

17/4/21 DTH (200.14)

STRUCTURE AND CLASSIFICATION OF LIPIDS

STRUCTURE:- Heterogeneous group of organic compounds of Carbon, hydrogen and oxygen containing more hydrogen and less oxygen in comparison to carbohydrates is known as lipid. This term was first proposed by Bloor. Lipids are in possession of following features:

- 1.) Lipids are insoluble in water but soluble in so called organic fat solvents like benzene, chloroform, ether, carbon disulphide, hot alcohol, petroleum, ether etc. Due to this reason these are regarded to be hydrophobic.
2. In plants, these are present in seeds, nuts and fruits. In animals, these are present as constituents of cells (subcutaneous layer serving as insulator of heat, pads of various organs, humps of camel source of reserve water), nervous tissue (myelin sheath - serving as insulator of electrical charges), liver and bone-marrow (reserve food). Lipid constitutes about 10-20 percent of the body weight of normal healthy human beings.
- 3.) Lipids are high energy yielding compounds. These serve as reserve food materials. Oxidation of one gram of lipid yields 9.3 calories of energy.
- 4.) Some lipids participate in the synthesis of hormones (steroids) vitamins and components of enzyme systems.

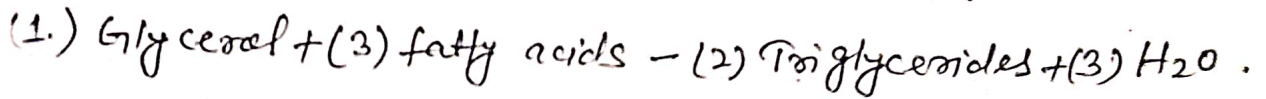
* Classification of Lipids

Lipids have been classified into following three categories

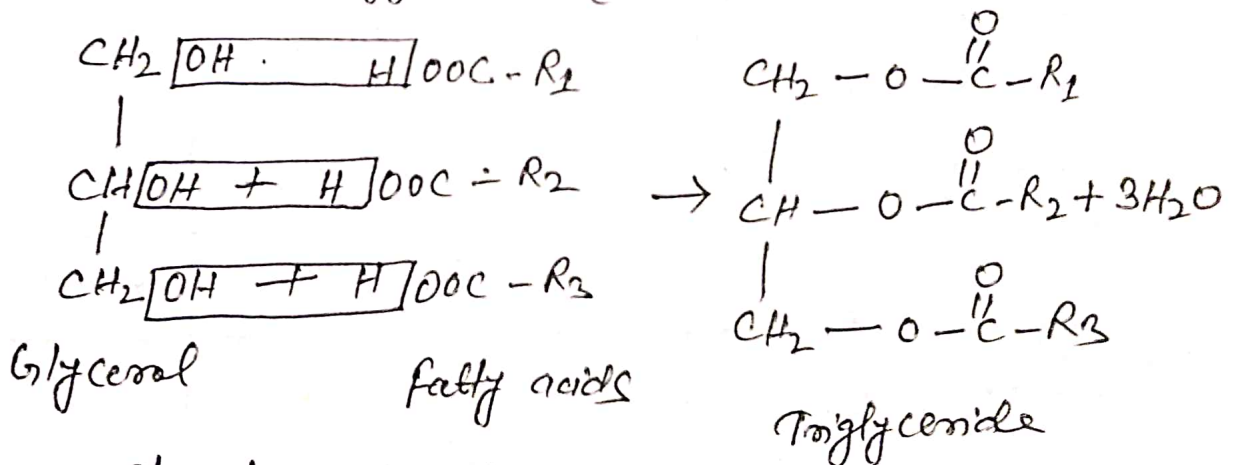
- 1.) Simple Lipids:- Lipids formed by the esterification of alcohol by fatty acids are known as simple lipids. Esters formed by the combination of alcohol and fatty acids are designated as simple lipids. These include fats and oils as well as waxes.

Categorization into fats and oils or waxes is based mainly on the type of alcohols combining with fatty acids.

Fats and oils:- Esters formed by the combination of glycerol and fatty acids are known as fats and oils. These have four parts, as these are formed by the esterification of one molecule of glycerol by three molecules of fatty acids. Due to this reason these are also known as triglycerides.



The synthesis of triglycerides takes place by condensation. The hydrogen ion H^+ of carboxyl group present at the end of each fatty acid combines with hydroxyl groups OH^- of glycerol resulting in the formation of three molecules of water and establishment of oxygen bonds (also known as ester bonds).



Three molecules of fatty acids participating in the synthesis of fats and oils may be of one kind or two kinds or three different kinds. When all the three molecules are of the same type the triglyceride is said to be simple otherwise it is known as mixed triglyceride.