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METHODS OF EXPRESSING CONCENTRATION

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- **The methods of expressing concentration are based upon chemical formula or combining power, The word "Concentration" is frequently used as a general term referring to a quantity of substance in a defined volume of solution.**
- 1. Molarity(M) : The molarity of a solution expresses the number of moles (gram-molecular weights) of solute dissolved in 1000 ml (1 Litre) of solution.**
 - 2. Molality(m) : The molality of a solution expresses as the number of moles of a solute dissolved in 1000 gm of a solvent.**



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3. Normality (N) : The normality of a solution expresses the number of equivalents (gram- equivalent weight) of the solute in one litre of solution.

4. Formality (F) : Formality may be defined as the number of gram formula weight (GFW) of the solute dissolved per litre of solution. Formality (F) = $\text{GFW/Litres of solution}$.



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5. Percent w/w (% w/w) - (% weight in weight) expresses the number of grams of solute in 100 gm of product. e.g. H_2SO_4 98.0% w/w; CH_3COOH 33% w/w etc.
6. Percent w/v (% w/v) - (% weight in volume) It expresses the number of grams of solute in 100 ml of product. (i.e. 100 ml of solution). e.g. H_2O_2 solution 5-7% w/v.
7. Percent v/v (% v/v) - (% volume in volume) It expresses the number of millilitres of solute in 100 ml of product. e.g. Alcohol 95% v/v.



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8. Percent v/w (%v/w) - (% volume in weight) It expresses the number of millilitres of solute in 100 gm of product.

9. Parts per million (ppm) - When the concentration of a solution is expressed as parts per million (ppm), it means weight in weight , unless otherwise specified. PPM- the number of grams of solute contained in 106 gm of solution. e.g. In the limit test of chloride 25 ppm of cl.



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THANK YOU