

Some Basic Concepts of Chemistry Formula Sheet



$$\textcircled{1} \quad 1 \text{ mole} = 6.022 \times 10^{23} = N_A$$

$$\textcircled{2} \quad \text{No. of moles of entities} = \frac{\text{Given no. of entities}}{6.022 \times 10^{23}}$$

$$\textcircled{3} \quad \text{No. of atoms} = \frac{\text{Given Mass of atom } (\mu)}{\text{Relative Atomic Mass } (\mu)}$$

$$\textcircled{4} \quad \text{Average Atomic Mass} = \frac{\%_1 M_1 + \%_2 M_2 + \dots}{\text{Total \%}}$$

$$\textcircled{5} \quad \text{Actual Molecular Mass} = \sum [\text{Actual Atomic Mass}]$$

$$\textcircled{6} \quad \text{Relative Molecular Mass} = \sum [\text{Relative Atomic Mass}]$$

$$\textcircled{7} \quad \text{No. of molecules} = \frac{\text{Given Mass of molecule } (\mu)}{\text{Relative Molecular Mass } (\mu)}$$

$$\textcircled{8} \quad \text{No. of moles} = \frac{\text{Given Mass (gms)}}{\text{Molar Mass (gms/mole)}}$$

$$\textcircled{9} \quad 1 \text{ gram-atom} = 1 \text{ mole atom}$$

$$\textcircled{10} \quad 1 \text{ gram-molecule} = 1 \text{ mole molecule}$$

$$(11) \text{ Average Molecular Mass} = \frac{M_A n_A + M_B n_B + \dots}{n_A + n_B + \dots}$$

$$(12) \text{ No. of moles (NTP)} = \frac{\text{Given Vol. (L)}}{22.4 \text{ L/mol}}$$

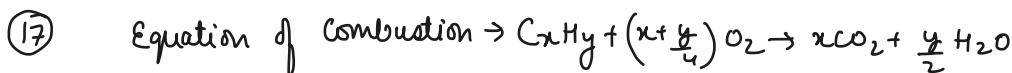
$$(13) \text{ No. of moles (STP)} = \frac{\text{Given Vol. (L)}}{22.7 \text{ L/mol}}$$

$$(14) \text{ Mole \% of element} = \frac{\text{Moles of element}}{\text{Total moles}} \times 100\%$$

$$(15) \text{ Mass \% of element} = \frac{\text{Total Mass of element}}{\text{Total Mass}} \times 100\%$$

$$= \frac{(\text{No. of atoms}) \times (\text{Mass of 1 atom})}{\text{Total Mass}} \times 100\%$$

$$(16) \text{ Vapour Density} = \frac{\text{Molar Mass}}{2}$$



$$(18) \text{ Volume Contraction} \rightarrow \left[\text{Total Volume of reactant gases} \right] - \left[\text{Total Volume of product gases} \right]$$

$$(19) \text{ Percentage yield} \rightarrow \left[\frac{\text{Actual yield}}{\text{Theoretical yield}} \right] \times 100\%$$

$$(20) \text{ Percentage Purity} = \frac{\text{Mass of pure substance}}{\text{Mass of sample}} \times 100\%$$

$$(21) \text{ Molarity (M)} = \frac{\text{No. of moles of solute}}{\text{Volume of solution (L)}} = \frac{\text{No. of milli-moles of solute}}{\text{Volume of solution (ml)}}$$

$$(22) \text{ Condition for dilution} = M_1 V_1 = M_2 V_2$$

$$(23) \text{ Molality (m)} = \frac{\text{No. of moles of solute}}{\text{Mass of solvent (kg)}}$$

$$(24) \text{ Mole fraction} \Rightarrow X_A = \frac{n_A}{n_A + n_B} \quad X_B = \frac{n_B}{n_A + n_B} \quad X_A + X_B = 1$$

(Binary solution)

$$(25) \text{ Mass/Mass}\% \Rightarrow \frac{\text{Mass of solute (gms)}}{\text{Mass of solution (gms)}} \times 100\%$$

$$(26) \text{ Mass/Volume}\% \Rightarrow \frac{\text{Mass of solute (gms)}}{\text{Volume of solution (ml)}} \times 100\%$$

$$(27) \text{ Volume/Volume}\% \Rightarrow \frac{\text{Vol. of solute (ml)}}{\text{Vol. of solution (ml)}} \times 100\%$$

$$(28) \text{ ppm} = \frac{\text{mass of solute (gms)}}{\text{mass of solution (gms)}} \times 10^6$$

$$(29) \text{ ppb} = \frac{\text{mass of solute (gms)}}{\text{mass of solution (gms)}} \times 10^9$$

$$(30) \text{ ppt} = \frac{\text{mass of solute (gms)}}{\text{mass of solution (gms)}} \times 10^{12}$$

$$\textcircled{31} \quad \text{Formality} = \frac{\text{No. of moles of ionic compound}}{\text{Vol. of soln (l)}}$$

$$\textcircled{32} \quad \text{Strength} = \frac{\text{Mass of solute (gms)}}{\text{Vol. of solution (l)}}$$