Chemistry Study Materials for Class 9 (NCERT Based notes of Chapter -02)

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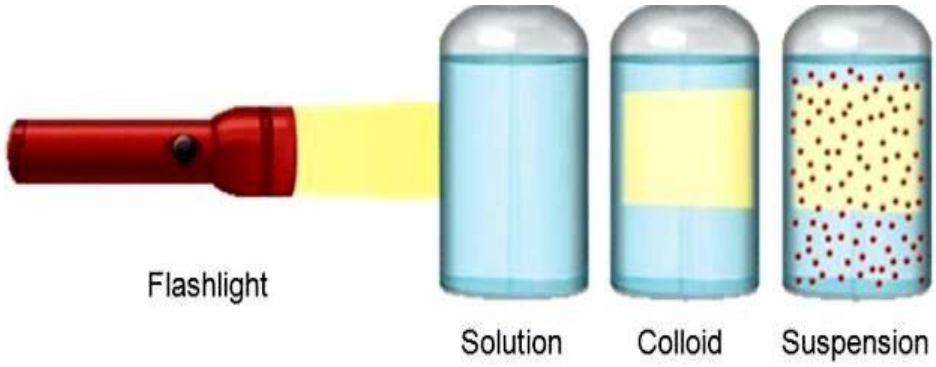
TYPES OF MIXTURE

Mixture can be categorized in three types on the basis of their particles' size. These are; solution, suspension and colloid.



SOLUTION

Mixture of two or more substances with one phase only, i.e. having no distinct boundary of constituent particles are called solution.

For example, solution of sugar and water, solution of salt and water, lemonade, soft drinks, etc. Solution is a homogeneous mixture of two or more substances.

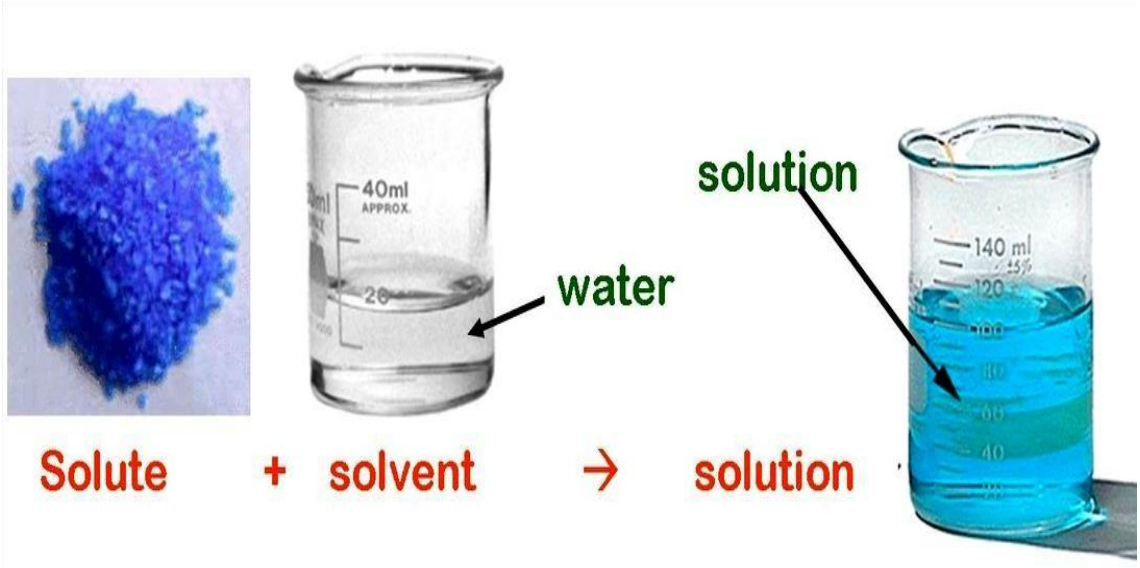
In a solution, components are mixed in such a way that they appear as only one phase. Seeing by naked eye, constituent particles of a solution cannot be identified because particles are mixed evenly throughout.

In a solution, there are two types of components – one is called solute and other is called solvent.

Solute – Substance which is present in smaller quantity in a mixture is called solute.

Solvent – Substance in a mixture which is present in larger quantity in a mixture is called solvent.

Example: In the solution of salt and water, salt is present in small quantity while water is present in larger quantity. Here salt is solute and water is solvent.



Solution of tincture iodine is made by dissolving iodine in alcohol. In this solution, iodine is solute and alcohol is solvent.

Air is mixture of many gases. Since air consists of only one phase, thus it is considered as solution. Air consists about 78% of nitrogen and 22% rest of other gases. Thus in the case of air, nitrogen can be called as solvent and rest other gases as solutes. Solvent and solute can be solid, liquid or gas.

