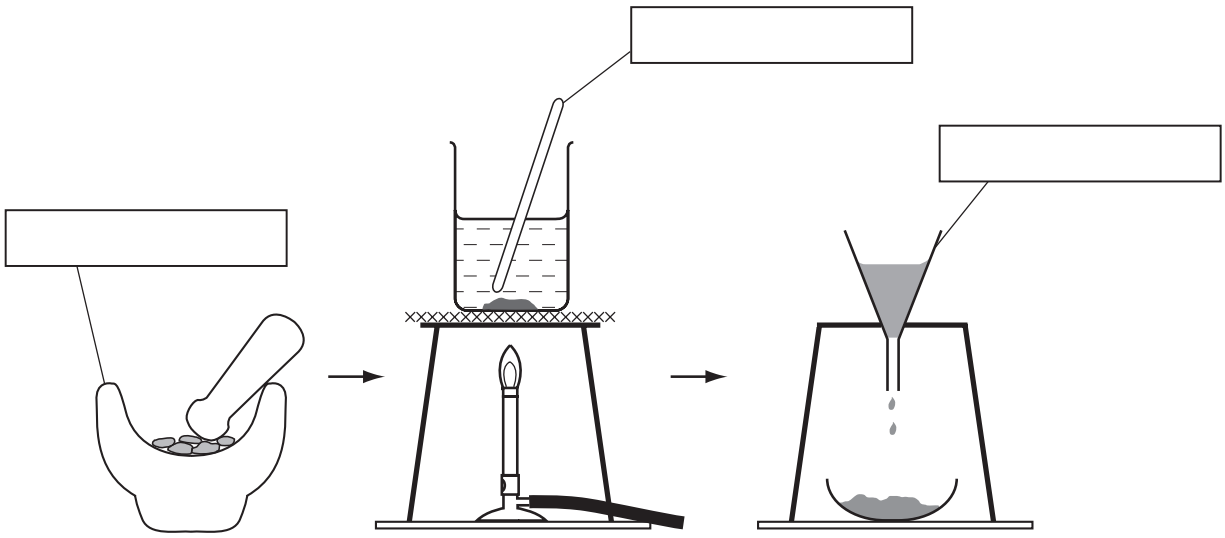
CAMBRIDGE LOWER SECONDARY CHECKPOINT
PRACTISE QUESTIONS -MARKSCHEMES

Subject: Chemistry

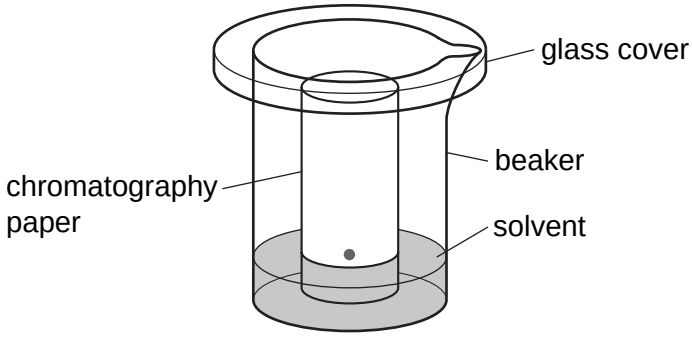
Topic:Mixtures and Impurity-ChromatographySet-1

1 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

MARKING SCHEME

1 **(a)** mortar (1)
stirrer/(glass) rod (1) not metal rod or thermometer
funnel (1) not filter or filter paper [3]

(b) (i) water [1]

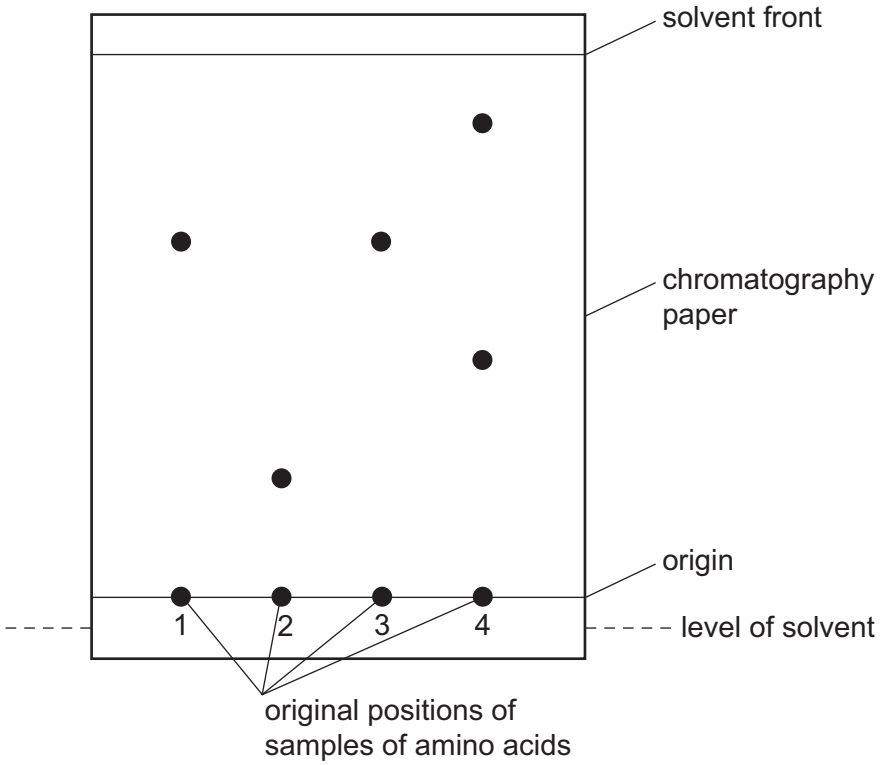
(ii) origin correctly labelled on diagram i.e. at dot [1]

