



Ministry of Higher education and Scientific Research

Al- Mustaqbal University

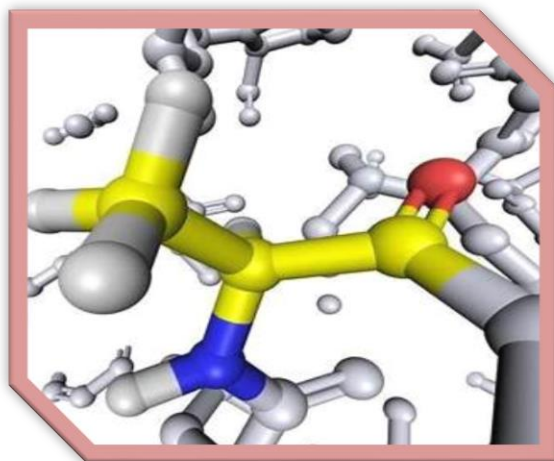
College of Science

MSC.Saja Jawad Abaid

Saja.Jawad.Abaid@uomus.edu.iq

Lecture (3)

Qualitative Analysis Of Carbohydrates –Fructose



Qualitative Analysis of Carbohydrate – Fructose

Introduction

Fructose is a monosaccharide belonging to the ketose family, also known as fruit sugar. It occurs naturally in fruits, honey, and fruit juices and is commonly used as a sweetener in various food products. Fructose can be identified using qualitative chemical tests that react with specific reagents.

Qualitative Tests for Fructose

1- Molisch's Test

Purpose: General test for carbohydrates.

Reagent: α -naphthol in ethanol (Molisch's reagent).

Reaction:

-A few drops of Molisch's reagent are added to the fructose solution, followed by careful addition of concentrated sulfuric acid.

-The formation of a violet ring at the interface indicates the presence of carbohydrates.

2- Benedict's Test

Purpose: Detecting reducing sugars, including fructose.

Reagent: Benedict's solution (contains copper sulfate, sodium citrate, and sodium carbonate).

Reaction:

-The fructose solution is heated with Benedict's reagent for a few minutes.

-The color changes from blue to green, then orange, and finally red, confirming the presence of a reducing sugar.

3- Barfoed's Test

Purpose: Differentiating between monosaccharides and disaccharides.

Reagent: Barfoed's solution (contains copper acetate in an acidic medium).

Reaction:

-When heated with Barfoed's reagent, fructose forms a red precipitate of cuprous oxide (Cu_2O) within 2-3 minutes, indicating it is a monosaccharide.

4- Seliwanoff's Test

Purpose: Distinguishing between ketose (fructose) and aldose (glucose) sugars.

Reagent: Resorcinol and concentrated hydrochloric acid.

Reaction:

-When heated with Seliwanoff's reagent, fructose rapidly develops a red color, indicating the presence of a ketose sugar.

-Glucose also gives a red color but takes longer to react.

5- Fluoroglucinol Test

Purpose: Specific qualitative test for fructose.

Reaction:

-When mixed with fluoroglucinol in an acidic medium, fructose produces a characteristic red color.

Distinguishing Between Fructose and Glucose

Test	Fructose	Glucose
Molisch's	Positive	Positive
Benedict's	Positive	Positive
Barfoed's	Positive	Positive
Seliwanoff's	Red color appears quickly	Red color appears after a delay
Fluoroglucinol	Positive (red color)	Negative

Fructose is an important monosaccharide that can be identified using several qualitative tests. Seliwanoff's test helps differentiate it from glucose, while Benedict's test confirms its reducing sugar nature. These tests are useful for detecting fructose in food samples and biological materials.