



Ministry of Higher Education and Scientific Research

University of Anbar

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Department of Chemistry



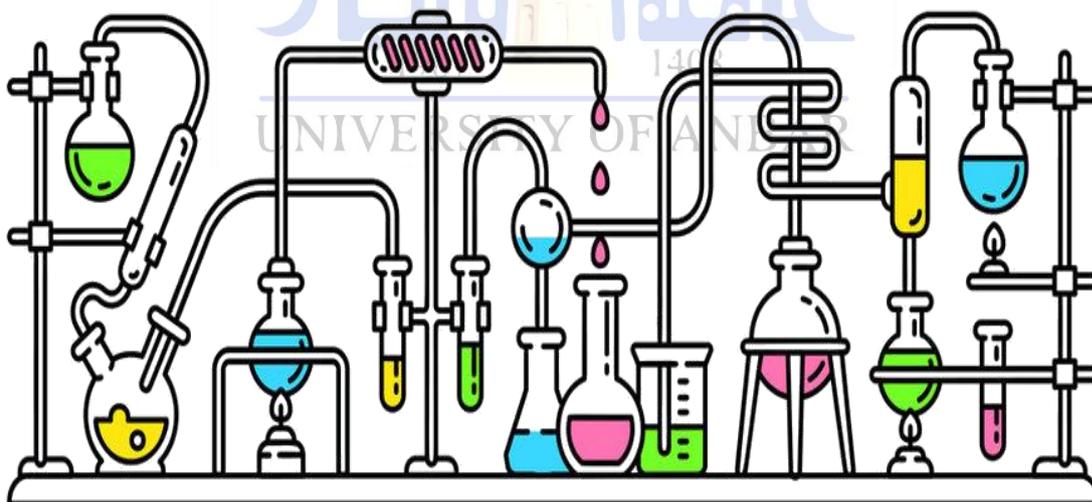
# ORGANIC DIAGNOSIS PRACTICAL

Fourth stage

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2024-2025

## Practical Organic Diagnosis

### INTRODUCTION

Practical organic diagnosis involves the identification and characterization of organic compounds, either in isolation or in comparison with other compounds, to determine their molecular structure. There are three main methods used in organic diagnosis :

1. Systematic Method
2. Microscopic Method
3. Physical Method

#### ➤ Systematic Method

The systematic method includes the following steps:

##### 1. Observation of Physical Properties

Determine whether the compound is solid or liquid.

Many organic compounds are colored due to the presence of specific functional groups.

Test its effect on litmus paper.

##### 2. Determination of Physical Constants (a or b)

a) Measure the melting point (m.p) for solid organic compounds.

b) Measure the boiling point (b.p) and refractive index for liquid organic compounds.

##### 3. Combustion Test

Provides information on whether the compound is aliphatic, aromatic, or halogenated.

#### 4. Solubility and Acid–Base Tests

Determine solubility in various solvents.

Test acidity or basicity.

#### 5. Detection of Functional Groups

Identify functional groups present in the compound.

#### 6. Derivative Preparation

After listing possible structures, derivatives are prepared to confirm the compound's identity, with reference to scientific literature.

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### Systematic Diagnosis of Organic Compounds

Physical Examination

Combustion Test

Measurement of  
Melting/Boiling Point

Elemental Analysis (N, S, X)

Solubility Testing

Acidity Testing

Functional Group Tests

Derivative Preparation

## Systematic Diagnosis of Organic Compounds

**Physical Examination :** Observe the state, color, and odor.

### Combustion Test :

- Black smoke with residue → Aromatic compound.
- Black smoke without residue → Cyclic compound.
- Black smoke without residue + green flame → Aliphatic compound containing halogens.
- White smoke without residue → Aliphatic compound.

### Determination of Purity of Organic Compounds :

Purity is determined and improved using:

1. Recrystallization
2. Distillation
3. Chromatographic separation methods

