

Preparation of Benzoic Acid from Benzamide

Experiment 16 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To prepare and characterise benzoic acid by supervised hydrolysis of benzamide.

Principle

Hydrolysis converts the amide group to a carboxylic-acid system. In an alkaline route, benzoate is formed and subsequent controlled acidification gives benzoic acid; purification uses its temperature-dependent solubility.

Requirements

- Instructor-assigned benzamide and approved hydrolysis reagents
- Controlled heating setup, filtration and recrystallisation equipment
- Balance, melting-point apparatus and assigned PPE

Procedure

1. Plan

Record the balanced transformation, limiting reactant and instructor-approved working quantities.

2. Hydrolyse

Carry out the assigned supervised hydrolysis method, documenting heating and completion checks.

3. Isolate

Cool and perform the prescribed controlled acidification of an alkaline reaction mixture; collect the precipitated product.

4. Purify

Recrystallise using the assigned suitable solvent, then collect and dry as instructed.

5. Characterise

Record appearance, dry mass, melting range and assigned identity tests.

6. Calculate

Use the limiting-reactant mole amount to calculate theoretical mass and percentage yield.

Observations and Record

Field	Actual record
Benzamide mass / molar amount	_____
Dry product mass	_____
Melting range	_____
Identity observation	_____
Theoretical mass / yield	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- Illustrative calculation only: 1.2113 g benzamide is 0.01000 mol using 121.13 g/mol. At a 1:1 conversion, theoretical benzoic acid is 1.2212 g using 122.12 g/mol.
- If dry isolated mass is 1.050 g, $\text{yield} = 1.050 / 1.2212 \times 100 = 85.98\%$.

Result

Record the observed outcome and calculated value, with units. State whether the stated laboratory specification was met; do not copy the worked example as your result.

Precautions

- Follow the approved heated-reagent method and ventilation.
- Add acid carefully to the cooled mixture under supervision.
- Yield must use dry purified product, not wet crystals.

Viva Questions and Answers

1. Why acidify a benzoate solution?

It converts soluble benzoate to the less soluble free acid.

2. Why recrystallise?

To separate the desired product from soluble and insoluble impurities.

3. Does high yield prove purity?

No; retained water or contaminants can inflate mass.

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