

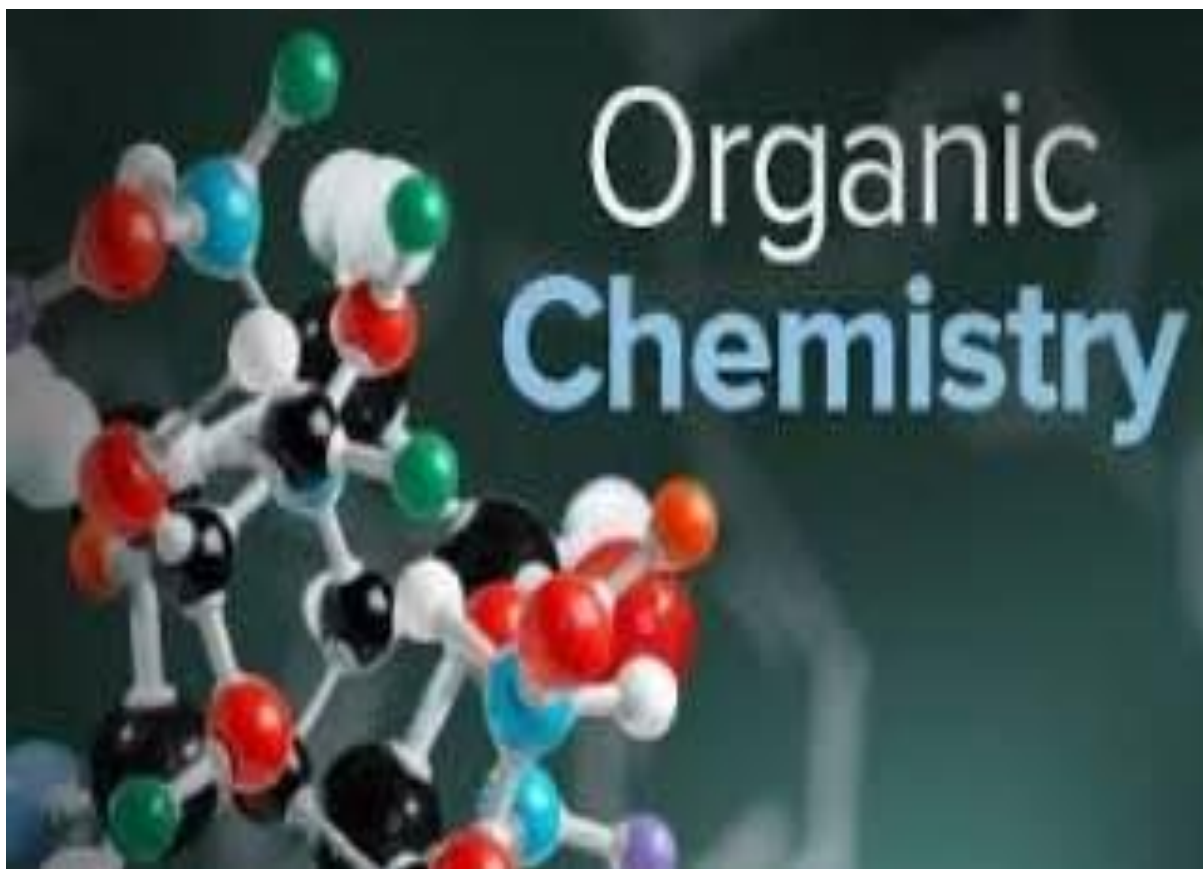
**Al- Mustaqbal University**  
**College of Science**  
**Medical Physics Department**  
**First Stage**

# **الكيمياء العضوية**

**نقطه الانصهار**

**Lecture one**

**2024 – 2025**



## Introduction to Organic Chemistry

**Organic chemistry** is the branch of chemistry that studies carbon-containing compounds. These compounds include natural substances like proteins, carbohydrates, and fats, as well as synthetic materials like plastics, medicines, and dyes.



## Classification of Organic Compounds

Organic compounds are classified into different groups based on their functional groups:

- Hydrocarbons (الهيدروكربونات): Compounds made of carbon and hydrogen only, such as alkanes, alkenes, and alkynes.
- Alcohols (الكحولات): Compounds containing an -OH (hydroxyl) group.
- Carboxylic Acids (الأحماض الكربوكسيلية): Compounds with a -COOH (carboxyl) group, such as acetic acid (vinegar).
- Esters (الإسترات): Formed from acids and alcohols, often used in perfumes and flavorings.
- Amines (الأمينات): Compounds containing nitrogen, found in proteins and many drugs.

## Importance of Organic Chemistry

Organic chemistry plays a vital role in many fields, including:

- Medicine (الطب): Used in drug synthesis and the study of biological molecules.
- Agriculture (الزراعة): Helps develop fertilizers, pesticides, and herbicides.
- Industry (الصناعة): Used in manufacturing plastics, textiles, and dyes.
- Energy (الطاقة): Involved in the production of fuels like gasoline and natural gas.



## Melting Point in Organic Chemistry

### Definition of Melting Point

The melting point is the temperature at which a solid turns into a liquid under normal atmospheric pressure. It is a crucial physical property used to identify and characterize organic compounds

### Factors Affecting Melting Point

#### 1. Intermolecular Forces (قوى التجاذب بين الجزيئات):

- Strong intermolecular forces (such as hydrogen bonding) increase the melting point.
- Weak forces (such as van der Waals forces) lower the melting point.

#### 2. Molecular Weight (الوزن الجزيئي):

- Larger molecules usually have higher melting points due to stronger intermolecular attractions.

#### 3. Molecular Structure (البنية الجزيئية):

- Symmetrical molecules pack better in the solid state, leading to higher melting points.
- Irregular or branched structures decrease melting points.

#### 4. Purity of the Compound (نقاء المركب):

- Pure compounds have a sharp melting point.
- Impurities lower and broaden the melting range.

## Importance of Melting Point in Organic Chemistry

Identification of Compounds (تحديد المركبات): Comparing the melting point of an unknown compound with known values helps in identifying the substance.

- Checking Purity (فحص النقاء): A sharp and defined melting point indicates purity, while a broad melting range suggests impurities.
- Distinguishing Isomers (تمييز المتماكبات): Isomers (compounds with the same formula but different structures) often have different melting points.

