	²⁶³ Cf	111.320		
²⁹³ Pu	314.560	²⁶⁷ Am	144.610	²⁴¹ Cm	55.000	³¹⁶ Cm	459.970	²⁹⁰ Bk	255.820	²⁶⁴ Cf	114.480		
²⁹⁴ Pu	321.140	²⁶⁸ Am	150.320	²⁴² Cm	55.820	³¹⁷ Cm	468.900	²⁹¹ Bk	261.530	²⁶⁵ Cf	119.390		
²⁹⁵ Pu	328.940	²⁶⁹ Am	154.660	²⁴³ Cm	58.030	³¹⁸ Cm	476.850	²⁹² Bk	268.390	²⁶⁶ Cf	122.400		
²⁹⁶ Pu	335.630	²⁷⁰ Am	159.980	²⁴⁴ Cm	59.110			²⁹³ Bk	274.270	²⁶⁷ Cf	126.990		
²⁹⁷ Pu	343.730	²⁷¹ Am	163.900	²⁴⁵ Cm	61.720	²¹⁸ Bk	70.630	²⁹⁴ Bk	281.200	²⁶⁸ Cf	130.830		
²⁹⁸ Pu	350.570	²⁷² Am	169.420	²⁴⁶ Cm	63.050	²¹⁹ Bk	67.570	²⁹⁵ Bk	287.250	²⁶⁹ Cf	135.550		
²⁹⁹ Pu	358.980	²⁷³ Am	174.190	²⁴⁷ Cm	65.980	²²⁰ Bk	65.960	²⁹⁶ Bk	294.300	²⁷⁰ Cf	138.700		
³⁰⁰ Pu	365.700	²⁷⁴ Am	180.260	²⁴⁸ Cm	67.670	²²¹ Bk	63.150	²⁹⁷ Bk	300.450	²⁷¹ Cf	143.640		
³⁰¹ Pu	373.820	²⁷⁵ Am	185.120	²⁴⁹ Cm	71.140	²²² Bk	61.820	²⁹⁸ Bk	307.700	²⁷² Cf	147.260		
³⁰² Pu	380.900	²⁷⁶ Am	191.090	²⁵⁰ Cm	73.520	²²³ Bk	59.320	²⁹⁹ Bk	314.130	²⁷³ Cf	152.310		
³⁰³ Pu	389.340	²⁷⁷ Am	196.290	²⁵¹ Cm	77.330	²²⁴ Bk	59.840	³⁰⁰ Bk	321.410	²⁷⁴ Cf	155.850		
³⁰⁴ Pu	396.640	²⁷⁸ Am	202.560	²⁵² Cm	79.680	²²⁵ Bk	58.010	³⁰¹ Bk	328.020	²⁷⁵ Cf	161.020		
³⁰⁵ Pu	405.400	²⁷⁹ Am	208.240	²⁵³ Cm	83.690	²²⁶ Bk	59.350	³⁰² Bk	335.580	²⁷⁶ Cf	165.110		
³⁰⁶ Pu	413.000	²⁸⁰ Am	215.600	²⁵⁴ Cm	86.150	²²⁷ Bk	57.180	³⁰³ Bk	342.460	²⁷⁷ Cf	170.770		
³⁰⁷ Pu	421.910	²⁸¹ Am	221.610	²⁵⁵ Cm	90.090	²²⁸ Bk	57.010	³⁰⁴ Bk	350.190	²⁷⁸ Cf	175.010		
³⁰⁸ Pu	429.710	²⁸² Am	228.400	²⁵⁶ Cm	92.670	²²⁹ Bk	55.550	³⁰⁵ Bk	356.940	²⁷⁹ Cf	180.660		
³⁰⁹ Pu	438.700	²⁸³ Am	234.130	²⁵⁷ Cm	96.760	²³⁰ Bk	55.730	³⁰⁶ Bk	364.750	²⁸⁰ Cf	185.230		
³¹⁰ Pu	446.560	²⁸⁴ Am	240.920	²⁵⁸ Cm	99.580	²³¹ Bk	54.530	³⁰⁷ Bk	371.710	²⁸¹ Cf	191.240		
³¹¹ Pu	455.670	²⁸⁵ Am	246.770	²⁵⁹ Cm	104.100	²³² Bk	54.870	³⁰⁸ Bk	379.770	²⁸² Cf	196.290		
³¹² Pu	463.560	²⁸⁶ Am	253.690	²⁶⁰ Cm	107.470	²³³ Bk	54.000	³⁰⁹ Bk	387.030	²⁸³ Cf	203.240		
		²⁸⁷ Am	260.330	²⁶¹ Cm	112.270	²³⁴ Bk	54.580	³¹⁰ Bk	395.410	²⁸⁴ Cf	208.470		
²¹² Am	62.570	²⁸⁸ Am	266.860	²⁶² Cm	115.810	²³⁵ Bk	54.000	³¹¹ Bk	402.830	²⁸⁵ Cf	215.260		
²¹³ Am	59.170	²⁸⁹ Am	273.350	²⁶³ Cm	120.910	²³⁶ Bk	54.820	³¹² Bk	411.170	²⁸⁶ Cf	220.530		
²¹⁴ Am	57.720	²⁹⁰ Am	280.570	²⁶⁴ Cm	124.300	²³⁷ Bk	54.490	³¹³ Bk	418.680	²⁸⁷ Cf	226.850		
²¹⁵ Am	54.480	²⁹¹ Am	286.730	²⁶⁵ Cm	129.160	²³⁸ Bk	55.670	³¹⁴ Bk	427.050	²⁸⁸ Cf	231.770		
²¹⁶ Am	53.080	²⁹² Am	294.040	²⁶⁶ Cm	133.400	²³⁹ Bk	55.640	³¹⁵ Bk	434.610	²⁸⁹ Cf	238.260		
²¹⁷ Am	50.470	²⁹³ Am	300.390	²⁶⁷ Cm	138.290	²⁴⁰ Bk	56.960	³¹⁶ Bk	443.370	²⁹⁰ Cf	243.460		
²¹⁸ Am	49.280	²⁹⁴ Am	307.830	²⁶⁸ Cm	141.570	²⁴¹ Bk	57.390	³¹⁷ Bk	451.170	²⁹¹ Cf	250.080		
²¹⁹ Am	46.870	²⁹⁵ Am	314.370	²⁶⁹ Cm	147.110	²⁴² Bk	59.120	³¹⁸ Bk	459.800	²⁹² Cf	255.470		
²²⁰ Am	45.920	²⁹⁶ Am	321.900	²⁷⁰ Cm	151.110	²⁴³ Bk	59.680	³¹⁹ Bk	467.710	²⁹³ Cf	262.300		
²²¹ Am	43.890	²⁹⁷ Am	328.560	²⁷¹ Cm	156.410	²⁴⁴ Bk	61.650	³²⁰ Bk	476.610	²⁹⁴ Cf	267.870		
²²² Am	44.870	²⁹⁸ Am	336.340	²⁷² Cm	160.140	²⁴⁵ Bk	62.660	³²¹ Bk	484.750	²⁹⁵ Cf	274.820		
²²³ Am	43.950	²⁹⁹ Am	343.170	²⁷³ Cm	165.640	²⁴⁶ Bk	64.880			²⁹⁶ Cf	280.480		
²²⁴ Am	45.390	³⁰⁰ Am	351.040	²⁷⁴ Cm	170.080	²⁴⁷ Bk	66.150	²²¹ Cf	73.870	²⁹⁷ Cf	287.540		
²²⁵ Am	43.400	³⁰¹ Am	358.060	²⁷⁵ Cm	176.070	²⁴⁸ Bk	68.680	²²² Cf	70.630	²⁹⁸ Cf	293.360		
²²⁶ Am	44.070	³⁰² Am	365.970	²⁷⁶ Cm	180.610	²⁴⁹ Bk	70.320	²²³ Cf	69.250	²⁹⁹ Cf	300.550		
²²⁷ Am	43.300	³⁰³ Am	373.050	²⁷⁷ Cm	186.570	²⁵⁰ Bk	73.430	²²⁴ Cf	66.400	³⁰⁰ Cf	306.660		
²²⁸ Am	43.780	³⁰⁴ Am	381.190	²⁷⁸ Cm	191.440	²⁵¹ Bk	75.540	²²⁵ Cf	66.760	³⁰¹ Cf	314.020		
²²⁹ Am	43.030	³⁰⁵ Am	388.470	²⁷⁹ Cm	197.710	²⁵² Bk	79.250	²²⁶ Cf	64.690	³⁰² Cf	320.340		
²³⁰ Am	43.770	³⁰⁶ Am	396.950	²⁸⁰ Cm	203.050	²⁵³ Bk	81.560	²²⁷ Cf	65.910	³⁰³ Cf	327.820		
²³¹ Am	43.350	³⁰⁷ Am	404.550	²⁸¹ Cm	210.490	²⁵⁴ Bk	85.250	²²⁸ Cf	63.410	³⁰⁴ Cf	334.330		
²³² Am	44.380	³⁰⁸ Am	413.170	²⁸² Cm	216.130	²⁵⁵ Bk	87.680	²²⁹ Cf	63.260	³⁰⁵ Cf	342.120		
²³³ Am	44.270	³⁰⁹ Am	420.900	²⁸³ Cm	223.450	²⁵⁶ Bk	91.270	²³⁰ Cf	61.470	³⁰⁶ Cf	348.740		
²³⁴ Am	45.530	³¹⁰ Am	429.570	²⁸⁴ Cm	229.240	²⁵⁷ Bk	93.820	²³¹ Cf	61.560	³⁰⁷ Cf	356.500		
²³⁵ Am	45.690	³¹¹ Am	437.480	²⁸⁵ Cm	235.950	²⁵⁸ Bk	97.570	²³² Cf	60.010	³⁰⁸ Cf	363.200		
²³⁶ Am	47.260	³¹² Am	446.150	²⁸⁶ Cm	241.210	²⁵⁹ Bk	100.360	²³³ Cf	60.390	³⁰⁹ Cf	371.220		
²³⁷ Am	47.750	³¹³ Am	454.030	²⁸⁷ Cm	248.030	²⁶⁰ Bk	104.530	²³⁴ Cf	59.110	³¹⁰ Cf	378.200		
