

Lipids

Lipids: Are organic compounds including fats ,oils, steroids and waxes. They stored in adipose tissue of the body, they have insoluble in water and soluble in non- polar solvents suchas ether and chloroform.

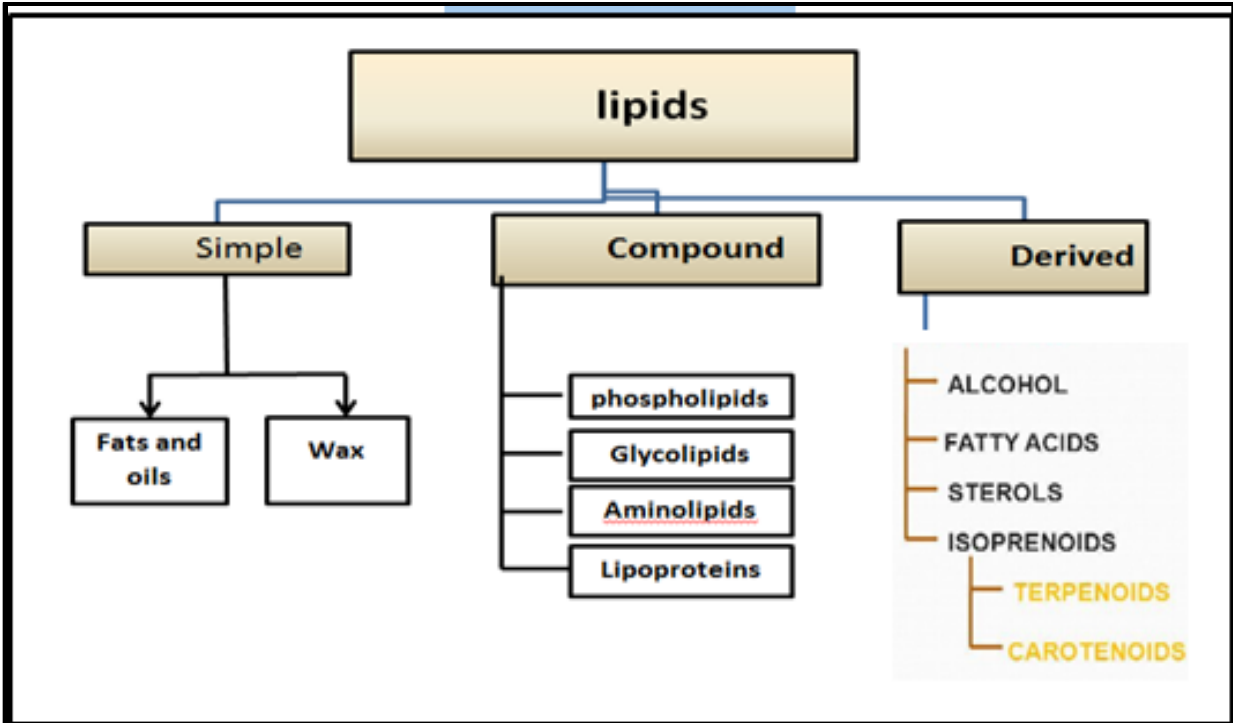
Functions of Lipids

- 1-Lipids are source of high energy value (1gm of fat =9 Calories).
- 2-Lipids are components of membrane structure and regulate the membrane permeability.
- 3- Lipids serve as a source of fat soluble vitamins (A, D, k and E).
- 4-Lipids protect the internal organs sever as insulating.

