

PERIODIC TABLE OF THE ELEMENTS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
 IA IIA IIIB IVB VB VIB VIIB ----- VIIIB ----- IB IIB IIIA IVA VA VIA VIIA VIIIA

1 H 1.008																	2 He 4.003
3 Li 6.941	4 Be 9.012											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 24.31											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	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 72.61	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 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
55 Cs 132.9	56 Ba 137.3	57 La 138.9	72 Hf 178.5	73 Ta 180.9	74 W 183.8	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209.0	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra 226.0	89 Ac 227.0	104 Rf (267)	105 Db (268)	106 Sg (269)	107 Bh (270)	108 Hs (277)	109 Mt (278)	110 Ds (281)	111 Rg (282)	112 Cn (285)	113 Nh (286)	114 Fl (289)	115 Mc (289)	116 Lv (293)	117 Ts (294)	118 Og (294)

58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm (145)	62 Sm 150.4	63 Eu 152.0	64 Gd 157.3	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0	71 Lu 175.0
90 Th 232.0	91 Pa 231.0	92 U 238.0	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)

Conversions:

$$T_K = T_C + 273.15$$

$$1 \text{ atm} = 760 \text{ torr}$$

Constants:

$$R = 0.08206 \text{ L} \cdot \text{atm} / \text{mol} \cdot \text{K}$$

$$\text{or } 8.314 \text{ J} / \text{mol} \cdot \text{K}$$

$$\text{one mole} = 6.022 \times 10^{23} \text{ entities}$$

$$c = 3.00 \times 10^8 \text{ m/s}$$

$$h = 6.626 \times 10^{-34} \text{ J} \cdot \text{s}$$

Average atomic mass

$$\text{atomic mass} = (f_A \cdot m_A) + (f_B \cdot m_B) \dots$$

Dilution

$$M_{\text{conc}} V_{\text{conc}} = M_{\text{dil}} V_{\text{dil}}$$

Heat capacity

$$q = mC_s \Delta T$$

Speed of light

$$c = \lambda \nu$$

Standard enthalpy of reaction

$$\Delta H^\circ = \sum n \Delta H_f^\circ(\text{products}) - \sum n \Delta H_f^\circ(\text{reactants})$$

Energy of a photon

$$E = h\nu$$

or

$$E = \frac{hc}{\lambda}$$

Ideal gas law

$$PV = nRT$$

Partial pressure and mole fraction

$$P_A = \chi_A \cdot P_T$$

Root mean squared speed of a gas

$$u_{\text{rms}} = \sqrt{\frac{3RT}{\text{molar mass}}}$$

Lattice Energy

$$E = \frac{kQ_1Q_2}{r}$$

Enthalpy approximation

$$\Delta H \approx \sum D(\text{bonds broken}) - \sum D(\text{bonds formed})$$

Bond order

$$\text{bond order} = \frac{1}{2} (\#e^-_{\text{bonding}} - \#e^-_{\text{antibonding}})$$

