**Organic Compounds Lab Instructions**

**BACKGROUND**  
The foods you eat are made of organic compounds. You can perform chemical tests to learn what foods contain carbohydrates, lipids, and/or proteins.

**MATERIALS**

8 test tubes   
test-tube rack  
lab apron   
Benedict's solution   
stirring rod   
masking tape   
plastic gloves   
Biuret reagent   
test-tube holder   
pencil   
safety goggles   
Lugol's solution  
distilled water   
newsprint paper  
Food substances:

apple juice  
melted butter   
raw egg white  
raw fish  
raw potato   
raw spinach  
vegetable oil

**PROCEDURE**

1. Read all the directions for this activity before you begin your work.
2. Put on your safety goggles, lab apron, and plastic gloves.
3. Make a prediction on your Organic Compounds Lab Answers as to which items will test for the highest level of lipids, proteins, starches, and sugars.
4. Put 8 test tubes in your test-tube rack. Label each test tube by putting masking tape near the top edge of the test tube. Use a pencil to write one of the seven food substances on each label. Mark the eighth label *water*. The water is your control.

**PART I: Testing for Carbohydrates (STARCH)**

1. Use a medicine dropper to put ~10 drops of each food in the test tube with the matching label. Add 3-4 drops of Lugol's solution (iodine) to each test tube.
2. Starch is one form of carbohydrate. If the substance in your test tube contains starch, it will turn a blue-black color when it mixes with the iodine solution.
3. Observe the contents of your test tubes and Record the amount of starch present (0, +, ++, +++, ++++) in your data chart. The food which contains the most starch should be recorded as ++++.
4. Empty and wash each test tube and return it to your test tube rack.

**PART II: Testing for Carbohydrates (SUGAR)**

1. Use a medicine dropper to put ~10 drops of each food into the test tube with the matching label. Add 10 drops of Benedict's solution to each test tube. CAUTION: Benedicts solution is poisonous. Do not get any in your mouth and do not swallow any!
2. Use a test-tube holder to carefully place the test tubes in the hot water bath your teacher has prepared. Heat the test tubes for 2 to 3 minutes. CAUTION: Use a test-tube holder to handle hot test tubes. Point the open end of a test tube away from yourself and others.
3. Use a test -tube holder to return the hot test tubes to the test-tube rack. If the substance in your test tube contains sugar, Benedict's solution will change color. See Table 1 below:

**Table 1: Appearance of Substance after Adding Benedict's Solution**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Amount of Sugar in Food** | 0 none | + trace | ++ little sugar | +++ some sugar | ++++ much sugar |
| **Color** | blue | blue/green | green | yellow | orange/red |

1. Observe your test tubes (using white paper as a background). Record the amount of sugar present, in your data table.
2. Empty your test tubes, clean them thoroughly, and return them to the test tube rack.

**PART III: TESTING FOR LIPIDS**

1. Use a medicine dropper to put ~1 drop of each food onto the newsprint.
2. Observe and compare/contrast the translucence of each food substance. Record the information, in order of translucence (0, +, ++, +++, ++++) in your data chart. The food which contains the most lipids should be recorded as ++++.

**PART IV: TESTING FOR PROTEIN**

1. Use a medicine dropper to put ~10 drops of each food on the test tube with the matching label. Use a medicine dropper to carefully add 10 drops of Biuret reagent to each test tube. CAUTION: Biuret reagent can burn your skin. Wash off spills and splashes immediately with plenty of water while calling to your teacher.
2. Observe the contents of each test tube (using white paper as a background). If the food contains proteins, it will turn a pinkish purple. Record the amount (0, +, ++, +++, ++++) of protein for each food substance in your data table. The food which contains the most protein should be recorded as ++++.
3. Empty the test tubes and clean them thoroughly. Before leaving the laboratory, clean up all materials and wash your hands thoroughly.