

Denaturation of Proteins

- Disruption of the native conformation of a protein will cause the protein to lose its biological activity. This is called denaturation.
- Various changes in the surroundings of a protein such as pH, temperature, presence of salts or certain chemical agents can disrupt the complex three-dimensional structure (conformation) of the proteins.
- Due to physical and chemical changes, the H-bonds are disturbed.

Ex :(i) On boiling an egg the albumin get coagulated.
(ii) During formation of cheese from milk, the globular protein lactalbumin becomes fibrous.

Previous Year's Questions



Which structure(s) of proteins remain(s) intact during denaturation process?

[NEET-2019]

- (1) Both secondary and tertiary structure
- (2) Primary structure only
- (3) Secondary structure only
- (4) Tertiary structure only



Detection of Protein

- (1) **Millon's test:** Aqueous solution of protein (except tyrosine) gives a white precipitate with millon's reagent (Mercurous nitrate and mercuric nitrate in HNO_2).
- (2) **Xantho protein test:** Here, protein having tyrosine and phenyl alanine amino acids give a yellow colour when tested with conc. HNO_3
- (3) **Nin-hydrin test:** Protein on boiling with dilute aqueous solution of nin-hydrin (2, 4-dihydroxy indane-1, 3-dione) gives blue violet colouration.
- (4) **Biuret test:** Alkaline solution of proteins gives violet colouration with 1% copper sulphate solution due to formation of a complex between Cu^{2+} and the peptide linkage.

LIPIDS

- Lipids are generally not soluble in water
 - Lipids are simple fatty acids. Carboxyl group attached to an R group form fatty acids, it can be ethyl ($-\text{C}_2\text{H}_5$), or methyl ($-\text{CH}_3$) or higher number of $-\text{CH}_2$ groups (1 carbon to 19 carbons).
- Ex :** (i) palmitic acid has 16 carbons including carboxyl carbon.
(ii) Arachidonic acid contains twenty carbon atoms which includes the carboxyl carbon.
- Fatty acids contains saturated (without double bond) or unsaturated groups (with one or more than one $\text{C}=\text{C}$ double bonds).
 - Glycerol is another simple lipid which is trihydroxy propane.
 - Both glycerol and fatty acids makes many lipids. Fatty acids are found esterified with glycerol, therefore they can be monoglycerides, diglycerides and triglycerides.
 - Oils have lower M.P. (e.g., gingelly oil) and hence remain as oil in winters. These are also called oils and fats based on melting point.

Concept Ladder



The most widely used method for determining the N-terminal amino acid residue in a protein or a polypeptide molecule is called the DNP-method or Sanger's method.

Rack your Brain



What is difference between lipid and fat?

Previous Year's Questions



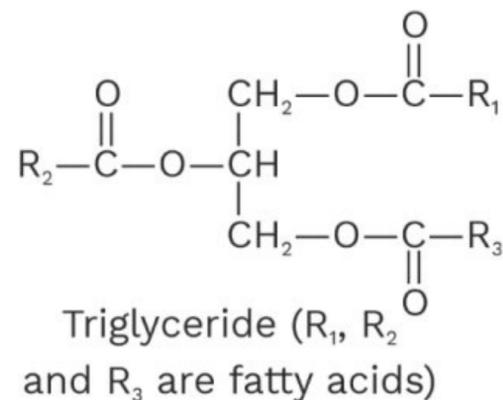
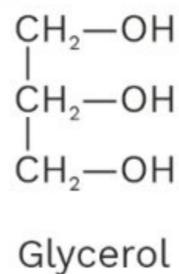
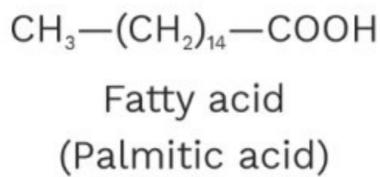
The cell membranes are mainly composed of

[AIPMT]

- (1) Fats
- (2) Proteins
- (3) Phospholipids
- (4) Carbohydrates



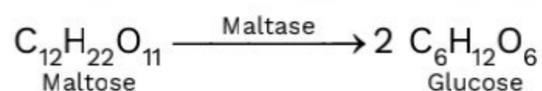
- Phospholipids are some lipids containing phosphorous and a phosphorylated organic compound in them. Lecithin is one example. They are found in cell membrane.
- Some tissues especially the neural tissues have lipids with more complex structures.



ENZYMES

- The biological catalysts which can increase the rate of biochemical reactions even under mild conditions of temperature and pH of living organisms are termed as enzymes.
- Enzymes are chemically similar to globular proteins.
- They are very specific for each reaction and for every substrate.
- They are usually named after the compound or group of compounds upon which they work.

Ex : The enzyme that catalyses hydrolysis of maltose into glucose is named as maltase



- After the reaction enzymes are also mentioned, where they are used.
- Ex :** Oxidoreductase enzymes are the enzymes which can catalyse the oxidation of one substrate and simultaneously reduce another substrate.
- They are very specific in their action on substrates and each enzyme catalyses only a specific type of reaction.

Concept Ladder



Iodine number is no. of grams of I_2 that combines with 100 g of fat or oil. It is used to measure extent of unsaturation in oil or fat.

Previous Year's Questions



Enzymes are made up of

[AIPMT]

- (1) Edible proteins
- (2) Proteins with specific structure
- (3) Nitrogen containing carbohydrates
- (4) Carbohydrates