

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
1	0	1	n	1.008664923	5	8	13	O	13.024810400
0	1	1	H	1.007825032	10	4	14	Be	14.042815522
1	1	2	H	2.014101778	9	5	14	B	14.025404064
2	1	3	H	3.016049268	8	6	14	C	14.003241988
1	2	3	He	3.016029310	7	7	14	N	14.003074005
3	1	4	H	4.027834627	6	8	14	O	14.008595285
2	2	4	He	4.002603250	5	9	14	F	14.036080
1	3	4	Li	4.027182329	10	5	15	B	15.031097291
4	1	5	H	5.039542911	9	6	15	C	15.010599258
3	2	5	He	5.012223628	8	7	15	N	15.000108898
2	3	5	Li	5.012537796	7	8	15	O	15.003065386
1	4	5	Be	5.040790	6	9	15	F	15.018010856
5	1	6	H	6.044942608	11	5	16	B	16.039808836
4	2	6	He	6.018888072	10	6	16	C	16.014701243
3	3	6	Li	6.015122281	9	7	16	N	16.006101417
2	4	6	Be	6.019725804	8	8	16	O	15.994914622
5	2	7	He	7.028030527	7	9	16	F	16.011465730
4	3	7	Li	7.016004049	6	10	16	Ne	16.025756907
3	4	7	Be	7.016929246	12	5	17	B	17.046931399
2	5	7	B	7.029917389	11	6	17	C	17.022583712
6	2	8	He	8.033921838	10	7	17	N	17.008449673
5	3	8	Li	8.022486670	9	8	17	O	16.999131501
4	4	8	Be	8.005305094	8	9	17	F	17.002095238
3	5	8	B	8.024606713	7	10	17	Ne	17.017697565
2	6	8	C	8.037675026	13	5	18	B	18.056170
7	2	9	He	9.043820323	12	6	18	C	18.026757058
6	3	9	Li	9.026789122	11	7	18	N	18.014081827
5	4	9	Be	9.012182135	10	8	18	O	17.999160419
4	5	9	B	9.013328806	9	9	18	F	18.000937667
3	6	9	C	9.031040087	8	10	18	Ne	18.005697066
8	2	10	He	10.052399713	7	11	18	Na	18.027180
7	3	10	Li	10.035480884	14	5	19	B	19.063730
6	4	10	Be	10.013533720	13	6	19	C	19.035248094
5	5	10	B	10.012937027	12	7	19	N	19.017026896
4	6	10	C	10.016853110	11	8	19	O	19.003578730
3	7	10	N	10.042618	10	9	19	F	18.998403205
8	3	11	Li	11.043796166	9	10	19	Ne	19.001879839
7	4	11	Be	11.021657653	8	11	19	Na	19.013879450
6	5	11	B	11.009305466	14	6	20	C	20.040322395
5	6	11	C	11.011433818	13	7	20	N	20.023367295
4	7	11	N	11.026796226	12	8	20	O	20.004076150
9	3	12	Li	12.053780	11	9	20	F	19.999981324
8	4	12	Be	12.026920631	10	10	20	Ne	19.992440176
7	5	12	B	12.014352109	9	11	20	Na	20.007348260
6	6	12	C	12.0000000	8	12	20	Mg	20.018862744
5	7	12	N	12.018613202	15	6	21	C	21.049340
4	8	12	O	12.034404776	14	7	21	N	21.027087574
9	4	13	Be	13.036133834	13	8	21	O	21.008654631
8	5	13	B	13.017780267	12	9	21	F	20.999948921
7	6	13	C	13.003354838	11	10	21	Ne	20.993846744
6	7	13	N	13.005738584	10	11	21	Na	20.997655099

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
9	12	21	Mg	21.011714174	12	15	27	P	26.999191645
8	13	21	Al	21.028040	11	16	27	S	27.018795
16	6	22	C	22.056450	19	9	28	F	28.035670
15	7	22	N	22.034440259	18	10	28	Ne	28.012108072
14	8	22	O	22.009967157	17	11	28	Na	27.998890410
13	9	22	F	22.002999250	16	12	28	Mg	27.983876703
12	10	22	Ne	21.991385510	15	13	28	Al	27.981910184
11	11	22	Na	21.994436782	14	14	28	Si	27.976926533
10	12	22	Mg	21.999574055	13	15	28	P	27.992312330
9	13	22	Al	22.019520	12	16	28	S	28.004372661
8	14	22	Si	22.034530	11	17	28	Cl	28.028510
16	7	23	N	23.040510	20	9	29	F	29.043260
15	8	23	O	23.015691325	19	10	29	Ne	29.019345902
14	9	23	F	23.003574385	18	11	29	Na	29.002811301
13	10	23	Ne	22.994467337	17	12	29	Mg	28.988554743
12	11	23	Na	22.989769675	16	13	29	Al	28.980444848
11	12	23	Mg	22.994124850	15	14	29	Si	28.976494719
10	13	23	Al	23.007264900	14	15	29	P	28.981801376
9	14	23	Si	23.025520	13	16	29	S	28.996608805
17	7	24	N	24.050500	12	17	29	Cl	29.014110
16	8	24	O	24.020369922	20	10	30	Ne	30.023872000
15	9	24	F	24.008099371	19	11	30	Na	30.009226487
14	10	24	Ne	23.993615074	18	12	30	Mg	29.990464529
13	11	24	Na	23.990963332	17	13	30	Al	29.982960304
12	12	24	Mg	23.985041898	16	14	30	Si	29.973770218
11	13	24	Al	23.999940911	15	15	30	P	29.978313807
10	14	24	Si	24.011545711	14	16	30	S	29.984902954
9	15	24	P	24.034350	13	17	30	Cl	30.004770
17	8	25	O	25.029140	12	18	30	Ar	30.021560
16	9	25	F	25.012094963	21	10	31	Ne	31.033110
15	10	25	Ne	24.997789899	20	11	31	Na	31.013595108
14	11	25	Na	24.989954352	19	12	31	Mg	30.996548459
13	12	25	Mg	24.985837023	18	13	31	Al	30.983946023
12	13	25	Al	24.990428555	17	14	31	Si	30.975363275
11	14	25	Si	25.004106640	16	15	31	P	30.973761512
10	15	25	P	25.020260	15	16	31	S	30.979554421
18	8	26	O	26.037750	14	17	31	Cl	30.992416014
17	9	26	F	26.019633157	13	18	31	Ar	31.012126
16	10	26	Ne	26.000461498	22	10	32	Ne	32.039910
15	11	26	Na	25.992589898	21	11	32	Na	32.019649792
14	12	26	Mg	25.982593040	20	12	32	Mg	31.999145889
13	13	26	Al	25.986891659	19	13	32	Al	31.988124379
12	14	26	Si	25.992329935	18	14	32	Si	31.974148129
11	15	26	P	26.011780	17	15	32	P	31.973907163
10	16	26	S	26.027880	16	16	32	S	31.972070690
18	9	27	F	27.026892316	15	17	32	Cl	31.985688908
17	10	27	Ne	27.007615200	14	18	32	Ar	31.997660660
16	11	27	Na	26.994008702	13	19	32	K	32.021920
15	12	27	Mg	26.984340742	22	11	33	Na	33.027386000
14	13	27	Al	26.981538441	21	12	33	Mg	33.005586975
13	14	27	Si	26.986704764	20	13	33	Al	32.990869587

N	Z	A	EI	mass (amu)	N	Z	A	EI	mass (amu)
19	14	33	Si	32.978000520	20	18	38	Ar	37.962732161
18	15	33	P	32.971725281	19	19	38	K	37.969080107
17	16	33	S	32.971458497	18	20	38	Ca	37.976318637
16	17	33	Cl	32.977451798	17	21	38	Sc	37.994700
15	18	33	Ar	32.989928719	16	22	38	Ti	38.009770
14	19	33	K	33.007260	26	13	39	Al	39.021900
23	11	34	Na	34.034900	25	14	39	Si	39.002300
22	12	34	Mg	34.009072440	24	15	39	P	38.986420000
21	13	34	Al	33.996927255	23	16	39	S	38.975135275
20	14	34	Si	33.978575745	22	17	39	Cl	38.968007677
19	15	34	P	33.973636381	21	18	39	Ar	38.964313413
18	16	34	S	33.967866831	20	19	39	K	38.963706861
17	17	34	Cl	33.973761967	19	20	39	Ca	38.970717729
16	18	34	Ar	33.980270118	18	21	39	Sc	38.984790009
15	19	34	K	33.998410	17	22	39	Ti	39.001323
14	20	34	Ca	34.014120	26	14	40	Si	40.005800
24	11	35	Na	35.044180	25	15	40	P	39.991050000
23	12	35	Mg	35.017490	24	16	40	S	39.975470000
22	13	35	Al	34.999937650	23	17	40	Cl	39.970415555
21	14	35	Si	34.984584158	22	18	40	Ar	39.962383123
20	15	35	P	34.973314249	21	19	40	K	39.963998672
19	16	35	S	34.969032140	20	20	40	Ca	39.962591155
18	17	35	Cl	34.968852707	19	21	40	Sc	39.977964014
17	18	35	Ar	34.975256726	18	22	40	Ti	39.990498907
16	19	35	K	34.988011615	17	23	40	V	40.011090
15	20	35	Ca	35.004765	27	14	41	Si	41.012700
24	12	36	Mg	36.022450	26	15	41	P	40.994800000
23	13	36	Al	36.006351501	25	16	41	S	40.980030000
22	14	36	Si	35.986687363	24	17	41	Cl	40.970650212
21	15	36	P	35.978259824	23	18	41	Ar	40.964500828
20	16	36	S	35.967080880	22	19	41	K	40.961825972
19	17	36	Cl	35.968306945	21	20	41	Ca	40.962278349
18	18	36	Ar	35.967546282	20	21	41	Sc	40.969251316
17	19	36	K	35.981293405	19	22	41	Ti	40.983131
16	20	36	Ca	35.993087234	18	23	41	V	40.999740
15	21	36	Sc	36.014920	28	14	42	Si	42.016100
25	12	37	Mg	37.031240	27	15	42	P	42.000090
24	13	37	Al	37.010310000	26	16	42	S	41.981490000
23	14	37	Si	36.992995990	25	17	42	Cl	41.973174994
22	15	37	P	36.979608338	24	18	42	Ar	41.963046386
21	16	37	S	36.971125716	23	19	42	K	41.962403059
20	17	37	Cl	36.965902600	22	20	42	Ca	41.958618337
19	18	37	Ar	36.966775912	21	21	42	Sc	41.965516761
18	19	37	K	36.973376915	20	22	42	Ti	41.973031622
17	20	37	Ca	36.985871505	19	23	42	V	41.991230
16	21	37	Sc	37.003050	18	24	42	Cr	42.006430
25	13	38	Al	38.016900	28	15	43	P	43.003310
24	14	38	Si	37.995980000	27	16	43	S	42.986600000
23	15	38	P	37.984470000	26	17	43	Cl	42.974203385
22	16	38	S	37.971163443	25	18	43	Ar	42.965670701
21	17	38	Cl	37.968010550	24	19	43	K	42.960715746

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
23	20	43	Ca	42.958766833	32	16	48	S	48.012990
22	21	43	Sc	42.961150980	31	17	48	Cl	47.994850
21	22	43	Ti	42.968523342	30	18	48	Ar	47.975070
20	23	43	V	42.980650	29	19	48	K	47.965512946
19	24	43	Cr	42.997707	28	20	48	Ca	47.952533512
29	15	44	P	44.009880	27	21	48	Sc	47.952234991
28	16	44	S	43.988320	26	22	48	Ti	47.947947053
27	17	44	Cl	43.978538712	25	23	48	V	47.952254480
26	18	44	Ar	43.965365269	24	24	48	Cr	47.954035861
25	19	44	K	43.961556146	23	25	48	Mn	47.968870
24	20	44	Ca	43.955481094	22	26	48	Fe	47.980560
23	21	44	Sc	43.959403048	21	27	48	Co	48.001760
22	22	44	Ti	43.959690235	33	16	49	S	49.022010
21	23	44	V	43.974400	32	17	49	Cl	48.999890
20	24	44	Cr	43.985470	31	18	49	Ar	48.982180
19	25	44	Mn	44.006870	30	19	49	K	48.967450084
30	15	45	P	45.015140	29	20	49	Ca	48.955673302
29	16	45	S	44.994820	28	21	49	Sc	48.950024065
28	17	45	Cl	44.979700000	27	22	49	Ti	48.947870789
27	18	45	Ar	44.968094979	26	23	49	V	48.948516914
26	19	45	K	44.960699658	25	24	49	Cr	48.951341135
25	20	45	Ca	44.956185938	24	25	49	Mn	48.959623415
24	21	45	Sc	44.955910243	23	26	49	Fe	48.973610
23	22	45	Ti	44.958124349	22	27	49	Co	48.989720
22	23	45	V	44.965782286	33	17	50	Cl	50.007730
21	24	45	Cr	44.979160	32	18	50	Ar	49.985940
20	25	45	Mn	44.994510	31	19	50	K	49.972782832
19	26	45	Fe	45.014560	30	20	50	Ca	49.957518286
31	15	46	P	46.023830	29	21	50	Sc	49.952187008
30	16	46	S	45.999570	28	22	50	Ti	49.944792069
29	17	46	Cl	45.984120	27	23	50	V	49.947162792
28	18	46	Ar	45.968093467	26	24	50	Cr	49.946049607
27	19	46	K	45.961976203	25	25	50	Mn	49.954243960
26	20	46	Ca	45.953692759	24	26	50	Fe	49.962993316
25	21	46	Sc	45.955170250	23	27	50	Co	49.981540
24	22	46	Ti	45.952629491	22	28	50	Ni	49.995930
23	23	46	V	45.960199491	34	17	51	Cl	51.013530
22	24	46	Cr	45.968361649	33	18	51	Ar	50.993240
21	25	46	Mn	45.986720	32	19	51	K	50.976380
20	26	46	Fe	46.000810	31	20	51	Ca	50.961474238
31	16	47	S	47.007620	30	21	51	Sc	50.953602700
30	17	47	Cl	46.987950	29	22	51	Ti	50.946616017
29	18	47	Ar	46.972186238	28	23	51	V	50.943963675
28	19	47	K	46.961677807	27	24	51	Cr	50.944771767
27	20	47	Ca	46.954546459	26	25	51	Mn	50.948215487
26	21	47	Sc	46.952408027	25	26	51	Fe	50.956824936
25	22	47	Ti	46.951763792	24	27	51	Co	50.970720
24	23	47	V	46.954906918	23	28	51	Ni	50.987720
23	24	47	Cr	46.962906512	34	18	52	Ar	51.998170
22	25	47	Mn	46.976100	33	19	52	K	51.982610
21	26	47	Fe	46.992890	32	20	52	Ca	51.965100000

