



This is “Appendix H: Periodic Table of Elements”, appendix 8 from the book Principles of General Chemistry (index.html) (v. 1.0M).

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# Chapter 32

## Appendix H: Periodic Table of Elements

Group

Period — 1

1 — Atomic number  
H — Symbol  
1.00794 — Atomic mass

Main group elements

1 (1A) 2 (2A)

13 (3A) 14 (4A) 15 (5A) 16 (6A) 17 (7A) 18 (8A)

Metals  
Semimetals  
Nonmetals

Alkali metals  
Alkaline earths  
Halogens  
Noble gases

1 H 1.00794	2 He 4.002602											13 Al 26.9815386	14 Si 28.0855	15 P 30.973762	16 S 32.065	17 Cl 35.453	18 Ar 39.948																												
3 Li 6.941	4 Be 9.012182											31 Ga 69.723	32 Ge 72.64	33 As 74.92160	34 Se 78.96	35 Br 79.904	36 Kr 83.798																												
11 Na 22.98976928	12 Mg 24.3050	3 B 10.811	4 C 12.0107	5 N 14.0067	6 O 15.9994	7 F 18.9984032	8 Ne 20.1797	Transition metals										9 Sc 44.955912	10 Ti 47.867	11 V 50.9415	12 Cr 51.9961	13 Mn 54.938045	14 Fe 55.845	15 Co 58.933195	16 Ni 58.6934	17 Cu 63.546	18 Zn 65.409	19 K 39.0983	20 Ca 40.078	21 Sc 44.955912	22 Ti 47.867	23 V 50.9415	24 Cr 51.9961	25 Mn 54.938045	26 Fe 55.845	27 Co 58.933195	28 Ni 58.6934	29 Cu 63.546	30 Zn 65.409	31 Ga 69.723	32 Ge 72.64	33 As 74.92160	34 Se 78.96	35 Br 79.904	36 Kr 83.798
19 K 39.0983	20 Ca 40.078	37 Rb 85.4678	38 Sr 87.62	39 Y 88.90585	40 Zr 91.224	41 Nb 92.90638	42 Mo 95.94	43 Tc [98]	44 Ru 101.07	45 Rh 102.90550	46 Pd 106.42	47 Ag 107.8682	48 Cd 112.411	49 In 114.818	50 Sn 118.710	51 Sb 121.760	52 Te 127.60	53 I 126.90447	54 Xe 131.293																										
55 Cs 132.9054519	56 Ba 137.327	57 La 138.90547	72 Hf 178.49	73 Ta 180.94788	74 W 183.84	75 Re 186.207	76 Os 190.23	77 Ir 192.217	78 Pt 195.084	79 Au 196.966569	80 Hg 200.59	81 Tl 204.3833	82 Pb 207.2	83 Bi 208.98040	84 Po [209]	85 At [210]	86 Rn [222]																												
87 Fr [223]	88 Ra [226]	89 Ac [227]	104 Rf [267]	105 Db [268]	106 Sg [271]	107 Bh [267]	108 Hs [269]	109 Mt [276]	110 Ds [281]	111 Rg [280]	112 Uub [285]	113 Uut [284]	114 Uuq [289]	115 Uup [288]	116 Uuh [293]																														
Lanthanides		58 Ce 140.116	59 Pr 140.90765	60 Nd 144.242	61 Pm [145]	62 Sm 150.36	63 Eu 151.964	64 Gd 157.25	65 Tb 158.92535	66 Dy 162.500	67 Ho 164.93032	68 Er 167.259	69 Tm 168.93421	70 Yb 173.04	71 Lu 174.967																														
Actinides		90 Th 232.03806	91 Pa 231.03588	92 U 238.02891	93 Np [237]	94 Pu [244]	95 Am [243]	96 Cm [247]	97 Bk [247]	98 Cf [251]	99 Es [252]	100 Fm [257]	101 Md [258]	102 No [259]	103 Lr [262]																														

Two systems for numbering periodic groups are shown: 1–18 is the system currently recommended by the International Union of Pure and Applied Chemistry (IUPAC); an older U.S. system, in which letters designate main group elements (A) and transition elements (B), is given in parentheses.

An atomic mass in brackets indicates the mass of the longest-lived isotope of an element having no stable isotopes.