²³⁸ Am	49.680	³¹⁴ Am	463.020	²⁸⁸ Cm	253.570	²⁶¹ Bk	107.880	²³⁵ Cf	59.660	³¹¹ Cf	386.510		
²³⁹ Am	50.600	³¹⁵ Am	471.100	²⁸⁹ Cm	260.580	²⁶² Bk	112.400	²³⁶ Cf	58.680	³¹² Cf	393.620		
²⁴⁰ Am	52.690			²⁹⁰ Cm	266.300	²⁶³ Bk	115.870	²³⁷ Cf	59.460	³¹³ Cf	401.930		
²⁴¹ Am	53.920	²¹⁵ Cm	65.570	²⁹¹ Cm	273.460	²⁶⁴ Bk	120.770	²³⁸ Cf	58.740	³¹⁴ Cf	409.120		
²⁴² Am	56.390	²¹⁶ Cm	62.220	²⁹² Cm	279.350	²⁶⁵ Bk	124.180	²³⁹ Cf	59.880	³¹⁵ Cf	417.440		
²⁴³ Am	57.900	²¹⁷ Cm	60.770	²⁹³ Cm	286.660	²⁶⁶ Bk	128.720	²⁴⁰ Cf	59.430	³¹⁶ Cf	424.940		
²⁴⁴ Am	60.600	²¹⁸ Cm	57.720	²⁹⁴ Cm	292.690	²⁶⁷ Bk	132.880	²⁴¹ Cf	60.680	³¹⁷ Cf	433.460		
²⁴⁵ Am	62.380	²¹⁹ Cm	56.500	²⁹⁵ Cm	300.100	²⁶⁸ Bk	137.640	²⁴² Cf	60.680	³¹⁸ Cf	440.910		
²⁴⁶ Am	65.170	²²⁰ Cm	53.670	²⁹⁶ Cm	306.320	²⁶⁹ Bk	140.950	²⁴³ Cf	62.170	³¹⁹ Cf	449.530		
²⁴⁷ Am	67.320	²²¹ Cm	52.600	²⁹⁷ Cm	313.890	²⁷⁰ Bk	146.100	²⁴⁴ Cf	62.480	³²⁰ Cf	457.190		
²⁴⁸ Am	70.810	²²² Cm	50.260	²⁹⁸ Cm	320.330	²⁷¹ Bk	150.060	²⁴⁵ Cf	64.400	³²¹ Cf	466.020		
²⁴⁹ Am	73.570	²²³ Cm	51.070	²⁹⁹ Cm	327.920	²⁷² Bk	155.080	²⁴⁶ Cf	65.000	³²² Cf	473.870		
²⁵⁰ Am	77.430	²²⁴ Cm	49.580	³⁰⁰ Cm	334.530	²⁷³ Bk	158.870	²⁴⁷ Cf	67.150	³²³ Cf	482.890		
²⁵¹ Am	80.270	²²⁵ Cm	51.270	³⁰¹ Cm	342.360	²⁷⁴ Bk	164.040	²⁴⁸ Cf	68.010	³²⁴ Cf	493.730		
²⁵² Am	84.140	²²⁶ Cm	48.890	³⁰² Cm	349.090	²⁷⁵ Bk	168.490	²⁴⁹ Cf	70.480	³²⁵ Cf	502.230		
²⁵³ Am	86.980	²²⁷ Cm	49.640	³⁰³ Cm	357.080	²⁷⁶ Bk	174.220	²⁵⁰ Cf	71.590				
²⁵⁴ Am	90.940	²²⁸ Cm	48.410	³⁰⁴ Cm	363.850	²⁷⁷ Bk	178.750	²⁵¹ Cf	74.770	²²⁴ Es	79.070		
²⁵⁵ Am	93.890	²²⁹ Cm	48.880	³⁰⁵ Cm	371.990	²⁷⁸ Bk	184.410	²⁵² Cf	76.520	²²⁵ Es	76.210		
²⁵⁶ Am	98.050	²³⁰ Cm	47.730	³⁰⁶ Cm	378.960	²⁷⁹ Bk	189.310	²⁵³ Cf	80.180	²²⁶ Es	76.160		
²⁵⁷ Am	101.220	²³¹ Cm	48.450	³⁰⁷ Cm	387.440	²⁸⁰ Bk	195.320	²⁵⁴ Cf	82.120	²²⁷ Es	73.850		
²⁵⁸ Am	105.780	²³² Cm	47.600	³⁰⁸ Cm	394.710	²⁸¹ Bk	200.670	²⁵⁵ Cf	85.570	²²⁸ Es	7		

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
²³¹ Es	69.450	³⁰⁶ Es	336.110	²⁷⁸ Fm	161.680	²⁵⁰ Md	79.740	³²⁵ Md	447.540	²⁹⁷ No	245.630		
²³² Es	69.170	³⁰⁷ Es	342.710	²⁷⁹ Fm	166.940	²⁵¹ Md	80.010	³²⁶ Md	455.950	²⁹⁸ No	250.500		
²³³ Es	67.650	³⁰⁸ Es	350.200	²⁸⁰ Fm	170.900	²⁵² Md	81.480	³²⁷ Md	463.670	²⁹⁹ No	256.710		
²³⁴ Es	67.590	³⁰⁹ Es	356.920	²⁸¹ Fm	176.230	²⁵³ Md	82.200	³²⁸ Md	474.760	³⁰⁰ No	261.690		
²³⁵ Es	66.280	³¹⁰ Es	364.610	²⁸² Fm	180.620	²⁵⁴ Md	84.580	³²⁹ Md	481.530	³⁰¹ No	268.010		
²³⁶ Es	66.470	³¹¹ Es	371.570	²⁸³ Fm	186.250	²⁵⁵ Md	85.820	³³⁰ Md	489.990	³⁰² No	273.130		
²³⁷ Es	65.410	³¹² Es	379.480	²⁸⁴ Fm	190.930	²⁵⁶ Md	88.360	³³¹ Md	497.710	³⁰³ No	279.620		
²³⁸ Es	65.820	³¹³ Es	386.500	²⁸⁵ Fm	197.370	²⁵⁷ Md	90.120	³³² Md	506.670	³⁰⁴ No	285.070		
²³⁹ Es	65.000	³¹⁴ Es	394.590	²⁸⁶ Fm	202.710	²⁵⁸ Md	92.690	³³³ Md	514.560	³⁰⁵ No	291.860		
²⁴⁰ Es	65.730	³¹⁵ Es	401.750	²⁸⁷ Fm	208.740	²⁵⁹ Md	94.300	³³⁴ Md	523.450	³⁰⁶ No	297.560		
²⁴¹ Es	65.200	³¹⁶ Es	409.770	²⁸⁸ Fm	213.670	²⁶⁰ Md	97.020			³⁰⁷ No	304.780		
²⁴² Es	66.190	³¹⁷ Es	417.290	²⁸⁹ Fm	219.650	²⁶¹ Md	98.840	²³² No	96.920	³⁰⁸ No	310.840		
²⁴³ Es	66.140	³¹⁸ Es	425.540	²⁹⁰ Fm	224.230	²⁶² Md	101.780	²³³ No	95.290	³⁰⁹ No	318.060		
²⁴⁴ Es	67.200	³¹⁹ Es	432.970	²⁹¹ Fm	230.370	²⁶³ Md	103.710	²³⁴ No	92.650	³¹⁰ No	324.100		
²⁴⁵ Es	67.450	³²⁰ Es	441.270	²⁹² Fm	235.240	²⁶⁴ Md	107.100	²³⁵ No	91.870	³¹¹ No	331.430		
²⁴⁶ Es	68.970	³²¹ Es	448.880	²⁹³ Fm	241.510	²⁶⁵ Md	109.690	²³⁶ No	89.500	³¹² No	337.560		
²⁴⁷ Es	69.500	³²² Es	457.450	²⁹⁴ Fm	246.560	²⁶⁶ Md	113.630	²³⁷ No	89.040	³¹³ No	344.960		
²⁴⁸ Es	71.260	³²³ Es	465.270	²⁹⁵ Fm	253.050	²⁶⁷ Md	116.390	²³⁸ No	87.040	³¹⁴ No	351.020		
²⁴⁹ Es	72.040	³²⁴ Es	473.990	²⁹⁶ Fm	258.250	²⁶⁸ Md	120.510	²³⁹ No	86.970	³¹⁵ No	358.470		
²⁵⁰ Es	73.950	³²⁵ Es	481.990	²⁹⁷ Fm	264.820	²⁶⁹ Md	123.600	²⁴⁰ No	85.130	³¹⁶ No	364.740		
²⁵¹ Es	75.170	³²⁶ Es	493.330	²⁹⁸ Fm	270.190	²⁷⁰ Md	127.540	²⁴¹ No	85.160	³¹⁷ No	372.410		
²⁵² Es	78.010	³²⁷ Es	500.390	²⁹⁹ Fm	276.860	²⁷¹ Md	130.540	²⁴² No	83.600	³¹⁸ No	378.860		
²⁵³ Es	79.710	³²⁸ Es	509.120	³⁰⁰ Fm	282.300	²⁷² Md	135.020	²⁴³ No	83.890	³¹⁹ No	386.540		
²⁵⁴ Es	83.000			³⁰¹ Fm	289.160	²⁷³ Md	137.990	²⁴⁴ No	82.550	³²⁰ No	393.110		
²⁵⁵ Es	84.920	²²⁶ Fm	83.920	³⁰² Fm	294.950	²⁷⁴ Md	142.240	²⁴⁵ No	83.070	³²¹ No	401.170		
²⁵⁶ Es	87.990	²²⁷ Fm	83.800	³⁰³ Fm	301.930	²⁷⁵ Md	145.490	²⁴⁶ No	82.170	³²² No	407.740		
²⁵⁷ Es	90.070	²²⁸ Fm	81.330	³⁰⁴ Fm	307.940	²⁷⁶ Md	149.840	²⁴⁷ No	82.980	³²³ No	415.940		
