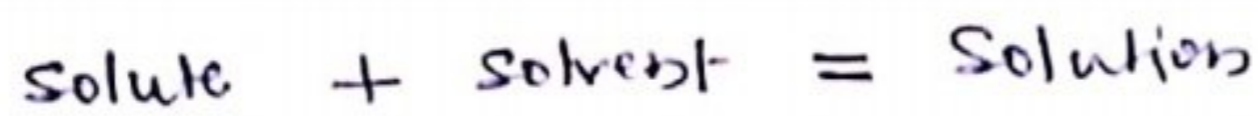


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(Chemistry)

## Solution

Solution - A homogeneous mixture of two or more substances is called solution.



### Characteristics :

- 1). A solution consists of one phase only.
- 2). All the non-reacting gases mix together and form a homogeneous solution.
- 3). Two or more solids do not form homogeneous solution. But many alloys such as steel, Brass etc are homogeneous.
- 4). The composition of the solution may be changed within certain limits.
- 5). The solution shows the properties of its components.
- 6). The substance present in smaller amount is called solute. The substance present in relatively large proportion is called solvent.
- 7). In case of solid-liquid type of solutions, solid is always considered as solute.
- 8). In solutions, particles are of molecular size. The different components of the solution can not be separated by filtration, centrifugation etc.



## Types of Solutions :-

(2)

| <u>Types</u>        | <u>solute</u> | <u>solvent</u> | <u>Examples</u>                                     |
|---------------------|---------------|----------------|---|
| 1) Gaseous solution | Gas           | Gas            | Air,  |
|                     | liquid        | Gas            | $\text{CHCl}_3$ vapour mixed with $\text{N}_2$ gas. |
|                     | solid         | Gas            | camphor vapour in $\text{N}_2$ gas.                 |
| 2) liquid solutions | Gas           | liquid         | $\text{O}_2$ dissolved in water                     |
|                     | liquid        | liquid         | Acetic acid in water                                |
|                     | solid         | liquid         | Aqueous soln of sugar                               |
| 3) solid solutions  | Gas           | solid          | $\text{H}_2$ gas in Pt.                             |
|                     | liquid        | solid          | Sod. amalgam, zinc amalgam                          |
|                     | solid         | solid          | Copper in gold.                                     |

### \* Binary solution :-

When a solution contains, only two components, it is called binary solution. eg  $\rightarrow$  sugar & water,

### \* Ternary solution :-

When a solution contains, three components, it is called ternary solution. eg  $\rightarrow$  A solution of water, methanol & ethanol.

### \* Aqueous solution :-

In solution, when solvent is taken as water, called aqueous solution. eg  $\rightarrow$  Sugar in water

### \* Non-aqueous solution :-

In solution, when solvent is taken as organic -



- solvents in stead of water, called non-aqueous solution.

eg → when  $C_6H_6$ ,  $CHCl_3$ ,  $C_2H_5OH$  etc are taken as solvent.

\* Liquid solution:-

A solution in which solvent is liquid and solute may be solid, liquid or gas.

eg →  $O_2$  dissolved in water, sugar solutions.

\* Miscible liquid solution:-

Liquids which mix with each other are called miscible liquid solution.

eg →  $H_2O$  & ~~water~~<sup>milk</sup>,  $H_2O$  & ~~benzene~~. Acetic acid.

\* Immiscible liquid solution:-

Those liquids which do not mix with each other are called immiscible liquid solution.

eg →  $H_2O$  &  $CHCl_3$ ,  $H_2O$  & benzene.

\* Solid solution:-

Alloys are homogeneous and form solid solutions. eg → Brass, steel etc. Ionic solid such as NaCl, KCl form solid solutions together.  $H_2$  gas dissolves in Pt or Pd forms solid solutions.

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