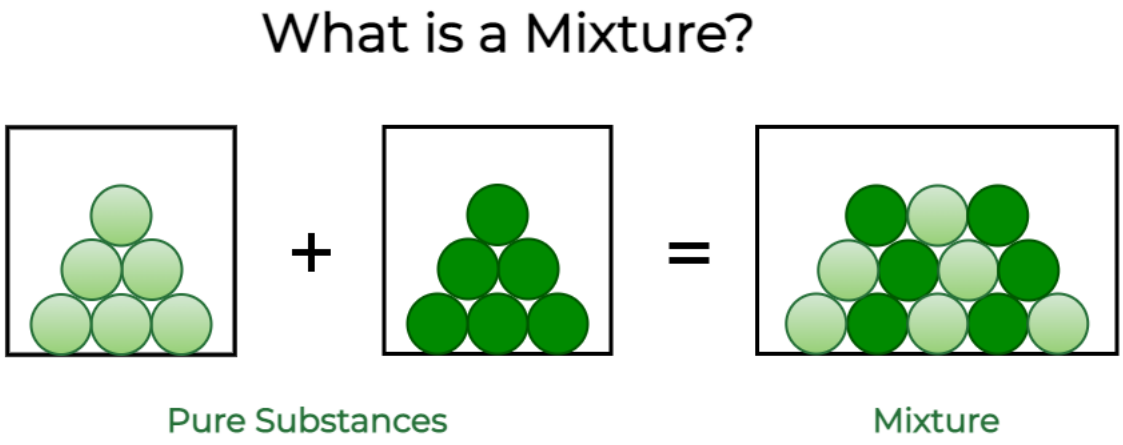
بِسْمِ ٱللَّهِ ٱلرَّحْمَٰنِ ٱلرَّحِيمِ

Mixtures:-

It is the product of combining two or more materials, the components of this mixture can be separated easily.



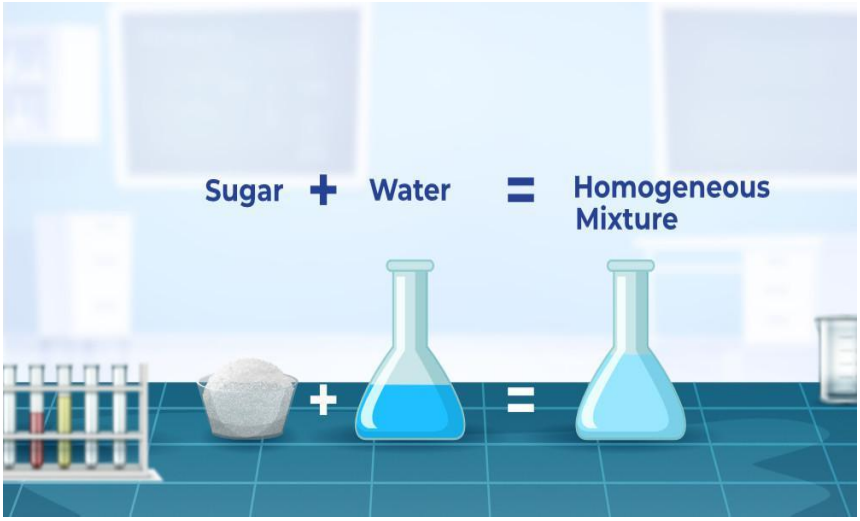
A mixture is an impure substance. It consists of different elements and substances combined together physically in an unknown ratio. Mostly mixtures are heterogeneous. Their constituents are not combined chemically but only physically. Mixtures have two main types, namely Homogeneous mixtures, and heterogeneous mixtures.

1) **Homogeneous** mixtures: are characterized by the uniformity of their components, so that they cannot be separated easily.

. Examples of homogeneous mixtures include: -

- Air.

- Water and sugar.
- Washing powders.
- Rain water.
- Vinegar.
- Steel



2) **Heterogeneous mixtures:** are known as mixtures that do not have a uniform composition, as the substances in them are not distributed evenly, these materials can be separated by mechanical means such as screening, filtering, and gravity.

