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## A-level Chemistry exemplar for required practical 12

### Separation of species by thin-layer chromatography:

### Analysis of the composition of some common medicines.

#### Student sheet

#### Requirements

You are provided with the following:

- ethanol or other solvent
- ethyl acetate
- ibuprofen tablet
- paracetamol tablet
- caffeine tablet
- aspirin tablet
- Anadin Extra tablet (or equivalent containing aspirin, paracetamol and caffeine)
- pestle and mortar
- weighing boat or bottle
- TLC plate
- capillary tubes
- developing chamber (or suitable container with lid)
- access to UV lamp.

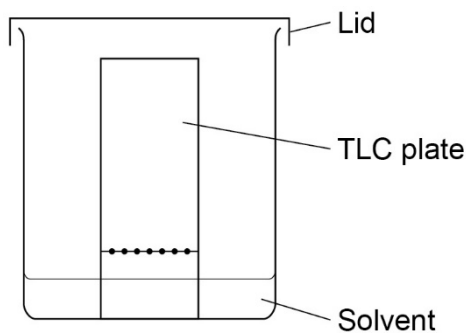
#### Suggested method

##### Preparation of samples

- Use a pestle and mortar to crush the aspirin tablet and transfer to a weighing boat or bottle.
- Dissolve approximately 0.1 g of the powdered tablet in 0.5 cm<sup>3</sup> of ethanol.
- Repeat steps (a) and (b) with the ibuprofen tablet and the paracetamol tablet.
- Use a pestle and mortar to crush the caffeine tablet and transfer to a weighing boat or bottle.
- Dissolve approximately 0.1 g of the powdered tablet in 7.0 cm<sup>3</sup> of ethanol.
- Repeat steps (d) and (e) with the Anadin Extra tablet.

##### Thin-layer chromatography

- 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.
- Use a capillary tube to apply a tiny drop of each solution to a different origin spot and allow the plate to air dry.
- Add approximately 10 cm<sup>3</sup> of ethyl acetate to a development chamber (or suitable container with a lid).
- Place the TLC plate into the developing 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.



- e) 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.
- f) Place the plate under a UV lamp in order to visualise the spots. Draw around them lightly in pencil.
- g) Calculate the  $R_f$  values of the observed spots.