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Preliminary Examination of Organic Compounds

Experiment 1 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To record physical appearance, solubility and selected screening reactions before systematic identification.

Principle

Physical state and solubility narrow the possible chemical classes. Acid-base conversion may turn a neutral organic compound into a water-soluble ionic form. Aromaticity and unsaturation cannot be established reliably from appearance or a sooty flame alone.

Requirements

- Instructor-assigned unknowns, water, prescribed dilute acid/base and bicarbonate reagents.
- Small labelled tubes, pipettes, pH paper and instructor-approved unsaturation-test reagents.

Procedure

1. Record appearance

Observe state and colour without direct smelling or tasting. Odour descriptions are taken from an approved sealed demonstration or the supplied data sheet.

2. Water test

Use the prescribed fixed quantity and water volume. Record dissolved, partly dissolved, insoluble or two phases; temperature and quantity must be stated.

3. Acid-base solubility

On new portions test the assigned dilute hydroxide, bicarbonate and acid systems. Solubility in hydroxide but not bicarbonate may support a weak acid such as a phenol; solubility in dilute acid may support a basic amine.

4. Unsaturation screen

The instructor demonstrates the prescribed dilute permanganate or bromine test with controls. Decolourisation can also result from oxidation of other reactive groups, so retain the limitation.

5. Aromaticity assessment

Combine the assigned spectroscopic or structural evidence with the later chemical pattern. Do not equate dark burning with definitive aromaticity.

6. Plan tests

Use the solubility evidence to select elemental and functional-group checks on fresh material; keep an untouched portion for physical-constant confirmation.

Observations and Record

Test	Observation	Tentative inference
State / colour / supplied odour	_____	_____
Water / dilute acid / hydroxide	_____	_____
Bicarbonate / unsaturation screen	_____	_____

Worked Example

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

- A solid dissolving in bicarbonate with gas evolution supports a carboxylic-acid candidate, but confirmation still needs the rest of the analysis.

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

- 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.

Viva Questions and Answers

1. Why record the quantity in a solubility test?

A limited-solubility material may dissolve at a small loading but form a separate phase at a higher loading.

2. Does permanganate decolourisation prove an alkene?

No. Other oxidisable substances may react.

3. Why retain an untouched portion?

It is needed for independent confirmation and avoids contamination from earlier tests.

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