**1.7 Separating Mixtures (I)**

**Definitions:**

1. **Filtration:** The process in which a solid is separated from its suspension through filter paper is called filtration. In this process, the solid gets trapped in the filter paper and the liquid passes through it.

Ex – Chalk Water

1. **Centrifuging:** The process in which a test-tube of suspension is spun around very fast, so that the solid gets flung to the bottom is called centrifuging.
2. **Evaporation:** The process in which the solution is heated so that the solvent evaporates, leaving the solid behind is called evaporation.

Ex – Salt Water

1. **Crystallising:** The process in which a solid is separated from its solution by letting them to form crystals is called crystallising.

Ex – Copper (II) Sulphate solution

**Questions:**

1. **What is: a filtrate? A residue?**

Filtrate: Filtrate is the liquid that passes through the filter paper during filtration.

Residue: Residue is the solid that gets trapped in the filter paper during filtration.

1. **Describe two ways of separating the solid from the liquid in a suspension.**

Two ways of separating the solid from the liquid in a suspension are:-

Filtration: Chalk can be separated from water by filtering the suspension through filter paper. The chalk gets trapped in the filter paper and the water passes through it. (attach picture from the book)

Centrifuging: A test-tube of suspension is spun around very fast, so that the solid gets flung to the bottom. The liquid can be poured out from the test-tube or removed with a small pipette and the solid is left behind. (attach picture from the book)

1. **Sugar cannot be separated from sugar solution by filtering. Explain why.**

A solid can’t be separated from a solution by filtering because it is spread all over the solvent in tiny particles. Filtration is used only to separate a solid from a suspension. So, sugar can’t be separated from sugar solution by filtering.

1. **What happens when a solution is evaporated?**

When a solution is evaporated, the solid is separated from its solution. The solvent evaporates, leaving behind the solid. (attach picture from the book)

1. **Describe how you would crystallise potassium nitrate from its aqueous solution.**

I would heat the solution of potassium nitrate at first, to get rid of the water. As the water evaporates, the solution gets more concentrated.

Then I would check if the solution is concentrated enough, by placing one drop on microscope slide. Crystals would form quickly on the cool glass.

Lastly, I would left the solution to cool and crystallise. (attach picture from the book)

1. **How would you separate salt and sugar? Mention any special precaution you would take.**

In order to separate salt and sugar, I would follow the following steps.

1. I would add ethanol to the mixture and stir it. Then the sugar dissolves.
2. I would filter the mixture and the salt is trapped in the filter paper but the sugar passes through it.
3. I would wash the salt and dry it in an oven.
4. Then I would evaporate the sugar solution to dryness.

In this process, I would use ethanol. But ethanol is inflammable. So, I would evaporate the sugar solution over a water bath to prevent any accidents.

**Extra Questions:**

1. **How would you separate the mixture of salt and sand?**

Hint: Similar answer to the Question no. 6

Use water in replace of ethanol because salt dissolves in water but sand doesn’t.

1. **What are the methods to separate a solid from its solution?**

There are two methods:-

1. Evaporation b) Crystallising