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
31	21	52	Sc	51.956650000	30	26	56	Fe	55.934942133
30	22	52	Ti	51.946898175	29	27	56	Co	55.939843937
29	23	52	V	51.944779658	28	28	56	Ni	55.942136339
28	24	52	Cr	51.940511904	27	29	56	Cu	55.958560
27	25	52	Mn	51.945570079	26	30	56	Zn	55.972380
26	26	52	Fe	51.948116526	25	31	56	Ga	55.994910
25	27	52	Co	51.963590	37	20	57	Ca	56.992356
24	28	52	Ni	51.975680	36	21	57	Sc	56.977040
23	29	52	Cu	51.997180	35	22	57	Ti	56.962900
35	18	53	Ar	53.006227	34	23	57	V	56.952360000
34	19	53	K	52.987120	33	24	57	Cr	56.943753800
33	20	53	Ca	52.970050	32	25	57	Mn	56.938287458
32	21	53	Sc	52.959240	31	26	57	Fe	56.935398707
31	22	53	Ti	52.949731709	30	27	57	Co	56.936296235
30	23	53	V	52.944342517	29	28	57	Ni	56.939800489
29	24	53	Cr	52.940653781	28	29	57	Cu	56.949215695
28	25	53	Mn	52.941294702	27	30	57	Zn	56.964910
27	26	53	Fe	52.945312282	26	31	57	Ga	56.982930
26	27	53	Co	52.954224985	37	21	58	Sc	57.983070
25	28	53	Ni	52.968460	36	22	58	Ti	57.966110
24	29	53	Cu	52.985550	35	23	58	V	57.956650000
35	19	54	K	53.993990	34	24	58	Cr	57.944250000
34	20	54	Ca	53.974680	33	25	58	Mn	57.939986451
33	21	54	Sc	53.963000000	32	26	58	Fe	57.933280458
32	22	54	Ti	53.950870000	31	27	58	Co	57.935757571
31	23	54	V	53.946444381	30	28	58	Ni	57.935347922
30	24	54	Cr	53.938884921	29	29	58	Cu	57.944540734
29	25	54	Mn	53.940363247	28	30	58	Zn	57.954596465
28	26	54	Fe	53.939614836	27	31	58	Ga	57.974250
27	27	54	Co	53.948464147	26	32	58	Ge	57.991010
26	28	54	Ni	53.957910508	38	21	59	Sc	58.988041
25	29	54	Cu	53.976710	37	22	59	Ti	58.971960
24	30	54	Zn	53.992950	36	23	59	V	58.959300000
36	19	55	K	54.999388	35	24	59	Cr	58.948630000
35	20	55	Ca	54.980550	34	25	59	Mn	58.940447166
34	21	55	Sc	54.967430	33	26	59	Fe	58.934880493
33	22	55	Ti	54.955120000	32	27	59	Co	58.933200194
32	23	55	V	54.947238194	31	28	59	Ni	58.934351553
31	24	55	Cr	54.940844164	30	29	59	Cu	58.939504114
30	25	55	Mn	54.938049636	29	30	59	Zn	58.949267074
29	26	55	Fe	54.938298029	28	31	59	Ga	58.963370
28	27	55	Co	54.942003149	27	32	59	Ge	58.981750
27	28	55	Ni	54.951336329	38	22	60	Ti	59.975640
26	29	55	Cu	54.966050	37	23	60	V	59.964500000
25	30	55	Zn	54.983980	36	24	60	Cr	59.949730000
36	20	56	Ca	55.985790	35	25	60	Mn	59.943193998
35	21	56	Sc	55.972660	34	26	60	Fe	59.934076943
34	22	56	Ti	55.957990000	33	27	60	Co	59.933822196
33	23	56	V	55.950360000	32	28	60	Ni	59.930790633
32	24	56	Cr	55.940645238	31	29	60	Cu	59.937368123
31	25	56	Mn	55.938909366	30	30	60	Zn	59.941832031

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
29	31	60	Ga	59.957060	37	28	65	Ni	64.930088013
28	32	60	Ge	59.970190	36	29	65	Cu	64.927793707
27	33	60	As	59.993130	35	30	65	Zn	64.929245079
39	22	61	Ti	60.982018	34	31	65	Ga	64.932739322
38	23	61	V	60.967410	33	32	65	Ge	64.939440762
37	24	61	Cr	60.954090000	32	33	65	As	64.949484
36	25	61	Mn	60.944460000	31	34	65	Se	64.964660
35	26	61	Fe	60.936749461	41	25	66	Mn	65.960820
34	27	61	Co	60.932479381	40	26	66	Fe	65.945980000
33	28	61	Ni	60.931060442	39	27	66	Co	65.939825412
32	29	61	Cu	60.933462181	38	28	66	Ni	65.929115232
31	30	61	Zn	60.939513907	37	29	66	Cu	65.928873041
30	31	61	Ga	60.949170	36	30	66	Zn	65.926036763
29	32	61	Ge	60.963790	35	31	66	Ga	65.931592355
28	33	61	As	60.980620	34	32	66	Ge	65.933846798
39	23	62	V	61.973140	33	33	66	As	65.944368
38	24	62	Cr	61.955800000	32	34	66	Se	65.955210
37	25	62	Mn	61.947970000	42	25	67	Mn	66.963820
36	26	62	Fe	61.936770495	41	26	67	Fe	66.950000000
35	27	62	Co	61.934054212	40	27	67	Co	66.940610000
34	28	62	Ni	61.928348763	39	28	67	Ni	66.931569638
33	29	62	Cu	61.932587299	38	29	67	Cu	66.927750294
32	30	62	Zn	61.934334132	37	30	67	Zn	66.927130859
31	31	62	Ga	61.944179608	36	31	67	Ga	66.928204915
30	32	62	Ge	61.954650	35	32	67	Ge	66.932738415
29	33	62	As	61.973200	34	33	67	As	66.939190417
40	23	63	V	62.976750	33	34	67	Se	66.950090
39	24	63	Cr	62.961860	32	35	67	Br	66.964790
38	25	63	Mn	62.949810000	42	26	68	Fe	67.952510
37	26	63	Fe	62.940118442	41	27	68	Co	67.944360000
36	27	63	Co	62.933615218	40	28	68	Ni	67.931844932
35	28	63	Ni	62.929672948	39	29	68	Cu	67.929637875
34	29	63	Cu	62.929601079	38	30	68	Zn	67.924847566
33	30	63	Zn	62.933215563	37	31	68	Ga	67.927983497
32	31	63	Ga	62.939141527	36	32	68	Ge	67.928097266
31	32	63	Ge	62.949640	35	33	68	As	67.936792976
30	33	63	As	62.963690	34	34	68	Se	67.941870
40	24	64	Cr	63.964200	33	35	68	Br	67.958248
39	25	64	Mn	63.953730000	43	26	69	Fe	68.957700
38	26	64	Fe	63.940870000	42	27	69	Co	68.945200000
37	27	64	Co	63.935813523	41	28	69	Ni	68.935181837
36	28	64	Ni	63.927969574	40	29	69	Cu	68.929425281
35	29	64	Cu	63.929767865	39	30	69	Zn	68.926553538
34	30	64	Zn	63.929146578	38	31	69	Ga	68.925580912
33	31	64	Ga	63.936838307	37	32	69	Ge	68.927972002
32	32	64	Ge	63.941572638	36	33	69	As	68.932280154
31	33	64	As	63.957572	35	34	69	Se	68.939562155
41	24	65	Cr	64.970370	34	35	69	Br	68.950178
40	25	65	Mn	64.956100000	33	36	69	Kr	68.965320
39	26	65	Fe	64.944940000	43	27	70	Co	69.949810
38	27	65	Co	64.936484581	42	28	70	Ni	69.936140000

N	Z	A	El	mass (amu)	N	Z	A	El	mass. (amu)
41	29	70	Cu	69.932409287	36	38	74	Sr	73.956310
40	30	70	Zn	69.925324870	47	28	75	Ni	74.952970
39	31	70	Ga	69.926027741	46	29	75	Cu	74.941700
38	32	70	Ge	69.924250365	45	30	75	Zn	74.932937379
37	33	70	As	69.930927811	44	31	75	Ga	74.926500645
36	34	70	Se	69.933504	43	32	75	Ge	74.922859494
35	35	70	Br	69.944616	42	33	75	As	74.921596417
34	36	70	Kr	69.956010	41	34	75	Se	74.922523571
44	27	71	Co	70.951730	40	35	75	Br	74.925776410
43	28	71	Ni	70.940000000	39	36	75	Kr	74.931033794
42	29	71	Cu	70.932619818	38	37	75	Rb	74.938569199
41	30	71	Zn	70.927727195	37	38	75	Sr	74.949920
40	31	71	Ga	70.924705010	48	28	76	Ni	75.955330
39	32	71	Ge	70.924953991	47	29	76	Cu	75.945990
38	33	71	As	70.927114724	46	30	76	Zn	75.933394207
37	34	71	Se	70.932268	45	31	76	Ga	75.928928262
36	35	71	Br	70.939246	44	32	76	Ge	75.921402716
35	36	71	Kr	70.950510	43	33	76	As	75.922393933
34	37	71	Rb	70.965320	42	34	76	Se	75.919214107
45	27	72	Co	71.956410	41	35	76	Br	75.924541974
44	28	72	Ni	71.941300000	40	36	76	Kr	75.925948304
43	29	72	Cu	71.935520	39	37	76	Rb	75.935071448
42	30	72	Zn	71.926861122	38	38	76	Sr	75.941610
41	31	72	Ga	71.926369350	49	28	77	Ni	76.960830
40	32	72	Ge	71.922076184	48	29	77	Cu	76.947950
39	33	72	As	71.926752647	47	30	77	Zn	76.937085857
38	34	72	Se	71.927112313	46	31	77	Ga	76.929281189
37	35	72	Br	71.936496876	45	32	77	Ge	76.923548462
36	36	72	Kr	71.941907540	44	33	77	As	76.920647703
35	37	72	Rb	71.959080	43	34	77	Se	76.919914610
45	28	73	Ni	72.946080	42	35	77	Br	76.921380123
44	29	73	Cu	72.936490	41	36	77	Kr	76.924667880
43	30	73	Zn	72.929779469	40	37	77	Rb	76.930406599
42	31	73	Ga	72.925169832	39	38	77	Sr	76.937761511
41	32	73	Ge	72.923459361	38	39	77	Y	76.949620
40	33	73	As	72.923825288	50	28	78	Ni	77.963800
39	34	73	Se	72.926766800	49	29	78	Cu	77.952810
38	35	73	Br	72.931794889	48	30	78	Zn	77.938569576
37	36	73	Kr	72.938931115	47	31	78	Ga	77.931655950
36	37	73	Rb	72.950366	46	32	78	Ge	77.922852886
35	38	73	Sr	72.965970	45	33	78	As	77.921828577
46	28	74	Ni	73.947910	44	34	78	Se	77.917309522
45	29	74	Cu	73.940200	43	35	78	Br	77.921146130
44	30	74	Zn	73.929458261	42	36	78	Kr	77.920386271
43	31	74	Ga	73.926940999	41	37	78	Rb	77.928141485
42	32	74	Ge	73.921178213	40	38	78	Sr	77.932179362
41	33	74	As	73.923929076	39	39	78	Y	77.943500
40	34	74	Se	73.922476561	50	29	79	Cu	78.955280
39	35	74	Br	73.929891152	49	30	79	Zn	78.942675
38	36	74	Kr	73.933258225	48	31	79	Ga	78.932916371
37	37	74	Rb	73.944470376	47	32	79	Ge	78.925401560

