**Macromolecule Lab:**

**How are indicators used to test for the presence of organic compounds?**

*Wear safety equipment.*

*Follow directions.*

*Make sure you use droppers provided for each substance to make sure there is no cross contamination.*

*Clean up your area before you leave.*

**Part A. Test for sugar.**

1. Fill a 500 mL beaker about ½ full of tap water. Put it on the

hot plate and turn it on high.

1. Put 5 ml (about 2 ½ squirts from a pipette) of the food

substances in separate test tubes. Make sure you have labels

on each of your test tubes. **Be careful to not let the test tubes**

**slide through the rack.**

1. Add 10 drops of Benedict’s indicator reagent to each test tube.
2. While holding the test tube carefully swirl test tubes to help mix the Benedict’s with the foods in the test tubes.
3. When the water in the beaker is hot, place all the test tubes into

the hot water bath for 3-5 minutes.

1. If the solution in the test tube turns a green, yellow, red, or

orange color, the presence of monosaccharides (simple sugars)

is positive.

1. Turn off the hot plate.
2. Carefully use tongs or pot holders to remove the test tubes from the hot water bath and place test tubes on a test tube rack to cool.
3. Let the test tubes cool completely before washing them out in the sink with a test tube brush.
4. Fill in the data table with your observations of Benedict’s indicating any color changes.

**Part B. Test for Lipids.**

1. Take a paper bag and use a pencil to draw 10 divisions or blocks on the bag.
2. Label each area with the name of the food substance.
3. Take one small drop of each food substance and place it on the paper bag.
4. Put your name on the bottom of the bag in case you have to wait for the results on Day 2.
5. When the bag is dry, any area that appears “wet” or translucent is a positive test for lipids – fats or oils. Please make sure the bag is dry before determining whether it is positive or negative.
6. Throw away the bag when you have recorded information in your data table.

**Part C. Test for starch.**

1. Get 5 ml (2 ½ squirts from pipette) of each food substance into clean test tubes.
2. Add 5 drops of iodine solution in each test tube.
3. If starch is present, there will be a color change to blue-black.
4. Record your results in the data table.
5. Clean your test tubes with a brush and running water.

**Part D. Test for proteins.**

1. Put 5 ml (2 ½ squirts from a pipette) into clean test tubes with labels.
2. Add 5 drops of Biuret reagent to each separate test tube.
3. While holding the test tube carefully swirl test tubes
4. If a protein is present in each food, Biuret changes to blue-violet.
5. Record results in data table.
6. Wash the test tubes thoroughly with brush and running water.

**Wipe down the counter you were working at and put back any items in your container/area.**

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

Please record data in the table below. Cut out table and glue into your composition book under ***Results***

**Data Table**

**Food**  **Carbohydrate Tests Lipid Protein Test**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Substance** | Benedict color | Sugar present? | Iodine color | Starch present? | Fats or oils present? | Biuret color | Protein present? |
| Honey |  |  |  |  |  |  |  |
| Egg white |  |  |  |  |  |  |  |
| Corn oil |  |  |  |  |  |  |  |
| Lettuce |  |  |  |  |  |  |  |
| Gelatin |  |  |  |  |  |  |  |
| Butter |  |  |  |  |  |  |  |
| Potato |  |  |  |  |  |  |  |
| Apple juice |  |  |  |  |  |  |  |
| Distilled water |  |  |  |  |  |  |  |
| Unknown substance |  |  |  |  |  |  |  |

**Analysis and Conclusions**

1. Name the indicator used to test for simple sugars.
2. What color change indicated a positive test for sugar?
3. What substances tested positive? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Name the indicator used to test for lipids. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What two groups of lipids were you testing? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Name the indicator used to test for starch. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. What color change tested positive for starch? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. What food substances tested positive? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. What type of organic compound is starch? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. Name the indicator used for testing proteins. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. What color changes indicated protein presence? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. What foods had protein present? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
13. What did all indicators have in common? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
14. What was the purpose of the distilled water? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
15. What organic compound(s) were present in the unknown? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16. Draw the structure for each macromolecule.