Introductison

- In our day -to- day life, we need to separate substance from a mixture of materials.
- For example, tea leaves are separated from the liquid with a strainer.
- Grain is separated from stalks, while harvesting.
- Before cooking rice, impurities such as husk, stone etc. is separated from it.
- There are many other processes used to separate substances.

Methods of separation

Handpicking

- This method is used for separating slightly larger sized impurities like the pieces of dirt, stone, and husk from wheat, rice or pulses.
- This is a convenient method of separation when quantity of impurities is not very large.
- This method cannot be used when impurities are very small in size.
- Also, the method is very time consuming.

Threshing

- The process that is used to separate grain from stalks etc. is called threshing.
- The stalk of grains is dried under the sun.
- Thereafter, the stalks are beaten to remove the grain seeds.

Manual threshing

Threshing by machine

Winnowing

- This method of separation is used to separate heavier and lighter components of a mixture by wind or by blowing air.
- This is a very common method used by farmers to separate lighter husk particles
  from heavier seeds of grain.
- The mixture is taken in a plate and held high. This is slightly tilted and shaken gently.
- The lighter impurities like husk is removed and the grain collects as heaps.

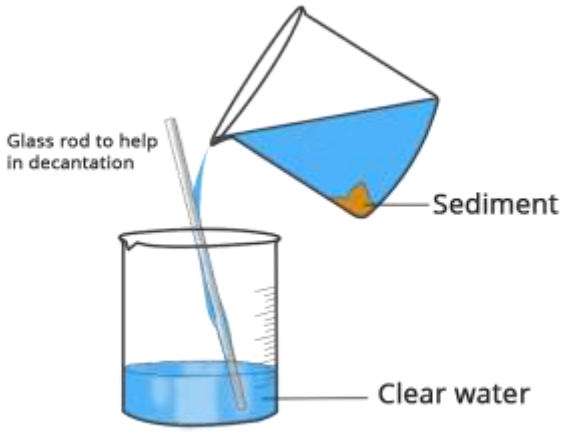
Sieving

- Sieving is used to filter out the dust particles.
- It is the most common method for cleaning flour.

- In sieving the fine flour particles are allowed to pass through the holes of the sieve while the bigger impurities are left behind on the sieve.

Sedimentation and Decantation

- After separation by other methods, there might be lighter impurities like dust or soil particles in rice or pulses.
- To remove these, water is added which allows the heavier component in a mixture to settle at the bottom. This is called sedimentation.
- When the water (along with the dust) is removed, the process is called decantation.
- The lighter dust particles still float on the surface of water which is discarded. This process of removal of water (or any other solute) along with lighter dust particles is called Decantation.
- A mixture of oil and water are separated similarly. Water is lighter than oil and it settles down. The oil is then separated.



Filtration

- The process of removing insoluble solids from a liquid by passing through pores of filter or a filter paper is known as Filtration. It is a common method used to separate tea leaves from tea.
- The liquid that passes through the filter paper and is collected in a container is called filtrate.
- The insoluble solids left behind on the filter paper is called the residue.
- Filter paper is a special paper with millions of tiny pores in it.

Evaporation

- The process of conversion of water into its vapour is called evaporation.
- This process is commonly used to obtain common salt from sea water.
- The sea water is left undisturbed in large shallow pits. The water evaporates leaving behind the salt which is further purified.

Use of more then one method of separation

- Many times, one method is not sufficient to separate the different substances of a mixture. Thus, more than one method is used in such cases.
- Best example is sand and salt mixture in water.
- Take a mixture of salt and sand with water.

- The salt will dissolve in water but sand will not dissolve.
- Leave the container undisturbed, after sometime, The sand can be separated by decantation or filtration.
- The decanted liquid still contains salt.
- Now heat the water such that it vaporizes (Evaporation takes place). Salt is left behind in the container.
- Then cool down the water vapor by bringing a plate of ice close to it. The vapour condenses to form water (Condensation takes place) and can be collected in another beaker.

Saturated solution

- When we keeping adding some solid substance like salt or sugar to a liquid say water. Initially it dissolves.
- But, after sometime a stage is reached when no more salt or sugar dissolves and remain as it is in the water.
- Such a solution in which no more solute dissolves in the solvent is known as saturated solution.