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Fourth grade	المرحلة الدراسية
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Recrystallization of Salicylic Acid	عنوان المحاضرة باللغة الانجليزية
إعادة بلورة لحمض الساليساليك	عنوان المحاضرة باللغة العربية
2	رقم المحاضرة
Organic Chemistry Laboratory Manuals	المصادر والمراجع
Vogel's Textbook of Practical Organic Chemistry	
Journal articles on recrystallization methods	

محتوى المحاضرة

Recrystallization of Salicylic Acid

1- Introduction

- **Recrystallization is a purification technique based on differences in solubility. It is widely used in organic chemistry to obtain pure compounds by dissolving impure samples in a hot solvent and allowing crystals to reform upon cooling.**

2- Objective

- **Purify salicylic acid through recrystallization.**
- **Remove impurities and improve purity.**
- **Obtain pure crystals suitable for pharmaceutical use.**

3- Theory of Recrystallization

- The process depends on solubility differences at high and low temperatures.
- The impure compound is dissolved in a hot solvent.
- Upon cooling, pure crystals form while impurities remain in solution.

4- Chemical Structure of Salicylic Acid

- Molecular Formula: $C_7H_6O_3$
- Molecular Weight: 138.12 g/mol
- Functional Groups: Hydroxyl (-OH) and Carboxyl(-) COOH.

5-Solvent Selection

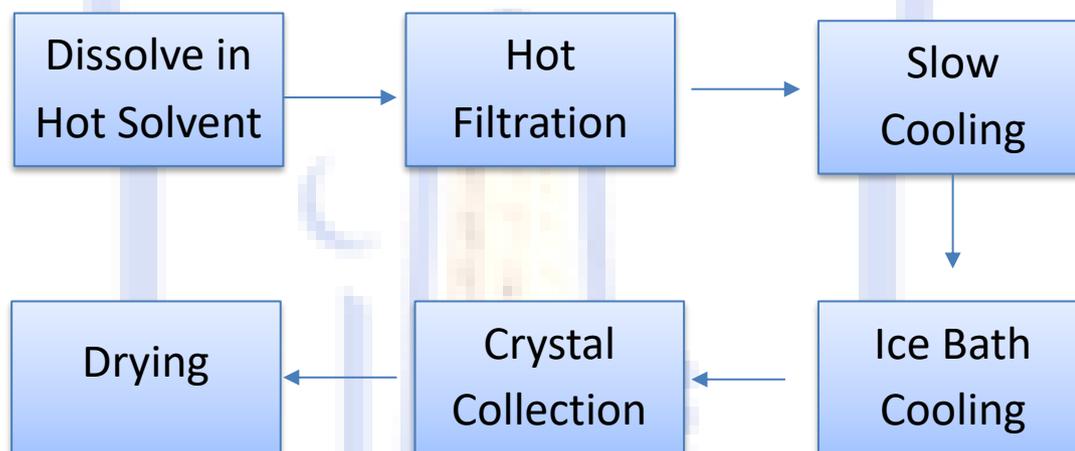
- Suitable solvents: Ethanol, water, or ethanol-water mixtures.
- Criteria for solvent selection:
 - The compound is soluble in hot solvent but sparingly soluble in cold.
 - Impurities are either soluble at all temperatures or insoluble.
- Ethanol-water is preferred because salicylic acid dissolves well when hot but recrystallizes efficiently when cooled.

6- Experimental Procedure

1. Dissolve impure salicylic acid in minimum hot ethanol or water.
2. Heat the solution until fully dissolved.
3. Filter hot solution to remove insoluble impurities.

4. Cool slowly to room temperature, then in ice bath.
5. Collect crystals by filtration.
6. Dry the purified product.

Recrystallization Process Flow



7-Conditions of Recrystallization

- Use minimum volume of hot solvent.
- Allow slow cooling for larger and purer crystals.
- Use ice bath for maximum yield after room temperature cooling.
- Avoid rapid cooling to prevent trapping of impurities.

8- Results & Observations

- **Before purification: impure, off-white powder.**
- **After recrystallization: white needle-like crystals.**
- **Melting point increases, indicating higher purity.**

9-Conclusion

- **Recrystallization is an effective method for purifying salicylic acid. The choice of ethanol-water as solvent and controlled cooling conditions leads to high purity crystals suitable for pharmaceutical applications.**

