Experimental Techniques

Question Paper 2

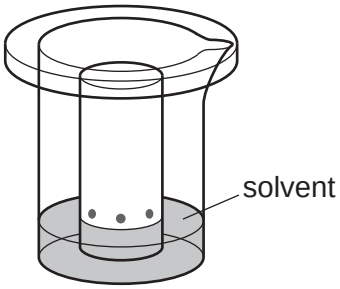
Level	IGCSE
Subject	Chemistry
Exam Board	CIE
Topic	Experimental Techniques
Sub-Topic	
Paper Type	Alternative to Practical
Booklet	Question Paper 2

Time Allowed: **51 minutes**

Score: **/42**

Percentage: **/100**

1 The colours present in some fruit sweets can be separated using the apparatus below. The colours are water-soluble dyes.



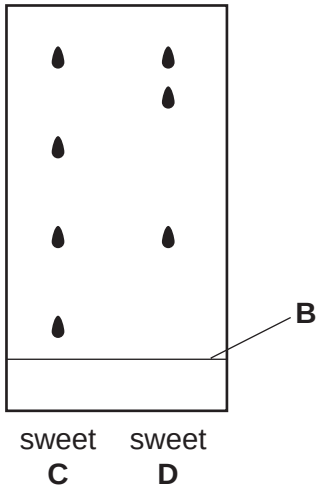
(a) Name the process used to separate the colours.

..... [1]

(b) Name the solvent used.

..... [1]

The results obtained for the colours in two different sweets, **C** and **D**, are shown below.



(c) What is the name for the line at position **B**?

..... [1]

(d) What conclusions can you draw about the colours present in sweets **C** and **D**?

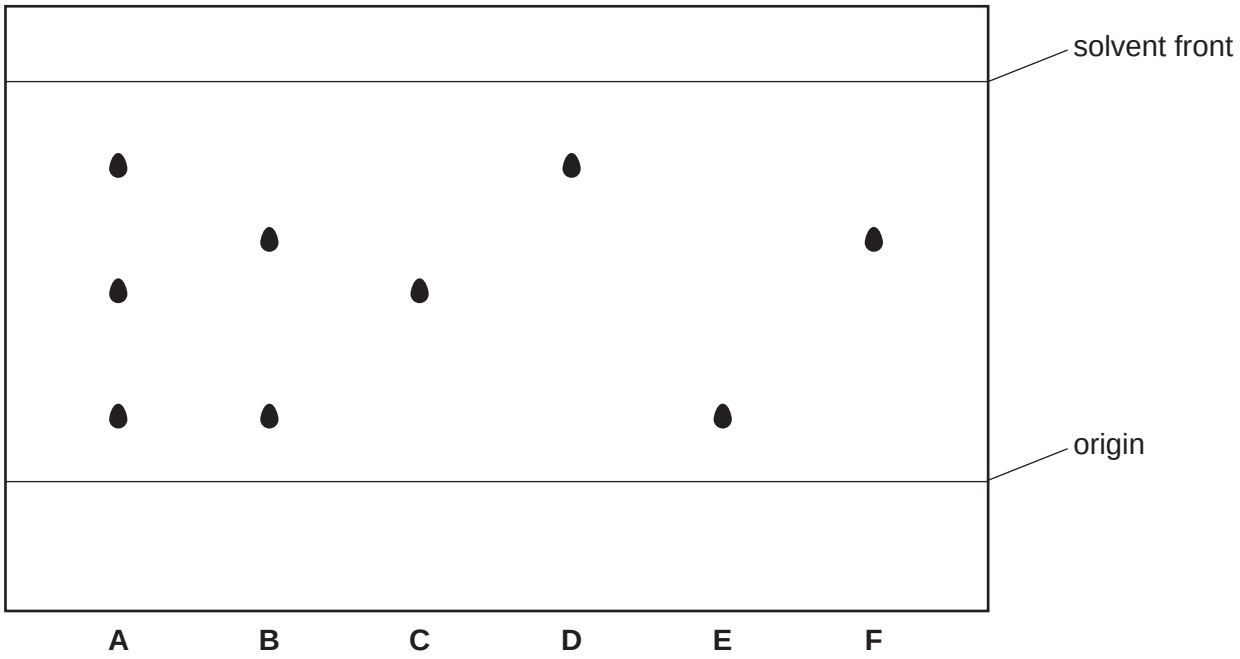
.....

.....

