



## Chapter 5 Organic Compounds

### Identifying Monosaccharides, Starch, Proteins, and Lipids

#### Lab # 5 Organic Compounds

*Note to Teacher: Answers appear in italics along with suggestions and specific teaching information.* A Biuret Reagent is chemical test used to detect peptide bonds in a substance. For this reason, it is a good indicator of the presence of Proteins in a substance. When a compound contains protein, the Biuret Reagent will turn a violet color. Benedict's will turn a substance red, green, or yellow depending on the concentration of glucose. Iodine solution will turn the substance that contains a polysaccharide dark blue, almost black especially when the concentration of polysaccharides are high. If a substance contains a lipid like cooking oil, a drop of oil on a brown paper bag will turn into a lighter circle on the bag. Here is a picture of three of the substances you are using with this lab.

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From left to right, the substances used are Benedict's, Iodine, and Biuret's Solutions. The last bottle is not included in this activity. It is used for testing lipids. Some people use this testing solution to test for lipids. The table listed below gives you the correct outcomes of the chemical tests.

**Questions--Answer all questions in complete sentences.**

1. **Which substances are monosaccharides and how do you know they are monosaccharides?**  
*Honey and Apple Juice contain glucose or fructose because the test to Benedict's was green.*
2. **Which substances are starches and how do you know they are starches?**  
*Lettuce, Corn Starch, Potato, and Flour contain starch or polysaccharides because the iodine solution turned dark blue almost black.*
3. **Which substances are proteins and how do you know they are proteins?**  
*Egg White and Gelatin contain protein because the bieret's reagent turned a violet color.*
4. **Which substances are lipids and how do you know they are lipids?**  
*Canola oil is the only lipid because a drop of it on the brown bag created a clear circle on the bag.*
5. **Which substances did not test positive for any of the organic compounds?**  
*Distilled water 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?**  
*Distilled water is the control group.*
7. **What do all of the indicators that you have used, have in common?**  
*They create a color change, once the test is positive.*
8. **What conclusions could you make if a positive test for any of the organic compounds occurred in the test tube containing distilled water?**  
*The test tube containing distilled water must be contaminated with some organic compound.*
9. **How does an indicator detect the presence of only one type of macromolecule?**  
*Each reagent is an indicator for the specific test. Benedict's solution tests for monosaccharides, Iodine for polysaccharides, biuret's solution tests for proteins, and the brown bag tests for lipids.*
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.**

*None, unless the teacher has added other substances that are not listed in this lab activity.*

Substances Tested	Monosaccharide	Polysaccharide	Protein	Lipid
honey	+	-	-	-
egg white	-	-	+	-
canola oil	-	-	-	+
lettuce	-	+	-	-
corn starch	-	+	-	-
potato	-	+	-	-
apple juice	+	-	-	-
gelatin	-	-	+	-
flour	-	+	-	-
distilled water	-	-	-	-