

LAB Sugar, Protein, and Complex Carbohydrate Tests

Last Name _____, First _____ per _____

**Safety: Use safety goggles. Avoid skin contact. (Flush with water if contact occurs).
Solutions used in these tests are corrosive.**

Food Test 1: Sugar Test-Benedict's solution

Benedict's solution is used to test for simple sugars, such as glucose. It is a clear blue solution of sodium and copper salts. In the presence of simple sugars, the blue solution changes color to green, yellow, and brick-red, depending on the amount of sugar. The molecular formula for glucose is (C₆H₁₂O₆). Sugar contains the elements carbon, hydrogen and oxygen.

1. Mix small amount of each food sample with water to make a test liquid.
2. To a test tube, add 20 drops of liquid to be tested.
3. Label each test tube with tape and a marker.
4. Add 10 drops of Benedict's solution to each test tube. Carefully heat the test tubes by suspending in a hot water bath at about 70 degrees celsius for three minutes.
5. Note any color change. If sugar is present solution will turn green, yellow, or brick-red, depending on sugar concentration.

Type of Food	Benedict's Color Change	Contains Sugar yes or no

Food Test 2: Protein Test - Biuret solution

Biuret solution is used to identify the presence of protein. Biuret reagent is a blue solution that, when it reacts with protein, will change color to pink-purple. Proteins are large organic molecules that contain the elements carbon, hydrogen, oxygen, nitrogen, and sometimes sulfur. Like sugar, proteins also contain carbon. Carbon is sometimes referred to as the element of life because it is found in organic compounds.

1. To a test tube, add 20 drops of liquid to be tested.
2. If testing more than one liquid, label each test tube with a marker.
3. Add 3 drops of Biuret solution to each test tube. Shake gently to mix.
4. Note any color change. Proteins will turn solution pink or purple.

Type of Food	Biuret Color Change	Contains Protein yes or no

Food Test 3: Complex Carbohydrate (starch) – Iodine solution

Iodine solution is used to test for the presence of complex carbohydrates. Iodine is a yellowish liquid that turns dark purple or black when it reacts with complex carbohydrates. Complex carbohydrates are very large energy rich organic molecules that contain carbon hydrogen and oxygen. Many sugar molecules chained together would form a complex carbohydrate.

1. Apply a drop of iodine directly to each food sample.
2. Note any color change. Starch will turn iodine dark purple or black.

Type of Food	Benedicts Color Change	Contains Starch yes or no

Analysis and Conclusions

1. What is molecular formula for glucose sugar? _____
2. What elements are found in sugar?
_____.
3. Give some examples of food that contain sugar. _____

4. What is a protein? _____

5. Give some examples of food that contain protein. _____

6. What is a complex carbohydrate? _____

7. Give some examples of foods that contain complex carbohydrates. _____

8. What element do all these organic compounds have in common, sometimes referred to as the element of life. _____