²⁵⁸ Es	93.390	²²⁹ Fm	82.020	³⁰⁵ Fm	315.500	²⁷⁷ Md	153.510	²⁴⁸ No	82.120	³²⁴ No	422.820		
²⁵⁹ Es	95.530	²³⁰ Fm	78.870	³⁰⁶ Fm	321.490	²⁷⁸ Md	157.880	²⁴⁹ No	83.150	³²⁵ No	431.090		
²⁶⁰ Es	98.850	²³¹ Fm	78.270	³⁰⁷ Fm	329.150	²⁷⁹ Md	161.620	²⁵⁰ No	82.780	³²⁶ No	438.380		
²⁶¹ Es	101.220	²³² Fm	76.070	³⁰⁸ Fm	335.470	²⁸⁰ Md	166.580	²⁵¹ No	84.060	³²⁷ No	446.760		
²⁶² Es	105.010	²³³ Fm	75.730	³⁰⁹ Fm	342.950	²⁸¹ Md	170.530	²⁵² No	83.880	³²⁸ No	454.160		
²⁶³ Es	107.960	²³⁴ Fm	73.830	³¹⁰ Fm	349.380	²⁸² Md	175.570	²⁵³ No	85.430	³²⁹ No	465.080		
²⁶⁴ Es	112.210	²³⁵ Fm	73.850	³¹¹ Fm	357.050	²⁸³ Md	179.980	²⁵⁴ No	85.580	³³⁰ No	471.610		
²⁶⁵ Es	115.330	²³⁶ Fm	72.170	³¹² Fm	363.670	²⁸⁴ Md	185.280	²⁵⁵ No	87.970	³³¹ No	480.110		
²⁶⁶ Es	120.050	²³⁷ Fm	72.360	³¹³ Fm	371.710	²⁸⁵ Md	189.910	²⁵⁶ No	88.750	³³² No	487.500		
²⁶⁷ Es	123.040	²³⁸ Fm	70.890	³¹⁴ Fm	378.230	²⁸⁶ Md	196.500	²⁵⁷ No	91.260	³³³ No	496.490		
²⁶⁸ Es	127.330	²³⁹ Fm	71.280	³¹⁵ Fm	386.270	²⁸⁷ Md	200.840	²⁵⁸ No	92.580	³³⁴ No	504.170		
²⁶⁹ Es	131.030	²⁴⁰ Fm	70.150	³¹⁶ Fm	393.080	²⁸⁸ Md	206.890	²⁵⁹ No	95.090	³³⁵ No	513.010		
²⁷⁰ Es	135.440	²⁴¹ Fm	70.840	³¹⁷ Fm	401.320	²⁸⁹ Md	211.760	²⁶⁰ No	96.300	³³⁶ No	520.820		
²⁷¹ Es	138.970	²⁴² Fm	69.920	³¹⁸ Fm	408.250	²⁹⁰ Md	217.430	²⁶¹ No	99.050	³³⁷ No	529.610		
²⁷² Es	143.400	²⁴³ Fm	70.860	³¹⁹ Fm	416.440	²⁹¹ Md	221.980	²⁶² No	100.340	³³⁸ No	537.500		
²⁷³ Es	147.010	²⁴⁴ Fm	70.400	³²⁰ Fm	423.590	²⁹² Md	227.800	²⁶³ No	103.210				
²⁷⁴ Es	151.710	²⁴⁵ Fm	71.390	³²¹ Fm	431.880	²⁹³ Md	232.630	²⁶⁴ No	104.750	²³⁵ Lr	102.440		
²⁷⁵ Es	155.700	²⁴⁶ Fm	71.240	³²² Fm	439.210	²⁹⁴ Md	238.610	²⁶⁵ No	108.100	²³⁶ Lr	101.270		
²⁷⁶ Es	160.200	²⁴⁷ Fm	72.700	³²³ Fm	447.740	²⁹⁵ Md	243.630	²⁶⁶ No	110.330	²³⁷ Lr	98.860		
²⁷⁷ Es	164.290	²⁴⁸ Fm	72.830	³²⁴ Fm	455.280	²⁹⁶ Md	249.800	²⁶⁷ No	114.260	²³⁸ Lr	98.020		
²⁷⁸ Es	169.620	²⁴⁹ Fm	74.530	³²⁵ Fm	463.970	²⁹⁷ Md	254.980	²⁶⁸ No	116.670	²³⁹ Lr	95.920		
²⁷⁹ Es	173.900	²⁵⁰ Fm	74.890	³²⁶ Fm	471.700	²⁹⁸ Md	261.230	²⁶⁹ No	120.680	²⁴⁰ Lr	95.370		
²⁸⁰ Es	179.250	²⁵¹ Fm	76.720	³²⁷ Fm	482.910	²⁹⁹ Md	266.540	²⁷⁰ No	123.470	²⁴¹ Lr	93.630		
²⁸¹ Es	183.910	²⁵² Fm	77.540	³²⁸ Fm	489.680	³⁰⁰ Md	272.900	²⁷¹ No	127.380	²⁴² Lr	93.360		
²⁸² Es	189.550	²⁵³ Fm	80.330	³²⁹ Fm	498.430	³⁰¹ Md	278.320	²⁷² No	130.060	²⁴³ Lr	91.790		
²⁸³ Es	194.580	²⁵⁴ Fm	81.620	³³⁰ Fm	506.120	³⁰² Md	284.840	²⁷³ No	134.470	²⁴⁴ Lr	91.670		
²⁸⁴ Es	200.960	²⁵⁵ Fm	84.600	³³¹ Fm	515.370	³⁰³ Md	290.570	²⁷⁴ No	137.140	²⁴⁵ Lr	90.330		
²⁸⁵ Es	206.230	²⁵⁶ Fm	86.390			³⁰⁴ Md	297.350	²⁷⁵ No	141.340	²⁴⁶ Lr	90.480		
²⁸⁶ Es	213.030	²⁵⁷ Fm	89.410	²²⁹ Md	91.230	³⁰⁵ Md	303.360	²⁷⁶ No	144.250	²⁴⁷ Lr	89.500		
²⁸⁷ Es	217.700	²⁵⁸ Fm	91.080	²³⁰ Md	91.590	³⁰⁶ Md	310.610	²⁷⁷ No	148.570	²⁴⁸ Lr	89.930		
²⁸⁸ Es	223.700	²⁵⁹ Fm	94.190	²³¹ Md	88.340	³⁰⁷ Md	316.650	²⁷⁸ No	151.930	²⁴⁹ Lr	89.030		
²⁸⁹ Es	228.660	²⁶⁰ Fm	96.050	²³² Md	87.310	³⁰⁸ Md	323.840	²⁷⁹ No	156.430	²⁵⁰ Lr	89.650		
²⁹⁰ Es	234.830	²⁶¹ Fm	99.350	²³³ Md	85.060	³⁰⁹ Md	330.190	²⁸⁰ No	159.820	²⁵¹ Lr	89.190		
²⁹¹ Es	239.960	²⁶² Fm	101.340	²³⁴ Md	84.320	³¹⁰ Md	337.550	²⁸¹ No	164.660	²⁵² Lr	90.090		
²⁹² Es	246.290	²⁶³ Fm	105.080	²³⁵ Md	82.330	³¹¹ Md	343.950	²⁸² No	168.280	²⁵³ Lr	89.810		
²⁹³ Es	251.670	²⁶⁴ Fm	107.680	²³⁶ Md	82.000	³¹² Md	351.320	²⁸³ No	173.370	²⁵⁴ Lr	90.970		
²⁹⁴ Es	258.140	²⁶⁵ Fm	111.950	²³⁷ Md	80.340	³¹³ Md	358.040	²⁸⁴ No	177.360	²⁵⁵ Lr	91.070		
²⁹⁵ Es	263.690	²⁶⁶ Fm	114.730	²³⁸ Md	80.170	³¹⁴ Md	365.510	²⁸⁵ No	182.730	²⁵⁶ Lr	93.070		
²⁹⁶ Es	270.280	²⁶⁷ Fm	119.410	²³⁹ Md	78.790	³¹⁵ Md	372.110	²⁸⁶ No	187.050	²⁵⁷ Lr	93.750		
²⁹⁷ Es	275.960	²⁶⁸ Fm	122.120	²⁴⁰ Md	78.790	³¹⁶ Md	379.820	²⁸⁷ No	193.070	²⁵⁸ Lr	95.870		
²⁹⁸ Es	282.670	²⁶⁹ Fm	126.380	²⁴¹ Md	77.540	³¹⁷ Md	386.620	²⁸⁸ No	197.690	²⁵⁹ Lr	97.070		
²⁹⁹ Es	288.490	²⁷⁰ Fm	129.720	²⁴² Md	77.840	³¹⁸ Md	394.280	²⁸⁹ No	203.760	²⁶⁰ Lr	99.230		
³⁰⁰ Es	295.330	²⁷¹ Fm	134.140	²⁴³ Md	76.900	³¹⁹ Md	401.470	²⁹⁰ No	209.960	²⁶¹ Lr	100.340		
³⁰¹ Es	301.410	²⁷² Fm	137.320	²⁴⁴ Md	77.460	³²⁰ Md	409.320	²⁹¹ No	214.250	²⁶² Lr	102.740		
³⁰² Es	308.480	²⁷³ Fm	141.710	²⁴⁵ Md	76.940	³²¹ Md	416.490	²⁹² No	218.530	²⁶³ Lr	103.950		
³⁰³ Es	314.790	²⁷⁴ Fm	144.990	²⁴⁶ Md	77.810	³²² Md	424.460	²⁹³ No	224.330	²⁶⁴ Lr	106.480		
³⁰⁴ Es	322.100	²⁷⁵ Fm	149.660	²⁴⁷ Md	77.330	³²³ Md	431.770	²⁹⁴ No	228.800	²⁶⁵ Lr	107.970		
³⁰⁵ Es	328.570	²⁷⁶ Fm	153.										

