



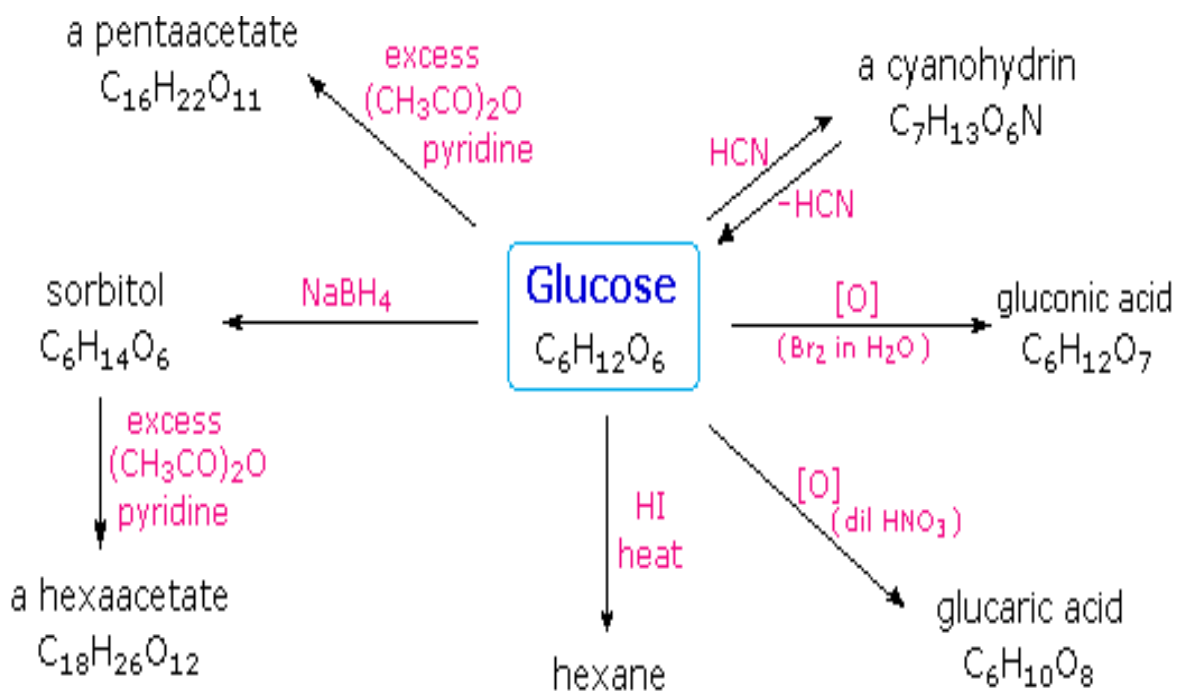
# AL-Mustaqbal University College

## Radiology Techniques Department

### First Class

### Practical General Chemistry

### First Lecture (Carbohydrates)





## **Introduction:**

**Carbohydrates:-** are organic compounds made up of hydrogen and oxygen. Carbohydrates are known as aldehyde derivatives or Ketone alcoholic derivatives. Polyhydroxyls (OH), or compounds that give these derivatives by its hydrolysis, it generally has a sweet taste and is therefore used in foods and drinks for sweetening.

The word sugar is used in everyday life to denote sugar. Sucrose used daily is a type of sweet sugar that is obvious. It is also called table sugar, similar to the name table salt (sodium chloride).

## **Definition of carbohydrates**

They are dehydrates or poly hydroxyl ketones of the formula  $C_nH_{2n}O_n$ .

## **Uses of Carbohydrates:**

1- A large source of energy, as the result of its decomposition and oxidation of energy used in Biochemical reactions of all living things.

2- The chemical energy derived from carbohydrates is stored in the form of compounds Rich in energy as ATP and GTP.

3- Carbohydrates are involved in the structural structure of the cell wall.

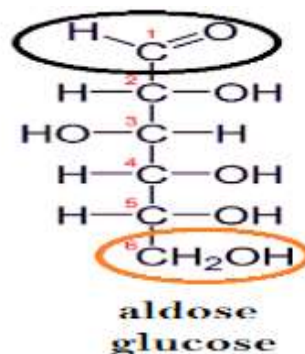
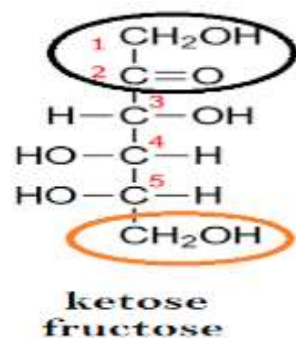
4- Fuel of the central nervous system: so that the brain and the rest of it can Parts of the central nervous system perform their functions in regulating the body.

