



Ministry of Higher education and Scientific Research

Al- Mustaqbal University

College of Science

M.S.C. SAJA JAWAD ABAID

SAJA.JAWAD.ABAID@UOMUS.EDU.IQ

LECTURE (2)

QUALITATIVE ANALYSIS OF CARBOHYDRATES - GLUCOSE



LECTURE ON QUALITATIVE ANALYSIS OF CARBOHYDRATES - GLUCOSE

1-Introduction to Carbohydrates .

Carbohydrates are organic molecules made up of carbon, hydrogen, and oxygen, and are one of the most important sources of energy in the body. Carbohydrates can be classified into simple sugars (such as glucose and fructose) and complex sugars (such as starch and cellulose). Glucose is one of the simple sugars and is considered the main source .of energy in the body

2-What is glucose.

Glucose is a monosaccharide sugar consisting of six carbon atoms. It has the chemical formula $C_6H_{12}O_6$. Glucose is absorbed from foods in the body and is used in metabolic processes to produce energy. Glucose is found in nature in the form of a liquid or crystals

3-Importance of Qualitative Analysis of Glucose .

Qualitative analysis is a set of methods used to detect the presence of a specific compound in a given sample. For glucose, qualitative analysis is used to determine whether .glucose is present in the sample or not

4-Qualitative Glucose Analysis Methods

A) Tollens Test

- .-This test is used to detect reducing sugars such as glucose
- -Glucose has a hydroxyl group (-OH) that can reduce silver nitrate solution (AgNO_3) in an alkaline environment
- -If the sample contains glucose, a reaction occurs in which a layer of metallic silver is formed on the wall of the tube, giving a positive result

B) Benedict's Test

- -.It is used to detect reducing sugars, such as glucose
- - Benedict's solution is added to the sample and heated. If the sample contains glucose, the solution will change color from blue to orange or red depending on the concentration of glucose

C) Molisch's Test

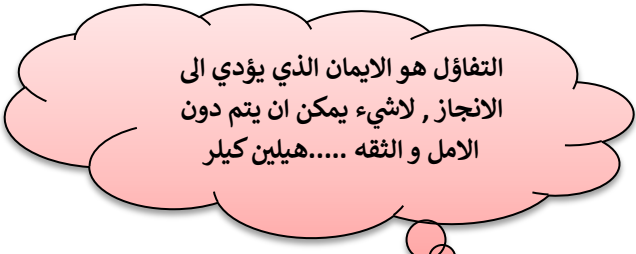
- This test reacts with all sugars, whether monosaccharides •
or polysaccharides
- It involves adding alpha-naphthol solution with •
concentrated sulfuric acid to the sample. If the sample
contains glucose, a violet color is formed upon reaction

d) Fehling's Test

- Glucose reacts with Fehling's solution (which contains •
copper hydroxide) to reduce copper ions (Cu^{2+}) to red
copper, resulting in a strong red color

5-Chemical Reactions That Occur

- Glucose contains an aldehyde group ($-\text{CHO}$) that reacts •
with different chemical solutions such as Benedict's or
Tyndall's solution to produce characteristic results
- Oxidation-reduction reactions are the basis for glucose •
detection



التفاؤل هو الايمان الذي يؤدي الى
الانجاز , لاشيء يمكن ان يتم دون
الامل و الثقة هيلين كيلر