..... [3]

[Total: 6]

2 The diagram shows the results of an experiment to separate and identify the colours present in two coloured mixtures, **A** and **B**.
Substances **C**, **D**, **E** and **F** are single colours.



(a) Name this method of separation.

..... [1]

(b) Draw a line **on the diagram** to show the level of the solvent at the beginning of the experiment. [1]

(c) Why should a pencil be used instead of a pen to draw the origin line?

.....

..... [1]

(d) State **one** difference and **one** similarity between the coloured mixtures, **A** and **B**.

difference .....

.....

similarity .....

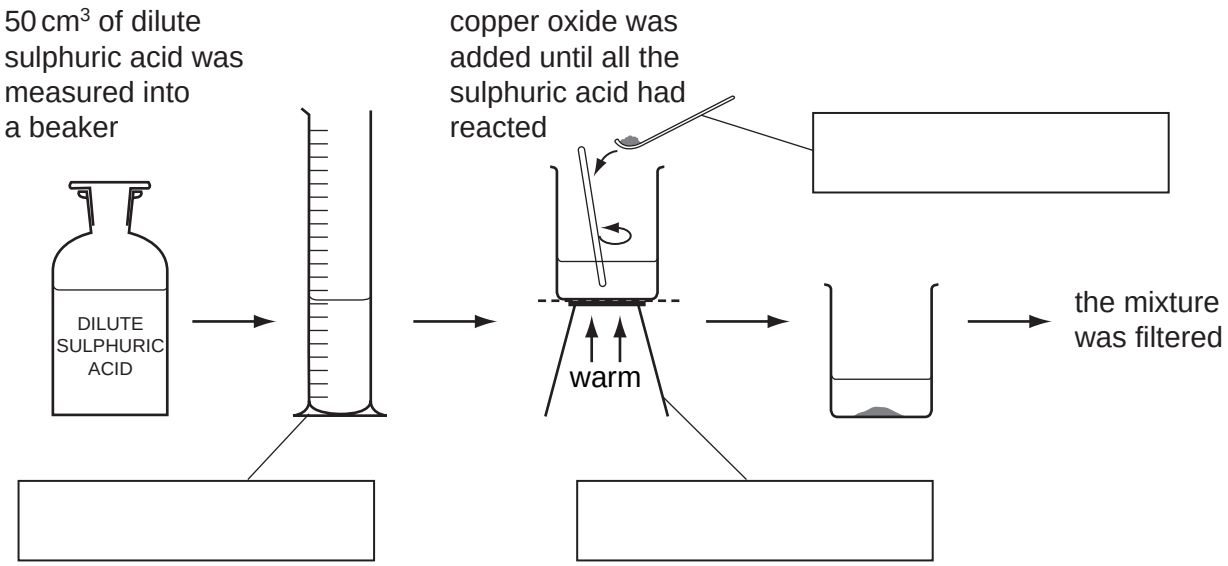
..... [2]

(e) Which substances are present in mixture **A**?

..... [1]

[Total: 6]

3 A solution of copper sulphate was made by reacting excess copper oxide with dilute sulphuric acid. The diagram shows the method used.



(a) Complete the empty boxes to name the pieces of apparatus. [3]

(b) What does the term *excess* mean?

.....

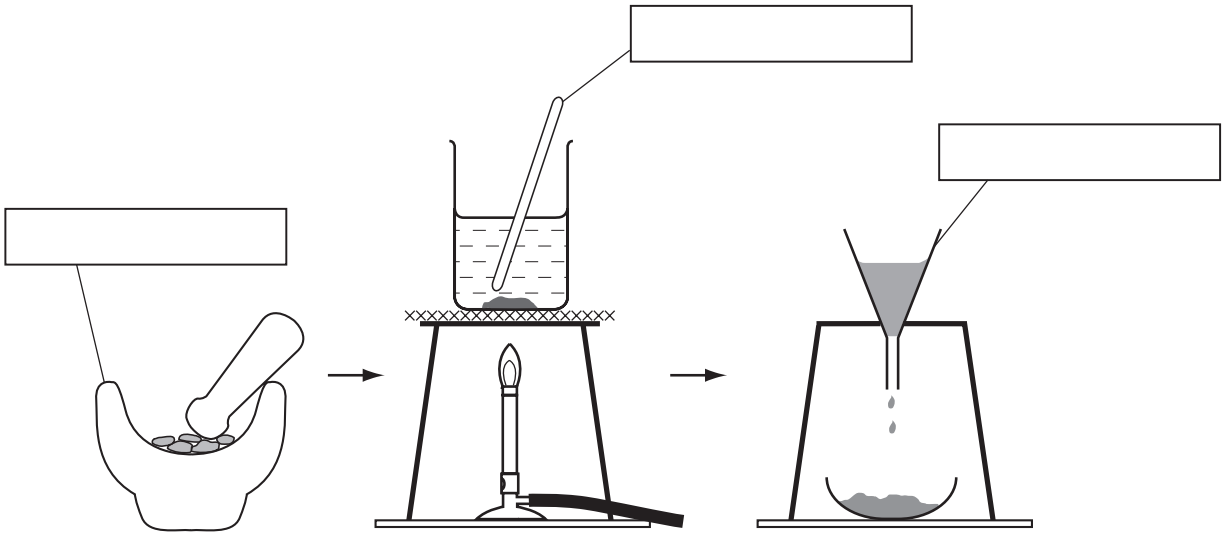
[1]

