



## Lect.1

### Carbohydrates:

A carbohydrate is a consisting of carbon (C), hydrogen (H) and oxygen (O) atoms, usually with a hydrogen–oxygen atom ratio of 2:1 (as in water); in other words, the general formula  $C_n (H_2O)_n$ .

carbohydrate defined as polyhydroxy aldehydes or polyhydroxy ketone or compounds which give them on hydrolysis .

Carbohydrates can be classified into three group.

1- Monosaccharides: These are The simple Carbohydrates.

2-Di saccharides : are formed by the two Monosaccharides molecule the Monosaccharides are connected by glycoside bond .

3-Oligosaccharides :they are formed by (from 3 to 10) Monosaccharide's.

4- Polysaccharides. they are formed by alarge number of Monosaccharides molecules .

they are general divided into two groups.

1-Homo Polysaccharides: they are Polysaccharides made the same kind of Monosaccharides units , such starch, glycogen .

2- Hetro Polysaccharides: they are Polysaccharides made the different kind of Monosaccharides units , such starch . such polymer of glucose .

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Chemical type of carbohydrates

Sugars can be divided in two groups

**1- Reducing sugars:**

Reducing sugars are sugars those which have potentially active aldehyde or ketone group in their structure . these sugars have a free anomeric carbon atom. Therefore they have ability to reduce other substance .

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**2 - Non Reducing sugars:**

their anomeric carbon atom are engaged in making bond with each other, they do not a free aldehyde or ketone group in their structure. They cannot reduce other substance.

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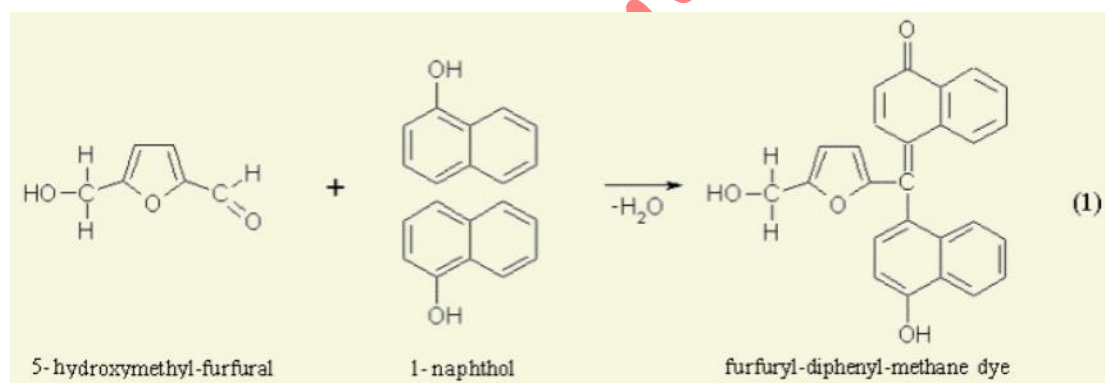
One Experiment Test for carbohydrate

Molisch's test

**Object :** To detect the carbohydrate in the given by solution by Molisch's test.

**Principle :**

The Molisch test is a general test for all carbohydrates, the polysaccharides and disaccharides by  $H_2SO_4$  con into monosaccharide's are dehydrated by  $H_2SO_4$  con. to form furfural or hydroxyl methyl furfural in the presence of  $H_2SO_4$  con . The alpha-naphthol reacts with the cyclic aldehydes to form violet colored.



**Reagents**

1-sugar solution    2- alpha-naphthol    3-  $H_2SO_4$  con

Molisch reagent prepared by dissolving 1gm of alpha-naphthol in 95% ethanol alcohol and making the volume up to 100ml.

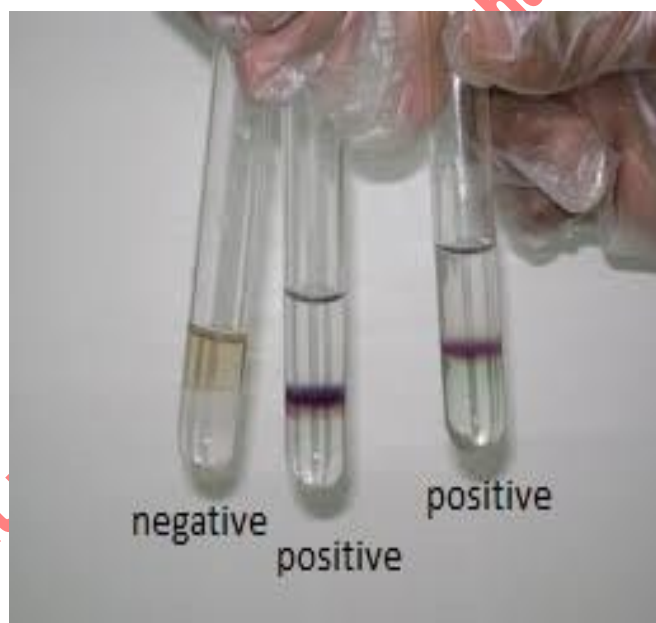
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Procedure

Add 2 drops of Molisch reagent to 2 ml of the sugar solution and mix thoroughly.

Incline the tube, and GENTLY pour 5 ml of concentrated  $H_2SO_4$  down the side of the test tube.

A purple color at the interface of the sugar and acid indicates a positive test.



(Molisch test)