TYPES OF SOLUTION

Solid - solid solution – Solution of two or more solids are generally known as solid-solid solution. For example – alloys. Alloy is a homogeneous mixture of two or more metals and non metals or two metals or two non-metals.

The components of an alloy cannot be separated by physical methods, their boundaries are not distinct and they can have variable compositions, thus alloy is considered as solution.

Solid – Liquid solution – Solution of solid and liquid is called solid-liquid solution. For example - solution of salt and water

Liquid – liquid solution – Solution of two miscible liquids are called liquid-liquid solution, such as solution of water and acetic acid. The solution of acetic acid in water is known as vinegar.

Gas - liquid solution – Solution of gas into liquid is called gas-liquid solution. For example – Soft drink In soft drink, carbon dioxide is usually dissolved in liquid, because of which a hiss sound comes while opening the cap of the bottle.

Gas-gas solution – Solution of two or more gas is called gas-gas solution. For example – air, which is the solution of many gases, such as hydrogen, oxygen, carbon dioxide, etc.

State of Solvent	State of Solute	State of Solution	Examples
Gas	Gas	Gas	Air, natural gas
Liquid	Liquid	Liquid	Alcoholic beverages, Antifreeze solution;
Liquid	Solid	Liquid	Seawater, sugar solution
Liquid	Gas	Liquid	Carbonated water (soda) Ammonia solution;
Solid	Solid	Solid	Metal alloys: brass, bronze,..
Solid	Gas	Solid	Hydrogen in platinum

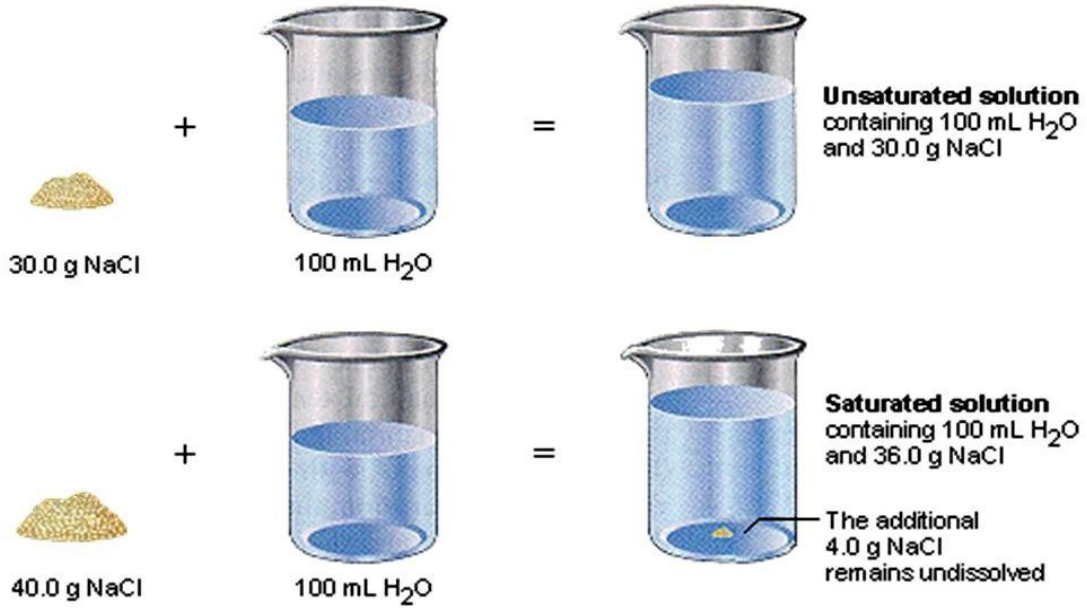
General Characteristics of Solution:

- Solutions are homogeneous mixture of two or more substances.
- Constituent particles of a solution are mixed evenly throughout.
- There is only one phase in a solution.

- Boundaries of constituent particles cannot be distinguished.
- The size of particles of solution is smaller than one nanometer.
- Solutions do not show Tyndall effect, because, small particles of solution do not scatter the ray of light.
- Solute cannot be separated by using filtration or decantation.
- Solutions are stable, since when left undisturbed the particles do not settle in bottom.

SATURATED AND UNSATURATED SOLUTIONS

Saturated Solution: When a solution cannot dissolve more solute at a given temperature, the point is called saturation point of the solution and solution is called saturated solution. This means, no more solute can be dissolved in a saturated solution at a given temperature.



Unsaturated Solution: Solution in which more solution can dissolved at a given temperature is called unsaturated solution.

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