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess				
268	Lr	116.690	241	Rf	103.010	316	Rf	339.790	292	Ha	200.060	271	Sg	123.940	253	Ns	117.340
269	Lr	119.130	242	Rf	100.970	317	Rf	346.920	293	Ha	204.530	272	Sg	125.750	254	Ns	117.120
270	Lr	122.920	243	Rf	100.690	318	Rf	352.980	294	Ha	210.280	273	Sg	129.160	255	Ns	115.660
271	Lr	125.700	244	Rf	98.730	319	Rf	360.190	295	Ha	214.120	274	Sg	131.290	256	Ns	115.710
272	Lr	129.240	245	Rf	98.590	320	Rf	366.390	296	Ha	219.270	275	Sg	134.450	257	Ns	114.470
273	Lr	131.850	246	Rf	96.860	321	Rf	373.710	297	Ha	223.410	276	Sg	136.390	258	Ns	114.750
274	Lr	135.850	247	Rf	97.000	322	Rf	379.990	298	Ha	228.730	277	Sg	140.120	259	Ns	114.020
275	Lr	138.550	248	Rf	95.620	323	Rf	387.500	299	Ha	233.050	278	Sg	141.990	260	Ns	115.010
276	Lr	142.610	249	Rf	96.000	324	Rf	393.990	300	Ha	238.530	279	Sg	145.300	261	Ns	114.820
277	Lr	145.500	250	Rf	94.710	325	Rf	401.690	301	Ha	243.000	280	Sg	147.430	262	Ns	115.990
278	Lr	149.490	251	Rf	95.290	326	Rf	408.410	302	Ha	248.540	281	Sg	151.030	263	Ns	116.120
279	Lr	152.840	252	Rf	94.440	327	Rf	416.350	303	Ha	253.130	282	Sg	153.690	264	Ns	117.470
280	Lr	157.120	253	Rf	95.250	328	Rf	423.310	304	Ha	258.840	283	Sg	157.850	265	Ns	117.670
281	Lr	160.480	254	Rf	94.580	329	Rf	431.390	305	Ha	263.520	284	Sg	160.440	266	Ns	119.040
282	Lr	165.020	255	Rf	95.560	330	Rf	438.460	306	Ha	269.370	285	Sg	164.530	267	Ns	119.370
283	Lr	168.640	256	Rf	95.410	331	Rf	448.830	307	Ha	274.480	286	Sg	167.560	268	Ns	121.000
284	Lr	173.410	257	Rf	97.280	332	Rf	455.080	308	Ha	280.720	287	Sg	171.950	269	Ns	121.610
285	Lr	177.430	258	Rf	97.610	333	Rf	463.310	309	Ha	286.010	288	Sg	175.230	270	Ns	123.820
286	Lr	182.420	259	Rf	99.660	334	Rf	470.460	310	Ha	292.470	289	Sg	179.900	271	Ns	125.230
287	Lr	186.750	260	Rf	100.430	335	Rf	479.140	311	Ha	298.100	290	Sg	183.640	272	Ns	128.090
288	Lr	192.360	261	Rf	102.490	336	Rf	486.590	312	Ha	304.730	291	Sg	189.570	273	Ns	129.860
289	Lr	196.940	262	Rf	103.230	337	Rf	495.150	313	Ha	310.400	292	Sg	193.110	274	Ns	132.910
290	Lr	204.100	263	Rf	105.420	338	Rf	502.700	314	Ha	317.110	293	Sg	198.560	275	Ns	135.110
291	Lr	209.020	264	Rf	106.350	339	Rf	511.330	315	Ha	322.820	294	Sg	202.770	276	Ns	137.950
292	Lr	212.960	265	Rf	108.780	241	Ha	113.360	316	Ha	329.590	295	Sg	208.240	277	Ns	139.790
293	Lr	217.180	266	Rf	109.840	242	Ha	112.350	317	Ha	335.490	296	Sg	212.450	278	Ns	143.240
294	Lr	222.660	267	Rf	112.790	243	Ha	110.290	318	Ha	342.360	297	Sg	217.650	279	Ns	145.080
295	Lr	227.140	268	Rf	114.640	244	Ha	109.660	319	Ha	348.350	298	Sg	221.410	280	Ns	148.060
296	Lr	232.820	269	Rf	118.190	245	Ha	107.670	320	Ha	355.530	299	Sg	226.710	281	Ns	150.180
297	Lr	237.510	270	Rf	120.310	246	Ha	107.170	321	Ha	361.530	300	Sg	230.730	282	Ns	153.430
298	Lr	243.290	271	Rf	124.070	247	Ha	105.410	322	Ha	368.680	301	Sg	236.160	283	Ns	156.100
299	Lr	248.130	272	Rf	126.520	248	Ha	105.140	323	Ha	374.910	302	Sg	240.290	284	Ns	159.830
300	Lr	254.070	273	Rf	130.020	249	Ha	103.710	324	Ha	382.120	303	Sg	245.850	285	Ns	162.580
301	Lr	258.940	274	Rf	132.310	250	Ha	103.720	325	Ha	388.610	304	Sg	250.100	286	Ns	166.290
302	Lr	264.990	275	Rf	136.390	251	Ha	102.390	326	Ha	395.980	305	Sg	255.730	287	Ns	169.350
303	Lr	270.030	276	Rf	138.680	252	Ha	102.570	327	Ha	402.690	306	Sg	260.100	288	Ns	173.390
304	Lr	276.210	277	Rf	142.510	253	Ha	101.620	328	Ha	410.420	307	Sg	266.010	289	Ns	176.630
305	Lr	281.570	278	Rf	145.040	254	Ha	102.110	329	Ha	417.290	308	Sg	270.700	290	Ns	181.000
306	Lr	288.060	279	Rf	149.020	255	Ha	101.310	330	Ha	425.050	309	Sg	276.940	291	Ns	184.720
307	Lr	293.810	280	Rf	152.020	256	Ha	101.920	331	Ha	432.110	310	Sg	281.920	292	Ns	189.950
308	Lr	300.730	281	Rf	156.400	257	Ha	101.690	332	Ha	442.130	311	Sg	288.400	293	Ns	193.890
309	Lr	306.620	282	Rf	159.420	258	Ha	103.150	333	Ha	448.440	312	Sg	293.670	294	Ns	199.040
310	Lr	313.550	283	Rf	163.880	259	Ha	103.420	334	Ha	456.390	313	Sg	300.250	295	Ns	203.230
311	Lr	319.560	284	Rf	167.270	260	Ha	105.030	335	Ha	463.560	314	Sg	305.640	296	Ns	208.410
312	Lr	326.630	285	Rf	171.970	261	Ha	105.720	336	Ha	471.970	315	Sg	312.280	297	Ns	212.940
313	Lr	332.700	286	Rf	175.560	262	Ha	107.430	337	Ha	479.440	316	Sg	317.720	298	Ns	217.740
314	Lr	339.870	287	Rf	180.630	263	Ha	108.100	338	Ha	487.700	317	Sg	324.440	299	Ns	221.510
315	Lr	346.130	288	Rf	184.660	264	Ha	109.920	339	Ha	495.260	318	Sg	330.030	300	Ns	226.490
316	Lr	353.250	289	Rf	190.330	265	Ha	110.680	244	Sg	118.180	319	Sg	336.950	301	Ns	230.510
317	Lr	359.480	290	Rf	195.070	266	Ha	112.860	245	Sg	117.740	320	Sg	342.800	302	Ns	235.610
318	Lr	366.850	291	Rf	201.590	267	Ha	113.800	246	Sg	115.410	321	Sg	350.020	303	Ns	239.750
319	Lr	373.230	292	Rf	204.850	268	Ha	116.410	247	Sg	114.850	322	Sg	355.890	304	Ns	244.960
320	Lr	380.600	293	Rf	210.720	269	Ha	118.280	248	Sg	112.730	323	Sg	363.220	305	Ns	249.160
321	Lr	387.150	294	Rf	214.600	270	Ha	121.460	249	Sg	112.450	324	Sg	368.880	306	Ns	254.500
322	Lr	394.670	295	Rf	220.050	271	Ha	123.590	250	Sg	110.620	325	Sg	375.900	307	Ns	258.870
323	Lr	401.460	296	Rf	224.230	272	Ha	127.010	251	Sg	110.600	326	Sg	382.110	308	Ns	264.410
324	Lr	409.170	297	Rf	229.890	273	Ha	129.550	252	Sg	108.860	327	Sg	389.470	309	Ns	269.100
325	Lr	416.220	298	Rf	234.210	274	Ha	132.720	253	Sg	109.000	328	Sg	395.990	310	Ns	275.040
326	Lr	424.190	299	Rf	240.010	275	Ha	134.980	254	Sg	107.660	329	Sg	403.570	311	Ns	280.030
327	Lr	431.440	300	Rf	244.510	276	Ha	138.570	255	Sg	108.000	330	Sg	410.120	312	Ns	286.170
328	Lr	439.540	301	Rf	250.360	277	Ha	141.010	256	Sg	106.790	331	Sg	417.870	313	Ns	291.410
