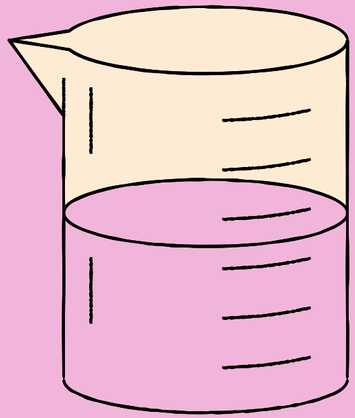
Ministry of Higher Education and Scientific Research

Al-Mustaqbal University
Coolege of Science

Department of Biology

Biochemistry / Laboratory



Qualitative Analysis of lipids

By:- M.S.c Saja Jawad Abaid

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

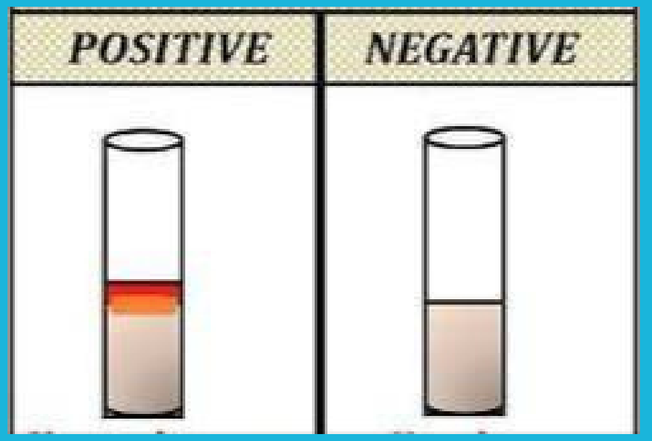
Lipids are nonpolar compounds; hence they are insoluble in water but .soluble in organic solvents

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

.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