Ministry of Higher education and Scientific Research

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LECTURE (5)

(QUALITATIVE ANALYSIS OF CARBOHYDRATE – MALTOS)

Practical Lecture on the Qualitative Analysis of Carbohydrates - Maltose

Qualitative analysis of carbohydrates involves various tests that help identify different types of carbohydrates, including disaccharides like maltose. Maltose is a disaccharide composed of two glucose molecules linked by a glycosidic bond.

:Here are the steps for the qualitative analysis of maltose

1- Fehling's Test .

:Materials Needed

- **(Fehling's solution A (Copper(II) sulfate**
- **(Fehling's solution B (Alkaline tartrate solution**

:Procedure

- **.Add a few drops of the maltose solution into a test tube**
- **.Add equal volumes of Fehling's solution A and B**
- **.Heat the mixture gently in a boiling water bath**

- If maltose is present, the solution will change from blue to red or orange due to the formation of copper(I) oxide (Cu_2O).

Interpretation:

Maltose is a reducing sugar, which means it contains an aldehyde group capable of reducing copper(II) ions to copper(I) oxide.

2-Molisch's Test

Materials Needed:

- Molisch's reagent (α-naphthol in ethanol)
- Concentrated sulfuric acid (H_2SO_4)

Procedure:

- Add a few drops of Molisch's reagent to the maltose solution in a test tube.
- Carefully add concentrated sulfuric acid along the side of the test tube to form a layer at the bottom.
- If a purple or violet ring forms at the interface between the acid and the solution, it indicates the presence of carbohydrates.

:**Interpretation**

Molisch's test reacts with all carbohydrates to produce a purple or violet ring due to the formation of an aromatic compound, which confirms the presence of carbohydrates .in the sample

3 -Benedict's Test .

:**Materials Needed**

- **Benedict's reagent (a blue solution containing copper(II) (sulfate**
- **(Heat source (e.g., a boiling water bath**

:**Procedure**

1. **.Add a few drops of maltose solution to a test tube**
2. **.Add Benedict's reagent to the tube and mix**
3. **.Heat the mixture in a boiling water bath**
4. **A positive result will cause the solution to change color from blue to green, yellow, orange, or red, depending on .the amount of reducing sugar present**

:**Interpretation**

Benedict's test detects reducing sugars like maltose, which can reduce copper(II) ions to copper(I), forming a .colored precipitate

4-(Iodine Test (for Starch Presence) .

Although this test is generally used for starch detection, it .can be used to differentiate between starch and maltose

:Materials Needed

- **(Iodine solution (KI in water**

:Procedure

- **Add a few drops of iodine solution to the maltose .solution**
- **If no blue color develops, this indicates that starch is absent, as iodine typically forms a blue complex with .starch**

:Interpretation

Maltose does not react with iodine to form a blue color, .differentiating it from starch

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THANK YOU AND GOOD LUCK