

Solutions

Solution: —

A solution is a ~~homotog~~ homogeneous mixture of two or more substances having a single phase.

for example — Aqueous soln of sugar, glucose, urea etc.

Solute + Solvent = Solution

eg- Sugar water sugar soln

Hence, Any two or more substances mixed together forming a single phase is a solution.

The substances which make up the solution are called components. The solution of two components are called binary solution. Similarly solution of three and four components are called ternary and quaternary solutions respectively.

Solute : — In a solution having two components, one present in small amount is called solute.

Solvent : — In a solution the component present in larger quantity is called solvent.

Saturated and Unsaturated solution

At a particular temperature if a solution does not dissolve more solute is called saturated solution. But the solution which can dissolve more solute is called unsaturated solution.

Dilute solution :- In a solution, amount of solute is small as compared to large amount of its solvent then the solution is called a dilute solution.

or

A solution whose molarity is equal to or less than 0.1 is called dilute solution.

Mole fraction :- Mole fraction of solute or solvent in a solution is the ratio of no. of moles of solute or solvent to the total no. of moles in a solution. It is represented by X .

Let n is the no. of moles of solute and N is the no. of moles of solvent present in a solution.

Hence, total no. of moles in solution = $(n + N)$ moles

$$\therefore X_{\text{solute}} = \frac{n}{n + N}$$

where X_{solute} is mole fraction of solute

$$X_{\text{solvent}} = \frac{N}{n + N}$$

where X_{solvent} is mole fraction of solvent

for Any soln -

$$X_{\text{solute}} + X_{\text{solvent}} = 1$$