

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use Total Task 1



General Certificate of Education
Advanced Level Examination
June 2012

Human Biology

HBI6X/PM1

Unit 6X A2 Externally Marked Practical Assignment

Task Sheet 1

To be completed before Task Sheet 2

For submission by 15 May 2012

For this paper you must have:

- a ruler with millimetre measurements
- a calculator.

Allergies and the food we eat

Introduction

Some doctors believe that vitamin C (ascorbic acid) helps protect the body from allergies.

Task 1 - Testing for the presence of vitamin C

In Task 1, you will carry out a test for the presence of vitamin C. This test uses iodine and starch.

If iodine solution is added to a solution containing starch, a blue-black colour develops. If iodine solution is added to a solution containing vitamin C and starch, it reacts with both starch and vitamin C. Until the iodine has reacted with all the vitamin C in the solution, any blue-black colour change only lasts for a few seconds. A permanent blue-black colour develops after iodine has reacted with all of the vitamin C in the solution.

The volume of iodine solution added to get a permanent blue-black colour can be used to calculate the mass of vitamin C in a solution.

You will carry out two trials to help you identify when the reaction is complete.

Materials

You are provided with

- vitamin C solution
- starch solution
- iodine solution
- 10 cm³ syringe
- two conical flasks
- dropping pipette (for use with starch solution)
- graduated pipette or syringe
- pipette filler (if pipette used)
- timer
- marker pen

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

Outline method

Read these instructions carefully before you start your investigation.

1. Label two conical flasks **A** and **B**.
2. Put 10 cm³ of vitamin C solution and 5 drops of starch solution into flask **A**.
3. Fill a syringe with about 10 cm³ of iodine solution. Record the starting volume in the syringe.
4. Add a small volume of the iodine solution to the mixture in flask **A** and swirl the contents of the flask allowing them to mix.
5. Repeat step 4 until the reaction is complete. The reaction is complete when the mixture changes colour and remains coloured for longer than 20 seconds.
6. Record the final volume of the iodine solution in the syringe.
7. Repeat steps 2 to 6 with flask **B**.

You will need to decide for yourself

- what volume of iodine solution you should add each time
- when the reaction is complete

Recording your results

Record your results in the table.

Flask	Iodine solution		
	Starting volume / cm ³	Final volume / cm ³	Volume required to complete the reaction / cm ³
A (trial 1)			
B (trial 2)			

Turn over for Question 1

Turn over ►

Questions on Task 1

Answer **all** questions in the spaces provided.

- 1** You used a dropping pipette to place 5 drops of starch solution into flask **A** (step 2). Did the use of a dropping pipette affect the accuracy with which you were able to find when the reaction was complete? Explain your answer.

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(1 mark)

- 2** When you first added iodine solution to the vitamin C and starch mixture in flask **A** (step 4), a blue-black colour appeared but this soon disappeared.

Explain why the colour disappeared.

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(2 marks)

- 3** In this investigation you did not control temperature. Explain why this had no effect on your result.

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(1 mark)

- 4** The 10 cm^3 of vitamin C solution in your flasks contained 10 mg vitamin C. This mass of vitamin C reacted with the volume of iodine solution that you added from the syringe.

A student who carried out this investigation found that she needed 8.5 cm^3 of iodine solution to complete the reaction.

Use her result to calculate the mass of vitamin C that reacts with 1 cm^3 of iodine solution. Show your working.

1 cm^3 of iodine solution reacts with mg vitamin C

(2 marks)

Turn over for the next question

Turn over ►

5 Another student carried out a similar investigation to you. He used DCPIP to detect vitamin C. DCPIP is a blue solution that turns colourless when it reacts with vitamin C. He used a syringe to add DCPIP to a solution containing vitamin C.

5 (a) Apart from the use of DCPIP give **one** way in which the student's method was different from yours.

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(1 mark)

5 (b) How would he know when the reaction was complete?

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(1 mark)

5 (c) What reading would he take when the reaction was complete?
Explain your answer.

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(2 marks)

END OF TASK 1

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