

## UNIT 2 - BASIC PRINCIPLES OF BODY CHEMISTRY

### ACTIVITY - Testing Organic Compounds

**Purpose:** To become familiar with organic compounds and their components.

**Introduction:** In this laboratory exercise, you will be studying carbohydrates, lipids, and proteins, the most common organic compounds found in cells. Various chemicals, known as indicators, will be used as they will change colors when different organic compounds are present. If a color change is observed, the test is said to be positive. If a color change is not observed the test is said to be negative.

In this lab, you will test distilled water and five other substances of your choice for each of several tests. Please be careful when handling the chemicals. Your clothes are made from organic compounds and you might just have a stain or two if you spill!!!

#### **Materials Needed for All Tests:**

different foods (students may bring these from home)	hot water bath
test tubes	Lugol's solution
test tube racks	Sudan IV
wax pencils	brown paper bags
Benedict's solution	distilled water
Biuret's solution	1.5% copper sulfate

#### **Procedure:**

##### **1. Carbohydrates**

###### **Monosaccharides**

1. Add 2 ml of a different food substance to each of five test tubes. In the sixth test tube, you should add only distilled water. Be sure and label each tube.
2. Add 2 ml of Benedict's solution to each of the six test tubes.
3. Place the test tubes in a hot water bath for three to five minutes.
4. If you observed a color change from blue to green, yellow, or red you have a positive test which indicates the presence of monosaccharides.
5. Complete the data table located at the end of this worksheet.

###### **Polysaccharides**

1. Using the same five foods, place 2 ml of each different food in each of five test tubes. In the sixth test tube, you should add only distilled water. Be sure and label each tube.
2. Add 2 ml of Lugol's solution to each of the six test tubes.

3. If you observed a color change from a yellow-brown color to a purplish-black color, it is a positive test and indicates the presence of starch (a polysaccharide).
4. Complete the data table located at the end of this worksheet.

## **2. Testing for Lipids:**

1. Using the same five foods, place 2 ml of each different food in each of five test tubes. In the sixth test tube, you should add only distilled water. Be sure and label each tube.
2. Add 2 ml of distilled water and 3 drops of Sudan IV to each of the six test tubes.
4. If you observed a color change to red, it is a positive test for lipids.
5. Complete the data table located at the end of this worksheet.

*Just in case — if you are having a difficult time getting this test to work properly, mix each of the foods with distilled water to form a paste. Label six spots on a brown paper bag and apply the food pastes, one to each spot. (In the sixth spot, you will place a few drops of distilled water). Wait for 15 minutes and observe whether or not you had grease (fat) spots leading away from the food stuffs. The spot will still look wet and will be translucent. (The water from the mixture will dry up). This is a positive test for fat.*

## **3. Testing for Proteins:**

1. Using the same five foods, place 2 ml of each different food in each of five test tubes. In the sixth test tube, you should add only distilled water. Be sure and label each tube.
2. Add 2 ml to 3 ml of Biuret's solution to each test tube.
3. If you observed a color change from a bluish color to a pinkish-purplish color, it is a positive test and indicates the presence of proteins.
4. Complete the data table located at the end of this worksheet.

Name \_\_\_\_\_ Period \_\_\_\_\_

**Post-lab Questions: Organic Compounds**

1. Data Table

Use (+) for a positive test and (-) for a negative test.

Food Substance and Test Tube	Carbohydrates Monosaccharides	Carbohydrates Polysaccharides	Lipids	Protein
1. Distilled Water				
2.				
3.				
4.				
5.				
6.				

1. Why did you use water in all of the tests?
2. Which food(s) contain the monosaccharides?
3. Which food(s) contain the polysaccharides?
4. Which food(s) contain the lipids?
5. Which food(s) contain the proteins?
6. Did you have any foods that contained all three organic compounds?  
If so, list them.
7. Did you have any foods that contained none of the organic compounds?  
If so, list them.