

Separation Techniques – Adsorption Chromatography

Background: Chromatography is a separation technique used for separating a chemical mixture into its components. Adsorption chromatography makes use of a liquid or gaseous mobile phase and a solid stationary phase or adsorbent. The sample's components get separated based on their relative affinities towards the surface of the stationary phase as the mobile phase gets adsorbed and rises through it.

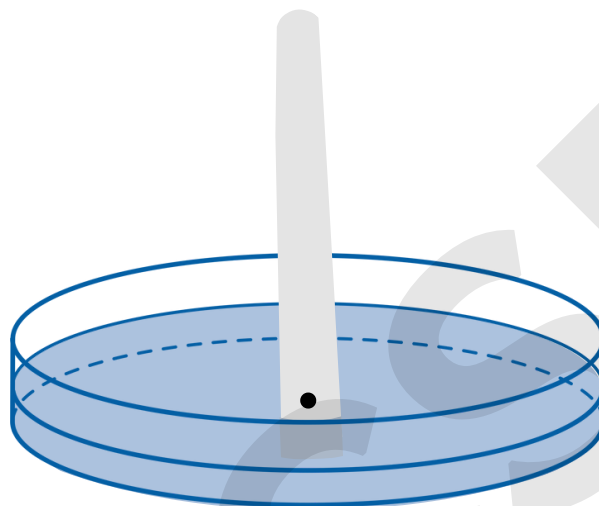


Fig.1: Chalk chromatography setup

Requirements:

Category	Particulars
Material/Apparatus	<ul style="list-style-type: none"> • White chalk (Do not use dustless chalk.) • Black ink (from a sketch pen of any local brand) • Dissecting needle • Petri dish • Plastic dropper • Tap water

Procedure:

1. Take a white chalk.
2. Using the needle, make a circular groove/notch 0.5 cm above the bottom edge of the chalk.
3. Using a dropper, add 2 small drops of black ink in the notch to form a spot a few millimeters in diameter.
4. Fill a Petri plate with 10 mL distilled water (mobile phase solvent).
5. Stand the chalk in it, ensuring that the ink spot is above the water level, as shown in Fig.1.
6. Observe the separation of the ink's pigments as the solvent rises in the chalk due to capillary action.
7. Remove the chalk from the Petri plate when the solvent level has reached 0.5 cm below the top.
8. Record your observations.

Points for Discussion:

1. Comment on the separation pattern obtained.
2. What is the order of colored components that can be observed after separation?
3. List out the colors in the order of increasing or decreasing absorptivity.