329	Lr	446.930	302	Rf	254.990	278	Ha	144.510	257	Sg	107.470	332	Sg	426.910	314	Ns	297.670
330	Lr	457.690	303	Rf	261.000	279	Ha	147.010	258	Sg	106.870	333	Sg	434.080	315	Ns	303.030
331	Lr	464.240	304	Rf	265.690	280	Ha	150.660	259	Sg	108.140	334	Sg	440.010	316	Ns	309.350
332	Lr	472.450	305	Rf	271.910	281	Ha	153.630	260	Sg	108.100	335	Sg	448.020	317	Ns	314.750
333	Lr	479.860	306	Rf	276.940	282	Ha	157.840	261	Sg	109.680	336	Sg	454.910	318	Ns	321.160
334	Lr	488.540	307	Rf	283.460	283	Ha	160.860	262	Sg	109.990	337	Sg	463.180	319	Ns	326.720
335	Lr	496.230	308	Rf	288.910	284	Ha	164.960	263	Sg	111.630	338	Sg	470.590	320	Ns	333.330
336	Lr	504.880	309	Rf	295.670	285	Ha	168.190	264	Sg	111.900	339	Sg	478.940	321	Ns	339.200
337	Lr	512.550	310	Rf	301.270	286	Ha	172.800	265	Sg	113.640	247	Ns	124.910	322	Ns	346.190
338	Lr	521.120	311	Rf	308.240	287	Ha	176.400	266	Sg	114.040	248	Ns	124.250	323	Ns	352.040
339	Lr	529.010	312	Rf	313.950	288	Ha	181.120	267	Sg	116.060	249	Ns	122.080	324	Ns	359.090
238	Rf	106.910	313	Rf	320.990	289	Ha	185.100	268	Sg	116.750	250	Ns	121.430	325	Ns	365.000
239	Rf	105.910	314	Rf	326.760	290	Ha	191.040	269	Sg	119.300	251	Ns	119.410	326	Ns	371.480
240	Rf	103.570	315	Rf	333.830	291	Ha	195.220	270	Sg	120.750	252	Ns	118.980	327	Ns	377.700

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess
³²⁸ Ns	384.770	³¹³ Hs	283.130	³⁰¹ Mt	221.370	²⁹² 110	178.850	²⁸⁶ 111	163.830	²⁸³ 112	160.290
³²⁹ Ns	391.250	³¹⁴ Hs	288.100	³⁰² Mt	226.050	²⁹³ 110	182.900	²⁸⁷ 111	165.640	²⁸⁴ 112	161.060
³³⁰ Ns	398.510	³¹⁵ Hs	294.340	³⁰³ Mt	229.680	²⁹⁴ 110	185.980	²⁸⁸ 111	168.580	²⁸⁵ 112	163.310
³³¹ Ns	405.050	³¹⁶ Hs	299.400	³⁰⁴ Mt	234.450	²⁹⁵ 110	191.210	²⁸⁹ 111	170.210	²⁸⁶ 112	164.350
³³² Ns	412.480	³¹⁷ Hs	305.640	³⁰⁵ Mt	238.250	²⁹⁶ 110	194.430	²⁹⁰ 111	173.220	²⁸⁷ 112	166.860
³³³ Ns	421.210	³¹⁸ Hs	310.790	³⁰⁶ Mt	243.170	²⁹⁷ 110	199.740	²⁹¹ 111	175.560	²⁸⁸ 112	168.120
³³⁴ Ns	428.080	³¹⁹ Hs	317.130	³⁰⁷ Mt	247.070	²⁹⁸ 110	203.520	²⁹² 111	178.910	²⁸⁹ 112	170.830
³³⁵ Ns	433.990	³²⁰ Hs	322.540	³⁰⁸ Mt	252.090	²⁹⁹ 110	208.530	²⁹³ 111	181.590	²⁹⁰ 112	172.140
³³⁶ Ns	441.740	³²¹ Hs	329.050	³⁰⁹ Mt	256.220	³⁰⁰ 110	212.810	²⁹⁴ 111	185.360	²⁹¹ 112	175.140
³³⁷ Ns	448.650	³²² Hs	334.640	³¹⁰ Mt	261.370	³⁰¹ 110	217.400	²⁹⁵ 111	188.410	²⁹² 112	177.130
³³⁸ Ns	456.650	³²³ Hs	341.530	³¹¹ Mt	265.850	³⁰² 110	221.170	²⁹⁶ 111	193.270	²⁹³ 112	180.430
³³⁹ Ns	464.140	³²⁴ Hs	347.380	³¹² Mt	271.490	³⁰³ 110	225.680	²⁹⁷ 111	196.510	²⁹⁴ 112	182.800
²⁵⁰ Hs	130.280	³²⁵ Hs	354.170	³¹³ Mt	276.170	³⁰⁴ 110	229.070	²⁹⁸ 111	201.730	²⁹⁵ 112	186.560
²⁵¹ Hs	129.620	³²⁶ Hs	359.910	³¹⁴ Mt	282.000	³⁰⁵ 110	233.860	²⁹⁹ 111	205.210	²⁹⁶ 112	189.300
²⁵² Hs	127.340	³²⁷ Hs	366.300	³¹⁵ Mt	286.930	³⁰⁶ 110	237.360	³⁰⁰ 111	210.540	²⁹⁷ 112	194.070
²⁵³ Hs	126.890	³²⁸ Hs	374.680	³¹⁶ Mt	292.860	³⁰⁷ 110	242.240	³⁰¹ 111	213.910	²⁹⁸ 112	197.060
²⁵⁴ Hs	124.750	³²⁹ Hs	381.980	³¹⁷ Mt	297.900	³⁰⁸ 110	245.860	³⁰² 111	218.810	²⁹⁹ 112	202.230
²⁵⁵ Hs	124.490	³³⁰ Hs	387.780	³¹⁸ Mt	303.810	³⁰⁹ 110	250.850	³⁰³ 111	222.600	³⁰⁰ 112	205.480
²⁵⁶ Hs	122.690	³³¹ Hs	394.890	³¹⁹ Mt	308.880	³¹⁰ 110	254.640	³⁰⁴ 111	227.560	³⁰¹ 112	210.680
²⁵⁷ Hs	122.710	³³² Hs	398.920	³²⁰ Mt	314.980	³¹¹ 110	259.850	³⁰⁵ 111	230.490	³⁰² 112	214.120
²⁵⁸ Hs	121.100	³³³ Hs	408.440	³²¹ Mt	320.230	³¹² 110	264.020	³⁰⁶ 111	235.010	³⁰³ 112	219.230
²⁵⁹ Hs	121.360	³³⁴ Hs	413.920	³²² Mt	326.600	³¹³ 110	269.630	³⁰⁷ 111	238.480	³⁰⁴ 112	222.750
²⁶⁰ Hs	120.290	³³⁵ Hs	420.770	³²³ Mt	332.200	³¹⁴ 110	274.020	³⁰⁸ 111	243.060	³⁰⁵ 112	227.840
²⁶¹ Hs	121.140	³³⁶ Hs	426.400	³²⁴ Mt	338.800	³¹⁵ 110	279.840	³⁰⁹ 111	246.670	³⁰⁶ 112	231.850
²⁶² Hs	120.540	³³⁷ Hs	434.140	³²⁵ Mt	344.390	³¹⁶ 110	284.480	³¹⁰ 111	251.400	³⁰⁷ 112	235.400
²⁶³ Hs	121.650	³³⁸ Hs	440.810	³²⁶ Mt	350.890	³¹⁷ 110	290.450	³¹¹ 111	255.150	³⁰⁸ 112	238.320
²⁶⁴ Hs	121.480	³³⁹ Hs	448.820	³²⁷ Mt	356.640	³¹⁸ 110	295.120	³¹² 111	260.120	³⁰⁹ 112	242.920
²⁶⁵ Hs	122.660	²⁵³ Mt	137.220	³²⁸ Mt	365.180	³¹⁹ 110	301.100	³¹³ 111	264.290	³¹⁰ 112	246.290
²⁶⁶ Hs	122.490	²⁵⁴ Mt	136.390	³²⁹ Mt	371.130	³²⁰ 110	305.880	³¹⁴ 111	269.600	³¹¹ 112	250.960
²⁶⁷ Hs	123.780	²⁵⁵ Mt	134.340	³³⁰ Mt	378.110	³²¹ 110	311.980	³¹⁵ 111	273.970	³¹² 112	254.410
²⁶⁸ Hs	123.710	²⁵⁶ Mt	133.750	³³¹ Mt	383.910	³²² 110	317.020	³¹⁶ 111	279.480	³¹³ 112	259.320
²⁶⁹ Hs	125.310	²⁵⁷ Mt	131.770	³³² Mt	390.760	³²³ 110	323.310	³¹⁷ 111	284.170	³¹⁴ 112	263.130
²⁷⁰ Hs	125.560	²⁵⁸ Mt	131.430	³³³ Mt	396.630	³²⁴ 110	328.610	³¹⁸ 111	289.810	³¹⁵ 112	268.470
²⁷¹ Hs	127.690	²⁵⁹ Mt	129.770	³³⁴ Mt	403.480	³²⁵ 110	335.210	³¹⁹ 111	294.560	³¹⁶ 112	272.710
²⁷² Hs	128.740	²⁶⁰ Mt	129.680	³³⁵ Mt	408.890	³²⁶ 110	340.440	³²⁰ 111	300.300	³¹⁷ 112	278.230
²⁷³ Hs	131.520	²⁶¹ Mt	128.550	³³⁶ Mt	415.460	³²⁷ 110	347.010	³²¹ 111	305.070	³¹⁸ 112	282.570
²⁷⁴ Hs	133.010	²⁶² Mt	129.220	³³⁷ Mt	421.060	³²⁸ 110	353.650	³²² 111	310.930	³¹⁹ 112	288.190
²⁷⁵ Hs	136.080	²⁶³ Mt	128.520	³³⁸ Mt	428.550	³²⁹ 110	360.500	³²³ 111	315.930	³²⁰ 112	292.650
²⁷⁶ Hs	137.780	²⁶⁴ Mt	129.190	³³⁹ Mt	435.230	³³⁰ 110	366.080	³²⁴ 111	321.980	³²¹ 112	298.340
²⁷⁷ Hs	140.600	²⁶⁵ Mt	128.780	²⁵⁶ 110	142.610	³³¹ 110	372.800	³²⁵ 111	326.960	³²² 112	302.850
²⁷⁸ Hs	142.510	²⁶⁶ Mt	129.600	²⁵⁷ 110	141.990	³³² 110	378.330	³²⁶ 111	333.120	³²³ 112	308.670
²⁷⁹ Hs	145.220	²⁶⁷ Mt	129.440	²⁵⁸ 110	139.770	³³³ 110	385.170	³²⁷ 111	338.320	³²⁴ 112	313.550
²⁸⁰ Hs	146.680	²⁶⁸ Mt	130.340	²⁵⁹ 110	139.340	³³⁴ 110	390.910	³²⁸ 111	344.850	³²⁵ 112	319.440
²⁸¹ Hs	149.610	²⁶⁹ Mt	130.130	²⁶⁰ 110	137.450	³³⁵ 110	397.360	³²⁹ 111	350.580	³²⁶ 112	324.100
²⁸² Hs	151.420	²⁷⁰ Mt	131.400	²⁶¹ 110	137.350	³³⁶ 110	402.400	³³⁰ 111	357.190	³²⁷ 112	330.190