(c) Draw a labelled diagram to show how the mixture was filtered.

[2]

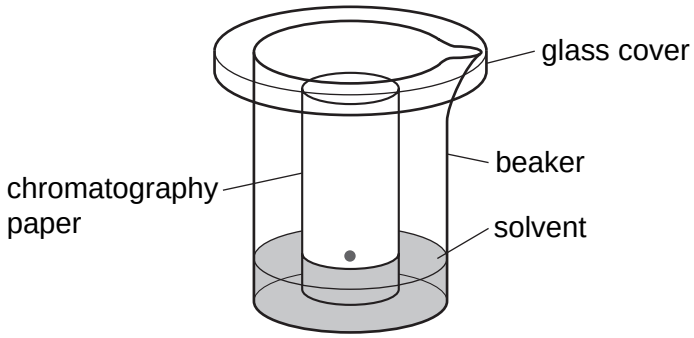
[Total: 6]

4 The colours present in some blackcurrant sweets can be separated by chromatography. The colours are water-soluble dyes.
The diagrams show how the colours can be extracted from the sweets.



(a) Complete the empty boxes to name the pieces of apparatus. [3]

The apparatus below was used to carry out the chromatography.



(b) **(i)** Name the solvent used.

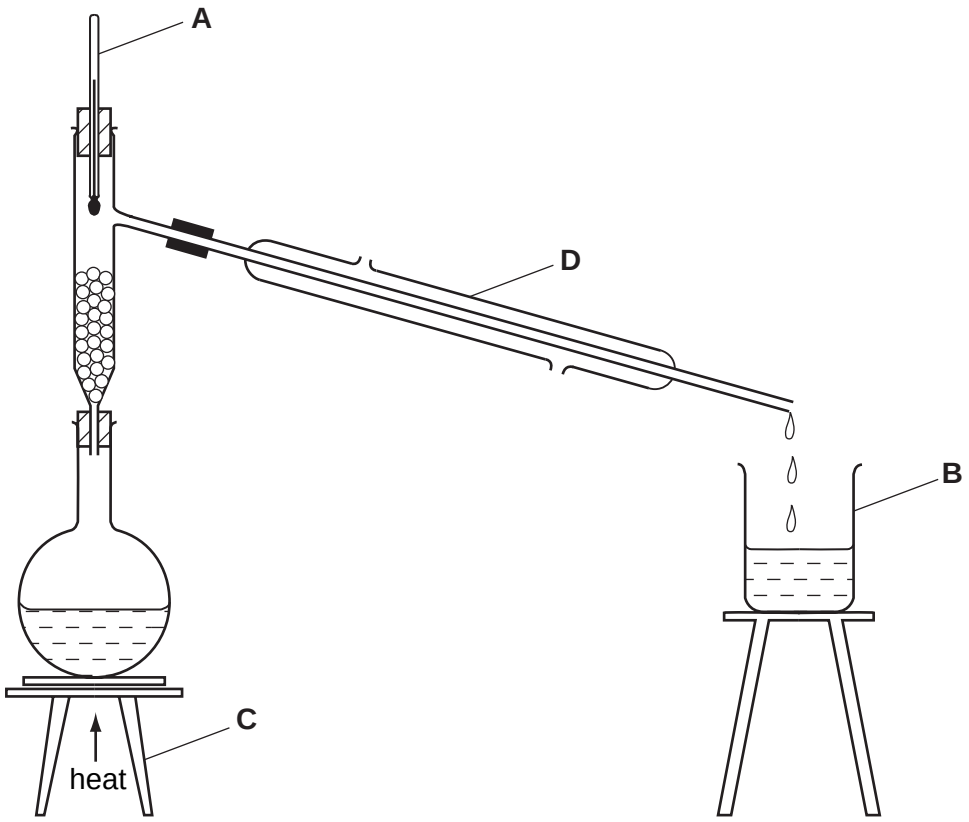
..... [1]

