

**01**

100 ml of water at room temperature of 25 °C is taken in a beaker and a little of solid S is dissolved in it by stirring to obtain a solution X. More and more of solid S is added to the solution with constant stirring, while keeping the temperature of solution constant at 30 °C. After some time, it is observed that no more solid dissolves in water and at the same time some solid is also left undissolved at the bottom of the beaker, The contents of beaker are filtered through a filter paper to obtain solution Y in the form of a filtrate.

- (a) What name is given to solution X ?
- (b) What name is given to solution Y ?
- (c) What will you observe if the solution Y at 30 °C is cooled down to 10 °C by keeping the beaker in crushed ice ? Why ?
- (d) What term is used to represent the amount of solid dissolved in 100 grams of water in a solution like Y ?

- (a) Solution X is known as unsaturated solution.
- (b) Solution Y is known as saturated solution.
- (c) If solution Y at 30 °C is cooled down to 10 °C by keeping the beaker in crushed ice, some of the dissolved part of the solid will separate from the solution and will settle at bottom of the beaker as crystals. It occurs due to decrease in the solubility of solids and decrease in the temperature from 30 °C to 10 °C.
- (d) Solubility is the amount of a solid dissolved in 100 grams of water.

**02** A mixture contains two solid constituents, common salt and chalk powder. Common salt is soluble in water whereas chalk powder is insoluble in water. So, this difference in their solubility will be used to separate them.

- (i) How will you separate common salt and chalk powder?
- (ii) By which process, chalk powder and salt solution are separated ?
- (iii) How will you obtain common salt crystals from salt solution ?

- (i) Some water is added to the mixture of common salt and chalk powder and stirred. Common salt dissolves in water to form salt solution whereas chalk powder remains undissolved.
- (ii) Filtration process. On filtering, chalk powder is obtained as a residue on the filter paper and salt solution is obtained as filtrate.
- (iii) The salt solution (filtrate) is evaporated to remove water and common salt crystal are left behind.

03

A girl wantedly mixed rice, all pins, biscuits, pebbles and powdered sugar into a bowl in equal proportions and gave the mixture to her brother. She asked him to separate each component of the mixture without using water.

- (i) Which components of the above mixture can be separated by using our hand ?
- (ii) Which constituent of the mixture can be separated by using a magnet ?
- (iii) Two constituents rice and powdered sugar are yet to be separated. How are they separated ?

- (i) Biscuits and pebbels can be separated from the mixture by hand picking.
- (ii) All pins are made up of iron, so they can be separated by using a magnet.
- (iii) As sugar is in the powder form, sugar and rice can be separated by sieving. Powdered sugar passes through the siever with rice grains on the top of the siever.

**04** A student has a mixture of three different substances P, Q and R as given below:

- I. P is heavy and non-magnetic.
- II. Q is magnetic and heavy.
- III. R is light and non-magnetic.

- (i) By which process P and Q are separated from R ?
- (ii) P and Q, both are heavy but P is non-magnetic and Q is magnetic. How both are separated ?
- (iii) By which process only R is separated from P and Q ?

- (i) P and Q are heavy but R is light, so winnowing helps in separation of P and Q from R.
- (ii) Q is magnetic but P is not, so by magnetic separation, P and Q are separated.
- (iii) R being light in weight and non-magnetic can be separated by winnowing.

**05**

You are given a mixture of sand, water and mustard oil. How will you separate each component of this mixture ?

- (i) By which process sand is separated from water and mustard oil ? Explain.
- (ii) Both water and mustard oil are immiscible liquids. Explain the process of their separation.

This mixture contains three components : sand, water and mustard oil. Now, sand is a solid which is insoluble in water as well as mustard oil. Water and mustard oil are immiscible liquids.

**Filtration process:**

- (i) The mixture of sand, water and mustard oil is filtered in a beaker by using a funnel and filter paper. Sand is left on the filter paper as residue. Water and mustard oil collect as filtrate in the beaker.
- (ii) The filtrate containing water and mustard oil is put in a separating funnel or in a beaker. Water forms the lower layer and mustard oil forms the upper layer. Oil being lighter than water can be poured into another beaker by decantation process. Water being heavy remains in the first beaker.