



Experiment 6: Chromatography

How differences in solubility can produce separations when solutions are passed through silica gel. How we tune this effect by choosing solvent mixtures that combine solvents with greater and lesser solubility towards the materials being separated.

Preparations

Read: Experiment 06 - Extraction (page 34)
Technique 20 - Thin Layer Chromatography

Do: Prepare your lab notebook:

- State experiment objectives (for each part assigned)
- List materials used w/ properties (solvents used in previous experiments do not need to be repeated)
- Make a procedures bullet list (for each part assigned)

Intended Learning Outcomes

- * Know chromatography is a technique for identifying and separating substances.
- * Know elution is moving substances over a stationary phase using solvent in which they are sparingly soluble.
- * Know the stationary phase strongly binds to substances so small differences in mobile phase solubility can produce large differences in the speed at which substances move.
- * Know silica gel is commonly used as a solid phase and is extremely polar.
- * Know ideal solvents for elution are ones in which the substances being solvated have medium solubility—too little solubility and the substances do not elute, too much and no separation occurs.
- * Know thin layer chromatography measures elution as retention factor (R_f), the ratio of distance a substance moves over the distance the solvent front moves.
- * Calculate R_f from a developed TLC plate.
- * Tentatively identify substances by eluting known substances on separate tracks with an unknown mixture
- * Predict an effective elution solvent for separating two substances based on the molecular structure of the solvent and substrates being separated.
- * Know elution mixtures can be more precisely tuned to give separation by using two miscible solvents as a mixture, one with greater and one with lesser solubility towards the substances being separated.
- * Identify the solvents with greater and lesser solubility in an elution mixture of two solvents.
- * Predict a better ratio of elution solvents for separating two substances, given one ratio of those solvents and the results of previously eluting substrates using that ratio.

Report

Prepare a report for this experiment according to this experiment's report description for the parts we accomplished. Include the questions with answers for this experiment, except any your instructor tells you to omit.