

Names: \_\_\_\_\_

Period: \_\_\_\_\_

Date: \_\_\_\_\_

Honors Biology  
Mr. Croft

## **Chapter 4 Lab: Identifying Organic Compounds**

### **50 Points**

I. Problem: How are indicators used to test for the presence of organic compounds?

II. Hypothesis:

Which substances do you think are carbohydrates?

Which substances do you think are lipids?

Which substances do you think are proteins?

III. Materials:

Test Tube #1: honey and water mixture	test tubes
Test Tube #2: egg white and water mixture	test tube rack
Test Tube #3: canola oil	hot plate
Test Tube #4: lettuce and water mixture	brown paper bag
Test Tube #5: corn starch and water mixture	Biuret reagent
Test Tube #6: potato and water mixture	Benedict's solution
Test Tube #7: apple juice and water mixture	Iodine solution
Test Tube #8: water	beakers

IV. Procedure:

Part I (Testing for Monosaccharides)

1. Obtain 8 clean test tubes and place them in a test tube rack.
2. Fill each test tube with 3 mL of one substance as indicated above.
3. Add 10 drops of Benedict's solution to each test tube.
4. Gently shake the contents of each test tube.
5. Place the test tubes in the hot-water bath for 3-5 minutes.
6. Remove the test tubes (using a test tube holder) and place them back in the test tube rack.
7. When heated, Benedict's solution will change color from blue to green, yellow, orange, or red in the presence of monosaccharides. In the data table, record any color changes and place a check mark next to any substances that test positive for monosaccharides.

Part II (Testing for Starch)

1. Obtain 8 clean test tubes and place them in a test tube rack.
2. Fill each test tube with 3 mL of one substance as indicated above.
3. Add 3 drops of Iodine solution to each test tube.

4. Gently shake the contents of each test tube.
5. Let the test tubes sit for 3-5 minutes.
6. Iodine will change color from yellow-brown to blue-black in the presence of starch. In the data table, record any color changes and place a check mark next to any substances that test positive for starch.

Part III (Testing for Proteins)

1. Obtain 8 clean test tubes and place them in a test tube rack.
2. Fill each test tube with 3 mL of one substance as indicated above.
3. Add 5 drops of Biuret reagent to each test tube.
4. Gently shake the contents of each test tube.
5. Let the test tubes sit for 3-5 minutes.
6. Biuret reagent changes color from yellow to blue-violet in the presence of protein. In the data table, record any color changes and place a check mark next to any substances that test positive for protein.

Part IV (Testing for Lipids)

1. Divide a piece of brown paper bag into 8 equal sections. In each section, write the name of one test substance (or use #1-8).
2. Place 2 drops of each substance onto the brown paper in the appropriate section.
3. Wait until all spots have dried.
4. Hold the paper up to a bright light. Some foods leave a translucent spot on the brown paper. The translucent spot indicates the presence of lipids. In the data table, place a check mark next to any substances that test positive for lipids.

V. Results:

Substance	Monosaccharides		Starches		Proteins		Lipids
	Benedict color	Present?	Iodine Color	Present?	Biuret color	Present?	Present?
honey							
egg white							
canola oil							
lettuce							
corn starch							
potato							
apple juice							
water							

VI. Conclusion (summary of experiment, analysis of data, discussion of error):

VII. Questions (complete sentences):

1. Which substances contain monosaccharides?
2. Which substances contain starch?
3. Which substances contain protein?
4. Which substances contain lipids?
5. Which substances did not test positive for any of the organic compounds?
6. What is the purpose of using distilled water as one of your test substances?
7. What do all of the indicators you have used have in common?
8. What conclusions could you make if a positive test for any of the organic compounds occurred in the test tube containing distilled water?
9. How does an indicator detect the presence of only one type of macromolecule?
10. Is there a macromolecule that the tests in this lab did not test for? If so, list the kinds of macromolecules not tested for, and give one reason why they were not tested for.