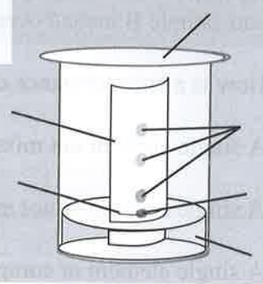
PRACTICAL

Paper Chromatography

Warm-Up

Complete the diagram by correctly labelling the different parts of the chromatography apparatus using the labels on the left, below.

Watch glass
Sample
Filter paper
Baseline
Solvent
Spots of chemicals



1 Paper chromatograms were produced for three dyes, **D**, **E** and **F**, using a variety of solvents. The chromatogram produced using ethanol as a solvent is shown in **Figure 1**.

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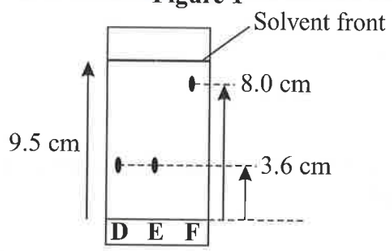
Figure 1



1.1 Calculate the R_f values for **E** and **F** in ethanol, using the chromatogram shown in **Figure 1**.

R_f of **E** = ...

R_f of **F** = ...

[4]

1.2 Why do the substances travel different distances?

.....

.....

[1]

1.3 In all solvents, each dye only has one spot.
What does this imply about the composition of the dyes?

.....

[1]

1.4 State which of the dyes could be the same.

.....

[1]

[Total 7 marks]

2 A paper chromatography experiment was used to identify the compounds in a mixture, **W**, as shown in **Figure 2**. Three known compounds, **A**, **B** and **C** were spotted alongside **W**. Water was used as the solvent.

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2.1 The experiment was conducted in a beaker with a watch glass functioning as a lid.
Why is it necessary to have a lid while conducting a paper chromatography experiment?

.....

[1]

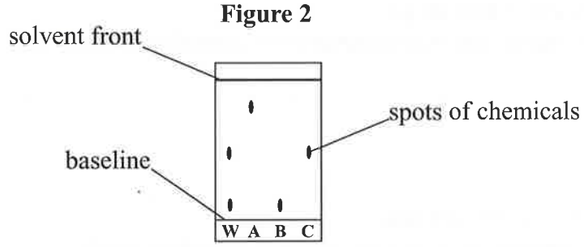
2.2 The R_f values of **A** and **B** were found to be 0.9 and 0.1 respectively. With reference to the mobile phase and stationary phase, suggest why **A** has a much larger R_f value than **B**.

.....

[1]

2.3 A diagram of the chromatogram from the experiment can be seen in **Figure 2**.
State which of the known compounds could be found in **W**.

Figure 2



.....

[1]

2.4 A student suggested that if the solvent was changed, the R_f value of compounds **A**, **B** and **C** would stay the same. Explain whether the student was correct.

.....

.....

.....

[2]

2.5 The experiment was repeated again using a different solvent. The mixture **W** had three spots on the resultant chromatogram. What does this suggest about the mixture **W**?

.....

[1]

2.6 Suggest why only two spots were shown on the chromatogram shown in **Figure 2**.

.....

.....

[1]

[Total 7 marks]

Exam Practice Tip

There are lots of different type of chromatography, but paper chromatography is the only one you need to know how to carry out. It's not just about knowing how to set up the apparatus — you also need to know how to analyse the results.