



Answer all the questions below as fully as you can then check your answers

1. Which of the following is NOT a method for separating mixtures?

- a) Filtration      b) Distillation      c) Combustion      d) Evaporation

2. What is the liquid that dissolves a substance called?

- a) Solute      b) Solution      c) Solvent      d) Residue

3. What is the solid left behind on the filter paper called?

- a) Filtrate      b) Residue      c) Solute      d) Solution

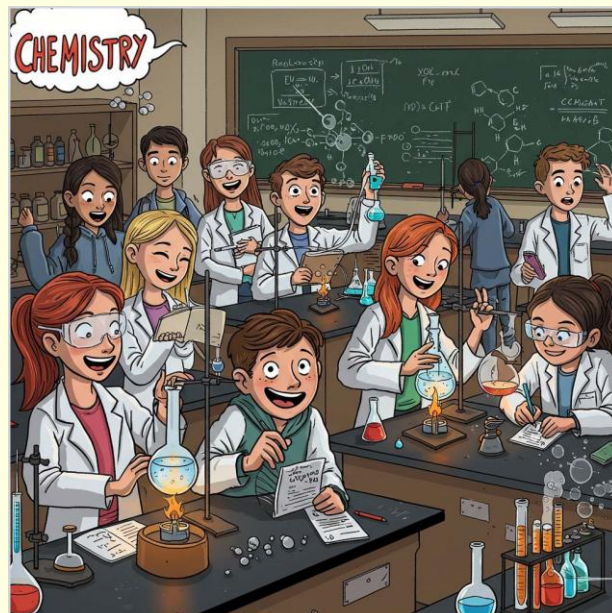
4. Explain why sand cannot be dissolved in water.

5. Describe the process of filtration.

6. What is the difference between a solute and a solvent?

7. Why can't filtration be used to separate salt from saltwater?

8. Explain how evaporation and crystallisation are used to separate a salt solution.



9. You have a mixture of sand, salt, and water. Describe the steps you would take to separate this mixture into its individual components.

10. You are given a solution of sugar dissolved in water. Which separation technique would you use to obtain pure sugar? Explain your choice.

11. A student wants to separate a mixture of ink (which is dissolved) and small pieces of undissolved charcoal from water. Describe, giving reasons, the best method she should use. (3 marks)

12. Explain why large crystals of salt are more likely to form when a salt solution is evaporated slowly compared to rapid evaporation. (2 marks)

## Answers

1. Which of the following is NOT a method for separating mixtures?

- a) Filtration            b) Distillation        c) Combustion        d) Evaporation

Answer: c) Combustion

2. What is the liquid that dissolves a substance called?

- a) Solute            b) Solution            c) Solvent            d) Residue

Answer: c) Solvent

3. What is the solid left behind on the filter paper called?

- a) Filtrate        b) Residue            c) Solute            d) Solution

Answer: b) Residue

4. Explain why sand cannot be dissolved in water.

Answer: Sand particles are too large to fit between the water molecules.

5. Describe the process of filtration.

Answer: A mixture of a solid and liquid is poured through filter paper. The liquid (filtrate) passes through, while the solid (residue) is trapped.

6. What is the difference between a solute and a solvent?

Answer: A solute is the substance that dissolves. A solvent is the liquid in which the solute dissolves.

7. Why can't filtration be used to separate salt from saltwater?

Answer: Salt is dissolved in the water (it's soluble), so it will pass through the filter paper along with the water. Filtration only separates insoluble solids from liquids.

8. Explain how evaporation and crystallisation are used to separate a salt solution.

Answer: The salt solution is heated, causing the water to evaporate. As the water evaporates, the salt concentration increases until it reaches a point where the salt can no longer remain dissolved. At this point, salt crystals begin to form.

9. You have a mixture of sand, salt, and water. Describe the steps you would take to separate this mixture into its individual components.

Answer:

- Filter the mixture to remove the sand (residue). The saltwater (filtrate) will pass through.
- Evaporate the water from the saltwater filtrate. The salt will be left behind as crystals.

10. You are given a solution of sugar dissolved in water. Which separation technique would you use to obtain pure sugar? Explain your choice.

Answer: Evaporation and crystallisation. Sugar is soluble in water, so filtration won't work. Heating the solution will evaporate the water, leaving the sugar behind. As the water evaporates and the solution becomes more concentrated, crystals of sugar will form.

11. A student wants to separate a mixture of ink (which is dissolved) and small pieces of undissolved charcoal from water. Describe, giving reasons, the best method she should use. (3 marks)

*Answer: Filtration should be used first to remove the charcoal since it is a solid undissolved in the water. The charcoal will be the residue and the ink solution will pass through as the filtrate. Distillation or chromatography would then be needed to separate the ink from the water since the ink is dissolved.*

12. Explain why large crystals of salt are more likely to form when a salt solution is evaporated slowly compared to rapid evaporation. (2 marks)

*Answer: Slow evaporation allows more time for the salt ions to arrange themselves into a crystal lattice structure. This leads to the formation of larger, more well-defined crystals. Rapid evaporation doesn't allow enough time for this organised arrangement, resulting in smaller, less regular crystals.*