



Human Biology

HBI3T/P11/task

Unit 3T AS Investigative Skills Assignment Task Sheet

The effect of amylase concentration on the rate of digestion of starch

Introduction

In this investigation, you will find out how the rate of digestion of starch is affected by the concentration of amylase. The starch is present in starch agar in Petri dishes.

Materials

You are provided with

- distilled water
- solutions of amylase of five different concentrations: 20 g dm^{-3} , 10 g dm^{-3} , 5 g dm^{-3} , 2.50 g dm^{-3} and 1.25 g dm^{-3}
- Pasteur pipettes (one for each solution and one for distilled water)
- 3 Petri dishes containing starch agar each with 6 equally sized wells cut in the starch agar
- marker pen or chinagraph pencil
- ruler marked in mm
- iodine in potassium iodide solution and dropper pipette
- Sellotape.

You may ask your teacher for any other apparatus you require.

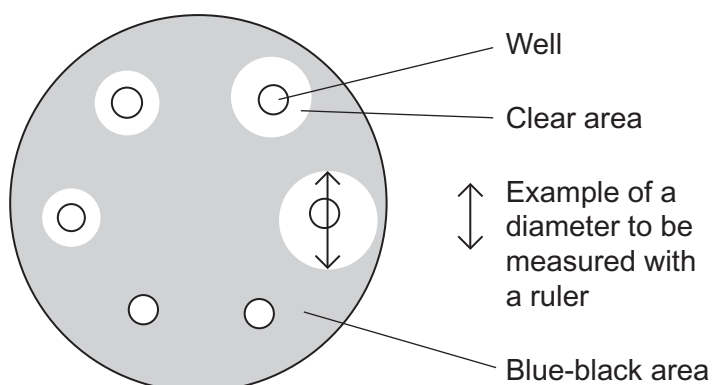
Outline method

Read these instructions carefully before you start your investigation.

1. Take one Petri dish and number the wells 1 to 6. Write the numbers on the bottom of the dish using a marker pen or chinagraph pencil.
2. Remove the lid of the dish and carefully fill each of the wells with an amylase solution as shown in the table. Fill each well to the same level. Use a different Pasteur pipette for each solution.

Well number	Concentration of amylase solution / g dm^{-3}
1	20
2	10
3	5
4	2.5
5	1.25
6	0 (distilled water)

3. Replace the lid and secure it in place with two short pieces of Sellotape.
4. Repeat steps 1 to 3 for the other two Petri dishes. Take care not to tilt the dishes at this stage.
5. Leave your Petri dishes in the same place. Your teacher will tell you how long to leave them.
6. At the end of this time, remove the lid from each Petri dish and use a dropper pipette to add just enough iodine solution to cover the surface of the starch agar. The dishes can be tilted to spread the iodine solution. The starch agar will turn blue-black but there will be clear areas around some of the wells.
7. Replace the lid on each Petri dish and secure it in place with Sellotape.
8. Turn over each of the Petri dishes and measure the diameter of each clear area to the nearest mm using a ruler. The diagram shows you how to do this.



9. Record your results in a suitable table on your results sheet for Stage 1.

You will need to decide for yourself

- the number of times to measure the diameter of each of the clear areas and the direction in which you make each of the measurements.

ISA HBI3T/P11 Candidate Results Sheet: Stage 1**The effect of amylase concentration on the rate of digestion of starch**

Centre Number

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Candidate Number

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Candidate Name

Record your data in a table in the space below.

(3 marks)

Hand in this sheet at the end of each practical session.

ISA HBI3T/P11 Candidate Results Sheet: Stage 2**The effect of amylase concentration on the rate of digestion of starch**Centre Number

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Candidate Number

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Candidate Name

Use the space below to process your data.

(6 marks)

Use the graph paper to plot a graph of your processed data.

Hand in this sheet at the end of each practical session.

Hand in this sheet at the end of each practical session.

