

QUALITATIVE ANALYSIS OF CARBOHYDRATES

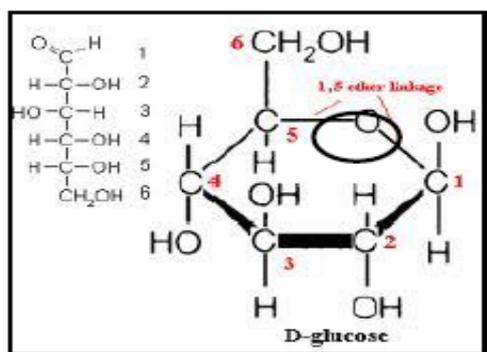
A carbohydrate is an organic compound with the general formula $C_n(H_2O)_n$, that is, consists only of carbon, hydrogen and oxygen, with the last two in the 2:1 atom ratio. Carbohydrates make up the bulk of organic substances on earth and perform numerous roles in living things. Carbohydrates are the key source of energy used by living things. Carbohydrates are defined as the polyhydroxy aldehydes or polyhydroxy ketones.

2. Complex sugar (more than one) :

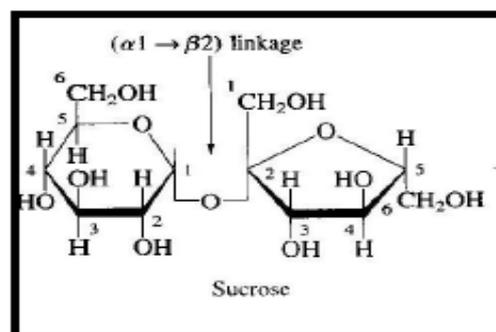
- ✚ Disaccharides are condensation products of two monosaccharide units; examples are maltose and sucrose
- ✚ Oligosaccharides are condensation products of three to ten monosaccharides.. Such as arabinose
- ✚ Polysaccharides are condensation products of more than ten monosaccharide units; Such as starch , glycogen and dextrin . all of these types serves as a source of energy .

Reducing and non reducing sugars

Reducing and non reducing sugar :If the oxygen on the anomeric carbon of a sugar is not attached to any other structure, that sugar can act as a reducing agent and is termed a reducing sugar.



reducing



Non-reducing

Activate
Go to Settings to

Chemical Properties of Carbohydrates:

1. **Molisch Test:** specific for all carbohydrates.
2. **Iodine Test:** specific for starch.
3. **Benedict's Test:** presence of reducing sugars.
4. **Barfoed's Test:** test used for detecting the presence of monosaccharides.
5. **Bial's Test:** used to detect pentose [5C] monosaccharides.
6. **Seliwanoff's Test:** distinguish between aldoses and ketoses.

1. Molisch test

This test is specific for all carbohydrates. Monosaccharide gives a rapid positive test, Disaccharides and polysaccharides react slower. based on the dehydration of the carbohydrate by sulfuric acid to produce an aldehyde, which condenses

Activate Wir
Go to Settings to

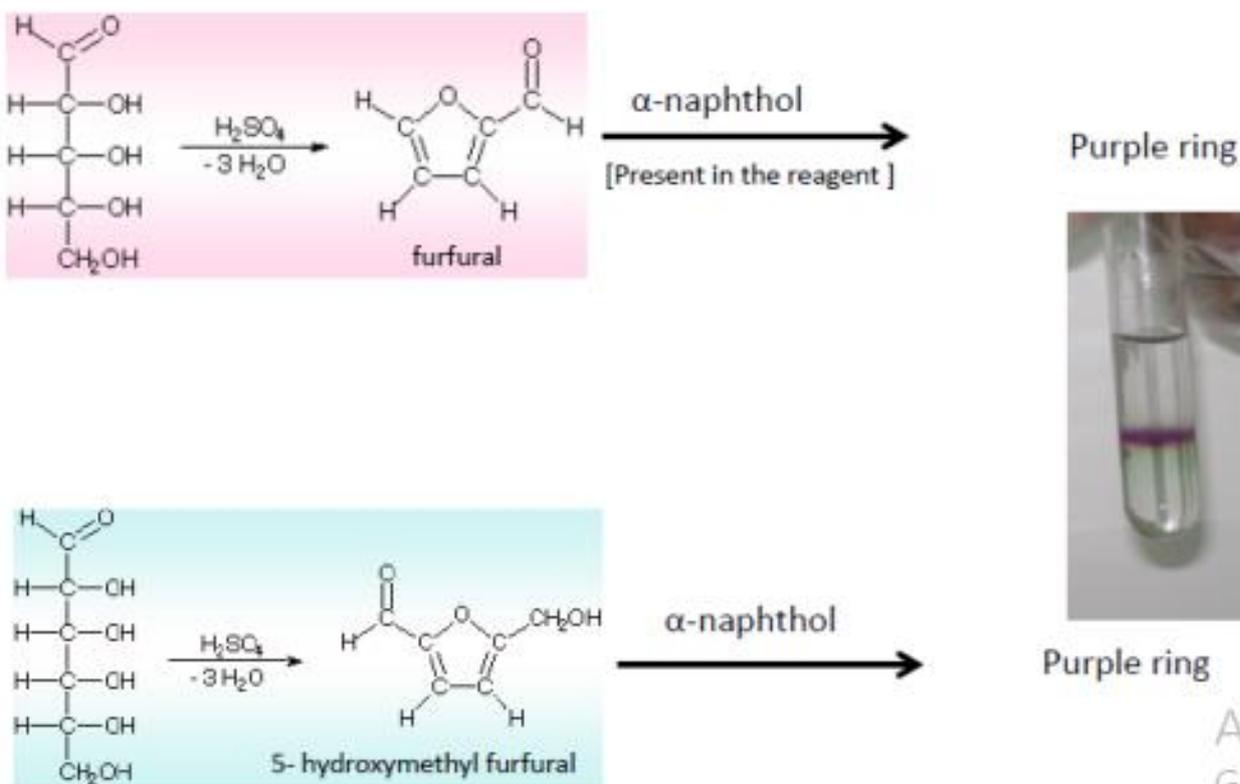
Lab. 3 -----medical chemistry----- Ass. lec. Ali Ihssan

with two molecules of phenol (usually α -naphthol, resulting in a red- or purple-colored compound.

Objective: To identify the carbohydrate from other macromolecules, lipids and proteins.

Principle:

- ❖ The test reagent(H_2SO_4) dehydrates pentose to form furfural and dehydrates hexoses to form 5- hydroxyl methyl furfural.
- ❖ The furfural and 5- hydroxyl methyl furfural further react with α -naphthol present in the test reagent to produce a purple ring.



Activa
Go to Se

Method :

1. Two ml of a sample solution is placed in a test tube.
2. Two drops of the Molisch reagent (which α -naphthol in 95% ethanol) is added.
3. The solution is then poured slowly into a tube containing two ml of concentrated sulfuric acid so that two layers form, producing violet ring appear as liaison between the surface separations.