

Paper Chromatography

Background

- Chromatography is an analytical method to separate components of a mixture.
- In Paper Chromatography, the paper is the stationary phase or support. The solvent is the mobile phase, which carries the components of the sample. The leading edge of the solvent is the solvent front.
- Each component is preferentially attracted to either the stationary phase (paper) or to the mobile phase (solvent) by intermolecular attractions.

Thus due to differences in their molecular structures, the components will move up the paper at different rates. This causes them to separate. The characteristic pattern of the components is called the chromatogram.

- The components are characterized by their Retention Factor, (R_f). The food dyes are also characterized by their color.

$$R_f = \left(\frac{\text{dist. traveled by component}}{\text{dist. traveled by solvent front}} \right)$$

Experiment

- **Unknown mixtures are identified by matching the unknown R_f values and colors to the R_f values and colors of the known dyes.**
- **You will separate food dyes, determine the components in unknown dye mixtures and in commercial food products.**
- **Good techniques are very important to achieve good separation of the components.**

Examples: Spotting the dyes and allowing them to dry before continuing the experiment. Allowing the solvent front to rise to within a finger's width of the top of the paper.