SOME BASIC CONCEPTS OF CHEMISTRY

Law of Chemical Combinations

Avagadro's

@ Constant Pressure & temperature. Volume is directly proportional to No of moles

Low of Conservation of mass

Matter can neither be created nor destroyed.

Low of Definite Proportions

A given compound always contain exactly the same proportions of elements

Gay Lussac's Law

@ Constant Volume, pressure is directly proportional to volume

Low 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 Chamical Equation

write correct formulas of reactant & products

↓

Balance number of C atoms

↓

Balance number of H atoms

↓

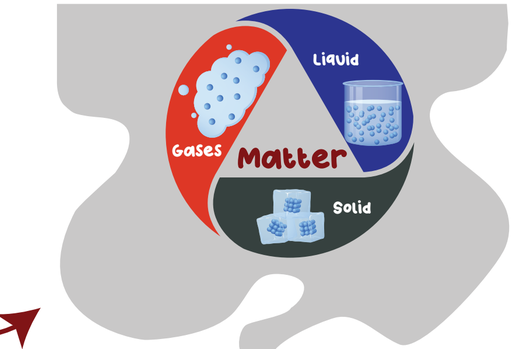
Balance number of O atoms

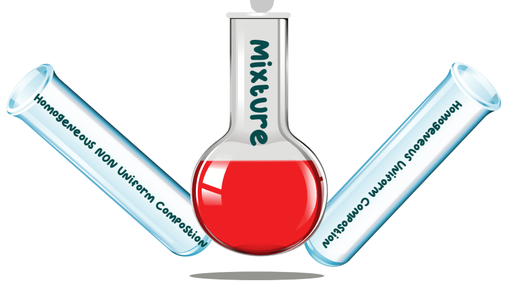
↓

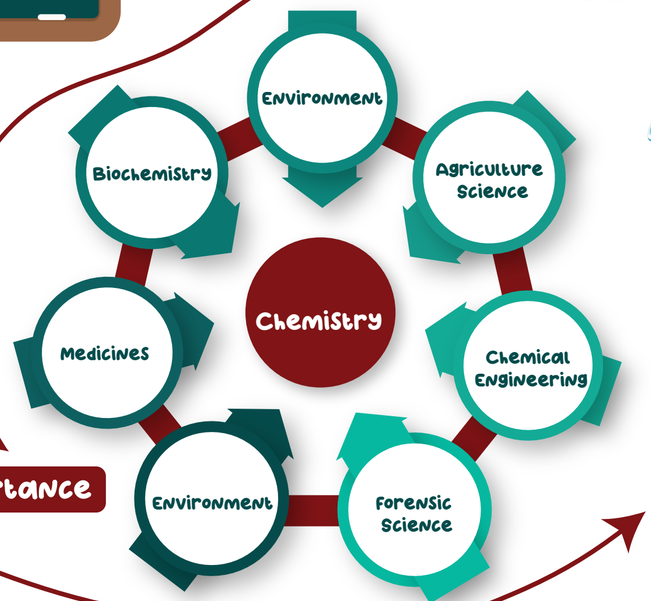
Verify number of atoms of elements

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.







Importance

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 NOR destroyed.
- Compounds are formed when atoms of different elements combine in a fixed ratio.

Limiting Reagent

"The reactant that is entirely used up in a reaction"

Concentration terms

Molarity

$$\frac{\text{No. of moles of Solute}}{\text{Volume of Solution in L}}$$

$\frac{w}{v}$%

$$\frac{\text{weight of Solutein Kg}}{\text{Volume of Solution in L}}$$

$\frac{v}{v}$%

$$= \frac{\text{Volume of Solute in L}}{\text{Volume of Solution in L}}$$

Normality

$$\text{Molarity} \times \text{N-factor}$$

Temperature Dependent

Molarity

$$\frac{\text{No. of moles of Solute}}{\text{weight of Solvent in kg}}$$

Mole fraction

$$\frac{\text{Moles of Solute or Solvent}}{\text{Total Moles of Solution}} =$$

$\frac{w}{w}$%

$$\frac{\text{weight of Solute in kg}}{\text{weight of Solution in kg}} \times 100$$

PPM Parts per Million

$$\frac{\text{weight of Solute in kg}}{\text{weight of Solution in kg}} \times 10^6$$

Temperature Independent

Moles (N)

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

$$\Downarrow$$

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

$$\Downarrow$$

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

Emperical & Molecular Formula

Step 1 → Conversion of mass % to grams

Step 2 → Convert into Number 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

M1V1 = M2V2

Basicity

No of H+ ion displaced in one molecule the acid

Acidity

No of OH− ion displaced in one molecule of the base