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
46	33	79	As	78.920948498	45	38	83	Sr	82.917555029
45	34	79	Se	78.918499802	44	39	83	Y	82.922352572
44	35	79	Br	78.918337647	43	40	83	Zr	82.928652130
43	36	79	Kr	78.920082992	42	41	83	Nb	82.936703713
42	37	79	Rb	78.923996719	41	42	83	Mo	82.948740
41	38	79	Sr	78.929707076	53	31	84	Ga	83.952340
40	39	79	Y	78.937350712	52	32	84	Ge	83.937310
39	40	79	Zr	78.949160	51	33	84	As	83.929060
51	29	80	Cu	79.961890	50	34	84	Se	83.918464523
50	30	80	Zn	79.944414722	49	35	84	Br	83.916503685
49	31	80	Ga	79.936588154	48	36	84	Kr	83.911506627
48	32	80	Ge	79.925444764	47	37	84	Rb	83.914384676
47	33	80	As	79.922578162	46	38	84	Sr	83.913424778
46	34	80	Se	79.916521828	45	39	84	Y	83.920387768
45	35	80	Br	79.918529952	44	40	84	Zr	83.923250
44	36	80	Kr	79.916378040	43	41	84	Nb	83.933570
43	37	80	Rb	79.922519322	42	42	84	Mo	83.940090
42	38	80	Sr	79.924524588	53	32	85	Ge	84.942690
41	39	80	Y	79.934337	52	33	85	As	84.931810
40	40	80	Zr	79.940550	51	34	85	Se	84.922244678
51	30	81	Zn	80.950480	50	35	85	Br	84.915608027
50	31	81	Ga	80.937752955	49	36	85	Kr	84.912526954
49	32	81	Ge	80.928821065	48	37	85	Rb	84.911789341
48	33	81	As	80.922132884	47	38	85	Sr	84.912932689
47	34	81	Se	80.917992931	46	39	85	Y	84.916427076
46	35	81	Br	80.916291060	45	40	85	Zr	84.921465220
45	36	81	Kr	80.916592419	44	41	85	Nb	84.927906486
44	37	81	Rb	80.918994165	43	42	85	Mo	84.936590
43	38	81	Sr	80.923213095	42	43	85	Tc	84.948940
42	39	81	Y	80.929128719	54	32	86	Ge	85.946270
41	40	81	Zr	80.936815296	53	33	86	As	85.936230
40	41	81	Nb	80.949050	52	34	86	Se	85.924271165
52	30	82	Zn	81.954840	51	35	86	Br	85.918797162
51	31	82	Ga	81.943160	50	36	86	Kr	85.910610313
50	32	82	Ge	81.929550326	49	37	86	Rb	85.911167080
49	33	82	As	81.924504668	48	38	86	Sr	85.909262351
48	34	82	Se	81.916700000	47	39	86	Y	85.914887724
47	35	82	Br	81.916804666	46	40	86	Zr	85.916472851
46	36	82	Kr	81.913484601	45	41	86	Nb	85.925037588
45	37	82	Rb	81.918207691	44	42	86	Mo	85.930695167
44	38	82	Sr	81.918401258	43	43	86	Tc	85.942880
43	39	82	Y	81.926792071	54	33	87	As	86.939580
42	40	82	Zr	81.931086249	53	34	87	Se	86.928520749
41	41	82	Nb	81.943130	52	35	87	Br	86.920710713
52	31	83	Ga	82.946870	51	36	87	Kr	86.913354251
51	32	83	Ge	82.934510	50	37	87	Rb	86.909183465
50	33	83	As	82.924980625	49	38	87	Sr	86.908879316
49	34	83	Se	82.919119072	48	39	87	Y	86.910877833
48	35	83	Br	82.915180219	47	40	87	Zr	86.914816578
47	36	83	Kr	82.914135952	46	41	87	Nb	86.920361435
46	37	83	Rb	82.915111951	45	42	87	Mo	86.927326830

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
44	43	87	Tc	86.936530	45	46	91	Pd	90.949480
43	44	87	Ru	86.949180	58	34	92	Se	91.949330
55	33	88	As	87.944560	57	35	92	Br	91.939255258
54	34	88	Se	87.931423982	56	36	92	Kr	91.926152752
53	35	88	Br	87.924065908	55	37	92	Rb	91.919725442
52	36	88	Kr	87.914446951	54	38	92	Sr	91.911029895
51	37	88	Rb	87.911318556	53	39	92	Y	91.908946832
50	38	88	Sr	87.905614339	52	40	92	Zr	91.905040106
49	39	88	Y	87.909503361	51	41	92	Nb	91.907193214
48	40	88	Zr	87.910226179	50	42	92	Mo	91.906810480
47	41	88	Nb	87.917956	49	43	92	Tc	91.915259655
46	42	88	Mo	87.921952728	48	44	92	Ru	91.920120
45	43	88	Tc	87.932830	47	45	92	Rh	91.931980
44	44	88	Ru	87.940420	46	46	92	Pd	91.940420
56	33	89	As	88.949230	58	35	93	Br	92.943100
55	34	89	Se	88.936020	57	36	93	Kr	92.931265246
54	35	89	Br	88.926387260	56	37	93	Rb	92.922032765
53	36	89	Kr	88.917632505	55	38	93	Sr	92.914022410
52	37	89	Rb	88.912279939	54	39	93	Y	92.909581582
51	38	89	Sr	88.907452906	53	40	93	Zr	92.906475627
50	39	89	Y	88.905847902	52	41	93	Nb	92.906377543
49	40	89	Zr	88.908888916	51	42	93	Mo	92.906812213
48	41	89	Nb	88.913495503	50	43	93	Tc	92.910248473
47	42	89	Mo	88.919480562	49	44	93	Ru	92.917051523
46	43	89	Tc	88.927542880	48	45	93	Rh	92.925740
45	44	89	Ru	88.936110	47	46	93	Pd	92.935910
44	45	89	Rh	88.949380	59	35	94	Br	93.948680
56	34	90	Se	89.939420	58	36	94	Kr	93.934362
55	35	90	Br	89.930634988	57	37	94	Rb	93.926407326
54	36	90	Kr	89.919523803	56	38	94	Sr	93.915359856
53	37	90	Rb	89.914808941	55	39	94	Y	93.911594008
52	38	90	Sr	89.907737596	54	40	94	Zr	93.906315765
51	39	90	Y	89.907151443	53	41	94	Nb	93.907283457
50	40	90	Zr	89.904703679	52	42	94	Mo	93.905087578
49	41	90	Nb	89.911264109	51	43	94	Tc	93.909656309
48	42	90	Mo	89.913936161	50	44	94	Ru	93.911359569
47	43	90	Tc	89.923555830	49	45	94	Rh	93.921698
46	44	90	Ru	89.929780	48	46	94	Pd	93.928770
45	45	90	Rh	89.942870	47	47	94	Ag	93.942780
57	34	91	Se	90.945370	59	36	95	Kr	94.939840
56	35	91	Br	90.933965300	58	37	95	Rb	94.929319260
55	36	91	Kr	90.923442418	57	38	95	Sr	94.919358213
54	37	91	Rb	90.916534160	56	39	95	Y	94.912823709
53	38	91	Sr	90.910209845	55	40	95	Zr	94.908042739
52	39	91	Y	90.907303415	54	41	95	Nb	94.906835178
51	40	91	Zr	90.905644968	53	42	95	Mo	94.905841487
50	41	91	Nb	90.906990538	52	43	95	Tc	94.907656454
49	42	91	Mo	90.911750754	51	44	95	Ru	94.910412729
48	43	91	Tc	90.918428200	50	45	95	Rh	94.915898541
47	44	91	Ru	90.926377434	49	46	95	Pd	94.924690
46	45	91	Rh	90.936550	48	47	95	Ag	94.935480

N	Z	A	EI	mass (amu)	N	Z	A	EI	mass (amu)
60	36	96	Kr	95.943070	50	49	99	In	98.934610
59	37	96	Rb	95.934283962	63	37	100	Rb	99.949870
58	38	96	Sr	95.921680473	62	38	100	Sr	99.935351729
57	39	96	Y	95.915897787	61	39	100	Y	99.927756402
56	40	96	Zr	95.908275675	60	40	100	Zr	99.917761704
55	41	96	Nb	95.908100076	59	41	100	Nb	99.914181434
54	42	96	Mo	95.904678904	58	42	100	Mo	99.907477149
53	43	96	Tc	95.907870803	57	43	100	Tc	99.907657594
52	44	96	Ru	95.907597681	56	44	100	Ru	99.904219664
51	45	96	Rh	95.914518212	55	45	100	Rh	99.908116630
50	46	96	Pd	95.918221940	54	46	100	Pd	99.908504596
49	47	96	Ag	95.930680	53	47	100	Ag	99.916069387
48	48	96	Cd	95.939770	52	48	100	Cd	99.920230232
61	36	97	Kr	96.948560	51	49	100	In	99.931149033
60	37	97	Rb	96.937342863	50	50	100	Sn	99.938954
59	38	97	Sr	96.926148757	64	37	101	Rb	100.953195994
58	39	97	Y	96.918131017	63	38	101	Sr	100.940517434
57	40	97	Zr	96.910950716	62	39	101	Y	100.930313395
56	41	97	Nb	96.908097144	61	40	101	Zr	100.921139958
55	42	97	Mo	96.906021033	60	41	101	Nb	100.915251567
54	43	97	Tc	96.906364843	59	42	101	Mo	100.910346543
53	44	97	Ru	96.907554546	58	43	101	Tc	100.907314380
52	45	97	Rh	96.911336643	57	44	101	Ru	100.905582219
51	46	97	Pd	96.916478921	56	45	101	Rh	100.906163526
50	47	97	Ag	96.924000	55	46	101	Pd	100.908289144
49	48	97	Cd	96.934940	54	47	101	Ag	100.912802135
61	37	98	Rb	97.941703557	53	48	101	Cd	100.918681442
60	38	98	Sr	97.928471177	52	49	101	In	100.926560
59	39	98	Y	97.922219525	51	50	101	Sn	100.936060
58	40	98	Zr	97.912746366	65	37	102	Rb	101.959210
57	41	98	Nb	97.910330690	64	38	102	Sr	101.943018795
56	42	98	Mo	97.905407846	63	39	102	Y	101.933555501
55	43	98	Tc	97.907215692	62	40	102	Zr	101.922981089
54	44	98	Ru	97.905287111	61	41	102	Nb	101.918037417
53	45	98	Rh	97.910716431	60	42	102	Mo	101.910297162
52	46	98	Pd	97.912720751	59	43	102	Tc	101.909212938
51	47	98	Ag	97.921759995	58	44	102	Ru	101.904349503
50	48	98	Cd	97.927579	57	45	102	Rh	101.906842845
49	49	98	In	97.942240	56	46	102	Pd	101.905607716
62	37	99	Rb	98.945420616	55	47	102	Ag	101.911999996
61	38	99	Sr	98.933315038	54	48	102	Cd	101.914777255
60	39	99	Y	98.924634736	53	49	102	In	101.924707541
59	40	99	Zr	98.916511084	52	50	102	Sn	101.930490
58	41	99	Nb	98.911617864	65	38	103	Sr	102.948950
57	42	99	Mo	98.907711598	64	39	103	Y	102.936940
56	43	99	Tc	98.906254554	63	40	103	Zr	102.926597062
55	44	99	Ru	98.905939307	62	41	103	Nb	102.919141297
54	45	99	Rh	98.908132101	61	42	103	Mo	102.913204596
53	46	99	Pd	98.911767757	60	43	103	Tc	102.909178805
52	47	99	Ag	98.917597103	59	44	103	Ru	102.906323677
51	48	99	Cd	98.925010	58	45	103	Rh	102.905504182

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
57	46	103	Pd	102.906087204	63	44	107	Ru	106.909907207
56	47	103	Ag	102.908972453	62	45	107	Rh	106.906750540
55	48	103	Cd	102.913418952	61	46	107	Pd	106.905128453
54	49	103	In	102.919913896	60	47	107	Ag	106.905093020
53	50	103	Sn	102.928130	59	48	107	Cd	106.906614232
52	51	103	Sb	102.940120	58	49	107	In	106.910292195
66	38	104	Sr	103.952330	57	50	107	Sn	106.915666702
65	39	104	Y	103.941450	56	51	107	Sb	106.924150
64	40	104	Zr	103.928780	55	52	107	Te	106.935036
63	41	104	Nb	103.922459464	68	40	108	Zr	107.944280
62	42	104	Mo	103.913758387	67	41	108	Nb	107.935010
61	43	104	Tc	103.911444898	66	42	108	Mo	107.923579
60	44	104	Ru	103.905430145	65	43	108	Tc	107.918479973
59	45	104	Rh	103.906655315	64	44	108	Ru	107.910192211
58	46	104	Pd	103.904034912	63	45	108	Rh	107.908730768
57	47	104	Ag	103.908628228	62	46	108	Pd	107.903894451
56	48	104	Cd	103.909848091	61	47	108	Ag	107.905953705
55	49	104	In	103.918338416	60	48	108	Cd	107.904183403
54	50	104	Sn	103.923185469	59	49	108	In	107.909719683
53	51	104	Sb	103.936287	58	50	108	Sn	107.911965339
66	39	105	Y	104.945090	57	51	108	Sb	107.922160
65	40	105	Zr	104.933050	56	52	108	Te	107.929486838
64	41	105	Nb	104.923934023	55	53	108	I	107.943291
63	42	105	Mo	104.916972087	68	41	109	Nb	108.937630
62	43	105	Tc	104.911658043	67	42	109	Mo	108.927810
61	44	105	Ru	104.907750341	66	43	109	Tc	108.919627
60	45	105	Rh	104.905692444	65	44	109	Ru	108.913201565
59	46	105	Pd	104.905084046	64	45	109	Rh	108.908735621
58	47	105	Ag	104.906528234	63	46	109	Pd	108.905953535
57	48	105	Cd	104.909467818	62	47	109	Ag	108.904755514
56	49	105	In	104.914673434	61	48	109	Cd	108.904985569
55	50	105	Sn	104.921390409	60	49	109	In	108.907154078
54	51	105	Sb	104.931528593	59	50	109	Sn	108.911286879
67	39	106	Y	105.950220	58	51	109	Sb	108.918136092
66	40	106	Zr	105.935910	57	52	109	Te	108.927456483
65	41	106	Nb	105.928190	56	53	109	I	108.938191658
64	42	106	Mo	105.918134284	69	41	110	Nb	109.942680
63	43	106	Tc	105.914355408	68	42	110	Mo	109.929730
62	44	106	Ru	105.907326913	67	43	110	Tc	109.923390
61	45	106	Rh	105.907284615	66	44	110	Ru	109.913966185
60	46	106	Pd	105.903483087	65	45	110	Rh	109.910949525
59	47	106	Ag	105.906666431	64	46	110	Pd	109.905152385
58	48	106	Cd	105.906458007	63	47	110	Ag	109.906110460
57	49	106	In	105.913461134	62	48	110	Cd	109.903005578
56	50	106	Sn	105.916880472	61	49	110	In	109.907168783
55	51	106	Sb	105.928763	60	50	110	Sn	109.907852688
54	52	106	Te	105.937702	59	51	110	Sb	109.916763
67	40	107	Zr	106.940860	58	52	110	Te	109.922407164
66	41	107	Nb	106.930310	57	53	110	I	109.935214
65	42	107	Mo	106.921694724	56	54	110	Xe	109.944476
64	43	107	Tc	106.915081691	69	42	111	Mo	110.934510

