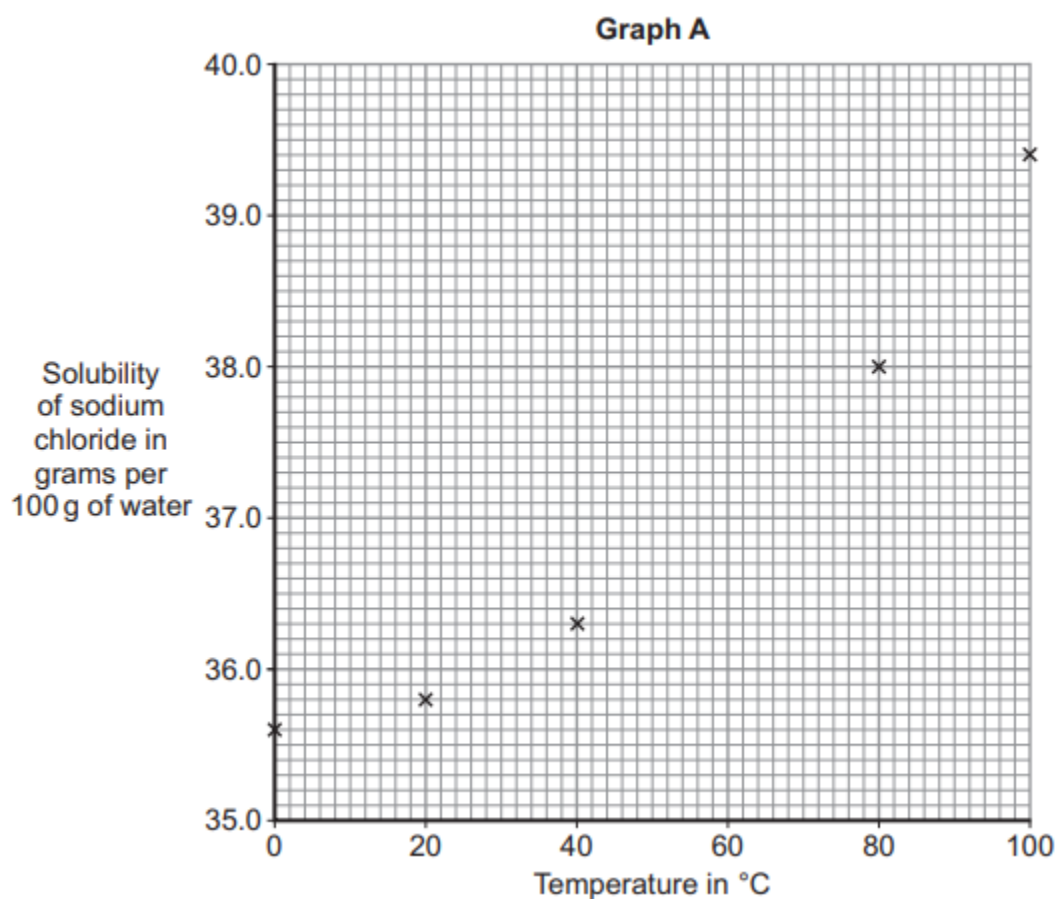


# SEPARATION TECHNIQUES 1

Q1. The table gives the solubility of sodium chloride in water at different temperatures.

Temperature in °C	0	20	40	80	100
Solubility in g per 100 g of water	35.6	35.8	36.3	38.0	39.4

(a) A student plotted Graph A using the data in the table.



(i) Draw a smooth curve through all the points on Graph A. (1 mark)

(ii) Use this graph to find the mass of sodium chloride that dissolves in 100 g of water at 60°C.

Mass = \_\_\_\_\_ g

(1 mark)

(iii) A saturated solution of sodium chloride in 100 g of water is made at 60°C. It is then cooled to 20°C.

