Now, try this activity.

Activity 8

Take four beakers and mark them as A, B, C and D. Pour 50 mL water in each of them.

- In beaker A, add a teaspoonful of tea granules and stir well.
- In beaker B, add a teaspoonful of salt and stir well.
- In beaker C, add a teaspoonful of chalk powder and stir well.
- Pour 50 mL milk in beaker D.

Now, filter the mixture of beaker A (tea granules and water) with the help of a filter paper.

Using a new filter paper each time, repeat the activity for mixtures in beakers B, C and D. Note your observations in the table given here.

Mixture	Description of residue, if any	Description of filtrate
Tea granules + water		
Salt + water		
Chalk + water		
Milk		

- Do you get a residue in each case?
- Why do you think, the filter paper was unable to separate the components of mixtures in beakers B and D?

What happens when a solid completely dissolves in a liquid? Can we get the dissolved solid back by any method?

I am sure, there must be some methods by which we can separate a dissolved solid from a liquid.

Evaporation

There are many solids that dissolve in water. Salt and sugar dissolve completely in water. But, can we separate salt or sugar from water by any of the methods of separation studied earlier in this chapter? No. In order to separate salt or sugar from water, we use a different method. Let us learn this with the help of an activity.

Activity 9

Take a china dish and add some water to it. Mix a teaspoonful of salt in it. Stir the mixture well. Can you see any salt in the china dish? It seems to disappear, but has it really?

Now, heat the china dish containing the mixture of salt and water till all the water boils away. What is left in the china dish?

You have separated salt from water by evaporating the water.

Evaporation is the process of converting water into water vapour.

The process of evaporation is used to recover a solid component that has dissolved in water or some other liquids. The dissolved solid is left behind as a residue when the liquid evaporates.

Sea water has common salt dissolved in it. Many other salts are also dissolved in it. In order to separate common salt from sea water, the sea water is trapped in shallow pits and is left in the sun for long. The sun's heat evaporates all the water leaving the salts behind. This mixture of salts is then purified to obtain common salt.

Fig. 5.5 Common salt being collected from shallow pits

A substance that dissolves in a liquid is called a **solute**. Here, salt is the solute.

The substance in which a solute dissolves is called a **solvent**. Here, salt dissolves in water. So, water is the solvent.

SOLUTION

The mixture of solute and solvent is called a **solution.** The mixture of salt and water forms the salt solution.

The maximum mass of a solute in grams which can be dissolved in 100 g of the solvent at a given temperature is called its **solubility.**

Unsaturated solution

A solution in which more solute can be dissolved is called an unsaturated solution.

Saturated solution

If you keep on adding salt to water, eventually, a state is reached when no more salt dissolves in water. The solution is now said to be saturated.

A solution in which no more solute can be dissolved at a given temperature is called a **saturated solution.**

Activity 10

Take 100 mL of water in a beaker. Add a teaspoonful of salt in it. Stir well (stirring helps to dissolve the salt). Now, add another teaspoonful of salt and stir. What do you notice after adding a few teaspoonfuls of salt? Now, heat this saturated solution. What do you find? Does the salt dissolve now?

Add another teaspoonful of salt to it. Does the salt dissolve now?

From this activity, we find that more salt dissolves on heating a saturated solution. So, we can say that solubility increases on increasing the temperature and decreases on reducing the temperature.

Activity 11

Prepare a saturated solution of salt in water. Heat the solution. Add more salt in small amounts and stir it until no more salt can be dissolved.

Transfer the solution into a china dish and leave aside for cooling.

Solid salt appears at the bottom of china dish. This shows that solubility of solute decreases if the temperature is decreased.

Water can dissolve many substances: solids, liquids and even gases. It is, therefore, known as a **universal solvent.**

Does same amount of water dissolve equal amounts of different substances?

No. It dissolves different substances in different amounts.

Activity 12

Bring at least 7–8 teaspoonfuls of the following substances to the class.

- sugar
- salt
- baking powder

(Teacher can also bring salts like copper sulphate and potassium sulphate to the class.)

Take separate beakers and fill equal amount, say 100 mL, of water in each beaker.

In the first beaker, add a teaspoonful of sugar. Stir well till the sugar dissolves. Keep on adding more sugar to this mixture, one teaspoonful at a time, till you get a saturated solution. Count the number of teaspoonfuls of sugar added to 100 mL of water to make a saturated solution.

Repeat this activity with other substances. Compare the number of spoons required to make a saturated solution of different substances. Are they equal? Note them in the table given below:

Solute	No. of teaspoonfuls of solute added
Sugar	
Salt	
Baking powder	
Copper sulphate	