

Activities for Chapter 5

Activity 5.3

Investigate the effect of temperature on the activity of amylase

Skills

A03.1 Using techniques, apparatus and materials

A03.3 Observing, measuring and recording

A03.4 Interpreting and evaluating observations and data

Amylase is an enzyme found in saliva. It digests (hydrolyses) starch to maltose. Maltose is a reducing sugar.

- 1 Take five test tubes and label them A to E.
- 2 Measure 5 cm³ of starch suspension into each test tube.
- 3 Take five more test tubes and label them AA to EE.
- 4 Measure 5 cm³ of amylase solution into tubes AA to EE.
- 5 Place each pair of tubes in an environment at a different temperature.
Copy the table below to record the temperatures.

Colour with Iodine after:	Tube				
	A/AA ____ °C	B/BB ____ °C	C/CC ____ °C	D/DD ____ °C	E/EE ____ °C
1 minute					
2 minutes					
3 minutes					
4 minutes					
5 minutes					
6 minutes					
7 minutes					
8 minutes					
9 minutes					
10 minutes					

- 6 Collect a white dimple tile (or five of them if possible) and place a drop of iodine solution into each dimple.
- 7 When you are absolutely ready, tip the contents of tube AA into tube A, and so on for each pair of tubes. Mix them well. Note the time, or start a stop watch.
- 8 After one minute, dip a glass rod into tube A and then dip the end of the rod into the first drop of iodine solution. Record the colour in the table. Repeat with the other four tubes, using a clean rod each time.
- 9 Repeat step 8 every minute for ten minutes.

Questions

- A1 Explain why it was important to have the same volume of starch solution in each tube.
- A2 Explain why the tubes were left at their temperature for at least five minutes, before mixing the amylase and the starch.
- A3
 - a Explain why the iodine solution sometimes turned black.
 - b Explain why the iodine solution sometimes stayed brown.
- A4 In which test tube did the starch disappear fastest? Why did this happen?
- A5 Was there any tube in which the starch was still there at the end of your experiment? If so, why did this happen?
- A6 Amylase hydrolyses starch to produce maltose. How could you carry out a test to check for the presence of maltose?
- A7 Describe some of the sources of error in your experiment. For each one, suggest how the experiment could be improved.