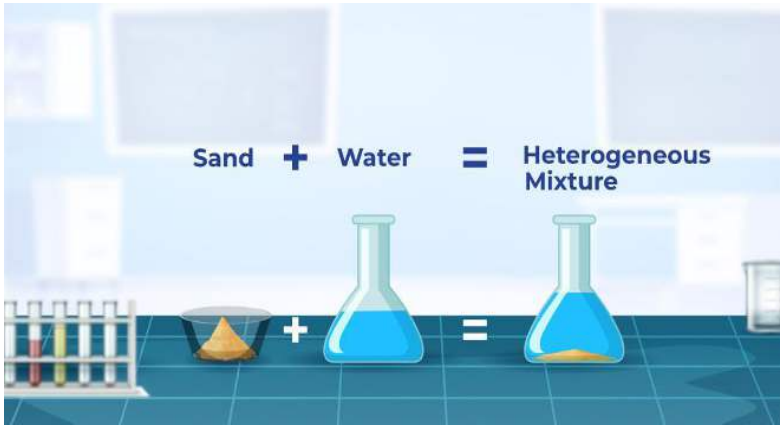
Types of heterogeneous mixtures

Heterogeneous mixtures are divided into two basic types:

1- Suspension Mixtures: are known as mixture of matter liquid and solids which do not dissolve in a liquid, so that these substances can settle it precipitates.
2- Colloidal mixtures: It is a heterogeneous mixture of two or more substances, no chemical union occurs between them.
3- Emulsion mixtures: it is a mixture of two liquids that cannot be combined with each other by stirring or vibration (Shaking), so that these liquids settle in two separate layers on top of each other when left for a period of time.

Examples of heterogeneous mixtures: -

- Sand in the water.
- Vinegar in oil.
- Water and cornstarch.
- Oil painting.
- The blood.



Difference between Homogeneous and Heterogeneous Mixtures

Homogeneous Mixture	Heterogeneous Mixture
Mixtures that have uniform composition.	Mixtures that do not have uniform composition throughout.
The boundary of separation could not be seen.	The boundary of separation of constituent particles is clearly visible.
Particles are not indistinguishable.	Particles can be physically distinguishable.
'Homo' means the same.	'Hetero' means different.
Particles can't be seen with the naked eye.	Particles can be seen with the naked eye.
It has uniform properties throughout.	Its different parts have different properties.

Homogeneous Mixture	Heterogeneous Mixture
For Example– Copper sulphate dissolves in water.	**For Example**– Muddy water, or detergent solution.