²⁸³ Hs	154.640	²⁷¹ Mt	131.490	²⁶² 110	135.890	³³⁷ 110	408.950	³³¹ 111	362.710	³²⁸ 112	335.120
²⁸⁴ Hs	156.900	²⁷² Mt	133.250	²⁶³ 110	136.330	³³⁸ 110	414.250	³³² 111	369.300	³²⁹ 112	341.400
²⁸⁵ Hs	160.580	²⁷³ Mt	134.240	²⁶⁴ 110	135.240	³³⁹ 110	421.750	³³³ 111	374.800	³³⁰ 112	346.600
²⁸⁶ Hs	163.010	²⁷⁴ Mt	136.710	²⁶⁵ 110	135.880	²⁵⁹ 111	149.750	³³⁴ 111	381.440	³³¹ 112	353.280
²⁸⁷ Hs	166.630	²⁷⁵ Mt	138.100	²⁶⁶ 110	135.180	²⁶⁰ 111	149.040	³³⁵ 111	386.790	³³² 112	358.420
²⁸⁸ Hs	169.300	²⁷⁶ Mt	140.800	²⁶⁷ 110	135.920	²⁶¹ 111	147.070	³³⁶ 111	393.250	³³³ 112	364.950
²⁸⁹ Hs	173.290	²⁷⁷ Mt	142.430	²⁶⁸ 110	135.270	²⁶² 111	146.610	³³⁷ 111	398.070	³³⁴ 112	370.140
²⁹⁰ Hs	176.320	²⁷⁸ Mt	144.980	²⁶⁹ 110	136.140	²⁶³ 111	145.130	³³⁸ 111	404.330	³³⁵ 112	376.700
²⁹¹ Hs	180.690	²⁷⁹ Mt	146.740	²⁷⁰ 110	135.660	²⁶⁴ 111	145.240	³³⁹ 111	409.610	³³⁶ 112	381.530
²⁹² Hs	184.100	²⁸⁰ Mt	149.090	²⁷¹ 110	136.800	²⁶⁵ 111	144.110	²⁶² 112	155.460	³³⁷ 112	387.870
²⁹³ Hs	189.500	²⁸¹ Mt	150.600	²⁷² 110	136.600	²⁶⁶ 111	144.370	²⁶³ 112	155.020	³³⁸ 112	392.390
²⁹⁴ Hs	193.170	²⁸² Mt	153.230	²⁷³ 110	138.240	²⁶⁷ 111	143.540	²⁶⁴ 112	153.210	³³⁹ 112	398.630
²⁹⁵ Hs	198.420	²⁸³ Mt	154.960	²⁷⁴ 110	138.900	²⁶⁸ 111	143.960	²⁶⁵ 112	153.240	²⁶⁶ 113	163.160
²⁹⁶ Hs	202.350	²⁸⁴ Mt	157.880	²⁷⁵ 110	141.270	²⁶⁹ 111	143.280	²⁶⁶ 112	151.770	²⁶⁷ 113	161.600
²⁹⁷ Hs	207.600	²⁸⁵ Mt	160.200	²⁷⁶ 110	142.290	²⁷⁰ 111	143.810	²⁶⁷ 112	152.000	²⁶⁸ 113	161.430
²⁹⁸ Hs	212.940	²⁸⁶ Mt	163.530	²⁷⁷ 110	144.960	²⁷¹ 111	143.310	²⁶⁸ 112	150.820	²⁶⁹ 113	160.160
²⁹⁹ Hs	216.920	²⁸⁷ Mt	165.810	²⁷⁸ 110	146.110	²⁷² 111	144.100	²⁶⁹ 112	151.210	²⁷⁰ 113	160.190
³⁰⁰ Hs	220.430	²⁸⁸ Mt	169.040	²⁷⁹ 110	148.470	²⁷³ 111	143.890	²⁷⁰ 112	150.170	²⁷¹ 113	159.080
³⁰¹ Hs	225.420	²⁸⁹ Mt	171.730	²⁸⁰ 110	149.560	²⁷⁴ 111	145.130	²⁷¹ 112	150.650	²⁷² 113	159.220
³⁰² Hs	229.050	²⁹⁰ Mt	175.390	²⁸¹ 110	151.900	²⁷⁵ 111	145.680	²⁷² 112	149.790	²⁷³ 113	158.300
³⁰³ Hs	234.130	²⁹¹ Mt	178.400	²⁸² 110	153.050	²⁷⁶ 111	147.640	²⁷³ 112	150.540	²⁷⁴ 113	158.690
³⁰⁴ Hs	237.930	²⁹² Mt	182.460	²⁸³ 110	155.640	²⁷⁷ 111	148.560	²⁷⁴ 112	149.930	²⁷⁵ 113	158.120
³⁰⁵ Hs	243.140	²⁹³ Mt	185.850	²⁸⁴ 110	157.040	²⁷⁸ 111	150.850	²⁷⁵ 112	151.180	²⁷⁶ 113	158.910
³⁰⁶ Hs	247.060	²⁹⁴ Mt	190.970	²⁸⁵ 110	159.930	²⁷⁹ 111	151.780	²⁷⁶ 112	151.330	²⁷⁷ 113	158.920
³⁰⁷ Hs	252.370	²⁹⁵ Mt	194.620	²⁸⁶ 110	161.850	²⁸⁰ 111	153.630	²⁷⁷ 112	153.190	²⁷⁸ 113	160.540
³⁰⁸ Hs	256.470	²⁹⁶ Mt	199.650	²⁸⁷ 110	165.140	²⁸¹ 111	154.550	²⁷⁸ 112	153.970	²⁷⁹ 113	161.130
³⁰⁹ Hs	262.000	²⁹⁷ Mt	203.580	²⁸⁸ 110	166.860	²⁸² 111	156.550	²⁷⁹ 112	155.850	²⁸⁰ 113	161.870
³¹⁰ Hs	266.390	²⁹⁸ Mt	209.670	²⁸⁹ 110	170.140	²⁸³ 111	157.640	²⁸⁰ 112	156.110	²⁸¹ 113	

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess						
284	113	165.620	288	114	173.070	295	115	188.740	305	116	220.900	318	117	265.180	334	118	329.330
285	113	166.350	289	114	175.000	296	115	191.470	306	116	223.590	319	117	268.230	335	118	334.540
286	113	168.280	290	114	175.640	297	115	193.560	307	116	228.220	320	117	272.740	336	118	338.470
287	113	169.290	291	114	178.080	298	115	196.710	308	116	231.220	321	117	276.370	337	118	343.880
288	113	171.490	292	114	179.190	299	115	199.110	309	116	235.640	322	117	281.140	338	118	347.930
289	113	172.510	293	114	181.890	300	115	203.410	310	116	238.630	323	117	284.990	339	118	353.350
290	113	175.000	294	114	183.570	301	115	205.850	311	116	241.770	324	117	289.880	284	119	207.400
291	113	176.250	295	114	186.580	302	115	210.400	312	116	244.460	325	117	293.820	285	119	206.280
292	113	178.960	296	114	188.620	303	115	213.240	313	116	248.770	326	117	298.660	286	119	206.300
293	113	181.000	297	114	192.090	304	115	217.870	314	116	251.310	327	117	302.760	287	119	205.180
294	113	184.030	298	114	194.500	305	115	220.870	315	116	255.470	328	117	307.700	288	119	205.520
295	113	186.430	299	114	199.120	306	115	225.580	316	116	258.420	329	117	311.400	289	119	205.120
296	113	189.880	300	114	201.590	307	115	228.670	317	116	262.740	330	117	316.500	290	119	205.660
297	113	192.610	301	114	206.480	308	115	233.370	318	116	265.870	331	117	320.570	291	119	205.260
298	113	197.240	302	114	209.340	309	115	236.580	319	116	270.610	332	117	325.730	292	119	206.190
299	113	200.030	303	114	214.290	310	115	239.850	320	116	274.220	333	117	329.980	293	119	206.010
300	113	204.920	304	114	217.320	311	115	243.080	321	116	279.280	334	117	335.240	294	119	207.180
301	113	208.110	305	114	222.340	312	115	247.290	322	116	283.120	335	117	339.450	295	119	207.560
302	113	212.980	306	114	225.450	313	115	250.380	323	116	288.300	336	117	344.870	296	119	209.240
303	113	216.410	307	114	230.560	314	115	254.590	324	116	292.220	337	117	349.270	297	119	209.510
304	113	221.250	308	114	233.750	315	115	257.770	325	116	297.300	338	117	354.710	298	119	211.050
305	113	224.770	309	114	238.920	316	115	262.090	326	116	301.370	339	117	359.110	299	119	211.970
306	113	229.960	310	114	242.180	317	115	265.530	327	116	306.570	281	118	199.770	300	119	214.150
307	113	233.190	311	114	245.080	318	115	270.280	328	116	310.400	282	118	197.510	301	119	215.620
308	113	237.010	312	114	248.150	319	115	274.180	329	116	315.750	283	118	197.680	302	119	218.160
309	113	240.300	313	114	252.590	320	115	279.190	330	116	319.810	284	118	196.470	303	119	219.890
310	113	244.610	314	114	255.720	321	115	283.390	331	116	325.270	285	118	196.900	304	119	223.500
311	113	247.910	315	114	260.350	322	115	288.470	332	116	329.550	286	118	196.050	305	119	225.250
312	113	252.300	316	114	263.800	323	115	292.810	333	116	335.270	287	118	196.650	306	119	229.150