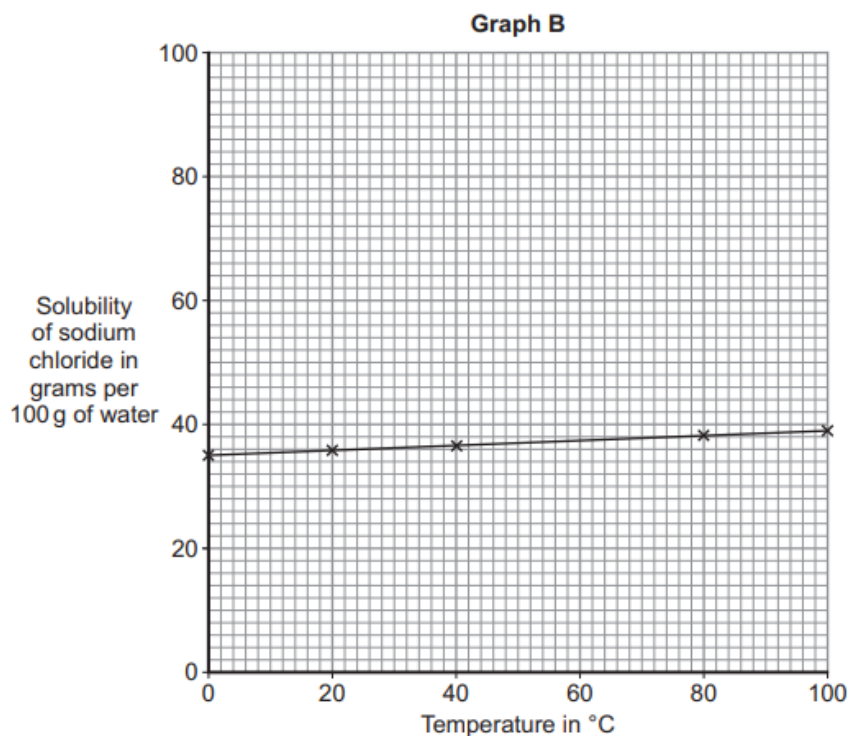
What mass of sodium chloride crystallises from the solution?

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(2 marks)

(b) Another student plotted Graph B using the same data.



The table shows the conclusion that each student made.

	How solubility changes as temperature increases
1 <sup>st</sup> student (Graph A)	Very large increase
2 <sup>nd</sup> student (Graph B)	Very small increase

Suggest why the students came to such different conclusions even though they had used the same data to plot their graphs.

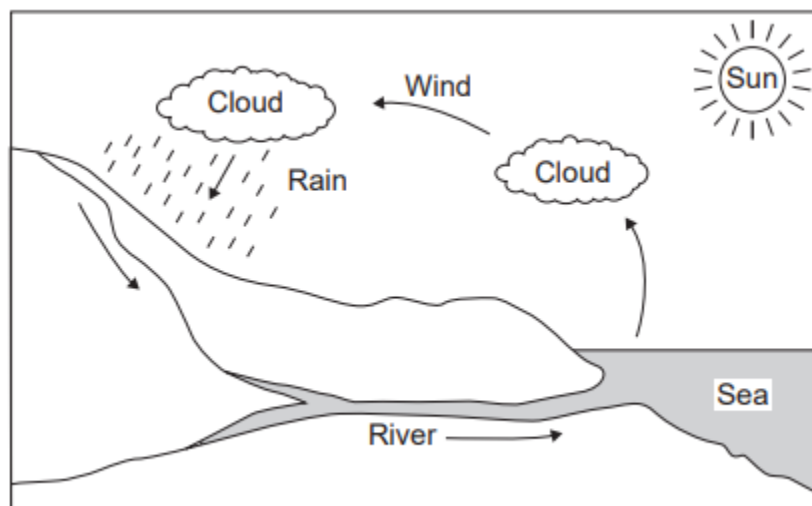
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(1 mark)

**Q2.** The diagram shows part of the Water Cycle.



**(a)** Draw a ring around the correct answer to complete each sentence about the Water Cycle.

Heat from the Sun causes water in the sea to

- |            |
|------------|
| boil.      |
| condense.  |
| evaporate. |

This forms water vapour that rises in the atmosphere. As it rises the water vapour cools.

