

LAB: Organic Compounds in Our Food

HONORS BIOLOGY: UNIT 1

Background:

The four groups of organic compounds found in living organisms include; **carbohydrates, lipids, proteins,** and **nucleic acids**. Common foods, consisting of plant materials and/or substances derived from animals, are also combinations of these organic compounds. There are simple chemical tests that can be run on food that will indicate what organic compounds are found in the food.

In this lab you will be using several “**indicators**” (chemicals) on a variety of food sources. A color change of the indicator is usually a positive test for the presence of that organic substance.



- **Biuret reagent** is an indicator of protein
- **Benedict’s solution** is an indicator of sugar
- **Iodine** is an indicator of starch
- **Brown paper bag** is an indicator of lipids

Materials:

- | | | | | |
|-------------------|------------------|---------------------|-----------------|--------------------|
| 6 test tubes | Test tube rack | Hot plate | Masking tape | Graduated cylinder |
| Brown paper | Biurets reagent | Benedict’s solution | Iodine Solution | Test tube holder |
| 5 known solutions | Unknown solution | | | |

Procedure:

Part A. Testing for Lipids

1. Obtain a piece of brown paper and label it as follows:

HONEY	CORN OIL	UNKNOWN	
EGG WHITE	GREEK YOGURT	POTATO	YOUR NAME

2. In each section rub a small amount of the identified food onto the brown paper. Be sure to rub it until the papers gets wet. Set the paper aside to dry.
3. When it is dry hold the piece of brown paper up to a bright light, you will notice some foods leave a translucent spot, this indicates the presence of lipids. Record in data table

Part B. Testing for carbohydrates

BE SURE TO CLEAN TEST TUBES BETWEEN EACH TEST

1. Use masking tape to make labels for the top of each test tube with the name of the substances.
2. Add 5 ml of each substance into the appropriate test tube.
3. Add 5 drops of **Iodine solution** to each test tube, gently shake each tube
4. Iodine will change color from a yellow-brown to a blue-black in the presence of starch.
5. Record your data in the table, place a check mark in the appropriate box if it contains **starch**.
6. Fill each test tube with 5 ml of each substance
7. Add 10 drops of **Benedict’s solution** to each test tube, gently shake each test tube and place in a hot water bath for 5 minutes.
8. When heated, Benedict’s solution will change color from blue to orange, yellow green or red to indicate the presence of a sugar.
9. Record your data in the table, place a check mark in the appropriate box if it contains **sugar**.

Part C. Testing for Protein

1. Fill each test tube with 5 ml of each substance.
2. Add 5 drops of **Biuret reagent** to each test tube, gently shake each test tube.
3. Biuret reagent changes color from yellow to blue-violet in the presence of protein.
4. Record your data in the table, place a check mark in the appropriate box if it contains **protein**.

Organic Compounds found in food tested- if present

Substance	Lipid Test	Carbohydrate Test			Protein Test		
	Lipids present <input checked="" type="checkbox"/>	Starches present <input checked="" type="checkbox"/>	Iodine Color	Sugars present <input checked="" type="checkbox"/>	Benedict Color	Proteins present <input checked="" type="checkbox"/>	Biuret Color
Honey							
Potato							
Corn Oil							
Greek Yogurt							
Egg White							
unknown							

Table cleaned after lab _____ Mr. Wilson's signature

Analysis Questions:

1. What conclusion could you make if a positive test occurred for an organic substance in which you knew it was not present (for example: positive iodine test for ground meat)?
2. What group of organic compounds were not tested for in this lab?
3. Did you test for a saturated or unsaturated fat with this experiment? How do you know?
4. Why would you not want to heat the test for protein? What does heat do to proteins?

5.

Organic compound	monomer	polymer	example
carbohydrate			
protein			