Chemistry Practical Class 12 Tests of Carbohydrates Fats and Proteins in Pure Samples and Their Detection in Given Food Stuffs Viva Questions with Answers

Q1: Name the tests for Carbohydrates.

Answer:

- ***Molisch's test*** - Given a sample of food and Molisch's reagent, the presence of carbohydrates is confirmed by a purple or violet ring.
- ***Fehling's test*** - Given a sample of food and Fehling's reagent, the presence of carbs is confirmed by a red precipitate.
- ***Benedict's test*** - Given a sample of food and Benedict's reagent, the presence of carbs is confirmed by a red precipitate.
- ***Tollen's test*** - Given a sample of food and Tollen's reagent, the presence of carbs is confirmed by a silver mirror.
- ***Iodine test*** – Given sample food + iodine solution – the blue colour solution confirms the presence of starch.

Q2: Name the bond which holds the monomer units of proteins together.

Answer:

Peptide bonds are the bonds that hold together the monomer units of proteins.

Q3: What is the colour of precipitate formed if Millon's reagent is added to a food solution having proteins?

Answer:

When Millon's reagent is introduced to a food solution containing proteins, a yellow colour precipitate develops.

Q4: What is called denaturation of proteins?

Answer:

Protein denaturation causes secondary and tertiary structures to be disrupted and potentially damaged. Because denaturation reactions aren't strong enough to break peptide bonds, the primary structure (amino acid sequence) remains unchanged after the procedure.

Q5: Give two examples of monosaccharides and disaccharides.

Answer:

Two examples of monosaccharides are Glucose and Fructose.
Two examples of disaccharides are Sucrose and Maltose.

Q6: What is Tollen's reagent?

Answer:

A solution made by diluting $AgNO_3$ with NaOH and then dissolving the ppt with NH_4OH.

Q7: Name the tests for Proteins.

Answer:

- ***Biuret test*** – Given specimen food + Aq. copper sulphate → Violet colouration proves the presence of Proteins
- ***Xanthoproteic test*** – Sample food + Nitric acid → Yellow colour solution proves the presence of proteins.
- ***Millon's test*** – Given sample food + Mercuric sulphate in the presence of sodium nitrite and sulfuric acid → Brick red colour solution proves the presence of proteins.
- ***Ninhydrin test*** – Sample food + Pyridine solution of ninhydrin → Violet colour solution confirms the existence of proteins.

Q8: Why do we get a shining mirror in Tollen's test?

Answer:

Silver deposits on the test-tube walls due to the production of silver.

Q9: What is the purple ring formed in Molisch's test?

Answer:

Cone. H_2SO_4 transforms carbohydrates into furfural or a furfural derivative, which subsequently interacts with a- naphthol to produce a violet-coloured molecule.

Q10: What is the difference between oils and fats?

Answer:

At room temperature, oils are liquids. They have a higher proportion of unsaturated acids than fats, which are solid at room temperature and have a higher proportion of saturated acids.

Q11: Name two tests for testing fats or lipids.

Answer: (i) Solubility test (ii) Acrolein test.

Q12: What is the name given to the reaction between protein and conc. HNO_3?

Answer: Xanthoprotein reaction.

Q13: Explain why fructose reduces Fehling's solution and Tollen's reagent despite the presence of a ketonic group.

Answer:

In an alkaline medium, fructose rearranges to glucose, and both are in equilibrium (Lobry de Bruyn-van Ekenstein rearrangement).

Q14: What are Fehling A and Fehling B solutions?

Answer:

Fehling solution A is a copper sulphate solution, while Fehling solution B is a combination of sodium potassium tartrate and sodium hydroxide solutions.

Q15: Do all the sugars give Fehling solution test?

Answer:

No, only reducing sugars like glucose and fructose give this test.

Q16: What are carbohydrates?

Answer:

Carbohydrates are polyhydroxy aldehydes or polyhydroxy ketones, or the compounds that hydrolyze to produce them.

Q17: How will you distinguish between sucrose and glucose?

Answer:

Since glucose is a reducing sugar, it will create a positive silver mirror test (Sucrose is a non-reducing sugar).

Q18: What is the role of citrate ions in Benedict's solution?

Answer:

It works as a complexing agent, preventing copper (II) hydroxide precipitation.

Q19: What are proteins?

Answer:

Proteins are complex nitrogenous organic compounds with high molecular weights that occur naturally. They are polypeptides made up of alpha-amino acids that have been condensed chemically.

Q20: What is the Biuret test for proteins?

Answer:

In a test tube, add an equal quantity of 10% NaOH solution to 2-3 ml of protein solution. Add a few drops of 0.5% copper sulphate solution and thoroughly mix. A purple-violet colour is achieved if protein is present.

Q21: Why do we get a red ppt. in Fehling's test?

Answer:

Because of the formation of cuprous oxide (Cu_2O).

Q22: Give the functions of carbohydrates.

Answer:

1. To provide energy to the organism in the form of biofuel and to store chemical energy in the form of glycogen in the liver.
2. It is a component of cell membranes.