(c) two spots/dots at different levels in vertical line [1]
allow three spots if one is origin

[Total: 6]

2 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]

[Total: 5]

MARKING SCHEME

(a) does not dissolve in solvent / interfere with results owtte (1) [1]

(b) 1 and 3 (1) [1]

(c) sample 4 (1)
two spots present (1) [2]

3 A sample of orange fruit jam was investigated to check the three colourings present.

Step 1 The jam was boiled with water.

Step 2 The mixture was filtered.

Step 3 The filtrate was concentrated.

Step 4 The concentrate was analysed by chromatography.

(a) What was the purpose of Step 1?

.....

[1]

(b) Why was the mixture filtered?

.....

[1]

(c) How was Step 3 carried out?

.....

[1]

(d) Draw a diagram to show the possible paper chromatogram obtained in Step 4.

[2]

MARKING SCHEME

(a) To extract the colour owtte (1) **[1]**

(b) To remove solid/insoluble impurities (1) **[1]**

(c) Heating/evaporation (1) **[1]**

(d) Diagram showing spots (1) 3 at different levels (1) **[2]**

4 Leaves from trees contain a mixture of coloured pigments which are not soluble in water. A student was given these two instructions to investigate the pigments in the leaves.

1. Crush some leaves to extract the coloured pigments.
2. Use the liquid extract to find the number of coloured pigments in the leaves.

(a) Describe an experiment to carry out instruction 2.
A space has been left below if you want to draw a diagram to help answer the question.

.....

.....

.....

.....

..... [4]

MARKING SCHEME

NB marks can be obtained from a diagram
chromatography or chromatogram (1)
paper (1)
apply spot/extract to paper (1)
description or name of solvent used (1)
and separation e.g. spots on paper (1) (max 4) [4]

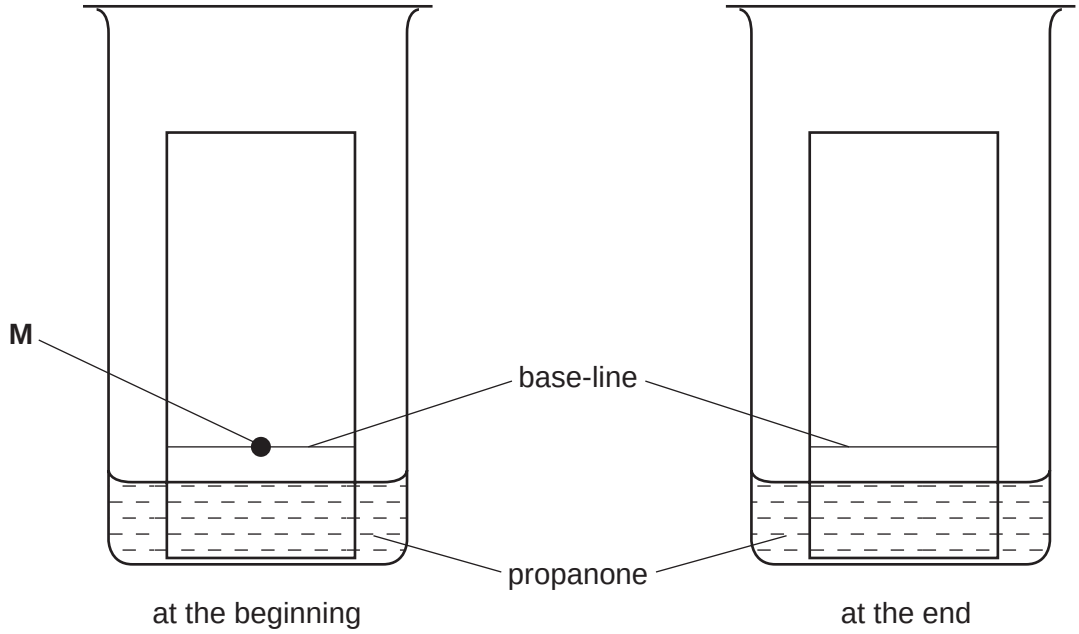
If water used as solvent (max 3)
If paper dipped into extract (max 3)
If method would not work (max 2)

5 Substance **M** is a mixture of four dyes. Three of the dyes have different solubilities in propanone. The fourth dye is insoluble in propanone.