### Classification of carbohydrates

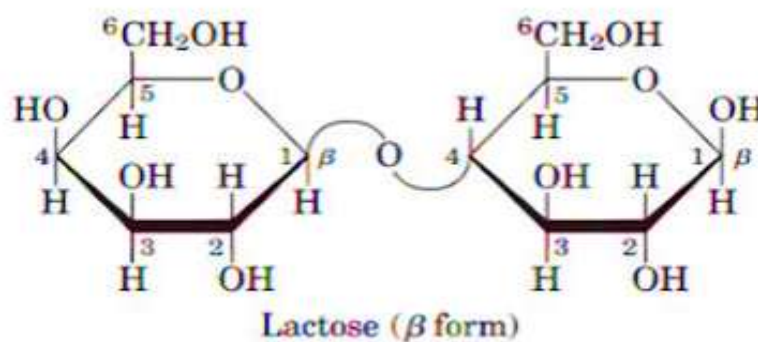
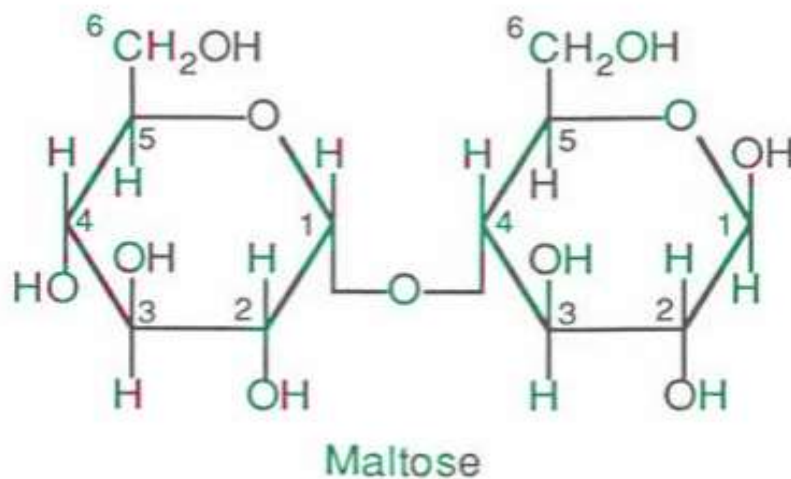
Carbohydrates are divided into three main categories according to the building blocks they are it contains sugar .

1-Monosaccharides: They are sugars that cannot be broken down into smaller units by Hydrolysis, these are sometimes called simple sugars, and they include polysaccharides Trioses , Tetroses, Pentoses, Hexoses.

A monosaccharide is called aldose if an atom is present the carbonyl is at the end of the chain of carbon atoms, but if it is found on one the other carbon atoms are called ketose.



2-Diabetes disaccharides: They are the sugars resulting from the combination of two parts of the hex monosaccharides. Its general symbol is  $C_{12}H_{22}O_{11}$ , the most important of which are sucrose, maltose, and lactose. Where it hydrolyses into two units of monosaccharides, which are sugars common in the vegetable kingdom, such as cane sugar and grapes, as it is found in the milk.



3-Polysaccharides They are long straight or branched polymer chains produced for the interconnection of one or more frequent monosaccharides by a glycosidic bond with a water partial deletion.



## The reactions of carbohydrates:

✚ Molisch test : The test solution is combined with a small amount of Molisch's reagent ( $\alpha$ -naphthol dissolved in ethanol) in a test tube. After mixing, a small amount of concentrated sulfuric acid is slowly added down the sides of the sloping test-tube, without mixing, to form a layer. A positive reaction is indicated by appearance of a purple red ring at the interface between the acid and test layers

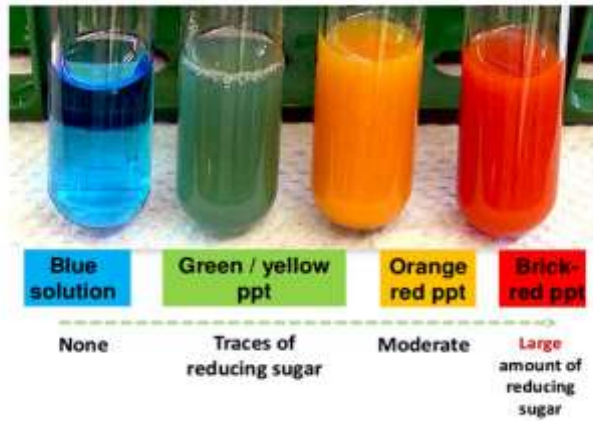


✚ Seliwanoff's's test: is a chemical test which distinguishes between aldose and ketose sugars. If the sugar contains a ketone group, it is a ketose. If a sugar contains an aldehyde group, it is an aldose. This test relies on the principle that, when heated, ketoses are more rapidly dehydrated than aldoses. It is named after Theodor Seliwanoff, the chemist that devised the test. When added to a solution containing ketoses, a red color is formed rapidly indicating a positive test. When added to a solution containing aldoses, a slower forming light pink is observed instead.



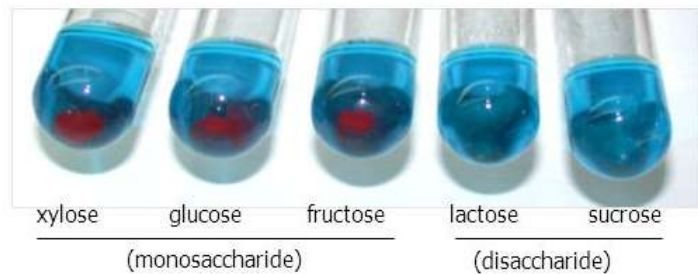


## + Test benedict :



## + Test barfoed:

Barfoed's test  
(test for monosaccharides)



## + The Iodine test