				(amu)								(amu)			
68	43	111	Tc	110.925050	60	54	114	Xe	113.928145						
67	44	111	Ru	110.917560	59	55	114	Cs	113.941421						
66	45	111	Rh	110.911660	58	56	114	Ba	113.950941						
65	46	111	Pd	110.907643952	72	43	115	Tc	114.938280						
64	47	111	Ag	110.905294679	71	44	115	Ru	114.928310						
63	48	111	Cd	110.904181628	70	45	115	Rh	114.920124676						
62	49	111	In	110.905110677	69	46	115	Pd	114.913683410						
61	50	111	Sn	110.907735404	68	47	115	Ag	114.908762282						
60	51	111	Sb	110.913210	67	48	115	Cd	114.905430553						
59	52	111	Te	110.921120589	66	49	115	In	114.903878328						
58	53	111	I	110.930276	65	50	115	Sn	114.903345973						
57	54	111	Xe	110.941632	64	51	115	Sb	114.906598812						
70	42	112	Mo	111.936840	63	52	115	Te	114.911578627						
69	43	112	Tc	111.929240	62	53	115	I	114.917918						
68	44	112	Ru	111.918553	61	54	115	Xe	114.926538						
67	45	112	Rh	111.914613	60	55	115	Cs	114.935939						
66	46	112	Pd	111.907313277	59	56	115	Ba	114.947710						
65	47	112	Ag	111.907004132	72	44	116	Ru	115.930160						
64	48	112	Cd	111.902757226	71	45	116	Rh	115.923713						
63	49	112	In	111.905533338	70	46	116	Pd	115.914158288						
62	50	112	Sn	111.904820810	69	47	116	Ag	115.911359558						
61	51	112	Sb	111.912394640	68	48	116	Cd	115.904755434						
60	52	112	Te	111.917061617	67	49	116	In	115.905259995						
59	53	112	I	111.927970	66	50	116	Sn	115.901744149						
58	54	112	Xe	111.935665350	65	51	116	Sb	115.906797235						
57	55	112	Cs	111.950331	64	52	116	Te	115.908420253						
71	42	113	Mo	112.942030	63	53	116	I	115.916735014						
70	43	113	Tc	112.931330	62	54	116	Xe	115.921738						
69	44	113	Ru	112.922540	61	55	116	Cs	115.932914152						
68	45	113	Rh	112.915420	60	56	116	Ba	115.941680						
67	46	113	Pd	112.910151346	73	44	117	Ru	116.934790						
66	47	113	Ag	112.906565708	72	45	117	Rh	116.925350						
65	48	113	Cd	112.904400947	71	46	117	Pd	116.917840						
64	49	113	In	112.904061223	70	47	117	Ag	116.911684187						
63	50	113	Sn	112.905173373	69	48	117	Cd	116.907218242						
62	51	113	Sb	112.909377941	68	49	117	In	116.904515731						
61	52	113	Te	112.915927	67	50	117	Sn	116.902953765						
60	53	113	I	112.923644245	66	51	117	Sb	116.904839590						
59	54	113	Xe	112.933382836	65	52	117	Te	116.908634180						
58	55	113	Cs	112.944535512	64	53	117	I	116.913647692						
71	43	114	Tc	113.935880	63	54	117	Xe	116.920564355						
70	44	114	Ru	113.923999	62	55	117	Cs	116.928639484						
69	45	114	Rh	113.918846	61	56	117	Ba	116.938860						
68	46	114	Pd	113.910365322	60	57	117	La	116.950010						
67	47	114	Ag	113.908807907	74	44	118	Ru	117.937030						
66	48	114	Cd	113.903358121	73	45	118	Rh	117.929430						
65	49	114	In	113.904916758	72	46	118	Pd	117.918983915						
64	50	114	Sn	113.902781816	71	47	118	Ag	117.914582383						
63	51	114	Sb	113.909095876	70	48	118	Cd	117.906914144						
62	52	114	Te	113.912057	69	49	118	In	117.906354623						
61	53	114	I	113.921850	68	50	118	Sn	117.901606328						

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
67	51	118	Sb	117.905531885	75	47	122	Ag	121.923320
66	52	118	Te	117.905825187	74	48	122	Cd	121.913500
65	53	118	I	117.913375230	73	49	122	In	121.910277103
64	54	118	Xe	117.916570920	72	50	122	Sn	121.903440138
63	55	118	Cs	117.926554883	71	51	122	Sb	121.905175415
62	56	118	Ba	117.933440	70	52	122	Te	121.903047064
61	57	118	La	117.946570	69	53	122	I	121.907592451
74	45	119	Rh	118.931360	68	54	122	Xe	121.908548396
73	46	119	Pd	118.922680	67	55	122	Cs	121.916121946
72	47	119	Ag	118.915666045	66	56	122	Ba	121.920260
71	48	119	Cd	118.909922582	65	57	122	La	121.930710
70	49	119	In	118.905846334	64	58	122	Ce	121.938010
69	50	119	Sn	118.903308880	63	59	122	Pr	121.951650
68	51	119	Sb	118.903946460	77	46	123	Pd	122.934260
67	52	119	Te	118.906408110	76	47	123	Ag	122.924900
66	53	119	I	118.910180837	75	48	123	Cd	122.917003675
65	54	119	Xe	118.915554295	74	49	123	In	122.910438951
64	55	119	Cs	118.922370879	73	50	123	Sn	122.905721901
63	56	119	Ba	118.931051927	72	51	123	Sb	122.904215696
62	57	119	La	118.940990	71	52	123	Te	122.904272951
61	58	119	Ce	118.952760	70	53	123	I	122.905597944
75	45	120	Rh	119.935780	69	54	123	Xe	122.908470748
74	46	120	Pd	119.924030	68	55	123	Cs	122.912990168
73	47	120	Ag	119.918788609	67	56	123	Ba	122.918850
72	48	120	Cd	119.909851352	66	57	123	La	122.926240
71	49	120	In	119.907961505	65	58	123	Ce	122.935510
70	50	120	Sn	119.902196571	64	59	123	Pr	122.945960
69	51	120	Sb	119.905074315	77	47	124	Ag	123.928530
68	52	120	Te	119.904019891	76	48	124	Cd	123.917648302
67	53	120	I	119.910047843	75	49	124	In	123.913175916
66	54	120	Xe	119.912151990	74	50	124	Sn	123.905274630
65	55	120	Cs	119.920678219	73	51	124	Sb	123.905937525
64	56	120	Ba	119.926045941	72	52	124	Te	123.902819466
63	57	120	La	119.938070	71	53	124	I	123.906211423
62	58	120	Ce	119.946640	70	54	124	Xe	123.905895774
76	45	121	Rh	120.938080	69	55	124	Cs	123.912245731
75	46	121	Pd	120.928180	68	56	124	Ba	123.915088437
74	47	121	Ag	120.919851074	67	57	124	La	123.924530
73	48	121	Cd	120.912980390	66	58	124	Ce	123.930520
72	49	121	In	120.907848847	65	59	124	Pr	123.942960
71	50	121	Sn	120.904236867	78	47	125	Ag	124.930540
70	51	121	Sb	120.903818044	77	48	125	Cd	124.921247170
69	52	121	Te	120.904929815	76	49	125	In	124.913601387
68	53	121	I	120.907366063	75	50	125	Sn	124.907784924
67	54	121	Xe	120.911386497	74	51	125	Sb	124.905247804
66	55	121	Cs	120.917183637	73	52	125	Te	124.904424718
65	56	121	Ba	120.924485908	72	53	125	I	124.904624150
64	57	121	La	120.933010	71	54	125	Xe	124.906398236
63	58	121	Ce	120.943670	70	55	125	Cs	124.909724871
62	59	121	Pr	120.955364	69	56	125	Ba	124.914620234
76	46	122	Pd	121.929800	68	57	125	La	124.920670

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
67	58	125	Ce	124.928540	74	55	129	Cs	128.906063369
66	59	125	Pr	124.937830	73	56	129	Ba	128.908673749
79	47	126	Ag	125.934500	72	57	129	La	128.912667334
78	48	126	Cd	125.922353996	71	58	129	Ce	128.918089
77	49	126	In	125.916464532	70	59	129	Pr	128.924860
76	50	126	Sn	125.907653953	69	60	129	Nd	128.933254
75	51	126	Sb	125.907248153	68	61	129	Pm	128.943160
74	52	126	Te	125.903305543	82	48	130	Cd	129.933980
73	53	126	I	125.905619387	81	49	130	In	129.924854941
72	54	126	Xe	125.904268868	80	50	130	Sn	129.913852185
71	55	126	Cs	125.909447953	79	51	130	Sb	129.911546459
70	56	126	Ba	125.911244146	78	52	130	Te	129.906222753
69	57	126	La	125.919370	77	53	130	I	129.906674018
68	58	126	Ce	125.924100	76	54	130	Xe	129.903507903
67	59	126	Pr	125.935310	75	55	130	Cs	129.906706163
66	60	126	Nd	125.943070	74	56	130	Ba	129.906310478
80	47	127	Ag	126.936880	73	57	130	La	129.912320
79	48	127	Cd	126.926434822	72	58	130	Ce	129.914694
78	49	127	In	126.917344048	71	59	130	Pr	129.923380
77	50	127	Sn	126.910350980	70	60	130	Nd	129.928780
76	51	127	Sb	126.906914564	69	61	130	Pm	129.940450
75	52	127	Te	126.905217290	68	62	130	Sm	129.948630
74	53	127	I	126.904468420	82	49	131	In	130.926767408
73	54	127	Xe	126.905179581	81	50	131	Sn	130.916919144
72	55	127	Cs	126.907417600	80	51	131	Sb	130.911946487
71	56	127	Ba	126.911121328	79	52	131	Te	130.908521880
70	57	127	La	126.916160	78	53	131	I	130.906124168
69	58	127	Ce	126.922750	77	54	131	Xe	130.905081920
68	59	127	Pr	126.930830	76	55	131	Cs	130.905460232
67	60	127	Nd	126.940500	75	56	131	Ba	130.906930798
80	48	128	Cd	127.927760617	74	57	131	La	130.910108489
79	49	128	In	127.920170658	73	58	131	Ce	130.914424137
78	50	128	Sn	127.910534953	72	59	131	Pr	130.920060245
77	51	128	Sb	127.909167330	71	60	131	Nd	130.927102697
76	52	128	Te	127.904461383	70	61	131	Pm	130.935800
75	53	128	I	127.905805254	69	62	131	Sm	130.945890
74	54	128	Xe	127.903530436	83	49	132	In	131.932919005
73	55	128	Cs	127.907747919	82	50	132	Sn	131.917744455
72	56	128	Ba	127.908308870	81	51	132	Sb	131.914413247
71	57	128	La	127.915447940	80	52	132	Te	131.908523782
70	58	128	Ce	127.918870	79	53	132	I	131.907994525
69	59	128	Pr	127.928800	78	54	132	Xe	131.904154457
68	60	128	Nd	127.935390	77	55	132	Cs	131.906429799
67	61	128	Pm	127.948260	76	56	132	Ba	131.905056152
81	48	129	Cd	128.932260	75	57	132	La	131.910110399
80	49	129	In	128.921657958	74	58	132	Ce	131.911490
79	50	129	Sn	128.913439976	73	59	132	Pr	131.919120
78	51	129	Sb	128.909150092	72	60	132	Nd	131.923120
77	52	129	Te	128.906595593	71	61	132	Pm	131.933750
76	53	129	I	128.904987487	70	62	132	Sm	131.940820
75	54	129	Xe	128.904779458	69	63	132	Eu	131.954160

