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Systematic Analysis of an Amino Ester

Experiment 12 - 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-led aromatic-primary-amine evidence plus the assigned ester reaction supports two functional groups

5. Physical confirmation

Use the dry-parent melting range and teacher-provided confirmatory spectrum or appropriate assigned derivative.

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 water solubility
Acid-base pattern	Can show increased solubility through protonation in the appropriate acid system
Elements	Nitrogen positive; sulphur and halogens negative in the teaching pattern
Functional pattern	Instructor-led aromatic-primary-amine evidence plus the assigned ester reaction supports two functional groups
Physical constant	Typical melting region about 88-90°C; compare with the actual batch standard
Supported candidate	Benzocaine

Worked Example

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

- Record the candidate as Benzocaine 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.
- A molecule can have more than one functional group; do not stop the analysis after detecting an amine.

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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