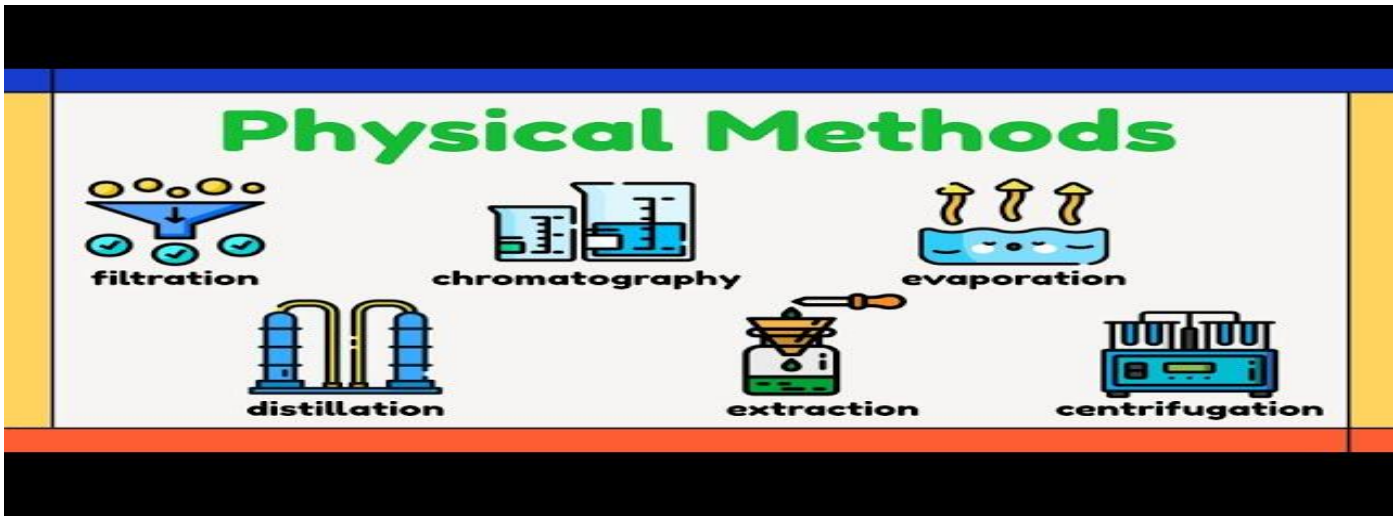
- Methods for separating mixtures

❖ **Chromatography**: is one method of separation Mixtures, which depend on passing the mixture in a suspension, solution, or steam through a medium in which it is separated depending on their movement at different rates.

❖ **Filtration**: One of the methods for separating mixtures is filtration during the separation of the pure substances in the mixtures consisting of particles of each other is large the volume is sufficient to be collected by the porous tools used for that filtering.

❖ **Evaporation**: Homogeneous mixtures containing one or more types of salts can be separated . The method of using evaporation technology, which relies on heating the liquid substance, and evaporating it.

❖ **Distillation**: is used as an effective tool to separate mixtures made of two or more types of liquids

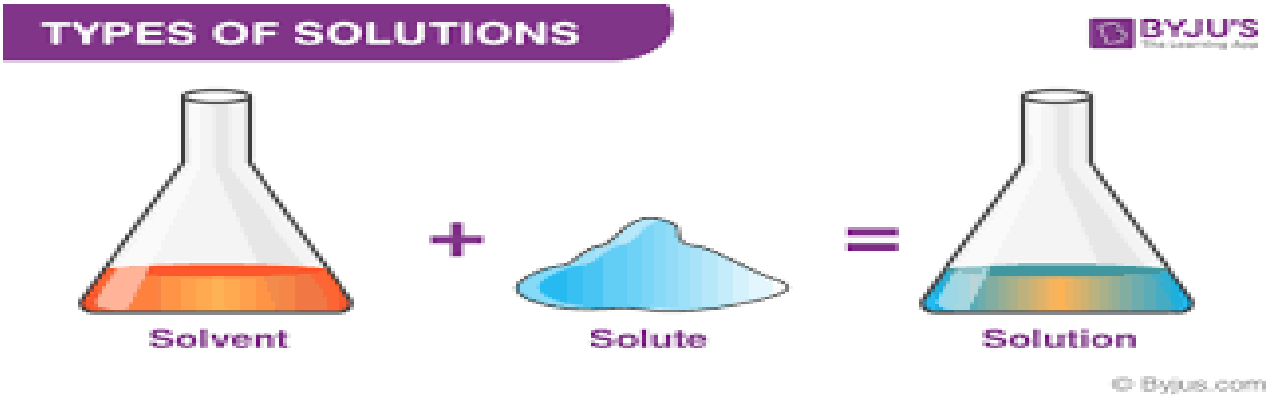


Solutions

❖A solution is a homogeneous mixture of a solute in a solvent.

❖A solute is the thing being dissolved

❖A solvent is the thing doing the dissolving



There is a limit to how much solid will dissolve into a liquid. This is referred to as its saturation.

There are three types of solution.

Under saturated is where more solute can be added to the solution.

Saturated means that the maximum amount of solute is dissolved in the solvent.

Supersaturated is a case in which more solute is dissolved in a solution than is normally allowed.