313	113	255.770	317	114	268.840	324	115	297.880	334	116	339.490	288	118	196.110	307	119	231.270
314	113	260.410	318	114	272.760	325	115	301.870	335	116	345.190	289	118	197.020	308	119	235.100
315	113	264.120	319	114	278.030	326	115	307.110	336	116	349.580	290	118	196.900	309	119	237.510
316	113	269.240	320	114	282.230	327	115	311.320	337	116	355.350	291	118	197.960	310	119	241.270
317	113	273.370	321	114	287.590	328	115	316.770	338	116	359.740	292	118	197.970	311	119	243.650
318	113	278.730	322	114	291.770	329	115	321.060	339	116	365.100	293	118	199.470	312	119	247.520
319	113	283.080	323	114	297.210	330	115	326.610	278	117	192.650	294	118	199.770	313	119	249.930
320	113	288.410	324	114	301.440	331	115	331.020	279	117	190.900	295	118	201.560	314	119	247.840
321	113	292.860	325	114	306.890	332	115	336.720	280	117	191.370	296	118	201.970	315	119	250.160
322	113	298.290	326	114	311.270	333	115	341.420	281	117	189.480	297	118	203.810	316	119	253.600
323	113	302.800	327	114	316.890	334	115	347.160	282	117	189.570	298	118	204.880	317	119	259.210
324	113	308.270	328	114	321.110	335	115	351.840	283	117	188.750	299	118	207.310	318	119	263.120
325	113	313.140	329	114	326.830	336	115	357.680	284	117	189.160	300	118	208.760	319	119	265.750
326	113	318.790	330	114	331.480	337	115	362.150	285	117	188.600	301	118	211.600	320	119	269.620
327	113	323.300	331	114	337.500	338	115	367.690	286	117	189.330	302	118	213.350	321	119	272.560
328	113	329.030	332	114	342.210	339	115	372.250	287	117	189.090	303	118	217.280	322	119	276.670
329	113	333.860	333	114	348.410	275	116	184.590	288	117	190.060	304	118	219.050	323	119	279.990
330	113	339.940	334	114	353.120	276	116	182.970	289	117	190.150	305	118	223.240	324	119	284.520
331	113	345.000	335	114	359.240	277	116	182.980	290	117	191.390	306	118	225.420	325	119	288.080
332	113	351.220	336	114	363.650	278	116	181.600	291	117	191.700	307	118	229.600	326	119	292.630
333	113	356.350	337	114	369.640	279	116	181.990	292	117	193.240	308	118	232.020	327	119	296.320
334	113	362.450	338	114	374.000	280	116	180.390	293	117	193.830	309	118	236.150	328	119	300.960
335	113	367.540	339	114	379.960	281	116	180.870	294	117	195.630	310	118	238.800	329	119	304.730
336	113	373.540	272	115	177.830	282	116	180.040	295	117	196.260	311	118	242.750	330	119	307.930
337	113	378.440	273	115	176.340	283	116	180.810	296	117	198.090	312	118	245.220	331	119	311.730
338	113	384.430	274	115	176.180	284	116	180.280	297	117	199.440	313	118	243.820	332	119	316.610
339	113	388.990	275	115	174.890	285	116	181.320	298	117	201.880	314	118	246.250	333	119	321.910
269	114	169.790	276	115	174.930	286	116	181.170	299	117	203.620	315	118	249.990	334	119	326.770
270	114	168.140	277	115	173.900	287	116	182.480	300	117	206.460	316	118	255.760	335	119	330.690
271	114	168.150	278	115	174.300	288	116	182.650	301	117	208.540	317	118	259.810	336	119	335.620
272	114	166.700	279	115	173.290	289	116	184.240	302	117	212.290	318	118	262.430	337	119	339.480
273	114	166.840	280	115	173.800	290	116	184.580	303	117	214.590	319	118	266.510	338	119	344.530
274	114	165.600	281	115	173.360	291	116	186.480	304	117	218.780	320	118	269.410	339	119	348.560
275	114	166.030	282	115	174.210	292	116	186.760	305	117	221.300	321	118	273.770	287	120	214.670
276	114	165.040	283	115	174.070	293	116	188.810	306	117	225.590	322	118	277.100	288	120	213.400
277	114	165.790	284	115	175.120	294	116	189.490	307	117	228.240	323	118	281.880	289	120	213.790
278	114	165.490	285	115	175.260	295	116	191.780	308	117	232.490	324	118	285.450	290	120	212.820
279	114	166.070	286	115	176.580	296	116	193.150	309	117	233.930	325	118	290.310	291	120	213.540
280	114	165.740	287	115	177.060	297	116	195.900	310	117	239.740	326	118	293.970	292	120	212.980
281	114	166.940	288	115	178.610	298	116	197.630	311	117	242.550	327	118	298.930	293	120	213.700
282	114	166.820	289	115	179.250	299	116	200.770	312	117	245.230	328	118	302.770	294	120	213.200
283	114	168.260	290	115	181.060	300	116	202.860	313	117	248.170	329	118				

Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess	Isotope	Mass Excess						
299	120	217.590	324	121	282.040	309	123	251.940	306	125	261.650	316	127	288.300	339	129	335.140
300	120	218.290	325	121	285.060	310	123	254.550	307	125	262.120	317	127	289.030	319	130	313.350
301	120	220.410	326	121	289.330	311	123	256.000	308	125	263.800	318	127	281.750	320	130	313.390
302	120	221.520	327	121	292.510	312	123	258.540	309	125	264.680	319	127	282.760	321	130	304.510
303	120	224.070	328	121	296.820	313	123	260.080	310	125	266.820	320	127	285.060	322	130	304.860
304	120	225.490	329	121	300.530	314	123	262.850	311	125	267.800	321	127	286.390	323	130	306.760
305	120	229.000	330	121	304.570	315	123	264.350	312	125	269.580	322	127	286.820	324	130	307.380
306	120	230.520	331	121	308.020	316	123	267.230	313	125	270.520	323	127	287.770	325	130	306.530
307	120	234.340	332	121	312.540	317	123	268.860	314	125	272.600	324	127	289.910	326	130	307.000
308	120	236.260	333	121	316.120	318	123	264.410	315	125	273.720	325	127	291.250	327	130	308.760
309	120	239.890	334	121	318.980	319	123	266.230	316	125	275.980	326	127	293.640	328	130	309.480
310	120	242.000	335	121	324.610	320	123	268.910	317	125	277.180	327	127	295.240	329	130	311.500
311	120	245.650	336	121	329.290	321	123	270.900	318	125	272.490	328	127	297.990	330	130	312.480
312	120	247.650	337	121	333.110	322	123	273.930	319	125	272.550	329	127	299.950	331	130	320.120
313	120	251.360	338	121	337.760	323	123	279.610	320	125	274.880	330	127	306.820	332	130	316.240
