Talent & Olympiad

Separation of Substances

Synopsis

- Matter can be broadly divided into two major groups "pure" and "impure"
- Matter is made up of tiny particles called molecules. Molecules are further made of same or different kinds of atoms.
- Molecules of a substance have all the properties of that substance.
- A pure substance is made up of only one type Of molecules and so it is called homogeneous substance, e.g., elements, compounds.
- An impure substance is made up of more than one type of molecules and it is called heterogeneous substance, e.g., mixtures.
- A substance which is uniform in its composition and properties throughout is called a homogeneous substance.
- A substance which is not uniform in its composition and properties throughout is called a heterogeneous substance.
- Methods of Separation: Some simple methods of separating substances that are mixed together are given below.
- Handpicking is used for separating slightly larger sized impurities like the pieces of dirt stones and husk from wheat, rice or pulses.
- Threshing is used to separate grain from stalks.
- Winnowing is used to separate heavier and lighter components of a mixture by wind or by blowing air.
- Sieving makes the fine flour particles to pass through the holes of the sieve while the bidder
- impurities remain on the sieve.
- Sedimentation settles the heavier component in a mixture after water is added to it.
- Filtration is used to separate components of a mixture of an insoluble solid and a liquid.

- Evaporation is the process of conversion of water into its vapour.
- Condensation is the process of conversion of water vapour into its liquid form.
- Saturated solution is the one in which no more of a substance can be dissolved.
- Sometimes, a combination of methods are to be used to separate mixtures of more than two substances.
- Substances may need to be separated from each other to remove impurities or to get two or more useful products.

Methods of separation

| Type of mixtures | Methods of separation |
|------------------------------------|---|
| (i) Solid-solid (heterogeneous) | Handpicking, winnowing, sieving, sublimation, magnetic separation |
| (ii) Solid-liquid (heterogeneous) | Filtration, sedimentation, decantation |
| (iii) Solid-liquid (homogeneous) | Evaporation, distillation, crystallisation |
| (iv) Liquid-liquid (heterogeneous) | Decantation, separating funnel |
| (v) Liquid-liquid (homogeneous) | Distillation, liquefaction, fractional distillation |