The Periodic Table of the Elements

1	hydrogen 1 **H** 1.0																helium 2 **He** 4.0
2	lithium 3 **Li** 6.9	beryllium 4 **Be** 9.0											boron 5 **B** 10.8	carbon 6 **C** 12.0	nitrogen 7 **N** 14.0	oxygen 8 **O** 16.0	fluorine 9 **F** 19.0	neon 10 **Ne** 20.2
3	sodium 11 **Na** 23.0	magnesium 12 **Mg** 24.3											aluminum 13 **Al** 27.0	silicon 14 **Si** 28.1	phosphorus 15 **P** 31.0	sulfur 16 **S** 32.1	chlorine 17 **Cl** 35.5	argon 18 **Ar** 40.0
4	potassium 19 **K** 39.1	calcium 20 **Ca** 40.1	scandium 21 **Sc** 45.0	titanium 22 **Ti** 47.9	vanadium 23 **V** 50.9	chromium 24 **Cr** 52.0	manganese 25 **Mn** 54.9	iron 26 **Fe** 55.9	cobalt 27 **Co** 58.9	nickel 28 **Ni** 58.7	copper 29 **Cu** 63.6	zinc 30 **Zn** 65.4	gallium 31 **Ga** 69.7	germanium 32 **Ge** 72.6	arsenic 33 **As** 75.0	selenium 34 **Se** 79.0	bromine 35 **Br** 79.9	krypton 36 **Kr** 83.8
5	rubidium 37 **Rb** 85.5	strontium 38 **Sr** 87.6	yttrium 39 **Y** 88.9	zirconium 40 **Zr** 91.2	niobium 41 **Nb** 92.9	molybdenum 42 **Mo** 95.9	technetium 43 **Tc** 97.9	ruthenium 44 **Ru** 101.0	rhodium 45 **Rh** 102.9	palladium 46 **Pd** 106.4	silver 47 **Ag** 107.9	cadmium 48 **Cd** 112.4	indium 49 **In** 114.8	tin 50 **Sn** 118.7	antimony 51 **Sb** 121.8	tellurium 52 **Te** 127.6	iodine 53 **I** 126.9	xenon 54 **Xe** 131.3
6	cesium 55 **Cs** 132.9	barium 56 **Ba** 137.3	lutetium 71 **Lu** 175.0	hafnium 72 **Hf** 178.5	tantalum 73 **Ta** 181.0	tungsten 74 **W** 183.8	rhenium 75 **Re** 186.2	osmium 76 **Os** 190.2	iridium 77 **Ir** 192.2	platinum 78 **Pt** 195.1	gold 79 **Au** 197.0	mercury 80 **Hg** 200.6	thallium 81 **Tl** 204.3	lead 82 **Pb** 207.2	bismuth 83 **Bi** 209.0	polonium 84 **Po** (209)	astatine 85 **At** (210)	radon 86 **Rn** (222)
7	francium 87 **Fr** (223)	radium 88 **Ra** (226)	lawrencium 103 **Lr** (260)	rutherfordium 104 **Rf** (261)	dubnium 105 **Db** (262)	seaborgium 106 **Sg** (263)	bohrium 107 **Bh** (262)	hassium 108 **Hs** (265)	meitnerium 109 **Mt** (268)	darmstadtium 110 **Ds** (272)	roentgenium 111 **Rg** (273)							

lanthanum 57 **La** 138.1	cerium 58 **Ce** 140.1	praseodymium 59 **Pr** 140.9	neodymium 60 **Nd** 144.2	promethium 61 **Pm** 144.9	samarium 62 **Sm** 150.4	europium 63 **Eu** 151.96	gadolinium 64 **Gd** 157.3	terbium 65 **Tb** 158.9	dysprosium 66 **Dy** 162.5	holmium 67 **Ho** 164.9	erbium 68 **Er** 167.3	thulium 69 **Tm** 168.9	ytterbium 70 **Yb** 173.0
actinium 89 **Ac** (227)	thorium 90 **Th** 232.0	protactinium 91 **Pa** 231.0	uranium 92 **U** 238.0	neptunium 93 **Np** (237)	plutonium 94 **Pu** (244)	americium 95 **Am** (243)	curium 96 **Cm** (247)	berkelium 97 **Bk** (247)	californium 98 **Cf** (251)	einsteinium 99 **Es** (252)	fermium 100 **Fm** (257)	mendelevium 101 **Md** (258)	nobelium 102 **No** (259)

Table 5.1 Ionic Charges of Representative Elements

Group Number	Oxidation Number	Examples
Metals		
1	1+	Li^+, Na^+, K^+
2	2+	Mg^{2+}, Ca^{2+}
13	3+	B^{3+}, Al^{3+}
Nonmetals		
15	3–	N^{3-}, P^{3-}
16	2–	O^{2-}, S^{2-}
17	1–	F^-, Cl^-, Br^-, I^-

Table 5.2 Common Polyatomic Ions

Name of Ion	Formula	Charge
ammonium	NH_4^+	1+
hydronium	H_3O^+	1+
hydrogen carbonate	HCO_3^-	1–
hydrogen sulfate	HSO_4^-	1–
acetate	$C_2H_3O_2^-$	1–
nitrite	NO_2^-	1–
nitrate	NO_3^-	1–
cyanide	CN^-	1–
hydroxide	OH^-	1–
dihydrogen phosphate	$H_2PO_4^-$	1–
permanganate	MnO_4^-	1–
carbonate	CO_3^{2-}	2–
sulfate	SO_4^{2-}	2–
sulfite	SO_3^{2-}	2–
oxalate	$C_2O_4^{2-}$	2–
monohydrogen phosphate	HPO_4^{2-}	2–
dichromate	$Cr_2O_7^{2-}$	2–
phosphate	PO_4^{3-}	3–