

Mixtures Separation

GCSE Chemistry · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Describe how to obtain pure, dry sand and salt crystals from a mixture of sand and salt. (4 marks)

Step 1 · Dissolve

Add warm water and stir: the salt dissolves, the sand does not.

Step 2 · Filter

Filter the mixture. Sand stays on the filter paper residue; salt solution passes through filtrate.

Step 3 · Dry the sand

Rinse the sand with a little water and leave it to dry.

Step 4 · Crystallise the salt

Heat the filtrate gently to evaporate some water, then leave it to cool so crystals form; filter and dry them.

Answer: Dissolve, filter, dry the residue, crystallise the filtrate

Check: Each separation step uses a difference in property: solubility, then volatility of water.

2. Now try one with the steps

Explain why simple distillation can separate pure water from seawater. (2 marks)

Step 1 · Difference in boiling point

Step 2 · What happens

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Define the term mixture. [1]

2. Name the method used to separate an insoluble solid from a liquid. [1]

3. Name the method used to obtain solid copper sulfate from copper sulfate solution. [1]

4. State what is meant by the residue and the filtrate in filtration. [2]
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5. Explain why the properties of a mixture are a mixture of the properties of its parts. [1]
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6. Give the purpose of the condenser in distillation. [1]
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7. Suggest why crystallisation is used rather than evaporating to dryness to obtain salt crystals. [2]
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8. Explain why the thermometer bulb is placed next to the side arm in distillation. [1]
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9. Describe how fractional distillation separates a mixture of liquids. [3]
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10. Name the separation technique used to separate the dyes in a sample of ink. [1]
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11. A student recovers 3.6 g of salt from 4.8 g of a salt and sand mixture. Calculate the percentage of salt in the mixture. [2]
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12. Suggest one reason why the student's mass of salt in question 11 could be lower than the true value. [1]
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13. Liquid A boils at 56 °C, liquid B at 82 °C and liquid C at 118 °C. State the order in which they are collected by fractional distillation. [1]
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14. Explain why heating a flammable solvent such should be done with an electric heater or water bath, [2]
not a Bunsen burner.

4. Before you hand it in

"Filtration separates salt from salt water."

Filtration removes insoluble solids only. Use crystallisation or distillation for dissolved substances.

Confusing evaporation and distillation

Distillation collects the solvent by condensing it; use it when you want the liquid.

"In fractional distillation the substance with the highest boiling point comes off first."

The lowest boiling point fraction reaches the top of the column and is collected first.