

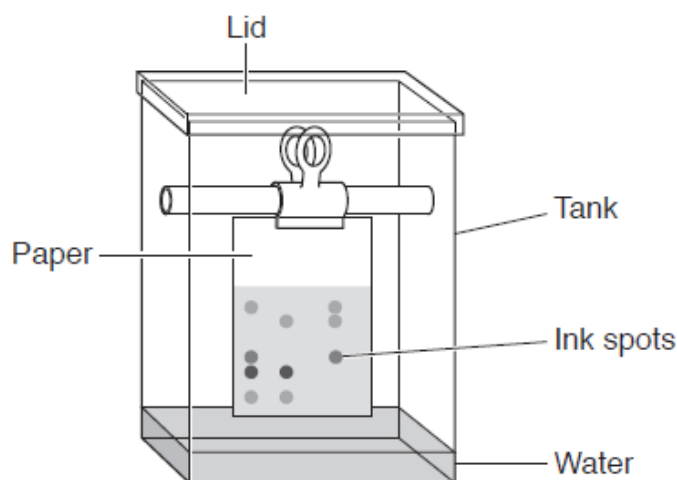
**GCSE Chemistry A (Gateway Science)**

**J248/01** Chemistry A C1-C3 and C7 (Foundation Tier)

**Question Set 21**

- 1 A forensic scientist is investigating the ink that has been used to forge the signature on a cheque. She separates the colours in some inks using paper chromatography.

Look at the diagram of her apparatus.



- (a) What is the **mobile phase** in this experiment?

The solvent that moves through the paper

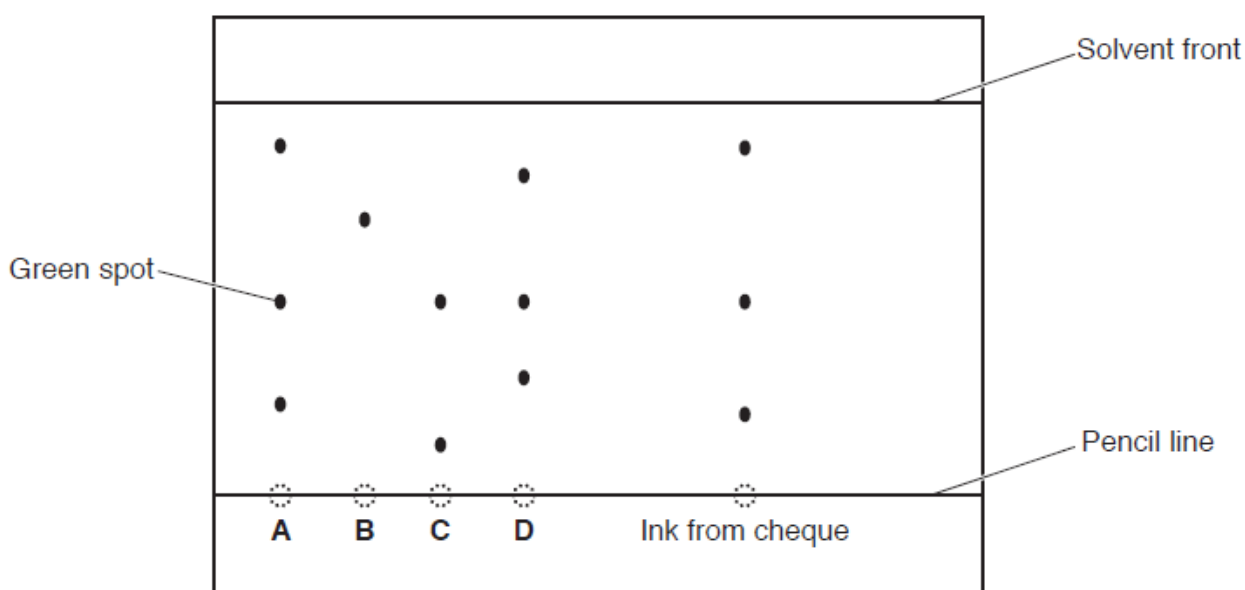
[1]

- (b) Explain how paper chromatography separates the colours in ink.

Different colours have different solubility thus travels with the solvent different distances leading to separation of colours.

[1]

- (c) Look at the results of the scientist's experiment.



- (i) Look at the green spot for ink A.

Calculate the  $R_f$  value for the green spot.

$$\frac{\text{distance travelled by solute}}{\text{distance travelled by solvent}} = \frac{2.5}{5.1} = 0.4901\dots$$

Answer = ..... 0.49 ..... [2]

- (ii) Which ink was used to forge the signature on the cheque?

Explain how you can tell.

A. The 3 colours of the ink from cheque travelled<sup>[2]</sup> across the same set of distances with ink A.

**Total Marks for Question Set 21: 6**

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