Mixture

Methods of Separation of Mixture:

- **Handing Picking**
- **Threshing**
- **Winnowing**
- **Sieving**
- **Sedimentation and Decantation**
- **Filtration**
- **Evaporation**
- **Condensation**

Solution

Mixture

A substance which is made of two or more kinds of particles (molecules) of different substances in such a way that the particles can be separated by physical means is called a mixture.

Examples:

- A glass of neembu-pani is a mixture of water, sugar and citric acid.
- Smoke is a mixture of carbon particles and air.
- Sea water is a mixture of water and a large number of salts of metals.
- Air is a mixture of oxygen, nitrogen, carbon dioxide and water vapour.
- Vinegar is a mixture of acetic acid and water.

The tea is been separated from the mixture of tea and tea leaves with the help of a strainer. The tea leaves are the impurities which are not required after the tea is made. The other examples from our day to day life are churning of milk to obtain butter and removing stones from grains.

Separation of tea leaves

We separate some substances from a mixture because they act as impurities or become harmful or useless. Like the tea leaves become **useless** after the tea is made. If the stones are not removed from the grains they become **harmful** to us when consumed with grains. When we churn milk for butter, both remain **useful**.

Methods of Separation of Mixture

Handpicking

It is the method of separating impurities from a mixture by hands. It can be used to separate only impurities that are larger in size like separating stones from grains.

Separation of stones from grains by handpicking

Threshing

The process in which the stalks of wheat from beaten to free it from seeds is called threshing. The grain seeds are separated from stalks by threshing.

Threshing stalks of wheat

Winnowing

Winnowing is a process used to separate heavier and lighter components of a mixture by wind or by blowing air. Chaff and husk can be separated from grains.

Winnowing

Sieving

The process of separating slightly larger particles from a mixture with the help of a sieve is called sieving. Separating pebbles from sand at construction sites, bran from flour.

Sieving flour

Sedimentation and decantation

When the heavier component in a mixture settles after water is added to it, the process is called sedimentation. To separate dust and soil from pulses, rice.

Sedimentation

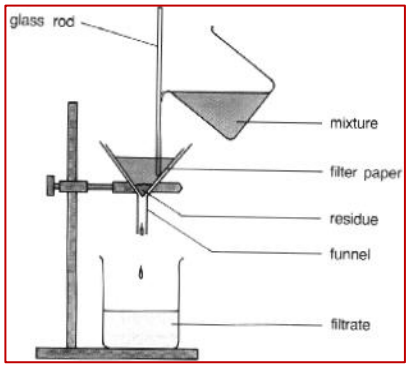
Decantation

Decantation is a fast method for separating a mixture of a liquid and a heavier solid. In this process, first the solid impurities are allowed to sediment at the bottom of the container. Then, the pure liquid is poured out carefully from the container into another container for example separating sand from water.

Filtration

The process of separating solid impurities from a liquid with the help of a filter is called filtration like separating lemon seeds from lemon juice.

This is a method which is the most especially effective for separating suspensions, for example mud in water. We pour the mixture into a funnel fitted with a piece of filter paper. There are tiny holes in the filter paper for the liquid to pass through, the solid particles are too large to do so, and therefore the solid particles will stay on the paper as what we called a solid residue. We called the liquid which pass through the filtrate.



Filtration

Evaporation

The process of conversion of water into its vapour form is called evaporation. Salts from sea are formed by evaporation and common salt is obtained by purification from the mixture.This method can be used to separate out salt from water.

Evaporation of salts solution

Condensation

The process in which vapours gets converted into liquid is called as condensation. Condensation is involved in the regulation of water cycle.

Activity

To filter chalk power mixed with water.

Steps:

- Take a filter paper and fold it to form a cone which is able to fit in a funnel.
- Now clamp this funnel on a stand and keep a beaker below it.
- Add the chalk powder mixed with water to it.

Observation

You will observe chalk powder remains on the filter paper while water collects in the beaker.

Use of more than one method of separation

For separation of some mixtures more than one method is used for e.g. separation of sand from salt. Let us see how it is separated. It takes place through four processes.

1. Decantation
2. Filtration
3. Evaporation
4. Condensation

- Add some water to the sand and salt mixture and allow it to settle for some time.
- The sand has settled at the bottom. Now decant the water.
- Sand is separated but the salt still needs to be separated from water.
- Boil the water in a kettle and place a metal plate with ice on it just above the spout of the kettle.
- Water droplets begin to fall from the metal plate. Collect it in a beaker.
- Let whole of the water evaporate. What is left behind is the salt.

Condensation

Solution

Every liquid dissolves a solute in a fixed amount. If the quantity of the solute increases it remains undissolved. Also a liquid dissolves different solids in different amounts. Perhaps we can dissolve more amount of solid in a liquid even after the saturation point has reached by heating the solution.

A solution that contains the maximum amount of solute that a solvent can dissolve in it is a **saturated solution.**

Activity

Steps:

- Take one table spoon of glucose powder and add it to some amount of water.
- Stir it till is dissolves. Now add another table spoon and stir it. The glucose dissolves.
- Keep repeating this process till a stage comes when the glucose remains undissolved.

Observation and Conclusion

The stage where no more of the solid can be added to the liquid is called as **saturation point**. Now heat the solution and add some more amount of glucose. To your surprise you will find that the glucose dissolves. This shows that salt can be dissolved beyond the saturation point. Now try to repeat the same process by taking sugar. You will find that less amount of sugar dissolves as compared to glucose. Or in other words, different solids have different saturation point.