Elements with atomic numbers 114 (ununquadium, 289 amu) and 116 (ununhexium, 293 amu) have been recognized by the International Union of Pure and Applied Chemistry (IUPAC). The collaborating scientists from the Joint Institute for Nuclear Research in Dubna, Russia, and Lawrence Livermore National Laboratory in California have been invited to propose names for the new elements. See <http://iupac.org/publications/pac/asap/PAC-REP-10-05-01>

<b>List of Elements</b>			
<b>Name</b>	<b>Symbol</b>	<b>Atomic Number</b>	<b>Atomic Mass</b>
Actinium	Ac	89	[227]*
Aluminum	Al	13	26.9815386(8)
Americium	Am	95	[243]*
Antimony	Sb	51	121.760(1)
Argon	Ar	18	39.948(1)
Arsenic	As	33	74.92160(2)
Astatine	At	85	[210]*
Barium	Ba	56	137.327(7)
Berkelium	Bk	97	[247]*
Beryllium	Be	4	9.012182(3)
Bismuth	Bi	83	208.98040(1)
Bohrium	Bh	107	[267]*
Boron	B	5	10.811(7)
Bromine	Br	35	79.904(1)
Cadmium	Cd	48	112.411(8)
Calcium	Ca	20	40.078(4)
Californium	Cf	98	[251]*
Carbon	C	6	12.0107(8)
Cerium	Ce	58	140.116(1)
Cesium	Cs	55	132.9054519(2)
Chlorine	Cl	17	35.453(2)
Chromium	Cr	24	51.9961(6)
Cobalt	Co	27	58.933195(5)
Copper	Cu	29	63.546(3)
<p><b>*Element has no stable isotope. A value enclosed in brackets, e.g. [209], indicates the mass number of the longest-lived isotope of the element. Three such elements (Th, Pa, and U), however, do have a characteristic terrestrial isotopic composition, and an atomic mass is given for them. An uncertainty in the last digit in the Atomic Mass column is shown by the number in parentheses; e.g., 1.00794(7) indicates <math>\pm 0.00007</math>.</b></p>			

<b>List of Elements</b>			
<b>Name</b>	<b>Symbol</b>	<b>Atomic Number</b>	<b>Atomic Mass</b>
Curium	Cm	96	[247]*
Darmstadtium	Ds	110	[281]*
Dubnium	Db	105	[268]*
Dysprosium	Dy	66	162.500(1)
Einsteinium	Es	99	[252]*
Erbium	Er	68	167.259(3)
Europium	Eu	63	151.964(1)
Fermium	Fm	100	[257]*
Fluorine	F	9	18.9984032(5)
Francium	Fr	87	[223]*
Gadolinium	Gd	64	157.25(3)
Gallium	Ga	31	69.723(1)
Germanium	Ge	32	72.64(1)
Gold	Au	79	196.966569(4)
Hafnium	Hf	72	178.49(2)
Hassium	Hs	108	[269]*
Helium	He	2	4.002602(2)
Holmium	Ho	67	164.93032(2)
Hydrogen	H	1	1.00794(7)
Indium	In	49	114.818(3)
Iodine	I	53	126.90447(3)
Iridium	Ir	77	192.217(3)
Iron	Fe	26	55.845(2)
Krypton	Kr	36	83.798(2)
<p><b>*Element has no stable isotope. A value enclosed in brackets, e.g. [209], indicates the mass number of the longest-lived isotope of the element. Three such elements (Th, Pa, and U), however, do have a characteristic terrestrial isotopic composition, and an atomic mass is given for them. An uncertainty in the last digit in the Atomic Mass column is shown by the number in parentheses; e.g., 1.00794(7) indicates <math>\pm 0.00007</math>.</b></p>			

