

PHC 251: PRACTICAL

This laboratory deals with the identification of organic compound through their physicochemical properties and their functional group characteristics.

Lab. No.

1 **Physical properties of organic compounds.**

- i. Condition:
- ii. Colour
- iii. Odour
- iv. Solubility:
 - a) in cold water
 - b) NaOH & Na₂CO₃.
 - c) dil. HCl
 - d) Na₂CO₃
- v. Ignition test.

2 **Classification by general chemical tests**

- a) Neutral ferric chloride solution.
- b) Heat sample.
- c) Aldehydes and ketones.
- d) Esters
- e) Amines
- f) Phenols

3 **Infrared spectroscopy**

Introduction to the techniques.
Interpretation of spectra.

4,5 **Functional group classification and characterization:**

- I. Alcohols:
 - a) Physical properties
 - b) Classification:
 - i) IR spectra
 - ii) Chemical test:
3,5-dinitrobenzoyl chloride
 - c) Full identification:
 - i. Ethanol
 - ii. Benzyl alc.
 - d) Special test: Methanol + Glycerol.
- II. Phenols:
 - a) Physical properties.

- b) Classification:
 - i) IR spectra.
 - ii) Chemical test:
 - 1. 3,5-dinitrobenzoyl chloride.
 - 2. FeCl_3 test
(to differentiate between alcohol & phenols).
- c) Identification:
 - 1. Phenol.
 - 2. m-Cresol.
- d) Special tests:

Resocinol, Catechol, Hydroquinone (Phthalein test),
(FeCl_3), (FeCl_3)

6 & 7 III. Aldehydes & Ketones:

- a) Physical properties.
- b) Classification.
 - i) IR spectra.
 - ii) Chemical tests:
 - 1. 2,4-Dinitrophenyl hydrazine.
 - 2. Tollen's test.
[to differentiate between ald.& ketones]
- c) Identification:

Aldehydes: Acetaldehyde - benzaldehyde
Ketones : Acetone - Acetophenone.
- d) Special tests: Formaldehyde.

8 Unknown (Revision)

9 **Practical examination No. 1**

10 **IV. Carboxylic acids.**

- a) Aliphatic carboxylic acids.
 - i. General reactions.
 - ii. Special tests.

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b) Aromatic carboxylic acids.

- i. General reactions.
- ii. Special tests.
- iii. Distinction from phenols.

11 **V. Esters of carboxylic acids.**

- a) Esters
- b) Amides and imides.

12 **VI. Amines**

- i) General reactions.
- ii) Differentiation between 1°, 2°, 3° amines.

13 **Revision.**

14 **Practical examination No. 2.**

14 Total

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