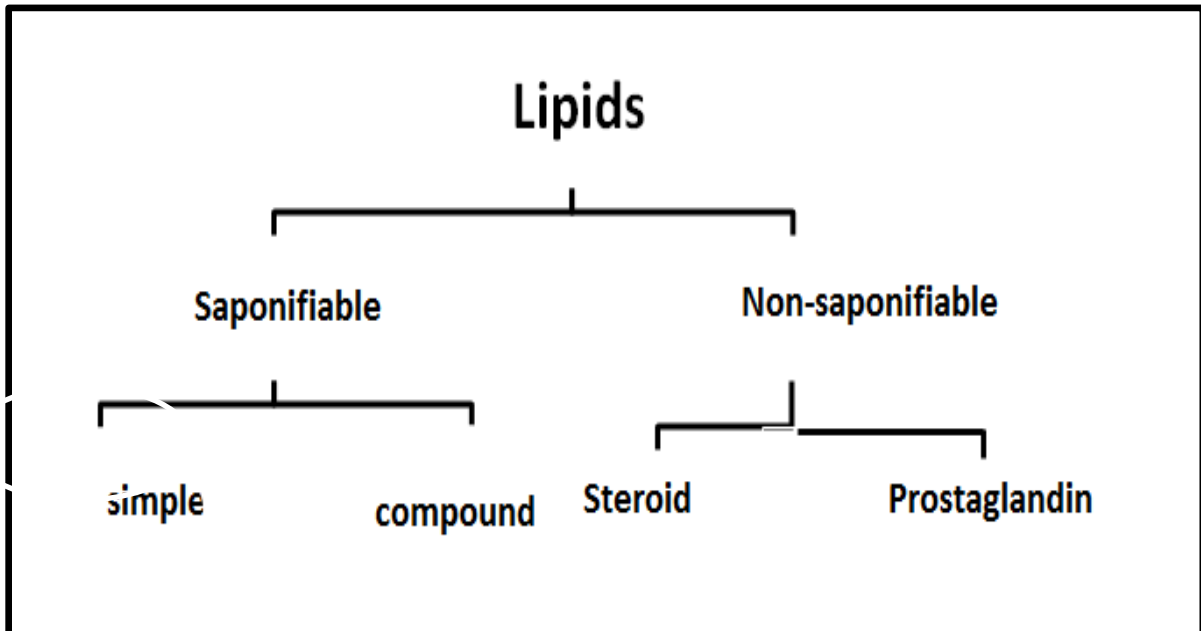
Classification of Lipids

Lipids classified in two classes:

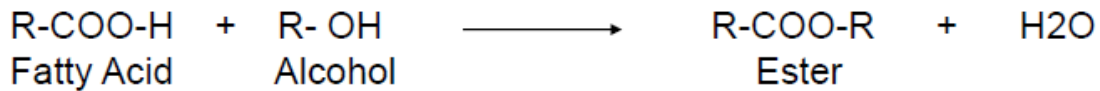
A. Based on the composition of lipids:



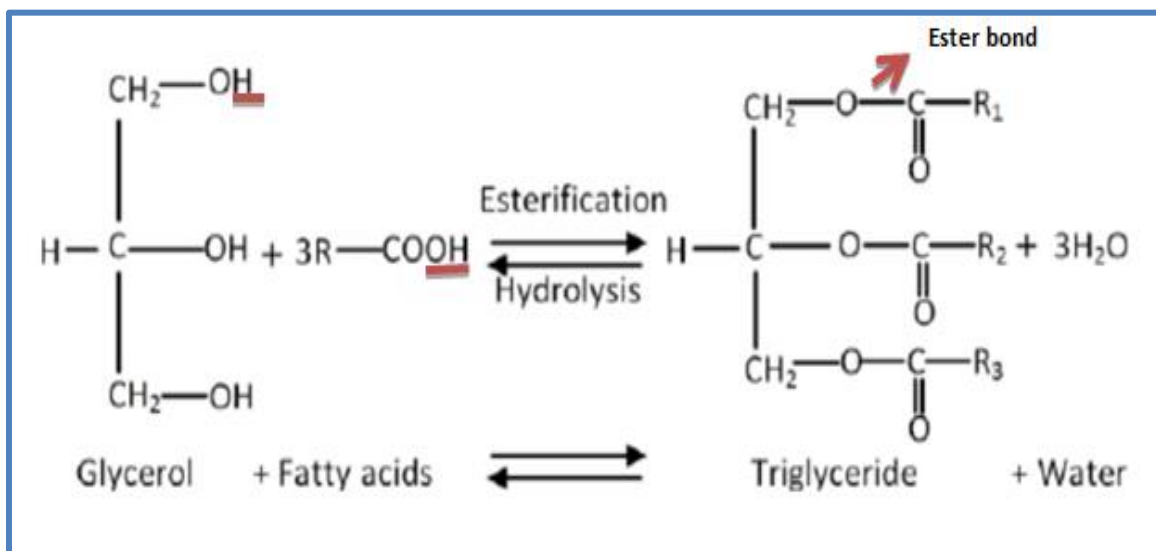
B. Based on saponifiable:



