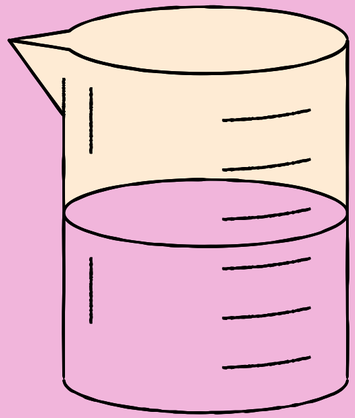
# Ministry of Higher Education and Scientific Research

## Al-Mustaqbal University
## College of Science

## Department of Medical biotechnology

## Biochemistry / Laboratory



# Qualitative Analysis of lipids

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## Definition of Lipids

Lipids are a group of organic compounds that are insoluble in water but soluble in organic solvents (e.g., ether, chloroform, benzene).

They include fats, oils, waxes, phospholipids, and sterols.

# IMPORTANCE OF QUALITATIVE ANALYSIS

- To differentiate between saturated and unsaturated lipids.
- To identify the presence of glycerides and fatty acids.
- To understand lipid reactivity in biological and chemical systems.

# Qualitative Tests for Lipids

## Test 1: Solubility Test

**:Principle**

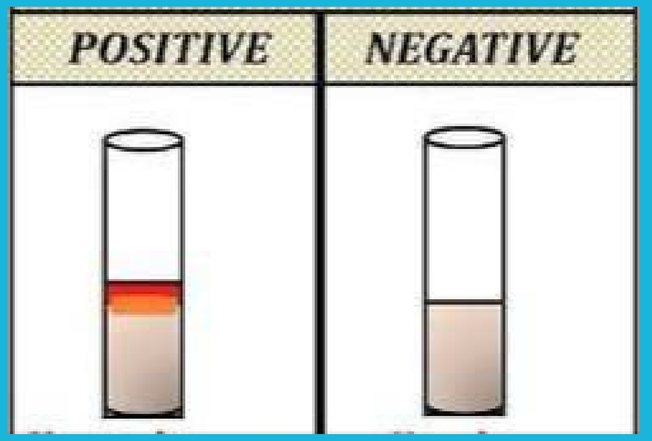
**Lipids are nonpolar compounds; hence they are insoluble in water but .soluble in organic solvents**

### procedure

1. **Add 1 mL of the lipid .sample into a test tube**
2. **Add 1 mL of water and shake gently**
3. **Repeat the test using organic solvents .such as ether, chloroform, and ethanol**

**Observation**

✅ **Insoluble in water •**
✅ **Soluble in ether and chloroform •**



# Test 2: Unsaturation Test (Bromine Test)

**:Principle**

**Unsaturated fatty acids contain double bonds that react with .bromine, causing the disappearance of bromine's brown color**

**Add a few drops of bromine solution in chloroform to the .lipid sample**

**.Observe the color change**

**Observation:**

- **Disappearance of brown color → .Unsaturated lipid**
- **No change in color → Saturated lipid**

# Test 3: Acrolein Test (for Glycerides)

**:Principle**

**When glycerides are heated with potassium bisulfate ($KHSO_4$), .acrolein is produced, which has a pungent odor**

**Mix a small amount of lipid .sample with $KHSO_4$ (solid)**

**.Heat gently over a flame**

**Observation:**

**• Pungent odor (similar to burnt fat) → Presence of glycerides.**

# Test 4: Saponification Test

**:Principle**

**.Alkaline hydrolysis of fats produces soap (fatty acid salt) and glycerol**

## procedure

**Add 2 mL of lipid sample to 2 mL .of alcoholic NaOH solution**

**Add cold water and .shake**

**Observation**

**• Formation of foam → Positive test for saponifiable lipids.**

# THANK YOU!

”لا حياة لمن يظل واقفًا على الضفاف، خائفًا من الأمواج والأعاصير، الحياة لمن يتحرك، يُقدِم، يُقبِل، يخوض، يتعثر، ينهض، يصبر، حتى يظفر أخيرًا.”

# ELEMENTS