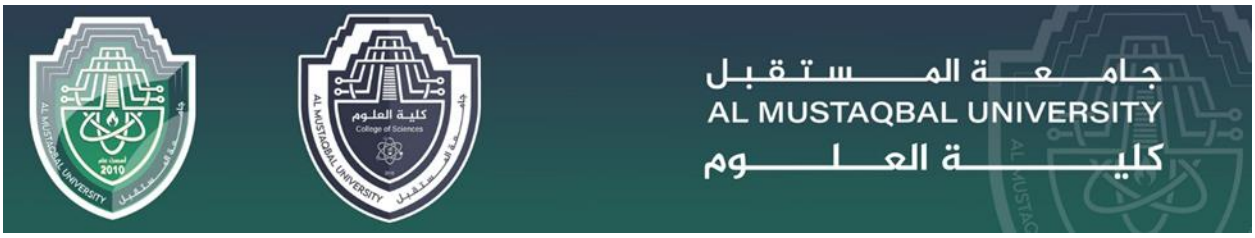

Organic Chemistry Laboratory Experiment

2nd stage

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Lecture 1: Purification

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Theory

Purification is an important process in organic chemistry to remove impurities from a compound, ensuring its desired properties and effectiveness in further reactions. Various techniques exist for purification, including .

1. recrystallization
2. distillation
3. sublimation
4. Chromatography

In this experiment, we will focus on recrystallization, which is widely used for purifying solid organic compounds based on their solubility differences in hot and cold solvents.

Apparatus & Chemicals

1. Beakers (100 mL, 250 mL)
2. Erlenmeyer flask (250 mL)
3. Hot plate
4. Filter paper
5. Buchner funnel & vacuum filtration setup

6. Stirring rod

7. Solvent (e.g., ethanol or water)

8. Impure organic compound (e.g., benzoic acid)

Procedure

1. Dissolve the impure solid compound in a minimum amount of hot solvent.

2. Filter the hot solution to remove insoluble impurities.

3. Allow the solution to cool slowly to room temperature, then place it in an ice bath to enhance crystallization.

4. Collect the purified crystals by vacuum filtration and wash them with a small amount of cold solvent.

5. Dry the purified product and determine the percentage recovery.

Calculations

Starts with 5.0 g of impure benzoic acid and recovers 4.2 g after recrystallization. Calculate the percentage recovery.

Sol:

Percentage Recovery = (Mass of purified compound / Initial mass of impure compound) × 100

= (4.2 g / 5.0 g) × 100 = 84%

Discussion

1. Why is slow cooling preferred in recrystallization?

2. Why is a minimum amount of hot solvent used?

3. How can you check if the purification was successful?

4. What happens if too much solvent is used?