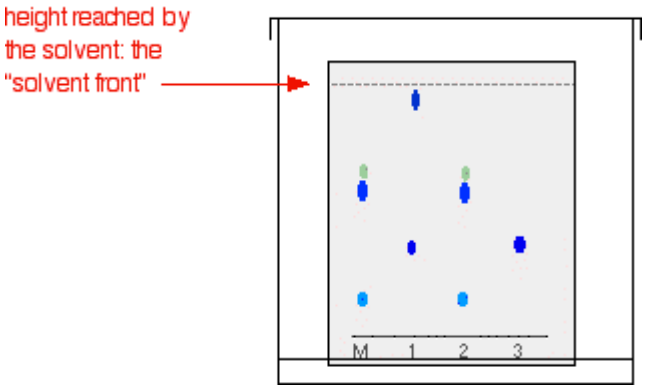
PAPER CHROMATOGRAPHY

1. This diagram from the Chemguide page shows the results of a simple paper chromatography experiment to identify the pen used to write a message.



M comes from the ink used to write the message, and 1,2 and 3 are from three possible pens that might have been used.

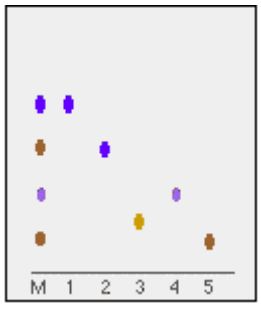
a) Which pen might have been used to write the message?

b) Describe briefly, but precisely, what you would have done in order to get to this stage. You don't need to describe how the paper is supported in the chromatography tank.

c) Why is there a cover on the tank?

d) This technique can be used to identify particular amino acids in a mixture of amino acids. However, these are all colourless. You can dry the paper and then spray it with something to make the spots visible. What would you spray the paper with?

e) A mixture of amino acids (M) was tested against five known amino acids (1 to 5) and the following chromatogram was made:

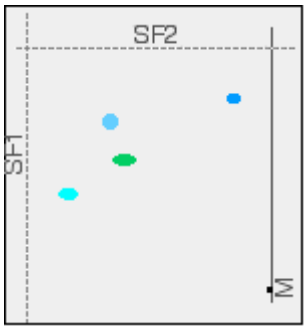


What can you say about the mixture M?

Chemguide – questions

2. This question is about two way paper chromatography and R_f values.

This diagram from the Chemguide page shows the result of two way paper chromatography on a mixture of dyes.

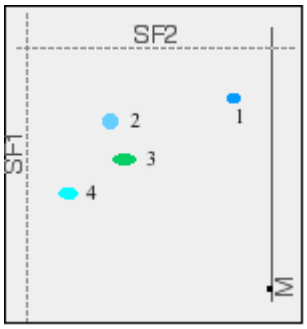


a) Describe briefly how this chromatogram would have been produced.

b) What is the significance of the dotted lines SF1 and SF2?

c) Using two way chromatography, you can't compare the dyes in the mixture directly with known dyes. Instead you have to make use of known R_f values. How is an R_f value measured?

d) This diagram is the same as the previous one, except with the various spots numbered:



(i) Which spot has the highest R_f value in solvent 1?

(ii) Which spot has the highest R_f value in solvent 2?

(iii) Which spot has the lowest R_f value in solvent 1?

(iv) Which spot has the lowest R_f value in solvent 2?

3. a) Describe briefly the structure of paper which is relevant to paper chromatography.

b) Suppose you carry out paper chromatography using a non-polar solvent such as hexane. Describe and explain how the polarity of a compound in a mixture will affect its R_f value.

c) What word is used to describe the tendency for a compound to divide its time between two immiscible liquids?