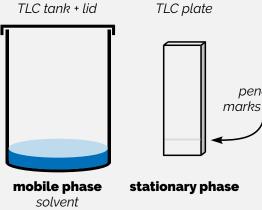
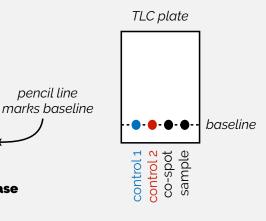
Thin Layer Chromatography (TLC)



Running a TLC experiment





1. Equipment

Thin layer chromatography requires a TLC plate, normally a glass or aluminium – plate coated in silica. This is the **stationary phase**. It should have the *baseline* marked in pencil.

A TLC tank that will contain solvent or the *mobile phase*. The mobile phase just covers the bottom and a lid ensures that the atmosphere is saturated with solvent.

2. Apply (spot) sample

A dilute solution of sample or **analyte** is *spotted* on the baseline by rapidly/lightly touching a capillary tube filled with sample. Control spots for known compounds allow comparison..

In addition, a **co-spot** that contains both sample and controls is applied to aid visualisation (and avoid experimental error).



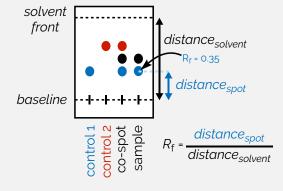
The TLC is placed in the tank ensuring that the baseline is above the level of the mobile phase.

baseline

must be above

mobile phase

The solvent is allowed to move up the plate, dragging the compounds with it. This causes the various components to separate out as each molecule moves at a different rate.



TLC plate

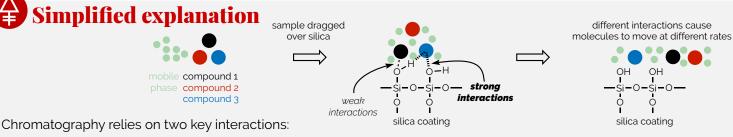
4. Analysis

The plate is removed when solvent front almost reaches top of plate.

The compounds are visualised by light, UV light or stains.

The $R_{\rm f}$ value or retention factor indicates how far each spot moved compared to the solvent front.

A pure compound will give one spot. If there are multiple spots then the sample is impure.



TLC - the blurb

Thin layer chromatography or TLC is a common technique used to assess purity or follow a reaction.

Like other forms of chromatography it involves a mobile phase moving a sample across a stationary phase. Different compounds have different interactions with the two phases leading to them moving at different rates and thus separating.

Chromatography is vital in many scientific jobs - not just chemistry.

sample • stationary phase - the stationary phase is normally silica. Its surface is covered in OH groups. The better the hydrogen bond donor or acceptor the sample is the slower it moves. The more polar the sample, the slower it moves (dipole-dipole interactions). The larger it is the slower it moves.

ii. **sample • mobile phase** - The more soluble the sample is in the mobile phase the faster it moves. The stronger the interactions between sample and mobile phase, the faster it moves.

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