(ii) Label, with an arrow, the origin on the diagram. [1]

(c) Sketch, in the box, the chromatogram you would expect if two different colours were present in the sweets.

[1]
[Total: 6]

5 A mixture of ethanol and water can be separated by fractional distillation. The apparatus below can be used to carry out such a separation in the laboratory.



(a) Name each piece of apparatus.

A .....

B .....

C ..... [3]

(b) What is the purpose of **D**?

..... [1]

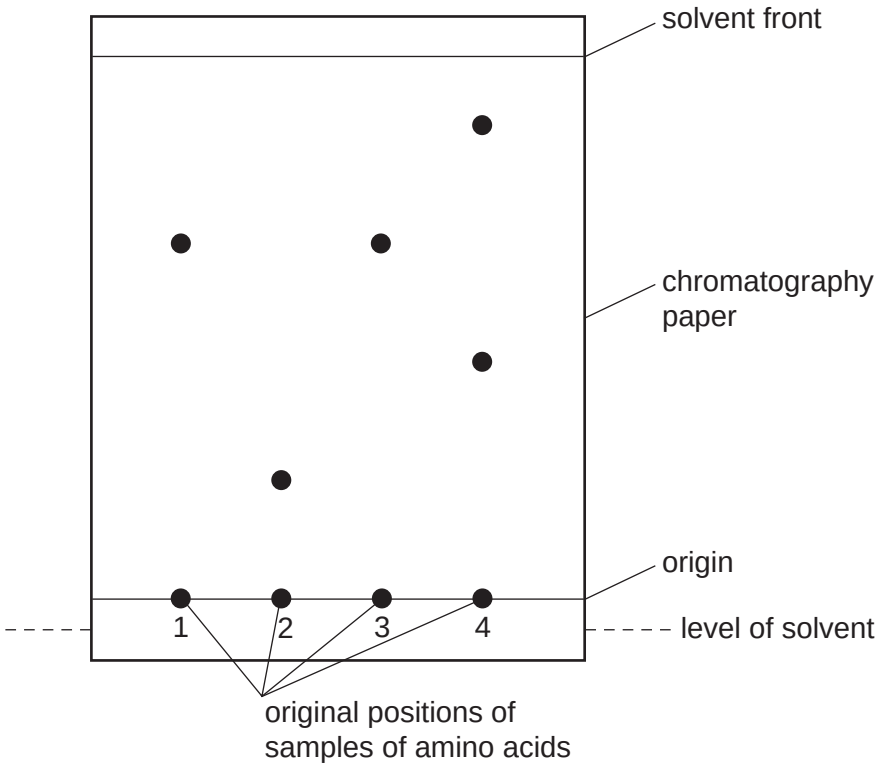
(c) How could the purity of the ethanol collected be checked?

..... [1]

[Total: 5]

6 Chromatography can be used to identify amino acids from a sample of protein.

The diagram shows the chromatogram obtained when four samples of amino acids were analysed. The paper was sprayed with ninhydrin.



(a) Why is the origin line drawn in pencil?

.....

[1]

(b) Which amino acids could possibly be the same?

.....

[1]

(c) Which amino acid sample contains more than one amino acid? Explain your answer.

sample .....

explanation .....

.....

[2]

(d) Suggest why it is necessary to spray the chromatogram with ninhydrin.

.....

[1]

[Total: 5]

7 The green pigment chlorophyll can be obtained from grass.

Step 1 The grass is crushed with sand.

Step 2 The grass is ground with ethanol until the solution is saturated.

Step 3 The solution is separated from the rest of the mixture.

Step 4 The colours in the solution are separated.

(a) What apparatus is used in Step 1?

.....

[2]

(b) Suggest why the grass is ground with ethanol rather than water in Step 2.

.....

[1]

(c) Name the separation method in Step 3.

.....

[1]

(d) Describe how Step 4 is carried out.

.....

.....

.....

.....

[4]