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
84	49	133	In	132.938340	79	57	136	La	135.907651181
83	50	133	Sn	132.923814085	78	58	136	Ce	135.907143574
82	51	133	Sb	132.915236466	77	59	136	Pr	135.912646935
81	52	133	Te	132.910939068	76	60	136	Nd	135.915020542
80	53	133	I	132.907806465	75	61	136	Pm	135.923447865
79	54	133	Xe	132.905905660	74	62	136	Sm	135.928300
78	55	133	Cs	132.905446870	73	63	136	Eu	135.939500
77	56	133	Ba	132.906002368	72	64	136	Gd	135.947070
76	57	133	La	132.908396372	87	50	137	Sn	136.945790
75	58	133	Ce	132.911550	86	51	137	Sb	136.935310
74	59	133	Pr	132.916200	85	52	137	Te	136.925324769
73	60	133	Nd	132.922210	84	53	137	I	136.917872653
72	61	133	Pm	132.929720	83	54	137	Xe	136.911562939
71	62	133	Sm	132.938730	82	55	137	Cs	136.907083505
70	63	133	Eu	132.948900	81	56	137	Ba	136.905821414
85	49	134	In	133.944660	80	57	137	La	136.906465656
84	50	134	Sn	133.928463576	79	58	137	Ce	136.907777634
83	51	134	Sb	133.920551554	78	59	137	Pr	136.910678351
82	52	134	Te	133.911540546	77	60	137	Nd	136.914639730
81	53	134	I	133.909876552	76	61	137	Pm	136.920713
80	54	134	Xe	133.905394504	75	62	137	Sm	136.927046709
79	55	134	Cs	133.906713419	74	63	137	Eu	136.935210
78	56	134	Ba	133.904503347	73	64	137	Gd	136.944650
77	57	134	La	133.908489607	87	51	138	Sb	137.940960
76	58	134	Ce	133.909026379	86	52	138	Te	137.929220
75	59	134	Pr	133.915672	85	53	138	I	137.922383666
74	60	134	Nd	133.918645	84	54	138	Xe	137.913988549
73	61	134	Pm	133.928490	83	55	138	Cs	137.911010537
72	62	134	Sm	133.934020	82	56	138	Ba	137.905241273
71	63	134	Eu	133.946320	81	57	138	La	137.907106826
85	50	135	Sn	134.934730	80	58	138	Ce	137.905985574
84	51	135	Sb	134.925167962	79	59	138	Pr	137.910748891
83	52	135	Te	134.916450782	78	60	138	Nd	137.911930
82	53	135	I	134.910050310	77	61	138	Pm	137.919445
81	54	135	Xe	134.907207499	76	62	138	Sm	137.923540
80	55	135	Cs	134.905971903	75	63	138	Eu	137.933450
79	56	135	Ba	134.905682749	74	64	138	Gd	137.939970
78	57	135	La	134.906971003	73	65	138	Tb	137.952870
77	58	135	Ce	134.909145555	88	51	139	Sb	138.945710
76	59	135	Pr	134.913139140	87	52	139	Te	138.934730
75	60	135	Nd	134.918240	86	53	139	I	138.926093402
74	61	135	Pm	134.924617	85	54	139	Xe	138.918786859
73	62	135	Sm	134.932350	84	55	139	Cs	138.913357921
72	63	135	Eu	134.941720	83	56	139	Ba	138.908835384
86	50	136	Sn	135.939340	82	57	139	La	138.906348160
85	51	136	Sb	135.930660	81	58	139	Ce	138.906646605
84	52	136	Te	135.920103155	80	59	139	Pr	138.908932181
83	53	136	I	135.914655105	79	60	139	Nd	138.911924150
82	54	136	Xe	135.907219526	78	61	139	Pm	138.916759814
81	55	136	Cs	135.907305741	77	62	139	Sm	138.922302000
80	56	136	Ba	135.904570109	76	63	139	Eu	138.929838

N	Z	A	El	mass (amu)		N	Z	A	El	mass (amu)
75	64	139	Gd	138.938080		87	56	143	Ba	142.920617184
74	65	139	Tb	138.948030		86	57	143	La	142.916058646
88	52	140	Te	139.938700		85	58	143	Ce	142.912381158
87	53	140	I	139.931210		84	59	143	Pr	142.910812233
86	54	140	Xe	139.921635665		83	60	143	Nd	142.909809626
85	55	140	Cs	139.917277075		82	61	143	Pm	142.910927571
84	56	140	Ba	139.910599485		81	62	143	Sm	142.914623555
83	57	140	La	139.909472552		80	63	143	Eu	142.920286634
82	58	140	Ce	139.905434035		79	64	143	Gd	142.926738636
81	59	140	Pr	139.909071204		78	65	143	Tb	142.934750
80	60	140	Nd	139.909309824		77	66	143	Dy	142.943830
79	61	140	Pm	139.915801649		76	67	143	Ho	142.954690
78	62	140	Sm	139.918991000		91	53	144	I	143.949610
77	63	140	Eu	139.928083921		90	54	144	Xe	143.938230
76	64	140	Gd	139.933945		89	55	144	Cs	143.932027373
75	65	140	Tb	139.945540		88	56	144	Ba	143.922940468
74	66	140	Dy	139.953790		87	57	144	La	143.919591666
89	52	141	Te	140.944390		86	58	144	Ce	143.913642686
88	53	141	I	140.934830		85	59	144	Pr	143.913300595
87	54	141	Xe	140.926646282		84	60	144	Nd	143.910082629
86	55	141	Cs	140.920043984		83	61	144	Pm	143.912585768
85	56	141	Ba	140.914406439		82	62	144	Sm	143.911994730
84	57	141	La	140.910957016		81	63	144	Eu	143.918774116
83	58	141	Ce	140.908271103		80	64	144	Gd	143.922789
82	59	141	Pr	140.907647726		79	65	144	Tb	143.932530
81	60	141	Nd	140.909604800		78	66	144	Dy	143.939070
80	61	141	Pm	140.913606636		77	67	144	Ho	143.951640
79	62	141	Sm	140.918468512		76	68	144	Er	143.960590
78	63	141	Eu	140.924885867		91	54	145	Xe	144.943670
77	64	141	Gd	140.932210		90	55	145	Cs	144.935388226
76	65	141	Tb	140.941160		89	56	145	Ba	144.926923807
75	66	141	Dy	140.951190		88	57	145	La	144.921638370
90	52	142	Te	141.948500		87	58	145	Ce	144.917227871
89	53	142	I	141.940180		86	59	145	Pr	144.914506897
88	54	142	Xe	141.929702981		85	60	145	Nd	144.912568847
87	55	142	Cs	141.924292317		84	61	145	Pm	144.912743879
86	56	142	Ba	141.916448175		83	62	145	Sm	144.913405611
85	57	142	La	141.914074489		82	63	145	Eu	144.916261285
84	58	142	Ce	141.909239733		81	64	145	Gd	144.921687498
83	59	142	Pr	141.910039865		80	65	145	Tb	144.928880
82	60	142	Nd	141.907718643		79	66	145	Dy	144.936953
81	61	142	Pm	141.912950738		78	67	145	Ho	144.946880
80	62	142	Sm	141.915193274		77	68	145	Er	144.957460
79	63	142	Eu	141.923400033		92	54	146	Xe	145.947300
78	64	142	Gd	141.928231		91	55	146	Cs	145.940162028
77	65	142	Tb	141.938859		90	56	146	Ba	145.930106645
76	66	142	Dy	141.946267		89	57	146	La	145.925700146
75	67	142	Ho	141.959860		88	58	146	Ce	145.918689722
90	53	143	I	142.944070		87	59	146	Pr	145.917588016
89	54	143	Xe	142.934890		86	60	146	Nd	145.913112139
88	55	143	Cs	142.927330292		85	61	146	Pm	145.914692165

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
84	62	146	Sm	145.913036760	83	66	149	Dy	148.927333981
83	63	146	Eu	145.917199714	82	67	149	Ho	148.933789944
82	64	146	Gd	145.918305344	81	68	149	Er	148.942174
81	65	146	Tb	145.927180629	80	69	149	Tm	148.952650
80	66	146	Dy	145.932720118	79	70	149	Yb	148.963480
79	67	146	Ho	145.944100	95	55	150	Cs	149.957970
78	68	146	Er	145.952120	94	56	150	Ba	149.945620
77	69	146	Tm	145.966495	93	57	150	La	149.938570
93	54	147	Xe	146.953010	92	58	150	Ce	149.930226399
92	55	147	Cs	146.943864435	91	59	150	Pr	149.926995031
91	56	147	Ba	146.933992519	90	60	150	Nd	149.920886563
90	57	147	La	146.927819639	89	61	150	Pm	149.920979477
89	58	147	Ce	146.922510962	88	62	150	Sm	149.917271454
88	59	147	Pr	146.918979001	87	63	150	Eu	149.919698294
87	60	147	Nd	146.916095794	86	64	150	Gd	149.918655455
86	61	147	Pm	146.915133898	85	65	150	Tb	149.923654158
85	62	147	Sm	146.914893275	84	66	150	Dy	149.925579728
84	63	147	Eu	146.916741206	83	67	150	Ho	149.933352
83	64	147	Gd	146.919089446	82	68	150	Er	149.937762
82	65	147	Tb	146.924037176	81	69	150	Tm	149.949670
81	66	147	Dy	146.930878496	80	70	150	Yb	149.957990
80	67	147	Ho	146.939840	79	71	150	Lu	149.972668
79	68	147	Er	146.949310	96	55	151	Cs	150.962000
78	69	147	Tm	146.961081	95	56	151	Ba	150.950700
93	55	148	Cs	147.948899539	94	57	151	La	150.941560
92	56	148	Ba	147.937682377	93	58	151	Ce	150.934040
91	57	148	La	147.932191197	92	59	151	Pr	150.928227869
90	58	148	Ce	147.924394738	91	60	151	Nd	150.923824739
89	59	148	Pr	147.922183237	90	61	151	Pm	150.921202693
88	60	148	Nd	147.916888516	89	62	151	Sm	150.919928351
87	61	148	Pm	147.917467786	88	63	151	Eu	150.919846022
86	62	148	Sm	147.914817914	87	64	151	Gd	150.920344273
85	63	148	Eu	147.918153775	86	65	151	Tb	150.923098169
84	64	148	Gd	147.918109771	85	66	151	Dy	150.926179630
83	65	148	Tb	147.924298636	84	67	151	Ho	150.931680791
82	66	148	Dy	147.927177882	83	68	151	Er	150.937460
81	67	148	Ho	147.937269	82	69	151	Tm	150.945434
80	68	148	Er	147.944440	81	70	151	Yb	150.955249
79	69	148	Tm	147.957550	80	71	151	Lu	150.967147
78	70	148	Yb	147.966760	96	56	152	Ba	151.954160
94	55	149	Cs	148.952720	95	57	152	La	151.946110
93	56	149	Ba	148.942460	94	58	152	Ce	151.936380
92	57	149	La	148.934370	93	59	152	Pr	151.931600
91	58	149	Ce	148.928289207	92	60	152	Nd	151.924682428
90	59	149	Pr	148.923791056	91	61	152	Pm	151.923490557
89	60	149	Nd	148.920144190	90	62	152	Sm	151.919728244
88	61	149	Pm	148.918329195	89	63	152	Eu	151.921740399
87	62	149	Sm	148.917179521	88	64	152	Gd	151.919787882
86	63	149	Eu	148.917925922	87	65	152	Tb	151.924071324
85	64	149	Gd	148.919336427	86	66	152	Dy	151.924713874
84	65	149	Tb	148.923241630	85	67	152	Ho	151.931740598

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
84	68	152	Er	151.935078452	83	72	155	Hf	154.962760
83	69	152	Tm	151.944300	98	58	156	Ce	155.951260
82	70	152	Yb	151.950167	97	59	156	Pr	155.944120
81	71	152	Lu	151.963610	96	60	156	Nd	155.935200
97	56	153	Ba	152.959610	95	61	156	Pm	155.931060357
96	57	153	La	152.949450	94	62	156	Sm	155.925526236
95	58	153	Ce	152.940580	93	63	156	Eu	155.924750855
94	59	153	Pr	152.933650	92	64	156	Gd	155.922119552
93	60	153	Nd	152.927694534	91	65	156	Tb	155.924743749
92	61	153	Pm	152.924113189	90	66	156	Dy	155.924278273
91	62	153	Sm	152.922093907	89	67	156	Ho	155.929710
90	63	153	Eu	152.921226219	88	68	156	Er	155.931015001
89	64	153	Gd	152.921746283	87	69	156	Tm	155.939006895
88	65	153	Tb	152.923430858	86	70	156	Yb	155.942847109
87	66	153	Dy	152.925760865	85	71	156	Lu	155.952907
86	67	153	Ho	152.930194506	84	72	156	Hf	155.959247
85	68	153	Er	152.935093125	83	73	156	Ta	155.971689
84	69	153	Tm	152.942027631	99	58	157	Ce	156.956340
83	70	153	Yb	152.949210	98	59	157	Pr	156.947170
82	71	153	Lu	152.958690	97	60	157	Nd	156.939270
97	57	154	La	153.954400	96	61	157	Pm	156.933200
96	58	154	Ce	153.943320	95	62	157	Sm	156.928354506
95	59	154	Pr	153.937390	94	63	157	Eu	156.925419435
94	60	154	Nd	153.929483295	93	64	157	Gd	156.923956686
93	61	154	Pm	153.926547019	92	65	157	Tb	156.924021155
92	62	154	Sm	153.922205303	91	66	157	Dy	156.925461256
91	63	154	Eu	153.922975386	90	67	157	Ho	156.928188059
90	64	154	Gd	153.920862271	89	68	157	Er	156.931945517
89	65	154	Tb	153.924686236	88	69	157	Tm	156.936756069
88	66	154	Dy	153.924422046	87	70	157	Yb	156.942658650
87	67	154	Ho	153.930596268	86	71	157	Lu	156.950101536
86	68	154	Er	153.932777294	85	72	157	Hf	156.958127
85	69	154	Tm	153.941424	84	73	157	Ta	156.968145
84	70	154	Yb	153.946242	99	59	158	Pr	157.951780
83	71	154	Lu	153.957100	98	60	158	Nd	157.941870
82	72	154	Hf	153.964250	97	61	158	Pm	157.936690
98	57	155	La	154.958130	96	62	158	Sm	157.929987938
97	58	155	Ce	154.948040	95	63	158	Eu	157.927841923
96	59	155	Pr	154.939990	94	64	158	Gd	157.924100533
95	60	155	Nd	154.932629551	93	65	158	Tb	157.925410260
94	61	155	Pm	154.928097047	92	66	158	Dy	157.924404637
93	62	155	Sm	154.924635940	91	67	158	Ho	157.928945730
92	63	155	Eu	154.922889429	90	68	158	Er	157.929912
91	64	155	Gd	154.922618801	89	69	158	Tm	157.936996
90	65	155	Tb	154.923500411	88	70	158	Yb	157.939857897
89	66	155	Dy	154.925748950	87	71	158	Lu	157.949169
88	67	155	Ho	154.929079084	86	72	158	Hf	157.954647
87	68	155	Er	154.933204273	85	73	158	Ta	157.966368
86	69	155	Tm	154.939191562	84	74	158	W	157.973939
85	70	155	Yb	154.945792	100	59	159	Pr	158.955230
84	71	155	Lu	154.954233	99	60	159	Nd	158.946390

