PERIODIC TABLE OF THE ELEMENTS

1 H 1.008																	2 He 4.00
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.30											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.06	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.90	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.39	31 Ga 69.72	32 Ge 72.59	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (98)	44 Ru 101.1	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.75	52 Te 127.60	53 I 126.91	54 Xe 131.29
55 Cs 132.91	56 Ba 137.33	57 *La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.21	76 Os 190.2	77 Ir 192.2	78 Pt 195.08	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.2	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra 226.02	89 †Ac 227.03	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (264)	108 Hs (277)	109 Mt (268)	110 Ds (271)	111 Rg (272)							

*Lanthanide Series	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (145)	62 Sm 150.4	63 Eu 151.97	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97
†Actinide Series	90 Th 232.04	91 Pa 231.04	92 U 238.03	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)

SOLUBILITY RULES FOR IONIC COMPOUNDS

1. Compounds containing **Group IA metals**, **ammonium**, **acetates**, **nitrates and perchlorates** are all soluble.
2. Most **halides** (Group 7A - chlorides etc.) are soluble. Exceptions include Ag^{+1}, Pb^{+2}, and Hg_2^{+2} halides.
3. Most **sulfates** are soluble. Exceptions include Ba^{+2}, Sr^{+2}, Ag^{+1}, Pb^{+2}, and Ca^{+2} sulfates.
4. Most **hydroxides** insoluble. Exceptions include hydroxides of Group 1A metals, ammonium, Ca^{+2}, Sr^{+2}, and Ba^{+2}.
5. Most **phosphates**, **carbonates**, **chromates**, and **sulfides** are insoluble. Exceptions include those compounds containing Group 1A metals and ammonium.
6. In addition, all **acids** are soluble!

ACTIVITY SERIES FOR METALS (and HYDROGEN)

highest activity	Li
	K
	Ca
	Na
	Mg
	Al
	Zn → Zn^{+2}
	Cr → Cr^{+3}
	Fe → Fe^{+2}
	Cd → Cd^{+2}
	Ni → Ni^{+2}
	Sn → Sn^{+2}
	Pb → Pb^{+2}
	H_2
lowest activity	Cu → Cu^{+2}
	Ag → Ag^{+1}
	Hg → Hg^{+2}
	Au → Au^{+3}

EQUATIONS

$$K = {}^{o}C + 273$$

$${}^{o}F = \left(1.8 \times {}^{o}C\right) + 32$$

$$d = \frac{m}{V}$$

$$q = mc\Delta T$$

$$c = \lambda \times \nu$$

$$E = h \times \nu$$

$$PV = nRT$$

$$\frac{P_1V_1}{n_1T_1} = \frac{P_2V_2}{n_2T_2}$$

$$M = \frac{n}{V}$$

$$M_1V_1 = M_2V_2$$

$$pH = -\log\left[H_3O^+\right]$$

$$\left[H_3O^+\right] = 10^{-pH}$$

CONSTANTS

Density of water = 1.00 g/mL

c = 2.998 x 10^{8} m/s

h = 6.626 x 10^{-34} J·s

Avogadro's Number = 6.022 x 10^{23}

R = 0.08206 L·atm/K·mol

Molar Volume at STP = 22.4 L

K_w = 1.0 x 10^{-14}

CONVERSIONS

1 inch = 2.54 cm
1 foot = 12 inches
1 mile = 5280 feet

1 atm = 760 torr (or mmHg)

1 L = 1.057 quarts
1 gallon = 4 quarts
1 mL = 1 cm^3

1 kg = 2.20 lbs
1 lb = 16 oz