Chemistry Formula Sheet

Chapter by chapter, topic by topic. Written by the PadhoNa team for quick revision.

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CHAPTER 1

Some Basic Concepts of Chemistry

Mole concept

$$n = \frac{\text{mass}}{M} = \frac{N}{N_A} = \frac{V_{\text{gas}}}{22.4\ \text{L}}\ (\text{at STP}), \qquad N_A = 6.022 \times 10^{23}$$

AVERAGE ATOMIC MASS

$$\bar{A} = \frac{\sum(\%\ \text{abundance} \times \text{mass})}{100}$$

Concentration terms

$$M = \frac{n_{\text{solute}}}{V_{\text{soln}}(\text{L})}, \qquad m = \frac{n_{\text{solute}}}{\text{kg solvent}}, \qquad N = M \times n\text{-factor}$$

MOLE FRACTION

$$x_A = \frac{n_A}{n_A + n_B}, \qquad x_A + x_B = 1$$

MOLARITY FROM % (W/W)

$$M = \frac{10 \times d \times \%w}{M_{\text{solute}}}$$

DILUTION / MIXING

$$M_1V_1 = M_2V_2; \qquad M_{\text{mix}} = \frac{M_1V_1 + M_2V_2}{V_1 + V_2}$$

Empirical formula and stoichiometry

MOLECULAR FORMULA

$$\text{molecular formula} = n \times \text{empirical formula}, \qquad n = \frac{\text{molar mass}}{\text{empirical formula mass}}$$

LIMITING REAGENT

$$\text{the reactant with the smallest } \frac{\text{moles}}{\text{coefficient}}$$

EQUIVALENTS

$$\text{equivalents} = n \times n\text{-factor}; \qquad \text{equivalents of A} = \text{equivalents of B in a reaction}$$

Laws of chemical combination

conservation of mass; definite proportions; multiple proportions; Gay-Lussac's gaseous volumes; Avogadro's law

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