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
98	61	159	Pm	158.939130	96	66	162	Dy	161.926794731
97	62	159	Sm	158.933200	95	67	162	Ho	161.929092420
96	63	159	Eu	158.929084500	94	68	162	Er	161.928774923
95	64	159	Gd	158.926385075	93	69	162	Tm	161.933970147
94	65	159	Tb	158.925343135	92	70	162	Yb	161.935750
93	66	159	Dy	158.925735660	91	71	162	Lu	161.943222
92	67	159	Ho	158.927708537	90	72	162	Hf	161.947202977
91	68	159	Er	158.930680718	89	73	162	Ta	161.957148
90	69	159	Tm	158.934808966	88	74	162	W	161.963342
89	70	159	Yb	158.940153735	87	75	162	Re	161.975707
88	71	159	Lu	158.946615113	86	76	162	Os	161.983819
87	72	159	Hf	158.954003	102	61	163	Pm	162.953520
86	73	159	Ta	158.962914	101	62	163	Sm	162.945360
85	74	159	W	158.972280	100	63	163	Eu	162.939210
100	60	160	Nd	159.949390	99	64	163	Gd	162.933990
99	61	160	Pm	159.942990	98	65	163	Tb	162.930643942
98	62	160	Sm	159.935140	97	66	163	Dy	162.928727532
97	63	160	Eu	159.931967	96	67	163	Ho	162.928730286
96	64	160	Gd	159.927050616	95	68	163	Er	162.930029273
95	65	160	Tb	159.927164021	94	69	163	Tm	162.932647648
94	66	160	Dy	159.925193718	93	70	163	Yb	162.936265492
93	67	160	Ho	159.928725679	92	71	163	Lu	162.941203796
92	68	160	Er	159.929078924	91	72	163	Hf	162.947057
91	69	160	Tm	159.935090772	90	73	163	Ta	162.954316650
90	70	160	Yb	159.937560	89	74	163	W	162.962532
89	71	160	Lu	159.946019	88	75	163	Re	162.971967
88	72	160	Hf	159.950713588	87	76	163	Os	162.982048
87	73	160	Ta	159.961358	102	62	164	Sm	163.948280
86	74	160	W	159.968369	101	63	164	Eu	163.942990
85	75	160	Re	159.981485	100	64	164	Gd	163.935860
101	60	161	Nd	160.954330	99	65	164	Tb	163.933347253
100	61	161	Pm	160.945860	98	66	164	Dy	163.929171165
99	62	161	Sm	160.938830	97	67	164	Ho	163.930230577
98	63	161	Eu	160.933680	96	68	164	Er	163.929196996
97	64	161	Gd	160.929665688	95	69	164	Tm	163.933450972
96	65	161	Tb	160.927566289	94	70	164	Yb	163.934520
95	66	161	Dy	160.926929595	93	71	164	Lu	163.941215
94	67	161	Ho	160.927851662	92	72	164	Hf	163.944422
93	68	161	Er	160.930001348	91	73	164	Ta	163.953570
92	69	161	Tm	160.933398042	90	74	164	W	163.958983810
91	70	161	Yb	160.937853	89	75	164	Re	163.970319
90	71	161	Lu	160.943543	88	76	164	Os	163.977927
89	72	161	Hf	160.950330852	103	62	165	Sm	164.952980
88	73	161	Ta	160.958372992	102	63	165	Eu	164.945720
87	74	161	W	160.967089	101	64	165	Gd	164.939380
86	75	161	Re	160.977661	100	65	165	Tb	164.934880
101	61	162	Pm	161.950290	99	66	165	Dy	164.931699828
100	62	162	Sm	161.941220	98	67	165	Ho	164.930319169
99	63	162	Eu	161.937040	97	68	165	Er	164.930722800
98	64	162	Gd	161.930981211	96	69	165	Tm	164.932432463
97	65	162	Tb	161.929484803	95	70	165	Yb	164.935397592

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
94	71	165	Lu	164.939605886	90	78	168	Pt	167.988035
93	72	165	Hf	164.944540	105	64	169	Gd	168.952870
92	73	165	Ta	164.950817	104	65	169	Tb	168.946220
91	74	165	W	164.958335962	103	66	169	Dy	168.940303648
90	75	165	Re	164.967050268	102	67	169	Ho	168.936868306
89	76	165	Os	164.976475	101	68	169	Er	168.934588082
88	77	165	Ir	164.987580	100	69	169	Tm	168.934211117
103	63	166	Eu	165.949970	99	70	169	Yb	168.935187120
102	64	166	Gd	165.941600	98	71	169	Lu	168.937648757
101	65	166	Tb	165.938050	97	72	169	Hf	168.941158567
100	66	166	Dy	165.932803241	96	73	169	Ta	168.945920
99	67	166	Ho	165.932281267	95	74	169	W	168.951759
98	68	166	Er	165.930289970	94	75	169	Re	168.958830
97	69	166	Tm	165.933553133	93	76	169	Os	168.967076205
96	70	166	Yb	165.933879623	92	77	169	Ir	168.976390868
95	71	166	Lu	165.939762646	91	78	169	Pt	168.986421
94	72	166	Hf	165.942250	105	65	170	Tb	169.950250
93	73	166	Ta	165.950470	104	66	170	Dy	169.942670
92	74	166	W	165.955019896	103	67	170	Ho	169.939614951
91	75	166	Re	165.965803	102	68	170	Er	169.935460334
90	76	166	Os	165.972526	101	69	170	Tm	169.935797877
89	77	166	Ir	165.985506	100	70	170	Yb	169.934758652
104	63	167	Eu	166.953050	99	71	170	Lu	169.938472190
103	64	167	Gd	166.945570	98	72	170	Hf	169.939650
102	65	167	Tb	166.940050	97	73	170	Ta	169.946090
101	66	167	Dy	166.935649025	96	74	170	W	169.949290
100	67	167	Ho	166.933126195	95	75	170	Re	169.958163
99	68	167	Er	166.932045448	94	76	170	Os	169.963569716
98	69	167	Tm	166.932848844	93	77	170	Ir	169.975033
97	70	167	Yb	166.934946862	92	78	170	Pt	169.982326
96	71	167	Lu	166.938307056	106	65	171	Tb	170.953300
95	72	167	Hf	166.942600	105	66	171	Dy	170.946480
94	73	167	Ta	166.947973	104	67	171	Ho	170.941461227
93	74	167	W	166.954672	103	68	171	Er	170.938025885
92	75	167	Re	166.962564	102	69	171	Tm	170.936425817
91	76	167	Os	166.971554	101	70	171	Yb	170.936322297
90	77	167	Ir	166.981543	100	71	171	Lu	170.937909903
104	64	168	Gd	167.948360	99	72	171	Hf	170.940490
103	65	168	Tb	167.943640	98	73	171	Ta	170.944460
102	66	168	Dy	167.937230	97	74	171	W	170.949460
101	67	168	Ho	167.935496424	96	75	171	Re	170.955547
100	68	168	Er	167.932367781	95	76	171	Os	170.963040
99	69	168	Tm	167.934170375	94	77	171	Ir	170.971779
98	70	168	Yb	167.933894465	93	78	171	Pt	170.981251
97	71	168	Lu	167.938698576	92	79	171	Au	170.991774
96	72	168	Hf	167.940630	106	66	172	Dy	171.949110
95	73	168	Ta	167.947787	105	67	172	Ho	171.944820
94	74	168	W	167.951863	104	68	172	Er	171.939352149
93	75	168	Re	167.961609	103	69	172	Tm	171.938396118
92	76	168	Os	167.967832911	102	70	172	Yb	171.936377696
91	77	168	Ir	167.979966	101	71	172	Lu	171.939082239

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
100	72	172	Hf	171.939457980	106	70	176	Yb	175.942568409
99	73	172	Ta	171.944739818	105	71	176	Lu	175.942682399
98	74	172	W	171.947424	104	72	176	Hf	175.941401828
97	75	172	Re	171.955285	103	73	176	Ta	175.944740551
96	76	172	Os	171.960078	102	74	176	W	175.945590
95	77	172	Ir	171.970643	101	75	176	Re	175.951570
94	78	172	Pt	171.977376138	100	76	176	Os	175.954950
93	79	172	Au	171.990109	99	77	176	Ir	175.963511
107	66	173	Dy	172.953440	98	78	176	Pt	175.969000
106	67	173	Ho	172.947290	97	79	176	Au	175.980269
105	68	173	Er	172.942400	96	80	176	Hg	175.987413248
104	69	173	Tm	172.939600336	109	68	177	Er	176.954370
103	70	173	Yb	172.938206756	108	69	177	Tm	176.949040
102	71	173	Lu	172.938926901	107	70	177	Yb	176.945257126
101	72	173	Hf	172.940650	106	71	177	Lu	176.943754987
100	73	173	Ta	172.943538	105	72	177	Hf	176.943220013
99	74	173	W	172.947832	104	73	177	Ta	176.944471766
98	75	173	Re	172.953062	103	74	177	W	176.946620
97	76	173	Os	172.959791	102	75	177	Re	176.950270
96	77	173	Ir	172.967707	101	76	177	Os	176.955045
95	78	173	Pt	172.976499642	100	77	177	Ir	176.961170
94	79	173	Au	172.986398138	99	78	177	Pt	176.968453
107	67	174	Ho	173.951150	98	79	177	Au	176.977215
106	68	174	Er	173.944340	97	80	177	Hg	176.986336874
105	69	174	Tm	173.942164618	96	81	177	Tl	176.996881
104	70	174	Yb	173.938858101	109	69	178	Tm	177.952640
103	71	174	Lu	173.940333522	108	70	178	Yb	177.946643396
102	72	174	Hf	173.940040159	107	71	178	Lu	177.945951366
101	73	174	Ta	173.944167937	106	72	178	Hf	177.943697732
100	74	174	W	173.946160	105	73	178	Ta	177.945750349
99	75	174	Re	173.953112	104	74	178	W	177.945848364
98	76	174	Os	173.957124	103	75	178	Re	177.950851081
97	77	174	Ir	173.966804	102	76	178	Os	177.953348225
96	78	174	Pt	173.972811276	101	77	178	Ir	177.961083
95	79	174	Au	173.984917	100	78	178	Pt	177.965710
108	67	175	Ho	174.954050	99	79	178	Au	177.975975
107	68	175	Er	174.947930	98	80	178	Hg	177.982476325
106	69	175	Tm	174.943832897	97	81	178	Tl	177.995228
105	70	175	Yb	174.941272494	110	69	179	Tm	178.955340
104	71	175	Lu	174.940767904	109	70	179	Yb	178.950170
103	72	175	Hf	174.941502991	108	71	179	Lu	178.947324216
102	73	175	Ta	174.943650	107	72	179	Hf	178.945815073
101	74	175	W	174.946770	106	73	179	Ta	178.945934113
100	75	175	Re	174.951393	105	74	179	W	178.947071733
99	76	175	Os	174.957080	104	75	179	Re	178.949981038
98	77	175	Ir	174.964279	103	76	179	Os	178.953951
97	78	175	Pt	174.972276	102	77	179	Ir	178.959150
96	79	175	Au	174.981552	101	78	179	Pt	178.965475
95	80	175	Hg	174.991411	100	79	179	Au	178.973412
108	68	176	Er	175.950290	99	80	179	Hg	178.981783
107	69	176	Tm	175.946991412	98	81	179	Tl	178.991466

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
110	70	180	Yb	179.952330	111	73	184	Ta	183.954009331
109	71	180	Lu	179.949879968	110	74	184	W	183.950932553
108	72	180	Hf	179.946548760	109	75	184	Re	183.952524289
107	73	180	Ta	179.947465655	108	76	184	Os	183.952490808
106	74	180	W	179.946705734	107	77	184	Ir	183.957388318
105	75	180	Re	179.950787680	106	78	184	Pt	183.959895
104	76	180	Os	179.952351	105	79	184	Au	183.967474
103	77	180	Ir	179.959253	104	80	184	Hg	183.971897
102	78	180	Pt	179.963215	103	81	184	Tl	183.981760
101	79	180	Au	179.972396	102	82	184	Pb	183.988198
100	80	180	Hg	179.978322	113	72	185	Hf	184.958780
99	81	180	Tl	179.990194	112	73	185	Ta	184.955559086
111	70	181	Yb	180.956150	111	74	185	W	184.953420586
110	71	181	Lu	180.951970	110	75	185	Re	184.952955747
109	72	181	Hf	180.949099124	109	76	185	Os	184.954043023
108	73	181	Ta	180.947996346	108	77	185	Ir	184.956590
107	74	181	W	180.948198054	107	78	185	Pt	184.960753782
106	75	181	Re	180.950064596	106	79	185	Au	184.965806956
105	76	181	Os	180.953274494	105	80	185	Hg	184.971983
104	77	181	Ir	180.957642156	104	81	185	Tl	184.979100
103	78	181	Pt	180.963177	103	82	185	Pb	184.987580
102	79	181	Au	180.969948	102	83	185	Bi	184.997708
101	80	181	Hg	180.977806	114	72	186	Hf	185.960920
100	81	181	Tl	180.986904	113	73	186	Ta	185.958550100
99	82	181	Pb	180.996714	112	74	186	W	185.954362204
111	71	182	Lu	181.955210	111	75	186	Re	185.954986529
110	72	182	Hf	181.950552893	110	76	186	Os	185.953838355
109	73	182	Ta	181.950152414	109	77	186	Ir	185.957951104
108	74	182	W	181.948205519	108	78	186	Pt	185.959432346
107	75	182	Re	181.951211444	107	79	186	Au	185.965997671
106	76	182	Os	181.952186222	106	80	186	Hg	185.969460021
105	77	182	Ir	181.958127689	105	81	186	Tl	185.978548
104	78	182	Pt	181.961267637	104	82	186	Pb	185.984301
103	79	182	Au	181.969620	103	83	186	Bi	185.996480
102	80	182	Hg	181.974751	114	73	187	Ta	186.960410
101	81	182	Tl	181.985610	113	74	187	W	186.957158365
100	82	182	Pb	181.992676101	112	75	187	Re	186.955750787
112	71	183	Lu	182.957570	111	76	187	Os	186.955747928
111	72	183	Hf	182.953531012	110	77	187	Ir	186.957360830
110	73	183	Ta	182.951373188	109	78	187	Pt	186.960558
109	74	183	W	182.950224458	108	79	187	Au	186.964562
108	75	183	Re	182.950821349	107	80	187	Hg	186.969785
107	76	183	Os	182.953110	106	81	187	Tl	186.976170
106	77	183	Ir	182.956814	105	82	187	Pb	186.984030
105	78	183	Pt	182.961729	104	83	187	Bi	186.993458
104	79	183	Au	182.967620	115	73	188	Ta	187.963710
103	80	183	Hg	182.974561	114	74	188	W	187.958486954
102	81	183	Tl	182.982697	113	75	188	Re	187.958112287
101	82	183	Pb	182.991930	112	76	188	Os	187.955835993
113	71	184	Lu	183.961170	111	77	188	Ir	187.958851962
112	72	184	Hf	183.955447880	110	78	188	Pt	187.959395697

