

CARBOHYDRATE

Polyhydroxy aldehyde (aldose) or ketone (ketose) containing at least one chiral center

MonoSaccharides

Further hydrolysis is not possible (simple sugar). Ex: Glucose, Fructose, Ribose

OligoSaccharides

Yields two to ten monosaccharides. Ex: Sucrose, Maltose, Lactose

PolySaccharides

Yields a large number of monosaccharides units. Ex: Starch, Cellulose, Glycogen

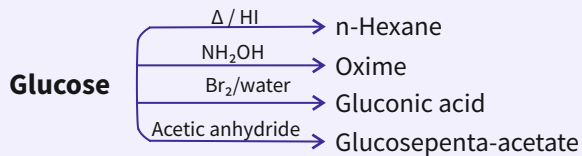
GLUCOSE

Preparation:-

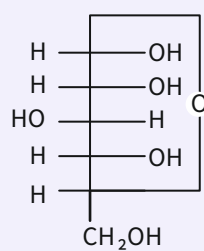
Sucrose $\xrightarrow{H^+}$ Glucose + Fructose

Starch + $nH_2O \rightarrow$ Glucose

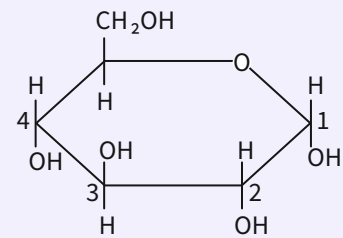
Chemical properties



Cyclic structure of glucose



[α -D-(+)-Glucose]
(Fischer Formula)



α -D-(+)-Glycopyranose
(Haworth structure)

Some Important Polysaccharides

Cellulose

It is found in plants. It contains β -D- glucose units connected vice glycosidic linkage

Starch

Polymer of α -glucose with two components **amylose** (15-20%) and **amylopectin** (80-85%)

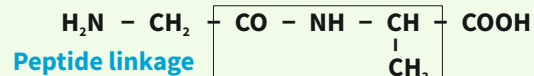
Glycogen

This is known as animal starch. It is present in liver, muscle and brain. It's structure is similar to amylopectin.

11. BIOMOLECULES

PROTEINS

Polymer of α -amino acids that contain $-NH_2$ and $-COOH$ group



CLASSIFICATION OF PROTEINS

On the Relative Number of $-NH_2$ and $-COOH$ Group

1. **Neutral:** equal no. of $-NH_2$ and $-COOH$ group.
2. **Basic:** More no. of $-NH_2$ than $-COOH$ group.
3. **Acidic:** more no. of $-COOH$ than $-NH_2$ group.

On the Basis of Place of Synthesis

1. **Essential amino acids** cannot be synthesized in the body.
2. **Non-essential amino acids** are synthesized in the body.

On the Basis of Shape

1. **Fibrous:** fibre like structure.
2. **Globular** protein.

Denaturation of Protein

When a protein in its native form is subjected to physical change, globules unfold, and proteins loses it's biological activity.

VITAMINS

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

CLASSIFICATION OF VITAMINS

Water Soluble: B group and vitamin C are soluble in water.

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

Enzyme

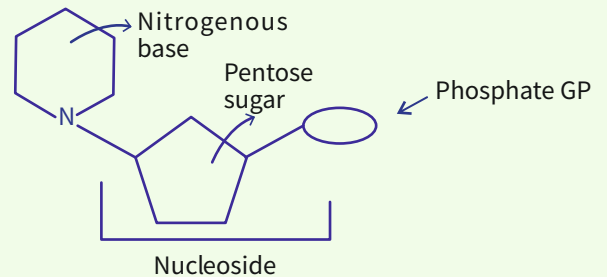
Globular proteins that are specific to a particular reaction and for a substrate.

Mechanism of enzyme action

Substrate $\xrightarrow{\text{Enzyme}}$ **Product**

NUCLEIC ACID

Particles of nucleus of the cell responsible for heredity are called chromosomes.



NUCLEIC ACID CHAIN

Base
|
Sugar - Phosphate - [Sugar - Phosphate] - Sugar
Base

DEOXYRIBONUCLEIC ACID (DNA)

Compound of sugar
 β -D-2 deoxyribose

RIBONUCLEIC ACID (RNA)

Compound of Sugar
 β -D-ribose

Bases that make up DNA and RNA

Adenine (A)
Guanine (G)
Cytosine (C)
Thymine (T)
Uracil (U)

Types of RNA:
m-RNA, r-RNA, t-RNA

HORMONES

Molecules that are synthesised by endocrine glands to control and regulate the functioning of specific organs.

Steroids

Polypeptides

Amino Acids