Some Basic Concepts of Chemistry

- Velocity = $\frac{\text{Distance}}{\text{time}}$
- Acceleration = $\frac{\text{Velocity}}{\text{time}}$
- 1 amu = 1.66056×10^{-24} gram

amu = atomic mass unit

- density = $\frac{\text{Mass}}{\text{Volume}}$
- Pnessure = $\frac{\text{Force}}{\text{Area}}$
- Tempenature: $^\circ F = \frac{9}{5}(^\circ C) + 32$
- $K = {}^\circ C + 273.15$

$^\circ F$ = Fonenheit
$^\circ C$ = Celsius
K = Kelvin

- Number of grams of atoms = $\frac{\text{Weight (in grams)}}{\text{gram atomic mass}}$

X = Multiply

- Molecular Mass $(A_x B C_y) = x \times [\text{Atomic mass of A}] + [\text{Atomic mass of B}] + y \times [\text{Atomic mass of C}]$

OR

- Molecular Mass = $\frac{\text{Actual mass of a molecule of matter}}{\frac{1}{12} \times \text{mass of one } C^{12} \text{ atom}}$
- Gram Molecular No. = $\frac{\text{Mass (in grams)}}{\text{Molecular weight}}$
- Equivalent weight of the element = $\frac{\text{atomic weight of the element}}{\text{valency}}$
- Equivalent weight of common salt = $\frac{\text{formula weight of salt}}{\text{total charge on the cationic part}}$
- Equivalent weight of acidic salt = $\frac{\text{formula weight of salt}}{\text{Displaceable H- atom present in salt}}$
- Equivalent weight of acid = $\frac{\text{Molecular weight of acid}}{\text{No. of } H^+ \text{ ions in a molecule}}$
- Equivalent weight of Base = $\frac{\text{Molecular weight of Base}}{\text{No. of } OH^- \text{ ions given by a molecule}}$
- Gram Equivalent weight = $\frac{\text{Mass (in grams)}}{\text{Equivalent weight}}$
- Molecular weight = 2 X Vapour density
- $A = E \times V$

A = atomic weight
E = Equivalent weight
V = Valency

- $n = \frac{\text{Molecular formula weight}}{\text{Empirical formula weight}}$

n = Integen (1, 2, 3, 4 . . .)

- formula mass of AB = Atomic mass of A + Atomic mass of B

- $\text{Percentage composition} = \frac{\text{Mass of the element in the compound}}{\text{Molar mass of the compound}} \times 100$

- $\text{Mass Percentage} = \frac{\text{Mass of solute}}{\text{Mass of solution}} \times 100$

- Mole fraction

$$\text{Mole fraction of A} = \frac{\text{No. of moles of A}}{\text{No. of moles of solution}} = \frac{n_A}{n_A + n_B}$$

$$\text{Mole fraction of B} = \frac{\text{No. of moles of B}}{\text{No of moles of solution}} = \frac{n_B}{n_A + n_B}$$

The sum of the mole fractions of all the components of a solution is always the unit.

$$n_A + n_B = 1$$

- $\text{No. of Moles} = \frac{\text{weight}}{\text{Molecular Mass}}$

- $\text{Molarity (M)} = \frac{\text{No. of moles of solute}}{\text{Volume of solution in liters}}$

- $\text{Molality (m)} = \frac{\text{No. of moles of solute}}{\text{Mass of solvent in kg}}$