Revision Notes

CHAPTER – 5

Separation of Substances

PURE SUBSTANCES : substances which contain only one kind of particles .

IMPURE SUBSTANCES : substances which contain more than one kind of particles .

ELEMENT : A substance made from identical particles of one material.

COMPOUND : A substance formed as a result of chemical combination of two or more elements in a fixed ratio.

A solution is a mixture of two substances. the substance in larger quantity is the solvent and the other is the solute.

Elements and compounds are pure substances.

NEED FOR SEPARATING COMPONENT OF A MIXTURE

- **removing harmful or unwanted components, and**
- **obtaining useful and desire component in pure form.**

Methods of separation are

1. Threshing,
2. winnowing,
3. handpicking,
4. sieving,
5. magnetic separation,
6. floating and sinking method,
7. sedimentation and decantation
8. loading,
9. filtration,

10. separation to immiscible liquids,
11. churning to separate cream from milk,
12. sublimation.

(i) Separation of solid from other solids:

(a) Threshing: The process of separating grain from husk or chaff is called threshing.

Chaff : pieces of straw ; waste material of agriculture processes.

(b) Winnowing: The process of separation of heavier and lighter components of a mixture by wind or blowing air.

(c) Hand-picking: The process by which undesirable components are just picked up by hand.

(d) Sieving: The process by which separate solid constituents of a mixture which differ in their sizes.

A sieve is a device with many small holes in it , which allow the smaller particles to pass through.

(e) Magnetic separation: Process by which magnet is moved over such a mixture, the magnetic material sticks to it and is removed.

(ii) Separation of water soluble solids or separating solute soluble in solvent:

(a) Evaporation: Process by which the conversion of liquid state into gaseous state on heating.
(b) Condensation: Process by which conversion of gaseous state into liquid state on cooling.

(iii) Separation of insoluble solids from Liquids:

(a) Sedimentation: The process of settling down of heavier and insoluble component from mixture is called sedimentation.. Example: sand, water.

(b) Decantation: The process of transferring clean liquid without disturbing the sediment, is called decantation.

(c) Loading: The methods by which finer particles are made to settle faster by dissolving a small quantity of alum.

(d) Filtration: In this process the impurities are passed through a filter. The filter has pores in it that allow only liquids to pass through ; it can separate the suspended particles or solid particles.

The clear liquid so obtained is called the filtrate an the left over material on the filter paper is known as residue.

(iv) Separation of Immiscible Liquids:

IMMISCIBLE :- when two liquids do not mix well with one another.
(a) Funnel: The method of separating mixture of oil and water.
(b) Centrifugation: The method in which mixture containing suspended particles is rotated at a high speed in a centrifuge and heavier particles settle down. It is used for separating cream from milk.
(c) Churning: The method which is used for separating lighter particles of solid suspended in a liquid. Example: butter from curd.

SEPARATING SOLUTE NOT SOLUBLE IN A SOLVENT

Flotation and sinking methods :- This method is used when the components are not soluble in water and one of the component of a mixture is lighter than water an the other is heavier than water.

SUBLIMATION :- The changing of a solid directly to vapour, without coming to liquid state is called sublimation.

- · Husk and stones could be separated from grains by handpicking.
- · Husk is separated from heavier seeds of grain by winnowing.
- · A saturated solution is one in which no more of that substance can be dissolved.
- · More of a substance can be dissolved in a solution by heating it.
- · Water dissolves different amount of soluble substances in it.