

\* Useful Conversion:

1. Length -  $1 \text{ \AA} = 10^{-10} \text{ m}$ ,  $1 \text{ nm} = 10^{-9} \text{ m}$ ,  
 $1 \text{ pm} = 10^{-12} \text{ m}$

2. Volume -  $1 \text{ L} = 1000 \text{ mL} = 1000 \text{ cc} = 1 \text{ dm}^3 = 10^{-3} \text{ m}^3$

3. Pressure -  $1 \text{ atm} = 760 \text{ mmHg}$  or torr  
 $= 101325 \text{ Pa}$  or  $\text{N/m}^2$   
 $1 \text{ bar} = 10^5 \text{ Pa}$

4. Energy -  $1 \text{ calorie} = 4.184 \text{ J}$ ,  $1 \text{ eV} = 1.6022 \times 10^{-19} \text{ J}$   
 $1 \text{ J} = 10^7 \text{ ergs}$ .

5. Mass -  $1 \text{ amu} = 1.66 \times 10^{-27} \text{ kg}$ .

\* Physical Constants:

Bohr radius,  $a_0 = 0.529 \text{ \AA}$

Boltzmann Cons.,  $k = 1.3807 \times 10^{-23} \text{ J/K}$

Mass of  $e = 9.11 \times 10^{-31} \text{ kg}$ .

Gas Constant,  $R = 0.8206 \text{ L atm/mol K}$   
 $= 1.987 \text{ Cal/mol K}$   
 $= 8.314 \text{ J/mol K}$ .

Planck's Cons.  $h = 6.6262 \times 10^{-34} \text{ J s}$

Rydberg Cons.  $R_\infty = 2.1799 \times 10^{-18} \text{ J} = 1.0974 \times 10^7 \text{ m}^{-1}$

\* Important Molar masses ( $\text{g mol}^{-1}$ )

Al - 26.98, B - 10.81, Br - 79.91, Ca - 40.08,  
C - 12.01, Cl - 35.49, Co - 58.93, Cu - 63.54,  
F - 19, Ga - 69.72, Au - 196.97, He - 4,  
H - 1.0079, Fe - 55.85, Pb - 207.19, Li - 6.94,  
Mg - 24.31, Mn - 54.94, Hg - 200.59, Ni - 58.71,  
N - 14.0067, O - 16, P - 30.97, K - 39.10,  
Si - 28.08, Ag - 107.87, Na - 22.99, Xe - 131.30,  
Zn - 65.37.

\* Common name of some compounds:

Dry ice - Solid  $\text{CO}_2$ , Slaked lime -  $\text{Ca(OH)}_2$ ,  
Bleaching Powder -  $\text{CaOCl}_2$ , Nausadar -  $\text{NH}_4\text{Cl}$ ,  
Caustic soda -  $\text{NaOH}$ , Rock salt -  $\text{NaCl}$ ,  
Caustic potash -  $\text{KOH}$ , Potash Alum -  $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$   
Epsom -  $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ , Quick lime -  $\text{CaO}$ ,  
Plaster of paris -  $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ , Gypsum -  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ,  
Green vitrol -  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ , Mohr's salt -  $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ ,  
Blue vitrol -  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ , White vitrol -  $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ ,  
Marsh gas -  $\text{CH}_4$ , Veneegar -  $\text{CH}_3\text{COOH}$ , Hypo -  $\text{Na}_2\text{S}_2\text{O}_2$ ,  
Potash ash -  $\text{K}_2\text{CO}_3$ , Baking soda -  $\text{NaHCO}_3$ ,  
Washing soda -  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ , Chalk (marble) -  $\text{CaCO}_3$ ,  
Lunar caustic -  $\text{AgNO}_3$ , Laughing gas -  $\text{N}_2\text{O}$ ,  
Chloroform -  $\text{CHCl}_3$ , Vermelium -  $\text{HgS}$ ,  
Borax -  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ , Alcohol -  $\text{C}_2\text{H}_5\text{OH}$ ,  
Sugar -  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ , Glauber's salt -  $\text{Na}_2\text{SO}_2 \cdot 10\text{H}_2\text{O}$ ,  
TNT -  $\text{C}_6\text{H}_3\text{CH}_3(\text{NO}_2)_3$ , Calomel -  $\text{HgCl}_2$ ,  
Sand -  $\text{SiO}_2$ .