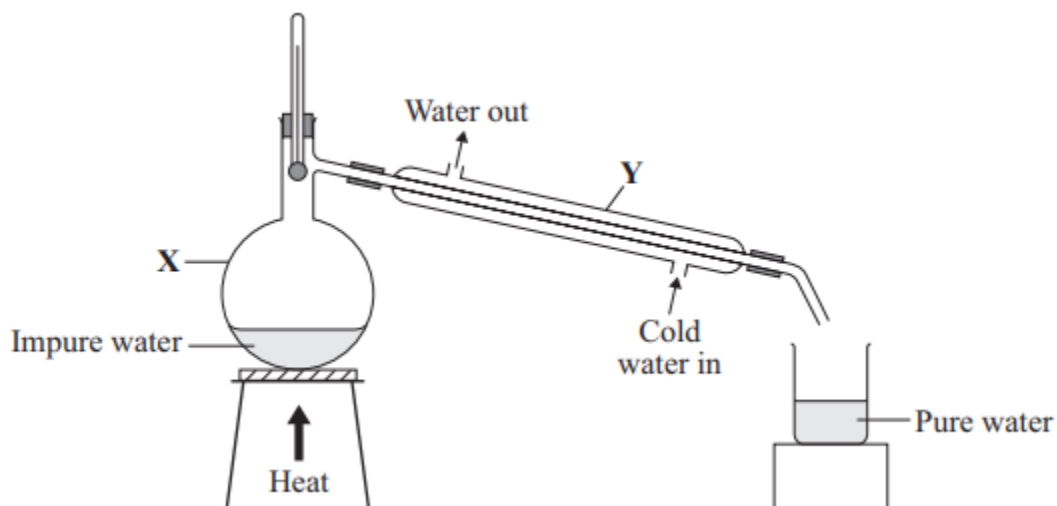
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This forms clouds because the water vapour

- boils.
- condenses.
- evaporates.

(2 marks)

**Q3.** The diagram shows how pure water can be made from impure water by distillation.



Choose the correct words from the box to name apparatus X and Y.

beaker	condenser	flask	thermometer
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(i) Apparatus X is a \_\_\_\_\_.

(1 mark)

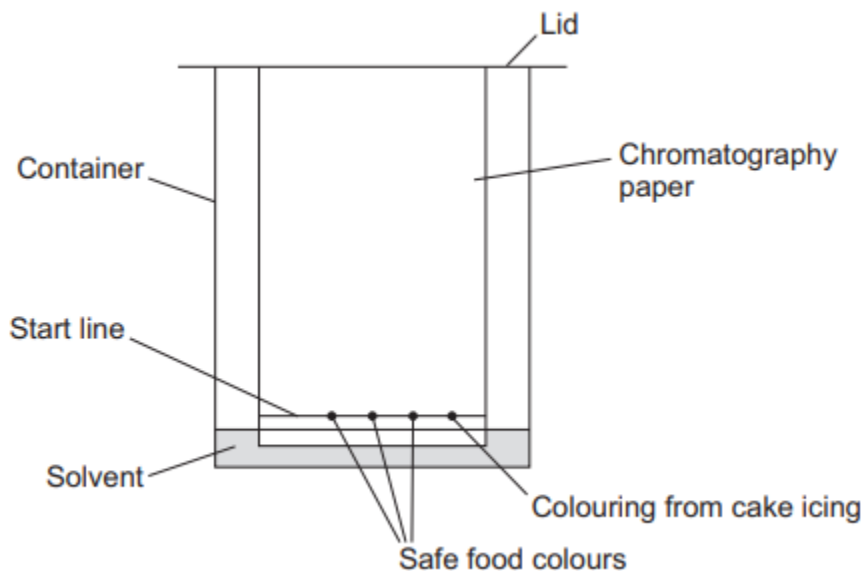
(ii) Apparatus Y is a \_\_\_\_\_.

