Explorations of Crystallization

Source: AEM Handout. (Note that both procedures below can be included together for grading as one experiment in your lab notebook!)

Procedure 1. Miniscale Recrystallization of Phthalic Acid

Dissolve ~1 g (know the exact mass to 3 decimal places!) of phthalic acid in a minimum amount of boiling water in a 25 mL Erlenmeyer flask. Be sure to add a boiling chip or stick when you start adding the water, and also to keep the mixture near the boiling point during the dissolving process. You do NOT need to keep track of the amount of water that you add! Decolorize and/or gravity filter any solid impurities from the solution, if needed. (After filtration, you may need to reduce the volume of the solution to make it saturated again.) Allow the saturated solution to cool very slowly (without disturbing the flask) to room temperature to grow the best crystals. Cool further in an ice bath for at least 10 minutes. Collect the crystals using suction filtration.

After the crystals are very dry (next lab period) measure the mass of the isolated crystals, calculate the % recovery, and measure the mp. These crystals will be turned in for grading.

Cleanup. The aqueous mother liquor should be poured down the drain with lots of water. After they are graded, the solids should be put in the solid hazardous waste container.

Procedure 2. Microscale Recrystallization of Benzoic Acid

Recrystallize ~0.5 g (know exact mass to 3 decimal places!) of benzoic acid from water using the same procedures that you used for the phthalic acid above. After the crystals are very dry (next lab period) measure the mass of the isolated crystals, calculate the % recovery, and measure the mp. These crystals will be turned in for grading.

Cleanup. The aqueous mother liquor should be poured down the drain with lots of water. After they are graded, the solids should be put in the solid hazardous waste container.

Note:

$$\text{Percent Recovery} = \% \text{ Recovery} = \frac{\text{mass of purified substance}}{\text{mass of impure substnace}} \times 100$$