desirable value because a higher value would mean a more positive result. Some factors that could have caused this result are: the amount of decolorizing charcoal added, external contamination (e.g. wind, human touch), slight frothing while heating, and intervention during the cooling processes. The result that was shown through the percent recovery is that only about half of the original substance was restored, and so not fulfilling the goal of obtaining a high percent recovery of pure crystal acetanilide.

IV. Summary

Recrystallization was done to recover pure acetanilide in the form of a crystal from a contaminate acetanilide by using decolorizing charcoal and the process of filtering to remove its impurities. Both the melting point and the percent recovery were determined which were 109.4°C and 50.5% respectively.

V. Answers to Questions

1. The solubility of Acetanilide in water at 100°C is 5.5g/100mL, and its solubility in water at 0°C is 0.53g/100mL. What would be the maximum theoretical percent recovery from the crystallization of 5.2g of acetanilide from 163mL of water (assuming the solution is chilled to 0°C)?

   (163mL x 0.53g)/ 100mL = 0.8639g
   5.2g – 0.8639g = 4.3361g (amount that was crystallized)
   (4.3361g / 5.2g) x 100 = <u>83.39% recovery</u>

   * 5.2g is the amount that dissolved in water

2. Refer to your answer in the Prelab Question #3. Does this suggest that adsorption of charcoal is exothermic, or endothermic? Explain.

   <u>It is exothermic because when the temperature is increasing, the adsorption decreases. There is also a force of attraction existing between the absorbate and the adsorbent, which releases heat energy, thus this is an exothermic process</u>

3. Circle the correct option:

   Compound B is contaminated with charcoal. The solubility of B in ethanol is 20g/L at 100°C and 0.2g/L at 0°C. In order to crystallize 15g of B from ethanol you will need **75liters/1liter/750mL/75mL** of solvent. Charcoal will be separated during the **cold/hot filtration**. After cooling **0.15g/1.5g/14.85g** will precipitate. The ideal %recovery for this recrystallization is **99%/19.8%/97.5%**. The solubility of compound B in water is 100g/L at 100°C and 33g/L at 0°C. Therefore, water is a **better/worse** recrystallization solvent since the percent recovery from water is **100%/33%/67%**.

   <u>750mL, Hot filtration, 14.85g, 99%, Worse, 67%</u>

4. Which type of filtration (gravity or suction filtration) will you prefer to remove any insoluble impurities, including the decolorizing charcoal, from the hot solution? Why?