

BIO MOLECULES

Globular proteins specific for particular reaction and for particular substrate.
Mechanism : Reduces the magnitude of activation energy

enzymes

carbohydrates

proteins

nucleic acids

vitamins

(Polymers of α - amino acids)

Amino acids contain $-NH_2$ and $-COOH$ groups.

Classification:

-On the basis of relative number of $-NH_2$ and $-COOH$ group

(i) Neutral - equal number of $-NH_2$ and $-COOH$ group

(ii) Basic - more number of $-NH_2$ than $-COOH$ group

(iii) Acidic - more number of $-COOH$ than $-NH_2$ group

-On the basis of place of synthesis

(i) Essential - cannot be synthesized in the body.

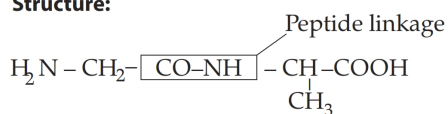
(ii) Non-essential - synthesized in the body.

-On the basis of shape

(i) Fibrous - fibre-like structure

(ii) Globular - spherical

Structure:



Denaturation of proteins :

When a protein in its native form is subjected to physical change, globules unfold, helix get uncoiled and protein loses its biological activity

Two types : Deoxyribonucleic acid (DNA), ribonucleic acid (RNA)

Deoxyribonucleic acid (DNA)

Ribonucleic acid (RNA)

Sugar is β-D-2-deoxyribose

Sugar is β-D-ribose

DNA Contains A=T, G=C

RNA Contains A=U, G=C.

Biological Functions :

- Chemical basis of heredity.

- Responsible for identity of different species of organisms.

- Nucleic acids are responsible for protein synthesis in cell.

Organic compounds required in diet in small amounts to perform specific biological functions for maintenance and growth

Classification:

(i) Fat soluble : Soluble in fats and oils but insoluble in water. (vitamins A, D, E and K)

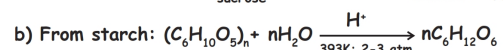
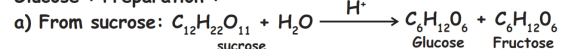
(ii) Water soluble : B group and vitamin C are soluble in water

Optically active polyhydroxy aldehydes or ketones or compounds which produce such units on hydrolysis

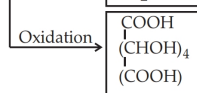
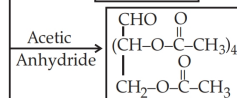
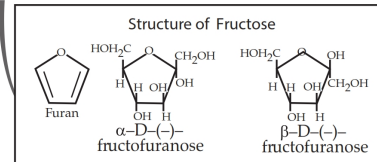
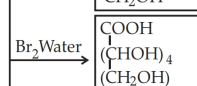
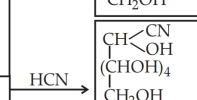
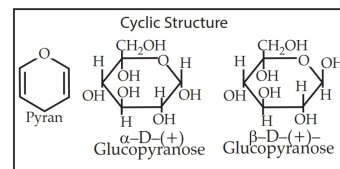
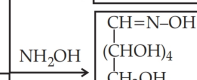
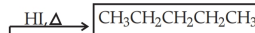
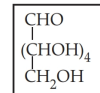
Classification:

(I) Monosaccharides : (Aldehyde group - aldose, keto group -ketose)

Glucose : Preparation :



Structure:



(ii) Disaccharides : Linkage between 2

monosaccharides- Glycosidic linkage

- 1) Sucrose-C-1 of α-glucose and C-2 of β-fructose
- 2) maltose-C-1 of α-D-glucose with C-4 of another α-D-glucose
- 3) lactose-C-4 of β-D-glucose with C-1 of β-D-galactose

(iii) Polysaccharides : Large number of monosaccharides units joined by glycosidic linkages.

(a) Starch : Polymer of α-glucose with two components amylose and amylopectin

(b) Cellulose: Polymer of β-D-glucose

(c) Glycogen: Animal starch-Polymer of glucose

Importance:

- Form a major portion of food.

- Cellulose forms cell wall of bacteria and plants.

- Raw materials for industries like textiles, paper, lacquers and breweries