ACTIVITY 10 Who Wrote the Will?

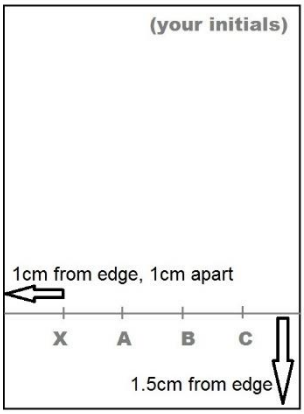
Background

Thin-layer chromatography (TLC) is a separation technique used to identify the different components within a mixture by separation on a solid medium. The mixture's components will travel at different rates and therefore separate. This method is ideal for separating the various dyes in pen inks. Different brands of pen use inks that separate differently, so if we analyse samples from different pens we can tell them apart.

For example, Mrs. Maud Flanders died in suspicious circumstances and left her entire estate to her surgeon, Dr. Nick Riviera. A forensic team was brought in to authenticate her Will, and the evidence they collected includes ink extracted from the Will plus pens obtained from the desks of Mrs. Flanders, Dr. Riviera and others. As the forensic chemist it's your job to determine which, if any, of these pens was used to write the Will.

Instructions and Safety Notes

- TLC metal plates can have sharp edges, and their white surface is easily damaged. Hold them by the edges to prevent finger marks but take care not to cut yourself. Label them with pencils not pens, and press lightly - don't dig into the coating.
- Capillary tubes may be sharp at one end, and only the blunt end will work properly. Watch how to use them before you touch them, don't touch the ends and practise on some filter paper before using them on your TLC plate.



Lightly rule a line across the plate, 1.5cm in from one of the short edges. Lightly write your initials along the opposite edge. Starting from the left side, lightly mark the line at 1cm intervals. You have several small vials, one labelled with X or a number and the rest with other letters like A, B, C etc. Label each pencil mark like one of your vials, starting with X or your number, so your plate looks like Figure 4.

Figure 4: Plate before spotting

Dip the blunt end of a capillary tube into your container of Sample X, so some liquid enters the tube. Then carefully touch the end onto a piece of filter paper so some liquid flows out onto the paper. If none comes out, check the tube is not at an angle. When the ink spot is about 2-3mm across, lift the tube off.

Spot one of the samples onto its mark (not above it). Allow to dry then do it once more in the same spot. Get a fresh capillary tube and repeat for the other samples, using a new capillary tube for each different ink. Your plate should look like Figure 5. Once all the spots have dried, take your plate to a demonstrator who will put it in a developing tank. You will do another activity while the plate develops over about 20min.

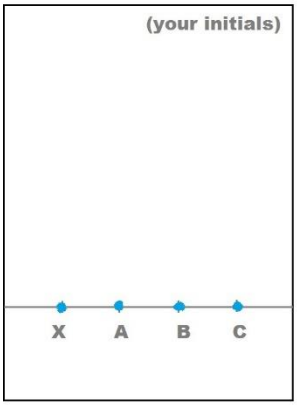


Figure 5: Plate after spotting

Results

The sample marked with a number or X is ink extracted from the Will. The rest are inks extracted from various different pens.

Which pen (if any) matches the sample from the Will? _____

Does this alone prove whether or not the Will is authentic? _____

From the results you obtained, state who you determined wrote the Will.

_____

_____