





**Parts per million : For trace quantities**  

$$\frac{\text{No. of parts of components} \times 10^6}{\text{Total no. parts of components of solution}}$$

**Normality:** Number of gram equivalents of the solute dissolved in one litre of solution

$$\frac{\text{No. of gram equivalent of solute} \times 100}{\text{Volume of solution}}$$

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Gram Equivalents of solute

$$= \frac{\text{Mass of solute}}{\text{Equivalent weight}}$$

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Equivalent weight =  $\frac{\text{Molecular mass}}{\text{Valency}}$

**Mass by volume percentage (w/v)**  

$$\frac{\text{Mass of solute}}{\text{Volume of solution}} \times 100$$

**Mass percentage w/w**  

$$\frac{\text{Mass of component in solution}}{\text{Total mass of solution}} \times 100$$

**Volume percentage v/v**  

$$\frac{\text{Volume of component}}{\text{Total volume of solution}} \times 100$$

**Mole fraction**  

$$\frac{\text{No. of moles of component}}{\text{Total No. of moles of all components}}$$

**Molality:** Number of moles of solute per kilogram of the solvent

$$\frac{\text{No. of moles of solute} \times 1000}{\text{Mass of solvent}}$$

**Molarity:** Number of moles of solute in 1L solution

$$\frac{\text{No. of moles of solute} \times 1000}{\text{Volume of solution}}$$