314	120	253.410	339	121	341.550	324	123	282.980	321	125	276.310	331	127	308.900	333	130	323.680
315	120	250.780	294	122	230.470	325	123	285.180	322	125	278.680	332	127	312.170	334	130	325.110
316	120	252.780	295	122	231.080	326	123	288.780	323	125	280.350	333	127	314.450	335	130	328.010
317	120	256.210	296	122	230.490	327	123	291.490	324	125	283.060	334	127	317.830	336	130	329.680
318	120	258.540	297	122	231.520	328	123	295.430	325	125	284.990	335	127	320.190	337	130	332.730
319	120	265.530	298	122	231.080	329	123	298.330	326	125	291.880	336	127	323.690	338	130	334.520
320	120	267.950	299	122	232.270	330	123	302.340	327	125	290.330	337	127	326.230	339	130	337.930
321	120	271.710	300	122	231.570	331	123	305.400	328	125	297.040	338	127	329.890	323	131	313.900
322	120	274.360	301	122	232.810	332	123	309.560	329	125	299.460	339	127	332.540	324	131	315.560
323	120	278.440	302	122	233.090	333	123	312.710	330	125	303.060	313	128	292.390	325	131	316.200
324	120	281.530	303	122	235.280	334	123	316.930	331	125	305.590	314	128	292.430	326	131	314.730
325	120	285.990	304	122	236.080	335	123	320.200	332	125	309.320	315	128	293.910	327	131	315.140
326	120	289.240	305	122	238.300	336	123	324.770	333	125	312.000	316	128	294.200	328	131	316.630
327	120	293.810	306	122	239.400	337	123	328.480	334	125	315.920	317	128	295.800	329	131	317.320
328	120	297.170	307	122	242.620	338	123	332.970	335	125	318.770	318	128	296.210	330	131	319.030
329	120	301.830	308	122	243.910	339	123	336.370	336	125	322.720	319	128	288.420	331	131	319.980
330	120	305.450	309	122	247.030	300	124	249.180	337	125	325.670	320	128	289.190	332	131	322.110
331	120	310.140	310	122	248.630	301	124	249.810	338	125	329.880	321	128	291.410	333	131	323.420
332	120	313.740	311	122	251.590	302	124	247.920	339	125	332.940	322	128	292.450	334	131	330.860
333	120	316.850	312	122	253.210	303	124	248.670	306	126	264.640	323	128	295.040	335	131	332.350
334	120	322.250	313	122	256.350	304	124	248.160	307	126	265.330	324	128	293.270	336	131	334.870
335	120	327.350	314	122	257.920	305	124	249.200	308	126	270.600	325	128	295.420	337	131	336.200
336	120	330.840	315	122	261.140	306	124	252.430	309	126	272.230	326	128	296.410	338	131	339.020
337	120	335.880	316	122	262.800	307	124	254.330	310	126	272.470	327	128	298.730	339	131	340.870
338	120	339.470	317	122	259.070	308	124	255.220	311	126	274.490	328	128	300.050	326	132	323.920
339	120	344.500	318	122	260.750	309	124	257.820	312	126	274.820	329	128	302.770	327	132	322.020
290	121	223.530	319	122	263.880	310	124	258.770	313	126	276.840	330	128	304.440	328	132	322.150
291	121	222.520	320	122	265.910	311	124	261.160	314	126	277.510	331	128	311.710	329	132	323.610
292	121	222.850	321	122	269.220	312	124	262.240	315	126	279.520	332	128	313.460	330	132	324.000
293	121	222.260	322	122	274.860	313	124	264.700	316	126	280.310	333	128	316.640	331	132	325.690
294	121	222.810	323	122	278.400	314	124	265.880	317	126	282.470	334	128	318.640	332	132	326.340
295	121	222.470	324	122	280.630	315	124	268.580	318	126	283.360	335	128	321.940	333	132	334.180
296	121	223.290	325	122	284.530	316	124	269.720	319	126	277.950	336	128	324.080	334	132	334.910
297	121	223.330	326	122	287.260	317	124	266.150	320	126	279.300	337	128	327.580	335	132	337.040
298	121	224.450	327	122	291.480	318	124	266.190	321	126	280.010	338	128	329.860	336	132	338.290
299	121	224.510	328	122	294.420	319	124	268.820	322	126	281.020	339	128	333.310	337	132	340.830
300	121	225.690	329	122	298.690	320	124	270.180	323	126	283.450	316	129	303.730	338	132	342.180
301	121	226.310	330	122	301.760	321	124	272.960	324	126	284.800	317	129	303.840	339	132	344.500
302	121	228.180	331	122	306.140	322	124	274.660	325	126	287.460	318	129	294.880	329	133	331.010
303	121	229.290	332	122	309.300	323	124	277.650	326	126	289.090	319	129	295.190	330	133	332.180
304	121	231.530	333	122	313.800	324	124	279.610	327	126	296.230	320	129	296.840	331	133	332.540
305	121	232.940	334	122	317.120	325	124	286.570	328	126	297.900	321	129	297.580	332	133	333.930
306	121	236.410	335	122	321.950	326	124	288.570	329	126	301.100	322	129	299.450	333	133	339.880
307	121	237.710	336	122	325.570	327	124	292.070	330	126	303.200	323	129	300.440	334	133	342.390
308	121	241.120	337	122	330.250	328	124	294.500	331	126	306.770	324	129	302.700	335	133	343.200
309	121	242.970	338	122	333.670	329	124	298.390	332	126	309.050	325	129	300.720	336	133	344.920
310	121	246.130	339	122	338.600	330	124	301.000	333	126	312.700	326	129	302.520	337	133	346.010
311	121	248.150	297	123	240.250	331	124	304.950	334	126	315.220	327	129	303.540	338	133	348.370
312	121	251.370	298	123	241.090	332	124	307.730	335	126	318.940	328	129	305.570	339	133	348.990
313	121	253.310	299	123	240.600	333	124	311.840	336	126	321.500	329	129	306.850	332	134	345.050
314	121	256.640	300	123	241.410	334	124	314.700	337	126	325.410	330	129	309.290	333	134	346.760
315	121	258.640	301	123	240.520	335	124	318.900	338	126	328.090	331	129	310.920	334	134	347.150
316	121	255.390	302	123	241.320	336	124	321.880	339	126	332.350	332	129	318.170	335	134	349.680
317	121	257.540	303	123	241.130	337	124	326.430	310	127	282.450	333	129	319.890	336	134	350.020
318	121	260.520	304	123	244.010	338	124	329.310	311	127	282.630	334	129	322.790	337	134	351.860
319	121	262.850	305	123	244.780	339	124	334.580	312	127	284.130	335	129				

Isotope Mass Excess

³³⁶135 358.560

³³⁷135 358.870

³³⁸135 360.350

³³⁹135 361.090

³³⁹136 367.860