<b>List of Elements</b>			
<b>Name</b>	<b>Symbol</b>	<b>Atomic Number</b>	<b>Atomic Mass</b>
Lanthanum	La	57	138.90547(7)
Lawrencium	Lr	103	[262]*
Lead	Pb	82	207.2(1)
Lithium	Li	3	6.941(2)
Lutetium	Lu	71	174.967(1)
Magnesium	Mg	12	24.3050(6)
Manganese	Mn	25	54.938045(5)
Meitnerium	Mt	109	[276]*
Mendelevium	Md	101	[258]*
Mercury	Hg	80	200.59(2)
Molybdenum	Mo	42	95.94(2)
Neodymium	Nd	60	144.242(3)
Neon	Ne	10	20.1797(6)
Neptunium	Np	93	[237]*
Nickel	Ni	28	58.6934(2)
Niobium	Nb	41	92.90638(2)
Nitrogen	N	7	14.0067(2)
Nobelium	No	102	[259]*
Osmium	Os	76	190.23(3)
Oxygen	O	8	15.9994(3)
Palladium	Pd	46	106.42(1)
Phosphorus	P	15	30.973762(2)
Platinum	Pt	78	195.084(9)
Plutonium	Pu	94	[244]*
<p><b>*Element has no stable isotope. A value enclosed in brackets, e.g. [209], indicates the mass number of the longest-lived isotope of the element. Three such elements (Th, Pa, and U), however, do have a characteristic terrestrial isotopic composition, and an atomic mass is given for them. An uncertainty in the last digit in the Atomic Mass column is shown by the number in parentheses; e.g., 1.00794(7) indicates <math>\pm 0.00007</math>.</b></p>			

<b>List of Elements</b>			
<b>Name</b>	<b>Symbol</b>	<b>Atomic Number</b>	<b>Atomic Mass</b>
Polonium	Po	84	[209]*
Potassium	K	19	39.0983(1)
Praseodymium	Pr	59	140.90765(2)
Promethium	Pm	61	[145]*
Protactinium	Pa	91	231.03588(2)*
Radium	Ra	88	[226]*
Radon	Rn	86	[222]*
Rhenium	Re	75	186.207(1)
Rhodium	Rh	45	102.90550(2)
Roentgenium	Rg	111	[280]*
Rubidium	Rb	37	85.4678(3)
Ruthenium	Ru	44	101.07(2)
Rutherfordium	Rf	104	[267]*
Samarium	Sm	62	150.36(2)
Scandium	Sc	21	44.955912(6)
Seaborgium	Sg	106	[271]*
Selenium	Se	34	78.96(3)
Silicon	Si	14	28.0855(3)
Silver	Ag	47	107.8682(2)
Sodium	Na	11	22.98976928(2)
Strontium	Sr	38	87.62(1)
Sulfur	S	16	32.065(5)
Tantalum	Ta	73	180.94788(2)
Technetium	Tc	43	[98]*
<p><b>*Element has no stable isotope. A value enclosed in brackets, e.g. [209], indicates the mass number of the longest-lived isotope of the element. Three such elements (Th, Pa, and U), however, do have a characteristic terrestrial isotopic composition, and an atomic mass is given for them. An uncertainty in the last digit in the Atomic Mass column is shown by the number in parentheses; e.g., 1.00794(7) indicates <math>\pm 0.00007</math>.</b></p>			

<b>List of Elements</b>			
<b>Name</b>	<b>Symbol</b>	<b>Atomic Number</b>	<b>Atomic Mass</b>
Tellurium	Te	52	127.60(3)
Terbium	Tb	65	158.92535(2)
Thallium	Tl	81	204.3833(2)
Thorium	Th	90	232.03806(2)*
Thulium	Tm	69	168.93421(2)
Tin	Sn	50	118.710(7)
Titanium	Ti	22	47.867(1)
Tungsten	W	74	183.84(1)
Ununbium	Uub	112	[285]*
Ununhexium	Uuh	116	[293]*
Ununpentium	Uup	115	[288]*
Ununquadium	Uuq	114	[289]*
Ununtrium	Uut	113	[284]*
Uranium	U	92	238.02891(3)*
Vanadium	V	23	50.9415(1)
Xenon	Xe	54	131.293(6)
Ytterbium	Yb	70	173.04(3)
Yttrium	Y	39	88.90585(2)
Zinc	Zn	30	65.409(4)
Zirconium	Zr	40	91.224(2)
<p><b>*Element has no stable isotope. A value enclosed in brackets, e.g. [209], indicates the mass number of the longest-lived isotope of the element. Three such elements (Th, Pa, and U), however, do have a characteristic terrestrial isotopic composition, and an atomic mass is given for them. An uncertainty in the last digit in the Atomic Mass column is shown by the number in parentheses; e.g., 1.00794(7) indicates <math>\pm 0.00007</math>.</b></p>			

*Source of data:* Atomic weights of the elements 2001 (IUPAC Technical Report) as supplemented by the Table of Standard Atomic Weights 2005 (to be published in Pure and Applied Chemistry) on the IUPAC web site, and “Nuclear Data Sheets for A-266-294” (to be published in Nuclear Data Sheets) at <http://www.nndc.bnl.gov/superheavy.pdf>.