

# LIPIDS

Q → What are lipids? Give classification of lipids.

Ans Heterogeneous groups of organic compounds of carbon, hydrogen and oxygen containing more hydrogen and less oxygen in comparison to carbohydrates is called lipid. The term lipid was proposed by Bloor.

Lipids are insoluble in water, but soluble in organic solvents like benzene, ether, chloroform etc. Lipids are present in seed, nut, fruits in plants and in animals it is found below subcutaneous layers, liver, bone marrow.

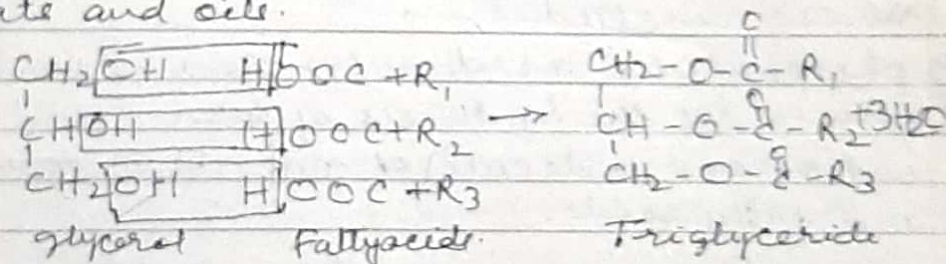
Classification of lipids :-

Lipids have been classified into three categories

## 1) SIMPLE LIPIDS :-

Lipids formed by the esterification of alcohol by fatty acids is known as simple lipids or Neutral lipids. These includes Fat, Oil and wax.

A) FAT & OILS :- Esters formed by combination of one molecule of glycerol and three molecules of fatty acids with the elimination of three water molecules known as fats and oils.



FATTY ACIDS A hydrocarbon chain having single carbonylic group at one end is called fatty acids. Those fatty acids which have single bond between carbon atoms, solid at room temperature and high melting point is called saturated fatty acids. Ex

Acetic acid  $\text{CH}_3\text{COOH}$ , Butyric acid  $\text{CH}_3(\text{CH}_2)_2\text{COOH}$   
Palmitic acid  $\text{CH}_3(\text{CH}_2)_{14}\text{COOH}$ , Stearic acid  $\text{CH}_3(\text{CH}_2)_{16}\text{COOH}$

Those fatty acids having one, two or more double bond between carbon atom, liquid at room temperature and low melting point called unsaturated fatty acids. Ex.

Oleic acid  $\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$

Linoleic acid  $\text{CH}_3(\text{CH}_2)_4\text{CH}=\text{CH}-\text{CH}_2-\text{CH}=\text{CH}(\text{CH}_2)_6\text{COOH}$

Some fatty acids such as Linoleic acid, Linolenic acids can not be synthesized in our body known as essential fatty acids.

### B) WAX :-

Ester of fatty acids formed by the combination with alcohol other than glycerol is called wax. Due to insoluble, indigestible and high melting point, these constitute protective and water resistant layer.

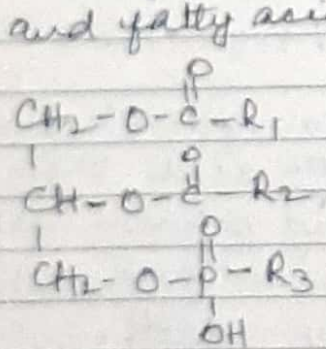
### 2) COMPOUND OR CONJUGATED LIPID :-

Lipids formed by addition of an additional chemical substance along with combination of fatty acid and alcohol are known as compound lipid.

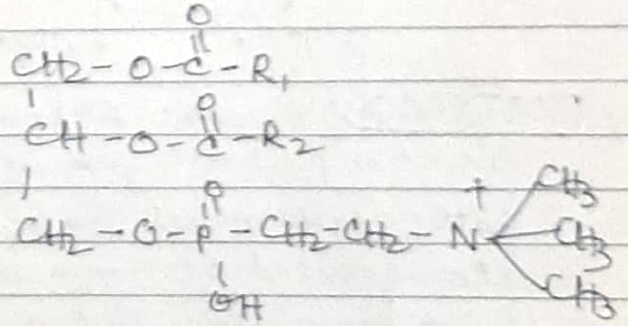
#### a) Phospholipid :-

Compound lipid having phosphorus as their additional chemical substance in the form of phosphoric acid and phosphate are known as phospholipids. These includes -

i) phosphatidic acid :- An intermediate compound formed by the synthesis of other lipid. It is composed of one molecule of glycerol, phosphoric acid and fatty acids.



Phosphatidic acid



Lecithin

#### ii) Lecithin :-

The lipids formed by one molecule of glycerol, two molecules of fatty acids, one molecule of phosphoric acid and one molecule of nitrogenous base choline is called lecithin.