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
109	79	188	Au	187.965085	112	81	193	Tl	192.970548
108	80	188	Hg	187.967555	111	82	193	Pb	192.976080
107	81	188	Tl	187.975920	110	83	193	Bi	192.983061
106	82	188	Pb	187.981061	109	84	193	Po	192.991102
105	83	188	Bi	187.992173	108	85	193	At	193.000188
115	74	189	W	188.961912220	118	76	194	Os	193.965179314
114	75	189	Re	188.959228359	117	77	194	Ir	193.965075610
113	76	189	Os	188.958144866	116	78	194	Pt	193.962663581
112	77	189	Ir	188.958716473	115	79	194	Au	193.965338890
111	78	189	Pt	188.960831900	114	80	194	Hg	193.965381832
110	79	189	Au	188.963892	113	81	194	Tl	193.971053
109	80	189	Hg	188.968132	112	82	194	Pb	193.973966
108	81	189	Tl	188.973689	111	83	194	Bi	193.982748
107	82	189	Pb	188.980880	110	84	194	Po	193.988284107
106	83	189	Bi	188.989505	109	85	194	At	193.998971
116	74	190	W	189.963179541	119	76	195	Os	194.968123889
115	75	190	Re	189.961816139	118	77	195	Ir	194.965976800
114	76	190	Os	189.958445210	117	78	195	Pt	194.964774449
113	77	190	Ir	189.960592299	116	79	195	Au	194.965017928
112	78	190	Pt	189.959930073	115	80	195	Hg	194.966638981
111	79	190	Au	189.964698757	114	81	195	Tl	194.969650
110	80	190	Hg	189.966277	113	82	195	Pb	194.974471
109	81	190	Tl	189.973792	112	83	195	Bi	194.980751
108	82	190	Pb	189.978180008	111	84	195	Po	194.988045
107	83	190	Bi	189.988518	110	85	195	At	194.996554
106	84	190	Po	189.995110	120	76	196	Os	195.969622550
116	75	191	Re	190.963123592	119	77	196	Ir	195.968379906
115	76	191	Os	190.960927951	118	78	196	Pt	195.964934884
114	77	191	Ir	190.960591191	117	79	196	Au	195.966551315
113	78	191	Pt	190.961684653	116	80	196	Hg	195.965814846
112	79	191	Au	190.963649239	115	81	196	Tl	195.970515
111	80	191	Hg	190.967063110	114	82	196	Pb	195.972710
110	81	191	Tl	190.971886	113	83	196	Bi	195.980608
109	82	191	Pb	190.978200	112	84	196	Po	195.985512
108	83	191	Bi	190.986053	111	85	196	At	195.995702
107	84	191	Po	190.994653	110	86	196	Rn	196.002309
117	75	192	Re	191.965960	120	77	197	Ir	196.969636496
116	76	192	Os	191.961479047	119	78	197	Pt	196.967323401
115	77	192	Ir	191.962602198	118	79	197	Au	196.966551609
114	78	192	Pt	191.961035158	117	80	197	Hg	196.967195333
113	79	192	Au	191.964810107	116	81	197	Tl	196.969536200
112	80	192	Hg	191.965572	115	82	197	Pb	196.973380
111	81	192	Tl	191.972142	114	83	197	Bi	196.978934287
110	82	192	Pb	191.975763	113	84	197	Po	196.985567
109	83	192	Bi	191.985368	112	85	197	At	196.993290
108	84	192	Po	191.991522	111	86	197	Rn	197.001661
117	76	193	Os	192.964148083	121	77	198	Ir	197.972280
116	77	193	Ir	192.962923700	120	78	198	Pt	197.967876009
115	78	193	Pt	192.962984504	119	79	198	Au	197.968225244
114	79	193	Au	192.964131745	118	80	198	Hg	197.966751830
113	80	193	Hg	192.966644169	117	81	198	Tl	197.970466294

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
116	82	198	Pb	197.971980	118	85	203	At	202.986847216
115	83	198	Bi	197.979024396	117	86	203	Rn	202.993316
114	84	198	Po	197.983343	116	87	203	Fr	203.001048
113	85	198	At	197.992752	115	88	203	Ra	203.009210
112	86	198	Rn	197.998779978	125	79	204	Au	203.977705
122	77	199	Ir	198.973787159	124	80	204	Hg	203.973475640
121	78	199	Pt	198.970576213	123	81	204	Tl	203.973848646
120	79	199	Au	198.968748016	122	82	204	Pb	203.973028761
119	80	199	Hg	198.968262489	121	83	204	Bi	203.977805161
118	81	199	Tl	198.969813837	120	84	204	Po	203.980307113
117	82	199	Pb	198.972909384	119	85	204	At	203.987261559
116	83	199	Bi	198.977576953	118	86	204	Rn	203.991365
115	84	199	Po	198.983595	117	87	204	Fr	204.000593
114	85	199	At	198.990633	116	88	204	Ra	204.006477
113	86	199	Rn	198.998309	126	79	205	Au	204.979610
122	78	200	Pt	199.971423885	125	80	205	Hg	204.976056104
121	79	200	Au	199.970717886	124	81	205	Tl	204.974412270
120	80	200	Hg	199.968308726	123	82	205	Pb	204.974467112
119	81	200	Tl	199.970945394	122	83	205	Bi	204.977374688
118	82	200	Pb	199.971815560	121	84	205	Po	204.981165396
117	83	200	Bi	199.978141983	120	85	205	At	204.986036352
116	84	200	Po	199.981735	119	86	205	Rn	204.991668
115	85	200	At	199.990293	118	87	205	Fr	204.998663961
114	86	200	Rn	199.995677	117	88	205	Ra	205.006187
113	87	200	Fr	200.006499	126	80	206	Hg	205.977498672
123	78	201	Pt	200.974496467	125	81	206	Tl	205.976095321
122	79	201	Au	200.971640839	124	82	206	Pb	205.974449002
121	80	201	Hg	200.970285275	123	83	206	Bi	205.978482854
120	81	201	Tl	200.970803770	122	84	206	Po	205.980465241
119	82	201	Pb	200.972846589	121	85	206	At	205.986599242
118	83	201	Bi	200.976970721	120	86	206	Rn	205.990160
117	84	201	Po	200.982209	119	87	206	Fr	205.998486886
116	85	201	At	200.988486908	118	88	206	Ra	206.003782
115	86	201	Rn	200.995535	127	80	207	Hg	206.982577025
114	87	201	Fr	201.003986	126	81	207	Tl	206.977407908
124	78	202	Pt	201.975740	125	82	207	Pb	206.975880605
123	79	202	Au	201.973788431	124	83	207	Bi	206.978455217
122	80	202	Hg	201.970625604	123	84	207	Po	206.981578228
121	81	202	Tl	201.972090569	122	85	207	At	206.985775861
120	82	202	Pb	201.972143786	121	86	207	Rn	206.990726826
119	83	202	Bi	201.977674504	120	87	207	Fr	206.996859385
118	84	202	Po	201.980704	119	88	207	Ra	207.003727
117	85	202	At	201.988448629	118	89	207	Ac	207.012094
116	86	202	Rn	201.993218	128	80	208	Hg	207.985940
115	87	202	Fr	202.003287	127	81	208	Tl	207.982004653
124	79	203	Au	202.975137256	126	82	208	Pb	207.976635850
123	80	203	Hg	202.972857096	125	83	208	Bi	207.979726699
122	81	203	Tl	202.972329088	124	84	208	Po	207.981231059
121	82	203	Pb	202.973375491.	123	85	208	At	207.986582508
120	83	203	Bi	202.976868118	122	86	208	Rn	207.989631237
119	84	203	Po	202.981412863	121	87	208	Fr	207.997133849

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
120	88	208	Ra	208.001776	130	84	214	Po	213.995185949
119	89	208	Ac	208.011485	129	85	214	At	213.996356412
128	81	209	Tl	208.985349125	128	86	214	Rn	213.995346275
127	82	209	Pb	208.981074801	127	87	214	Fr	213.998954740
126	83	209	Bi	208.980383241	126	88	214	Ra	214.000091141
125	84	209	Po	208.982415788	125	89	214	Ac	214.006893072
124	85	209	At	208.986158678	124	90	214	Th	214.011451
123	86	209	Rn	208.990376634	123	91	214	Pa	214.020739230
122	87	209	Fr	208.995915421	132	83	215	Bi	215.001832349
121	88	209	Ra	209.001944	131	84	215	Po	214.999414609
120	89	209	Ac	209.009568736	130	85	215	At	214.998641245
129	81	210	Tl	209.990065574	129	86	215	Rn	214.998729195
128	82	210	Pb	209.984173129	128	87	215	Fr	215.000326029
127	83	210	Bi	209.984104944	127	88	215	Ra	215.002704195
126	84	210	Po	209.982857396	126	89	215	Ac	215.006450832
125	85	210	At	209.987131308	125	90	215	Th	215.011726597
124	86	210	Rn	209.989679862	124	91	215	Pa	215.019097612
123	87	210	Fr	209.996398327	133	83	216	Bi	216.006199
122	88	210	Ra	210.000446	132	84	216	Po	216.001905198
121	89	210	Ac	210.009256802	131	85	216	At	216.002408839
120	90	210	Th	210.015030	130	86	216	Rn	216.000258153
129	82	211	Pb	210.988731474	129	87	216	Fr	216.003187873
128	83	211	Bi	210.987258139	128	88	216	Ra	216.003518402
127	84	211	Po	210.986636869	127	89	216	Ac	216.008721268
126	85	211	At	210.987480806	126	90	216	Th	216.011050963
125	86	211	Rn	210.990585410	125	91	216	Pa	216.019109649
124	87	211	Fr	210.995529332	133	84	217	Po	217.006253
123	88	211	Ra	211.000893996	132	85	217	At	217.004709619
122	89	211	Ac	211.007648196	131	86	217	Rn	217.003914555
121	90	211	Th	211.014858	130	87	217	Fr	217.004616452
130	82	212	Pb	211.991887495	129	88	217	Ra	217.006306010
129	83	212	Bi	211.991271542	128	89	217	Ac	217.009332676
128	84	212	Po	211.988851755	127	90	217	Th	217.013066169
127	85	212	At	211.990734657	126	91	217	Pa	217.018288571
126	86	212	Rn	211.990688899	134	84	218	Po	218.008965773
125	87	212	Fr	211.996194988	133	85	218	At	218.008681458
124	88	212	Ra	211.999783492	132	86	218	Rn	218.005586315
123	89	212	Ac	212.007811441	131	87	218	Fr	218.007563326
122	90	212	Th	212.012916	130	88	218	Ra	218.007123948
131	82	213	Pb	212.996500	129	89	218	Ac	218.011625045
130	83	213	Bi	212.994374836	128	90	218	Th	218.013267744
129	84	213	Po	212.992842522	127	91	218	Pa	218.020007906
128	85	213	At	212.992921150	126	92	218	U	218.023487
127	86	213	Rn	212.993868354	134	85	219	At	219.011296478
126	87	213	Fr	212.996174845	133	86	219	Rn	219.009474831
125	88	213	Ra	213.000345847	132	87	219	Fr	219.009240843
124	89	213	Ac	213.006573689	131	88	219	Ra	219.010068787
123	90	213	Th	213.012962	130	89	219	Ac	219.012404918
122	91	213	Pa	213.021183209	129	90	219	Th	219.015521253
132	82	214	Pb	213.999798147	128	91	219	Pa	219.019880348
131	83	214	Bi	213.998698664	127	92	219	U	219.024915423