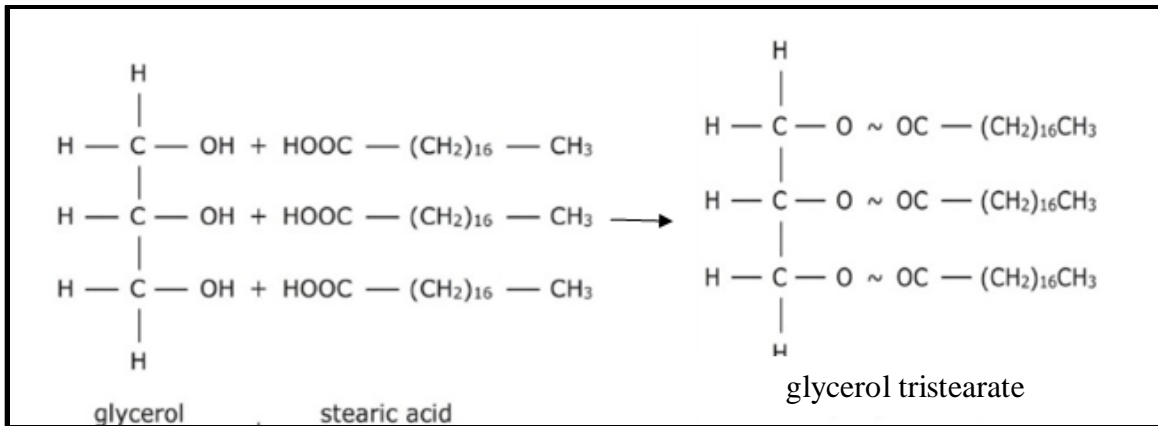
1.Simple Lipids: Are esters of fatty acids with different alcohols.



a. Fats and Oils: Are esters of fatty acids with glycerol. Oil is a liquid while fat is a solid at room temperature.



Triglyceride (Triacylglycerols): Are the esters of glycerol with fatty acids. They are insoluble in water and soluble in non-polar solvents and known as neutral fats. TG is a fuel reserves, for example three molecules of stearic and are linked to glycerol to produce glycerol tristearate .



b. waxes: Are esters of long chain alcohol and fatty acids as shown in fig (1). Waxes are insoluble in water and found in nature such as bees wax, its protective coating of skins of animals while carnauba wax was protective coating of leaves and fruits of plants.

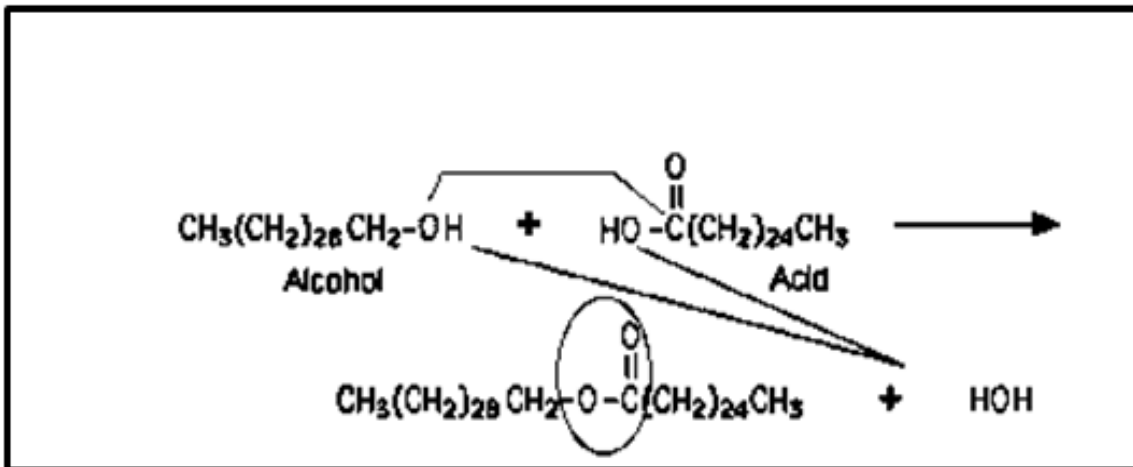


Fig (1): Structure of carnauba wax

2. Compound lipids: Esters of fatty acids with alcohols containing groups such as Phosphate, nitrogenous base, carbohydrate, protein, etc. They are divided into:

A-phospholipids: Lipids containing phosphoric acid, glycerol, fatty acid, nitrogenous base in their structure. Phospholipids are the major component of cell membranes. There are two classes of phospholipids:

Glycerol

- fatty acid
- fatty acid
- phosphoric acid-Nitrogenous compound

1. Glycerol phospholipids: These phospholipids contain glycerol as the alcohol e.g:

- Lecithin: Is a phosphoglycerid that contains the amino alcohol choline. It consists of (Glycerol + 2 fatty acid + phosphate + Choline) as shown in figure (2). Lecithin is found in egg yolk and soybeans and also a major component in the lipid bilayers of cell membranes.

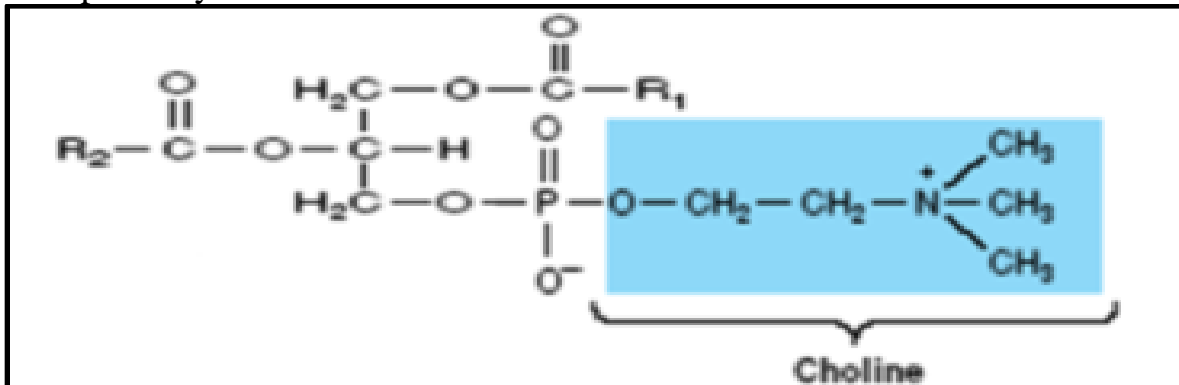


Figure (2) :Structure of lecithin

-Cephalin: Is a phosphoglycerid that contains the amino alcohol such as ethanolamine. It consists of (Glycerol + 2 fatty acid + phosphate + ethanolamine) as shown in figure (3). It is found in most cell membranes, particularly in brain tissues and also has an important role in the blood clotting process.

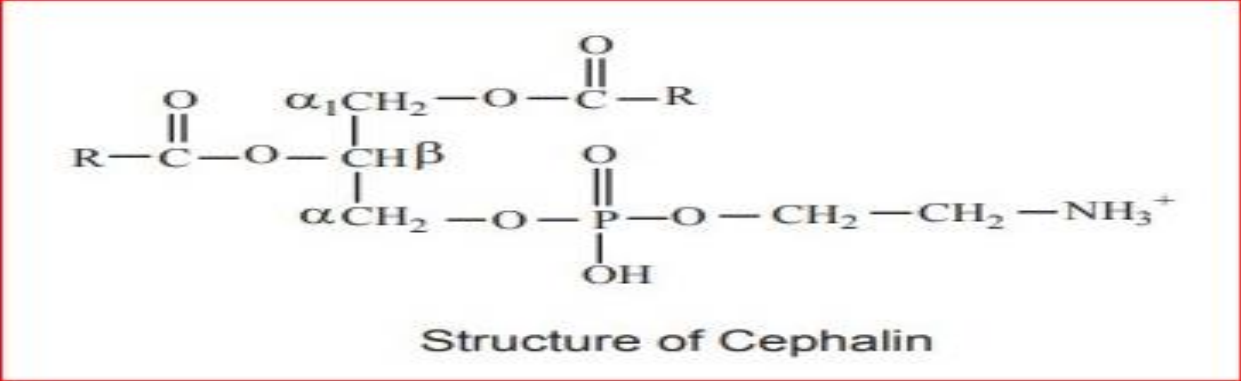


Figure (3):Structure of Cephalexin