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Systematic Analysis of an Amide

Experiment 10 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To organise an illustrative unknown-identification record and show how the assigned candidate is supported.

Principle

This is a worked teaching case, not an observation to copy into a laboratory record. An actual unknown is assigned by the instructor and may give different findings. A candidate is supported by consistent preliminary, elemental, functional and physical evidence.

Requirements

- Instructor-assigned unknown and the corresponding known control; the method notes in this subject.
- Prepared test reagents, separate test portions and calibrated physical-constant apparatus.

Procedure

1. Preliminary examination

Record the actual state and water behaviour at the prescribed quantity and temperature. Compare with the illustrative pattern below.

2. Solubility classification

Test fresh portions in the assigned acid/base reagents. Describe dissolution or effervescence before inferring a class.

3. Elements

Use the instructor-prepared extract or provided elemental report. Distinguish an element finding from a functional-group conclusion.

4. Functional confirmation

Instructor-controlled amide hydrolysis gives the corresponding acid/amine products; the original compound is not a free primary amine

5. Physical confirmation

Purify the parent by hot-water recrystallisation and compare the measured range with the assigned authentic material; use the prescribed hydrolysis-product confirmation.

6. Conclude

Write the candidate only after reviewing all evidence; list a plausible alternative and the test that distinguishes it.

Observations and Record

Evidence	Illustrative finding
State / water behaviour	White crystalline solid; Poor cold-water solubility
Acid-base pattern	Neutral preliminary pattern; does not behave as a simple carboxylic acid
Elements	Nitrogen positive; sulphur and halogens negative in the teaching pattern
Functional pattern	Instructor-controlled amide hydrolysis gives the corresponding acid/amine products; the original compound is not a free primary amine
Physical constant	Typical melting region about 113-116°C, with certified standards having batch-specific values
Supported candidate	Acetanilide

Worked Example

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

- Record the candidate as Acetanilide only if your own results support the pattern. An anomalous physical constant should be investigated before final assignment.

Result

Complete the actual unknown record with its identification evidence and justified candidate.

Precautions

- Use instructor-assigned quantities and prepared test reagents in the designated laboratory; wear eye protection and use the required fume hood.
- Do not taste unknowns, smell containers directly, burn unknown halogenated material or heat sealed vessels.
- Use fresh separate portions for independent tests. A single colour reaction does not establish molecular identity.
- Do not mistake nitrogen detection alone for proof of an amide.

Viva Questions and Answers

1. Can the title identify an actual unknown?

No. The title describes this worked case; the actual material must be analysed.

2. Why perform a confirmatory measurement?

Different molecules can share solubility and functional-group reactions.

3. What belongs in the result?

The observed evidence, proposed identity and any unresolved limitation.

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