A permanent stain ...

You are provided with :

SPECIMEN A : A sample of cloth from the suspect's pocket lining

SPECIMEN B : A pen found at the scene of the crime

Look at both of the specimens that you have been given

Do you think that the ink on the suspect's pocket lining came from <u>this</u> pen?

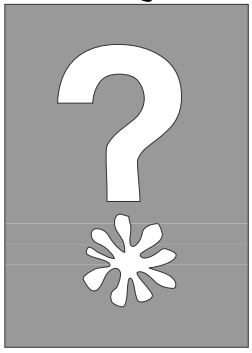
☐ Yes ☐ No

Can you prove your suspicions?

YOU MUST PUT ON SAFETY GOGGLES FOR THE NEXT PART

The technique used to do this is called **t**hin **l**ayer **c**hromatography (tlc) which separates the different components of the ink so that you can see its "fingerprint".

1. Put a small amount of ethanol into a sample tube.
2. Put the sample from the suspect's pocket lining into the solvent so that the ink washes out of the cloth.
3. Dip the tip of the micropipette into the liquid so that some of it is sucked up the tube.
4. Touch the tip onto the tlc plate and let the liquid be sucked out of the tube to give you a small spot on the plate
5. Blow the spot dry gently.
6. Put a small spot from the pen onto the plate at exactly the same level.



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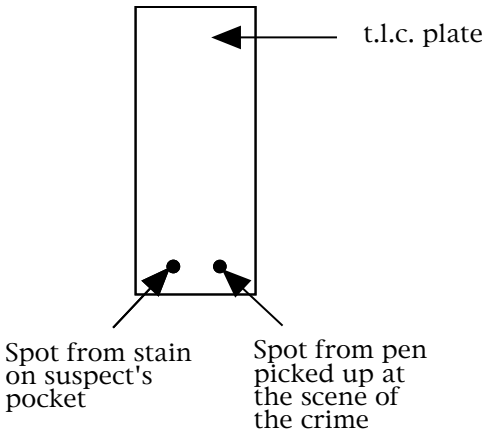
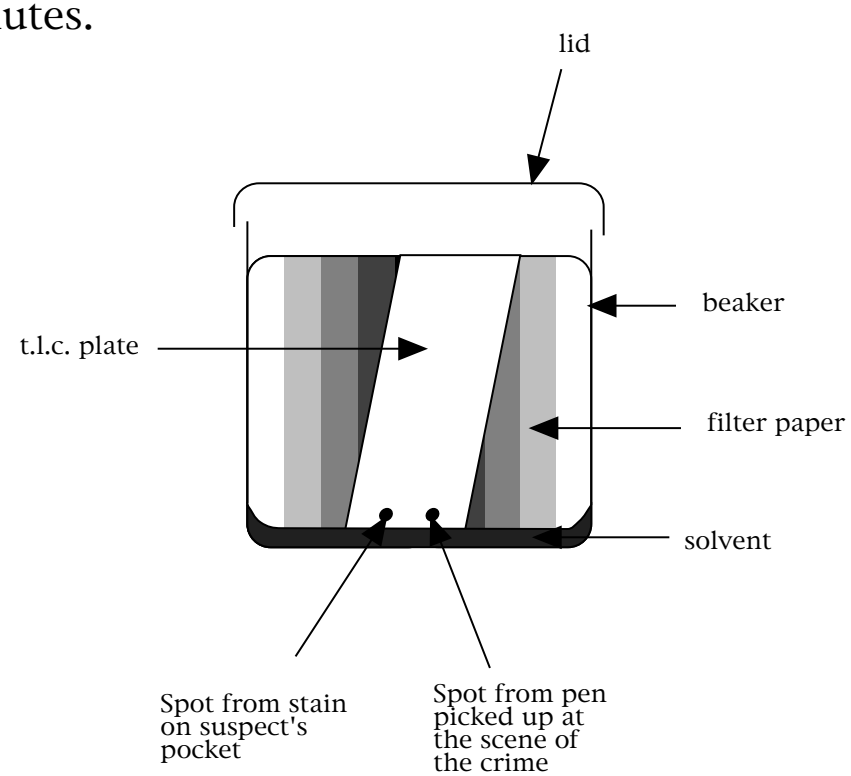
Your t.l.c. plate should look like this :



Carefully put the plate into the tank with the spots at the bottom and wait until the solvent has almost reached the top of the plate. This will take about 5 minutes.



What can you see ?
What does this tell you about the two ink samples?

Fill in your conclusions on the Court Report.

A permanent stain ...

When the suspect was arrested his shirt pocket was stained with black ink. A black pen was also found at the scene of the crime. Can this piece of evidence be used to tie the suspect to the scene of the crime?

This clue uses thin layer chromatography to match the ink from the two sources. Black ink from fibre-tip pens seems to work well as it contains a large number of components. If you try out a few pens you will quickly find which are suitable. Red ink from a Berol Toughpoint K36 marker has been used successfully.

Samples of "shirt pocket" can be easily prepared by tearing an old shirt into small squares and soaking each with ink. This is best done by dismantling a pen and squeezing ink from the cartridge onto the cloth, rather than trying to soak it up from the nib of the pen.

Equipment required

Silica tlc plates
Black fibre tip pens
Ethanol
Beakers
Filter paper
Petri-dishes or watch glasses
An old shirt, or a piece of cotton material (preferably the same type as that used in the "Hanging by a thread" clue)
Pasteur pipettes

Pasteur pipettes make the best applicators and are less likely to break than micro-pipettes or other tlc applicators.

Using black ink introduces an element of controversy over whether the two ink samples are the same. This is because black ink has a high carbon content that sticks to the cloth and cannot be extracted. This means that the spot from the pen on the tlc plate will have a large amount of base-line material on it. Point this out and see whether the pupils change their minds, or not!