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
135	85	220	At	220.015301	136	90	226	Th	226.024890681
134	86	220	Rn	220.011384149	135	91	226	Pa	226.027932750
133	87	220	Fr	220.012312978	134	92	226	U	226.029339750
132	88	220	Ra	220.011014669	133	93	226	Np	226.035129
131	89	220	Ac	220.014752105	141	86	227	Rn	227.035407
130	90	220	Th	220.015733126	140	87	227	Fr	227.031833167
129	91	220	Pa	220.021876493	139	88	227	Ra	227.029170677
128	92	220	U	220.024712	138	89	227	Ac	227.027746979
136	85	221	At	221.018140	137	90	227	Th	227.027698859
135	86	221	Rn	221.015455	136	91	227	Pa	227.028793151
134	87	221	Fr	221.014245654	135	92	227	U	227.031140069
133	88	221	Ra	221.013907762	134	93	227	Np	227.034958261
132	89	221	Ac	221.015575746	142	86	228	Rn	228.038084
131	90	221	Th	221.018171499	141	87	228	Fr	228.035723
130	91	221	Pa	221.021863742	140	88	228	Ra	228.031064101
129	92	221	U	221.026351	139	89	228	Ac	228.031014825
137	85	222	At	222.022330	138	90	228	Th	228.028731348
136	86	222	Rn	222.017570472	137	91	228	Pa	228.031036942
135	87	222	Fr	222.017543957	136	92	228	U	228.031366357
134	88	222	Ra	222.015361820	135	93	228	Np	228.036180
133	89	222	Ac	222.017828852	134	94	228	Pu	228.038727686
132	90	222	Th	222.018454131	142	87	229	Fr	229.038426
131	91	222	Pa	222.023726	141	88	229	Ra	229.034820309
130	92	222	U	222.026070	140	89	229	Ac	229.032930871
138	85	223	At	223.025340	139	90	229	Th	229.031755340
137	86	223	Rn	223.021790	138	91	229	Pa	229.032088601
136	87	223	Fr	223.019730712	137	92	229	U	229.033496137
135	88	223	Ra	223.018497140	136	93	229	Np	229.036246866
134	89	223	Ac	223.019126030	135	94	229	Pu	229.040138934
133	90	223	Th	223.020795153	143	87	230	Fr	230.042510
132	91	223	Pa	223.023963748	142	88	230	Ra	230.037084774
131	92	223	U	223.027722956	141	89	230	Ac	230.036025144
138	86	224	Rn	224.024090	140	90	230	Th	230.033126574
137	87	224	Fr	224.023235513	139	91	230	Pa	230.034532562
136	88	224	Ra	224.020202004	138	92	230	U	230.033927392
135	89	224	Ac	224.021708435	137	93	230	Np	230.037812591
134	90	224	Th	224.021459250	136	94	230	Pu	230.039645603
133	91	224	Pa	224.025614854	144	87	231	Fr	231.045407
132	92	224	U	224.027590139	143	88	231	Ra	231.041220
139	86	225	Rn	225.028440	142	89	231	Ac	231.038551503
138	87	225	Fr	225.025606914	141	90	231	Th	231.036297060
137	88	225	Ra	225.023604463	140	91	231	Pa	231.035878898
136	89	225	Ac	225.023220576	139	92	231	U	231.036289158
135	90	225	Th	225.023941441	138	93	231	Np	231.038233161
134	91	225	Pa	225.026115172	137	94	231	Pu	231.041258
133	92	225	U	225.029384369	136	95	231	Am	231.045560
132	93	225	Np	225.033899689	145	87	232	Fr	232.049654
140	86	226	Rn	226.030890	144	88	232	Ra	232.043693
139	87	226	Fr	226.029343423	143	89	232	Ac	232.042022474
138	88	226	Ra	226.025402555	142	90	232	Th	232.038050360
137	89	226	Ac	226.026089848	141	91	232	Pa	232.038581720

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
140	92	232	U	232.037146280	146	92	238	U	238.050782583
139	93	232	Np	232.040099	145	93	238	Np	238.050940464
138	94	232	Pu	232.041179445	144	94	238	Pu	238.049553400
137	95	232	Am	232.046590	143	95	238	Am	238.051977839
145	88	233	Ra	233.047995	142	96	238	Cm	238.053016298
144	89	233	Ac	233.044550	141	97	238	Bk	238.058266
143	90	233	Th	233.041576923	140	98	238	Cf	238.061410
142	91	233	Pa	233.040240235	148	91	239	Pa	239.057130
141	92	233	U	233.039628196	147	92	239	U	239.054287777
140	93	233	Np	233.040732350	146	93	239	Np	239.052931399
139	94	233	Pu	233.042987570	145	94	239	Pu	239.052156519
138	95	233	Am	233.046472	144	95	239	Am	239.053018481
137	96	233	Cm	233.050800	143	96	239	Cm	239.054951
146	88	234	Ra	234.050547	142	97	239	Bk	239.058362
145	89	234	Ac	234.048420	141	98	239	Cf	239.062579
144	90	234	Th	234.043595497	149	91	240	Pa	240.060980
143	91	234	Pa	234.043302325	148	92	240	U	240.056585734
142	92	234	U	234.040945606	147	93	240	Np	240.056168828
141	93	234	Np	234.042888556	146	94	240	Pu	240.053807460
140	94	234	Pu	234.043304681	145	95	240	Am	240.055287826
139	95	234	Am	234.047794	144	96	240	Cm	240.055519046
138	96	234	Cm	234.050240	143	97	240	Bk	240.059749
146	89	235	Ac	235.051102	142	98	240	Cf	240.062295
145	90	235	Th	235.047504420	141	99	240	Es	240.068920
144	91	235	Pa	235.045436759	149	92	241	U	241.060330
143	92	235	U	235.043923062	148	93	241	Np	241.058246266
142	93	235	Np	235.044055876	147	94	241	Pu	241.056845291
141	94	235	Pu	235.045281500	146	95	241	Am	241.056822944
140	95	235	Am	235.048029	145	96	241	Cm	241.057646736
139	96	235	Cm	235.051591	144	97	241	Bk	241.060223
138	97	235	Bk	235.056580	143	98	241	Cf	241.063716
147	89	236	Ac	236.055178	142	99	241	Es	241.068662
146	90	236	Th	236.049710	150	92	242	U	242.062925
145	91	236	Pa	236.048675176	149	93	242	Np	242.061635
144	92	236	U	236.045561897	148	94	242	Pu	242.058736847
143	93	236	Np	236.046559724	147	95	242	Am	242.059543039
142	94	236	Pu	236.046048088	146	96	242	Cm	242.058829326
141	95	236	Am	236.049569	145	97	242	Bk	242.062050
140	96	236	Cm	236.051405	144	98	242	Cf	242.063688713
139	97	236	Bk	236.057330	143	99	242	Es	242.069699
147	90	237	Th	237.053894	142	100	242	Fm	242.073430
146	91	237	Pa	237.051139430	150	93	243	Np	243.064273
145	92	237	U	237.048723955	149	94	243	Pu	243.061997013
144	93	237	Np	237.048167253	148	95	243	Am	243.061372686
143	94	237	Pu	237.048403774	147	96	243	Cm	243.061382249
142	95	237	Am	237.049970748	146	97	243	Bk	243.063001570
141	96	237	Cm	237.052891	145	98	243	Cf	243.065421
140	97	237	Bk	237.057127	144	99	243	Es	243.069631
139	98	237	Cf	237.062070	143	100	243	Fm	243.074510
148	90	238	Th	238.056243	151	93	244	Np	244.067850
147	91	238	Pa	238.054497046	150	94	244	Pu	244.064197650

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
149	95	244	Am	244.064279429	148	102	250	No	250.087493
148	96	244	Cm	244.062746349	155	96	251	Cm	251.082277873
147	97	244	Bk	244.065167882	154 <sup>*</sup>	97	251	Bk	251.080753440
146	98	244	Cf	244.065990390	153	98	251	Cf	251.079580056
145	99	244	Es	244.070969	152	99	251	Es	251.079983592
144	100	244	Fm	244.074077	151	100	251	Fm	251.081566467
151	94	245	Pu	245.067738657	150	101	251	Md	251.084919
150	95	245	Am	245.066445398	149	102	251	No	251.088960
149	96	245	Cm	245.065485586	148	103	251	Lr	251.094360
148	97	245	Bk	245.066355386	156	96	252	Cm	252.084870
147	98	245	Cf	245.068039	155	97	252	Bk	252.084303
146	99	245	Es	245.071317	154	98	252	Cf	252.081619582
145	100	245	Fm	245.075375	153	99	252	Es	252.082972247
144	101	245	Md	245.081017	152	100	252	Fm	252.082460071
152	94	246	Pu	246.070198429	151	101	252	Md	252.086630
151	95	246	Am	246.069768438	150	102	252	No	252.088965909
150	96	246	Cm	246.067217551	149	103	252	Lr	252.095330
149	97	246	Bk	246.068666836	156	97	253	Bk	253.086880
148	98	246	Cf	246.068798807	155	98	253	Cf	253.085126791
147	99	246	Es	246.072965	154	99	253	Es	253.084817974
146	100	246	Fm	246.075281634	153	100	253	Fm	253.085176259
145	101	246	Md	246.081933	152	101	253	Md	253.087280
153	94	247	Pu	247.074070	151	102	253	No	253.090649
152	95	247	Am	247.072086	150	103	253	Lr	253.095258
151	96	247	Cm	247.070346811	149	104	253	Db	253.100679
150	97	247	Bk	247.070298533	157	97	254	Bk	254.090600
149	98	247	Cf	247.070992043	156	98	254	Cf	254.087316198
148	99	247	Es	247.073650	155	99	254	Es	254.088016026
147	100	247	Fm	247.076819	154	100	254	Fm	254.086847795
146	101	247	Md	247.081804	153	101	254	Md	254.089725
153	95	248	Am	248.075745	152	102	254	No	254.090948746
152	96	248	Cm	248.072342247	151	103	254	Lr	254.096587
151	97	248	Bk	248.073080	150	104	254	Db	254.100166
150	98	248	Cf	248.072178080	157	98	255	Cf	255.091039
149	99	248	Es	248.075458	156	99	255	Es	255.090266386
148	100	248	Fm	248.077184411	155	100	255	Fm	255.089955466
147	101	248	Md	248.082909	154	101	255	Md	255.091075196
154	95	249	Am	249.078480	153	102	255	No	255.093232449
153	96	249	Cm	249.075947062	152	103	255	Lr	255.096769
152	97	249	Bk	249.074979937	151	104	255	Db	255.101492
151	98	249	Cf	249.074846818	150	105	255	Jl	255.107398
150	99	249	Es	249.076405	158	98	256	Cf	256.093440
149	100	249	Fm	249.079024	157	99	256	Es	256.093592
148	101	249	Md	249.083002	156	100	256	Fm	256.091766522
147	102	249	No	249.087823	155	101	256	Md	256.094052757
154	96	250	Cm	250.078350687	154	102	256	No	256.094275879
153	97	250	Bk	250.078310529	153	103	256	Lr	256.098763
152	98	250	Cf	250.076399951	152	104	256	Db	256.101179573
151	99	250	Es	250.078654	151	105	256	Jl	256.108110
150	100	250	Fm	250.079514759	158	99	257	Es	257.095979
149	101	250	Md	250.084488	157	100	257	Fm	257.095098635

N	Z	A	El	mass (amu)	N	Z	A	El	mass (amu)
156	101	257	Md	257.095534643	158	107	265	Bh	265.125198
155	102	257	No	257.096852778	157	108	265	Hn	265.130001
154	103	257	Lr	257.099606	156	109	265	Mt	265.136567
153	104	257	Db	257.103072	160	106	266	Rf	266.121928
152	105	257	Jl	257.107858	159	107	266	Bh	266.127009
158	100	258	Fm	258.097069	158	108	266	Hn	266.130042
157	101	258	Md	258.098425321	157	109	266	Mt	266.137940
156	102	258	No	258.098200	160	107	267	Bh	267.127740
155	103	258	Lr	258.101883	159	108	267	Hn	267.131774
154	104	258	Db	258.103568	158	109	267	Mt	267.137526
153	105	258	Jl	258.109438	157	110	267	Xa	267.143956
152	106	258	Rf	258.113151	160	108	268	Hn	268.132156
159	100	259	Fm	259.100588	159	109	268	Mt	268.138816
158	101	259	Md	259.100503	158	110	268	Xa	268.143529
157	102	259	No	259.101024	161	108	269	Hn	269.134114
156	103	259	Lr	259.102990	160	109	269	Mt	269.139106
155	104	259	Db	259.105628	159	110	269	Xa	269.145144
154	105	259	Jl	259.109721	161	109	270	Mt	270.140723
153	106	259	Rf	259.114652	160	110	270	Xa	270.144626
159	101	260	Md	260.103645	162	109	271	Mt	271.141229
158	102	260	No	260.102636	161	110	271	Xa	271.146078
157	103	260	Lr	260.105572	162	110	272	Xa	272.146310
156	104	260	Db	260.106434	161	111	272	Xb	272.153477
155	105	260	Jl	260.111427	163	110	273	Xa	273.149245
154	106	260	Rf	260.114435447					
153	107	260	Bh	260.121803					
159	102	261	No	261.105743					
158	103	261	Lr	261.106941					
157	104	261	Db	261.108752					
156	105	261	Jl	261.112106					
155	106	261	Rf	261.116199					
154	107	261	Bh	261.121800					
160	102	262	No	262.107520					
159	103	262	Lr	262.109692					
158	104	262	Db	262.109918					
157	105	262	Jl	262.114153					
156	106	262	Rf	262.116477					
155	107	262	Bh	262.123009					
160	103	263	Lr	263.111394					
159	104	263	Db	263.112540					
158	105	263	Jl	263.115078					
157	106	263	Rf	263.118313					
156	107	263	Bh	263.123146					
155	108	263	Hn	263.128710					
160	104	264	Db	264.113978					
159	105	264	Jl	264.117473					
158	106	264	Rf	264.118924					
157	107	264	Bh	264.124730					
156	108	264	Hn	264.128408258					
160	105	265	Jl	265.118659					
159	106	265	Rf	265.121066					