(1 mark)

**Q4.** Icing on cakes is tested to check that safe colours were used when they were made.



Paper chromatography is one method of testing which colours are in cake icing.



**(a)(i)** Suggest why there is a lid on the container.

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(1 mark)

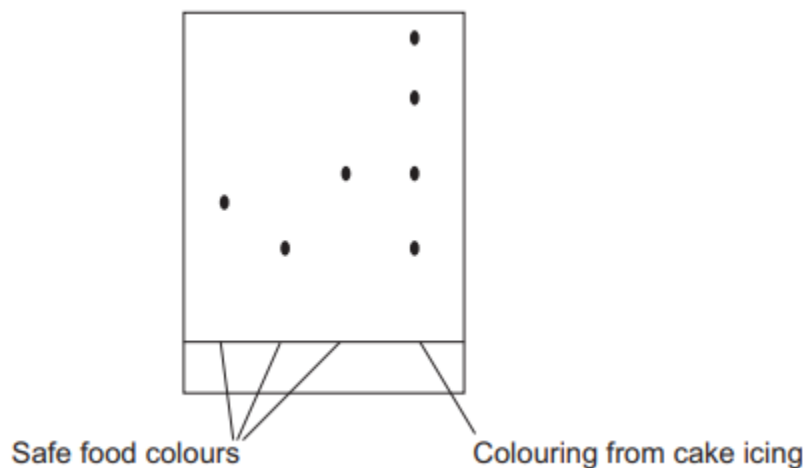
**(ii)** The start line should be drawn in pencil not in ink. Suggest why.

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(1 mark)

(b) The diagram shows the results of the paper chromatography experiment.



(i) How many different food colours were used in the colouring from the cake icing?

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(1 mark)

(ii) Is the cake icing safe to eat? Give a reason for your answer.

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(1 mark)

**Q5.** This question is about lead iodide and magnesium iodide.

Lead iodide can be made by mixing a solution containing lead ions with a solution containing iodide ions.

Lead iodide is formed as a solid.

**lead ions in solution + iodide ions in solution → lead iodide (solid)**

(i) Draw a ring around the name given to this type of reaction.

electrolysis

neutralisation

precipitation

(1 mark)

(ii) Tick (✓) the method used to separate solid lead iodide from the solution.

Method	Tick (✓)
distillation	
evaporation	
filtration	

(1 mark)

(iii) The table below gives information about the solubility of some compounds.

Soluble compounds	Insoluble compounds
all sodium and potassium salts	
all nitrates	
most chlorides, bromides and iodides	silver and lead chlorides, bromides and iodides

Use the table to help you to:

draw a ring around a soluble compound which contains lead ions

**lead bromide**

**lead chloride**

**lead nitrate**

draw a ring around a soluble compound which contains iodide ions.

**lead iodide**

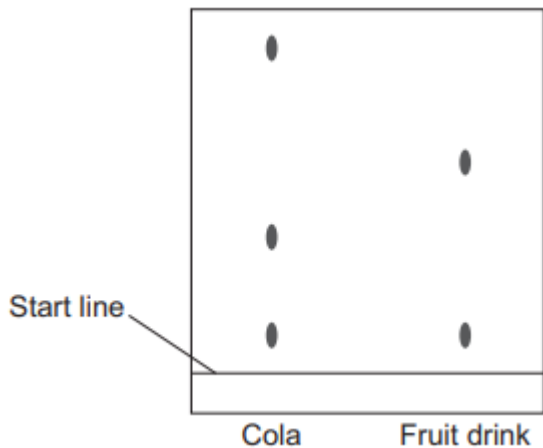
**silver iodide**

**sodium iodide**

(2 marks)

**Q6.** A student investigated the food colouring in Cola and in a fruit drink using paper chromatography.

The chromatogram in the figure shows the student's results.



**(i)** Complete the sentence.

The start line should be drawn with a ruler and .....

Give a reason for your answer.

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(2 marks)

**(ii)** Suggest three conclusions you can make from the student's results.

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(3 marks)

Total marks (22)