(a) Name the process that could be used to separate these dyes.

..... [1]

(b) Sketch on the right hand diagram the results you would expect if **M** was analysed as shown.



[2]

(c) Why is the base-line not drawn in ink?

.....

..... [1]

(d) Why must the level of the propanone be below the base-line?

..... [1]

[Total: 5]

MARKING SCHEME

(a) chromatography (1) [1]

(b) 3 dots above the line and must be vertical (1)
1 dot on base-line (1) [2]
allow: 1 mark for 4 dots above the base-line and must be vertical

(c) interferes with results/ink spreads/ink is soluble/owtte (1) [1]

(d) dyes would wash off/dissolves in propanone (1) [1]

[Total:5]

6 A student investigated the green colour in grass.
The student followed these instructions.

1 Cut the grass into small pieces and crush the grass by grinding with sand and ethanol.
2 Decant the liquid.
3 Investigate which colours are present in the green solution.

Outline how the student could carry out instruction 3. You may draw a diagram to help you answer this question.

.....

.....

.....

.....

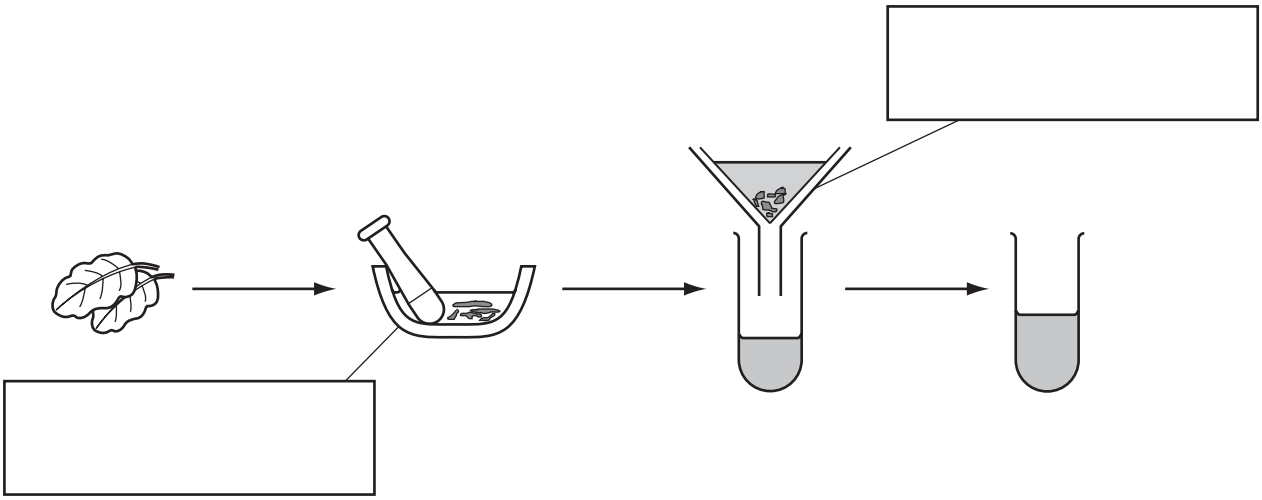
.....

..... [4]

MARKING SCHEME

chromatography/chromatogram (1)
apply solution to paper (1)
use of (named) solvent (1) not water
conclusion/results/spots at different levels (1)
all marks can be scored from a labelled diagram
dipping paper in green solution = max 2 [4]

7 A student extracted the colours present in some leaves using the apparatus below.



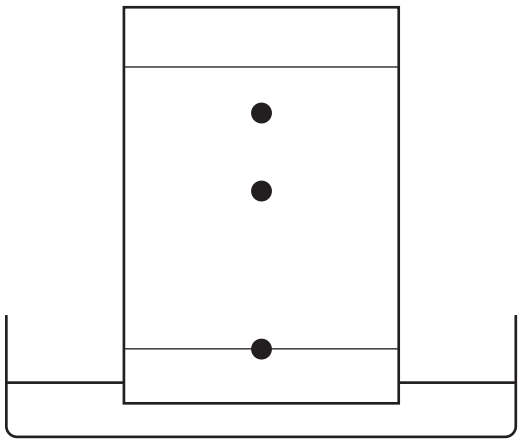
(a) Complete the boxes to identify the pieces of apparatus used. [2]

(b) Use labelled arrows to indicate

(i) the solvent,

(ii) the solution of colours. [2]

(c) Chromatography was used to separate the colours. The chromatogram obtained is shown.



(i) On the diagram, label the solvent front. [1]

(ii) How many colours were present?

..... [1]

[Total: 6]

MARKING SCHEME

(a) pestle and / or mortar (1) filter / funnel (1) [2]

(b) (i) labelled arrow at liquid in mortar (1)

(ii) labelled arrow at liquid in either tube or liquid in funnel or any combination (1) [2]

(c) (i) top line labelled (1) [1]

(ii) three (1) [1]

[Total: 6]