

**EXPERIMENT 38: CONVERSION OF STARCH TO GLUCOSE**

**Wear safety goggles. Do all heating in a water bath. Do not heat anything directly.**



Equipment: Bunsen burner, one 250mL beaker, 5 test tubes, rack, ring, ringstand, wire gauze.

Materials: 5mL glucose(aq), starch, Lugol's iodine solution, 10mL, Benedict's solution, 2mL HCl, 5-10mL Na<sub>2</sub>CO<sub>3</sub>, splints.

In this experiment you will learn how to make glucose from starch.

**PART I. HOW TO TEST FOR GLUCOSE**

A. To about 5mL of Benedict's solution in a test tube add 5mL. of glucose solution. Heat in a water bath. This is the method used to test for glucose. (5mL. = 1/6 of the test tube )

1. Describe the result. \_\_\_\_\_

**PART II. HOW TO TEST FOR STARCH**

B. Heat in a water bath a pinch (enough to cover the tip of a splint ) of starch in a test tube containing about 20mL. of water until it becomes clear. Pour 5mL. of this solution into another test tube. Cool it, and add a drop of iodine solution. This is the method used to test for starch.

2. Describe the result. \_\_\_\_\_

C. Pour into a test tube another 5 mL. of the starch solution prepared in "B" and heat in the water bath with 5mL. of Benedict's solution.

3. How can you chemically distinguish between starch and glucose? \_\_\_\_\_

**PART III. CONVERSION OF STARCH TO GLUCOSE**

D. To the remainder of the starch solution prepared in "B", add 2 mL of concentrated HCl and heat in the water bath for five to ten minutes. Now add enough Na<sub>2</sub>CO<sub>3</sub> to just neutralize the HCl.

E. Pour 5 mL of the solution prepared in "D", into a test tube, cool the solution, and add a drop of iodine solution.

4. What does the result indicate? \_\_\_\_\_

F. To the other portion of the solution prepared in "D", add about 5mL of Benedict's solution and heat in the water bath.

5. What does the result indicate? \_\_\_\_\_

6. The simplest formula for starch is  $(C_6H_{10}O_5)_n$ ; of glucose  $C_6H_{12}O_6$ . Write the equation for the conversion of starch of glucose.
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#### **PART IV. TESTING COMMERCIAL PRODUCTS FOR GLUCOSE**

G. Test a sample of candy for glucose.

7. What does the test indicate about the sugar used in some candies? \_\_\_\_\_

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#### **SUMMARY QUESTIONS**

8. Why is it important to chew such foods as bread and potatoes carefully? (See your textbook.) \_\_\_\_\_

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9. What is the purpose of the HCl? \_\_\_\_\_

\_\_\_\_\_

10. Starch is a polymer of \_\_\_\_\_.

11. How may starch be converted to glucose? \_\_\_\_\_

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12. State some important applications of this process. \_\_\_\_\_

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