

Moles & Stoichiometry

Relative Mass

- *Relative Atomic Mass* is the average mass of all the isotopes of an element relative to 1/12th of the mass of Carbon-12

- *Relative Molecular Mass* is the average mass of a molecule of an element or compound relative to 1/12th of the mass of Carbon-12

- *Relative Formula Mass* is the average mass of a formula unit of an ionic compound relative to 1/12th of the mass of Carbon-12

- *Relative Isotopic Mass* is the mass of an isotope of an element relative to 1/12th of the mass of Carbon-12

Mole and Avogadro Constant

- One mole of any substance contains 6.02×10^{23} atoms

- This number is known as Avogadro's constant

- One mole of a substance has mass equal to its Relative Atomic or Molecular Mass

- One mole of a gas at room temperature and pressure occupies 24dm^3 volume

Formulae

- Moles = Mass/A_r or M_r

- Moles = $\text{Volume} \times \text{Concentration}/1000$

- Moles = $\text{Volume of gas at r.t.p.}/24$

- Percentage Yield = $\text{actual mass} / \text{predicted mass} \times 100$

Empirical and Molecular Formula

- Empirical formula is the simplest whole number ratio of atoms in a molecule

- Molecular formula is the actual number of atoms of all the elements present in a molecule

Steps to Calculate Empirical Formula

- Divide the mass of the elements present by the atomic mass to get the moles

- Divide all the values calculated by the smallest value calculated to get ratio

- The ratio corresponds to the number of atoms of each element in the Empirical Formula

Combustion

- Combustion is the burning of a substance in air (O_2)

- General equation for combustion of gaseous Hydrocarbons:

