

Subject- Science

Activity 6 (b)-To deduce the action of Salivary amylase

Chapter 6 : Life Processes

Class-X

Duration-40mins

Nature of the Activity- Individual

Learning Outcome- The students will be able to explore the action of a simple and readily available enzyme.

What we have to do?

-To observe the effect of salivary amylase on food.

What do we require?

Test tube, funnel, cotton, iodine solution, 20 gm wheat flour

What do we need to know?

The first stage of the digestive process occurs in the mouth where food is mechanically broken down and mixed with saliva. Saliva contains an enzyme, amylase, which begins the digestion of starch and converts it to sugar molecules. In the presence of iodine ,starch turns blue black but sugar gives no color

How will we proceed?

- **Teacher's activity-** Teacher will give the instructions along with the protocol(Student's activity)

Teacher will arrange for the materials

- **Student's activity**

- 1.Collection of saliva (wash your mouth with water and think of some tasty food item, enough saliva will be collected in your mouth).
- 2.Filter the saliva through a cotton swab and collect 1 mL in a test tube. Add 9 mL of water to the saliva to make it saliva solution.(1:10)
3. Mix wheat flour in water (20 ml) and filter to make starch solution.
4. Take 5 mL of starch solution in two test tubes labelled as A and B.
- 5.To test tube A, add 1 mL of saliva solution and to test tube B, add 1mL of water and mix thoroughly.
6. Add 1 or 2 drops of iodine solution in both the tubes after 10 min.
7. Observe the colour change immediately.

What do we observe?

Test Your Saliva for Amylase:

	Change in colour
Test tube A	
Test tube B	

What have you learnt?

1. The concentration of amylase varies within an individual's mouth.
2. Starch reacts with iodine, to produce the blue starch-iodine complex
3. When the enzyme in your saliva, amylase, reacts with the starch it causes the starch to be broken down into simple sugars. Once the starch is broken down into simple sugars it no longer forms a complex with the iodine and so the dark blue color no longer is present.

What would I like to know?

Chew food (chapati/ rice) and note change in taste from tasteless to sweet. Do you think that your chapati/rice has become sweeter?

Extended learning-

- 1) What is the meant by optimum temperature for enzyme activity?
 - (a) The temperature at which the enzyme shows the maximum activity.
 - (b) The temperature at which the enzyme shows the minimum activity.
 - (c) The temperature at which the enzyme denaturated.
 - (d) The temperature at which the enzyme deactivated.

- 2) The digestion of food starts in the _____.
 - (a) Intestine
 - (b) Oesophagus
 - (c) Mouth
 - (d) Stomach

3.) The optimum temperature for the enzymatic activity of salivary amylase ranges from _____ to _____.
 - (a) 5°C to 10°C
 - (b) 20°C to 25°C
 - (c) 35°C to 40°C
 - (d) 50°C to 55°C

- 4.) The enzyme salivary amylase is most active at pH_____.
 - (a) 6.8
 - (b) 5.4
 - (c) 2.5
 - (d) 10

- 5.) What is an achromic point?
 - (a) The point at which starch gives blue-black colour with iodine.
 - (b) Time during the action of amylase on starch at which the reaction mixture no longer gives a change in colour with iodine.
 - (c) The point at which the enzyme shows the maximum activity.
 - (d) The time required to digest starch partially by the enzyme-salivary amylase.

6.) In the stomach the salivary amylase is not functioning. Why?
 - (a) pH of stomach is more than 6.
 - (b) Stomach is highly acidic.

- (c) Stomach is highly basic.
- (d) There is no enzyme for starch digestion in the stomach.

7.) The experiment set up to study the effect of temperature on the activity of salivary amylase on starch is carried out at 10 °C. The solution mixture that contains amylase and starch keeps on giving blue colour for iodine test for about half an hour. What is the reason for this is that at lower temperature-

- (a) starch lose its functionality
- (b) the enzyme is more activated
- (c) reaction rate of starch reduces
- (d) the enzyme is deactivated