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Diploma in Pharmacy 2nd Year
Biochemistry & Clinical Pathology
Experiment
To study the hydrolysis of starch from acid.

Aim:

To study the hydrolysis of starch from acid.

Reference :

‘ Dr. Gupta G.D. , Dr. Sharma Shailesh, Kaur Manpreet, “Practical Manual of Biochemistry & Clinical Pathology” Published by Nirali Prakashan, Page no 71 – 74

Materials Required

Iodine solution, Benedict's reagent, starch paste, conc. HCI, boiling water and six test tubes.

Theory :

1) Polysaccharides are polymers and their complete hydrolysis results in hundreds of monosaccharide molecules.
2) The end product of completely hydrolysed starch is glucose.

$$\text{Starch} \xrightarrow[\text{With acid}]{\text{Complete hydrolysis}} \text{Glucose}$$

3) Partial hydrolysis of starch results in a variety of sugars, including dextrin, maltose, and glucose.

$$\text{Starch} \xrightarrow[\text{With acid}]{\text{Complete hydrolysis}} \text{Dextrin + maltose + glucose}$$

4) A specific test for polysaccharides, oligosaccharides, and disaccharides is hydrolysis with acid.
5) One of the important elements in this reaction is heating time.
6) The solutions must react with Benedict's reagent to confirm that the hydrolysis of sucrose or starch occurred. (If hydrolysis is carried out, monosaccharides will be released and a red-colored cuprous oxide precipitate will be produced).
7) Conc HCI should be added carefully.
8) **Achromic Point:** It is a point at which iodine solution fails to form any colour. All the erythrodextrin get converted into archrodextrin and maltose at this point.
9) **Chromic Point:** It begins at zero and continues until the achromic point is reached, or it is the time needed to reach that point.

Procedure

1) Two sets of test tubes each containing six test tubes should be taken.
2) 1 ml of iodine solution should be added in all the test tubes of first set.
3) 5ml of Benedict's reagent should be taken in all test tubes of second set.
4) 35ml of starch paste should be taken in a beaker.
5) 15 to 20 drops of conc. HCI should be added in this beaker and then mixed. As a result, the contents will swell.
6) This mixture should now be transferred into a test tube.
7) This test tube should be placed in boiling water and time should be recorded.
8) Sample should be taken from the test tube for iodine and Benedict's test.
9) Sample should be taken from the bottom of the test tube, if possible. Iodine and Benedict's test should be performed.
10) The procedure should be repeated till achromic point is reached.

Interpretation

1) As starch is hydrolysed by acid in test tubes containing Benedict's reagent. the Benedict's test will gradually turn positive.
2) The hydrolysis of starch will cause the iodine test to gradually turn negative as any polysaccharides that are present turn into reducing monosaccharides

Result :

The hydrolysis of starch from acid was studied.

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