Experiment 3: Crystallization

Solutions at the limit of solubility can produce pure crystalline phases. How that effect can be predicted and utilized in the lab.

We will be doing parts A and C of this experiment. We will not be doing part B.

Preparations

Read: Experiment 03 - Crystallization (page 22)
Technique 08 - Filtration (section 8.3 and 8.5)
Technique 09 - Physical Constants of Solids, Melting Point

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 crystallization produces a solid phase of a solute from solution.

* Know chemists use crystallization as a way to get pure substances from reaction mixtures.

* Know chemists accomplish crystallization by varying a property of a solution (temperature, polarity, pH or other) to slowly reduce the solubility of a particular solute.

* Know the technique of crystallization requires finding a property which has a greater effect on the solubility of your desired solute, than it has on other solutes (impurities).

* Know the melting point of a mixture is always less than the melting point of either of it's components when they are pure.

* Know you can determine if two samples with similar melting points are the same substance by a mixed melting point test.

* Know a mixed melting point test is accomplished by comparing the mixed melting point of the two samples to the pure melting points of both.

* Predict the best solvent for crystallization of a particular substance based on solubility.

* Predict the best solvent for crystallization of a particular substance based on how solubility changes with temperature.

Report

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