AQA Chemistry A-level

Required Practical 12

Separation of species by thin-layer chromatography (TLC)

To analyse medicine samples (e.g. aspirin):

1. Crush an aspirin tablet with pestle and mortar.
2. Transfer to a weighing boat or bottle.
3. Dissolve approx 0.1 g of the powdered tablet in 0.5 cm of ethanol.
4. Repeat with other painkiller tablets. (caffeine/anadin tablets should be dissolved in 7.0cm ethanol)

Thin layer chromatography:

Method	Accuracy	Explanation
1) Wearing gloves carefully use a pencil to draw a faint line 1 cm above the bottom of a TLC plate and mark five spots, equally spaced, along this line.	• Gloves • Pencil line	• Gloves prevent contamination from the hands to the plate • Pencil line –will not dissolve in the solvent
2) Use a capillary tube to apply a tiny drop of each solution to a different origin spot and allow the plate to air dry. If required repeat this process to achieve small but concentrated spots	Tiny drop	Too big a drop will cause different spots to merge
3) Add approximately 10 cm^3 of solvent to a development chamber (or suitable container with a lid)	Depth of solvent	If the solvent is too deep it will dissolve the sample spots from the plate.
4) Place the TLC plate into the development chamber, making sure that the level of the solvent is below the spotting line. Replace the lid and make sure it is a tight seal.	Lid	To prevent evaporation of toxic solvent and so that the inside of the tank is saturated with the solvent vapour.

5) When the level of the solvent reaches about 1 cm from the top of the plate, remove the plate and mark the solvent front with a pencil. Allow the plate to dry in the fume cupboard.	• Allow solvent line to rise near to the top of the plate • Dry in fume cupboard	• Will get more accurate results if the solvent is allowed to rise to near the top of the plate but the Rf value can be calculated if the solvent front does not reach the top of the plate • Dry in a fume cupboard as the solvent is toxic
6) Place the plate under a UV lamp in order to visualise the spots. Draw around them lightly in pencil.	UV lamp	UV lamp used if the spots are colourless and not visible.
7) Calculate the Rf values of the observed spots.	Use mm ruler	Higher resolution - more precise Rf value calculated

N.B.

- If you use less solvent and have a high baseline you will get large spots
- If your sample is too concentrated then your spots overlap