Some Basic Concepts of Chemistry



Law of Chemical Combinations

Avagadro's Law

@ Constant Pressure & temperature. Volume is directly proportional to number of moles

Law of Definite Proportions

A given compound always contain same elements in the excat same proportions by mass

Gay Lussac's Law

@ Constant Volume, pressure is directly proportional to temperature

Law of Conservation of mass

Matter can neither be created nor be destroyed.

Law of Multiple Proportions

If two elements can combine to form more than one compound, the masses of one element that combine with a fixed mass of the other element are in ratio of small whole number

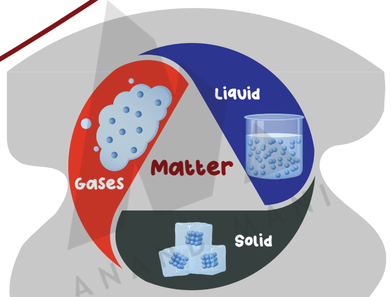
Stoichiometry

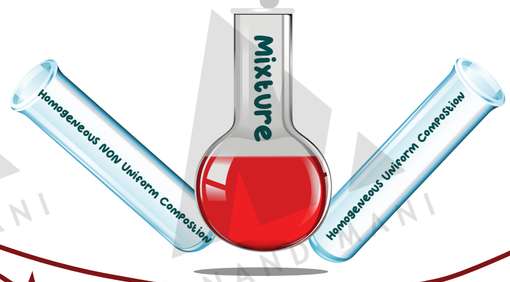
Balance a Chemical Equation

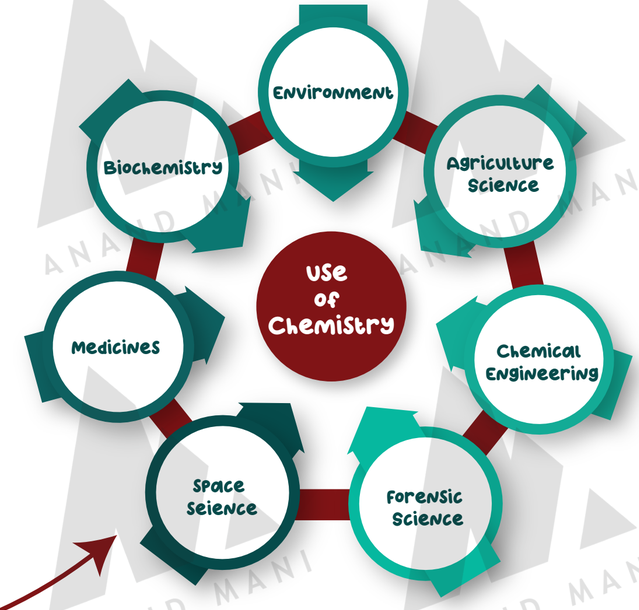
Write correct formulas of reactant & products
↓
Balance Number of C atoms
↓
Balance Number of H atoms
↓
Balance Number of O atoms
↓
Verify Number of atoms of elements

Significant Figures

- All the Non-zero numbers in a measurement are significant.
- Zeroes sandwiched anywhere between Non-zeroes are significant.
- Zeroes to the left of a first Non-zero digits are Not significant.
- The zeroes to the right of the last Non-zero digits are significant if No. has a decimal point.







Limiting Reagent

The reactant that is entirely used up in a reaction

Dalton's Atomic Theory

- Atoms consists of indivisble atoms.
- All the atoms of a given element have identical properties including identical mass.
- Atoms are neither created Non destroyed.
- Compounds are formed when atoms of different elements combine in a fixed ratio.

Moles (N)

$$N = \frac{\text{given Number}}{\text{Avagadro's No}} = \frac{n}{N_A}$$

$$\Downarrow$$

$$N = \frac{\text{given mass}}{\text{Molar mass}} = \frac{m}{M}$$

$$\Downarrow$$

$$N = \frac{\text{given Volume}}{22.4\ L} = \frac{V}{22.4\ L}$$

Emperical & Molecular Formula (EF and MF)

Step 1 → Conversion of mass % to grams
Step 2 → Convert into Number of moles of each element
Step 3 → Divide the mole value obtained above by the Smallest Number
Step 4 → Write Emperical formula by Mentioning the No. after writing the symbols of respective elements
Step 5 → Writing Molecular formula
(a) Determine EF mass. Add the atomic masses of various atoms present in the EF
(b) Divide Molar masses by EF mass
(c) Multiply EF by N obtained above

Dilution

$M_1V_1 = M_2V_2$

Basicity

Number of H^+ ion displaced in one molecule the acid

Acidity

Number of OH^- ion displaced in one molecule of the base

Concentration terms

