

Biology

BIO3T/Q14/task

Unit 3T AS Investigative Skills Assignment Task Sheet

Estimating the concentration of glucose in a solution

Introduction

Adding glucose to a solution of potassium manganate (VII) changes its colour from pink to colourless. The time for this reaction is directly related to the concentration of glucose in the solution.

In this investigation, you will use the results from glucose solutions of known concentration to plot a curve on a graph. This will be your reference curve. You will then use this curve to estimate the concentration of glucose in two solutions, **A** and **B**.

Materials

You are provided with the following:

- glucose solutions of concentrations 2%, 4%, 8%, 10% and 12%
- 2 glucose solutions, **A** and **B**, of unknown concentration
- dilute sulfuric acid
- solution of potassium manganate (VII)
- timer / stop clock
- glass rod
- boiling tubes and rack(s)
- syringes or pipettes with pipette filler
- eye protection.

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

Method

Read these instructions carefully before you start your investigation.

Using the glucose solutions of known concentration to produce your reference curve

1. Add 10 cm³ of the 2% glucose solution to a boiling tube.
2. Add 5 cm³ of dilute sulfuric acid to the boiling tube.
3. Add 2 cm³ of potassium manganate (VII) solution to the boiling tube and immediately start the timer.
4. Use the glass rod to stir the mixture continuously and record the time taken, in seconds, for the pink colour to disappear.
5. Repeat steps 1 to 4 with the four other known glucose concentrations. Rinse the syringe or pipette between concentrations.

Obtaining results to estimate the glucose concentrations of solutions A and B

6. Add 10 cm³ of solution **A** to a boiling tube.
7. Repeat steps 2 to 4.
8. Add 10 cm³ of solution **B** to a boiling tube.
9. Repeat steps 2 to 4.
10. Record your results for solution **A** and solution **B** in the spaces below:

Result for solution **A** seconds

Result for solution **B** seconds

You will need to decide for yourself:

- when the potassium manganate (VII) changes from pink to colourless.

ISA BIO3T/Q14 Candidate Results Sheet: Stage 1

Estimating the concentration of glucose in a solution

Centre Number

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Candidate Number

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Candidate Name

Record your results for steps 1 to 5 in a table in the space below.

[3 marks]

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

ISA BIO3T/Q14 Candidate Results Sheet: Stage 2

Estimating the concentration of glucose in a solution

Centre Number

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Candidate Number

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Candidate Name.....

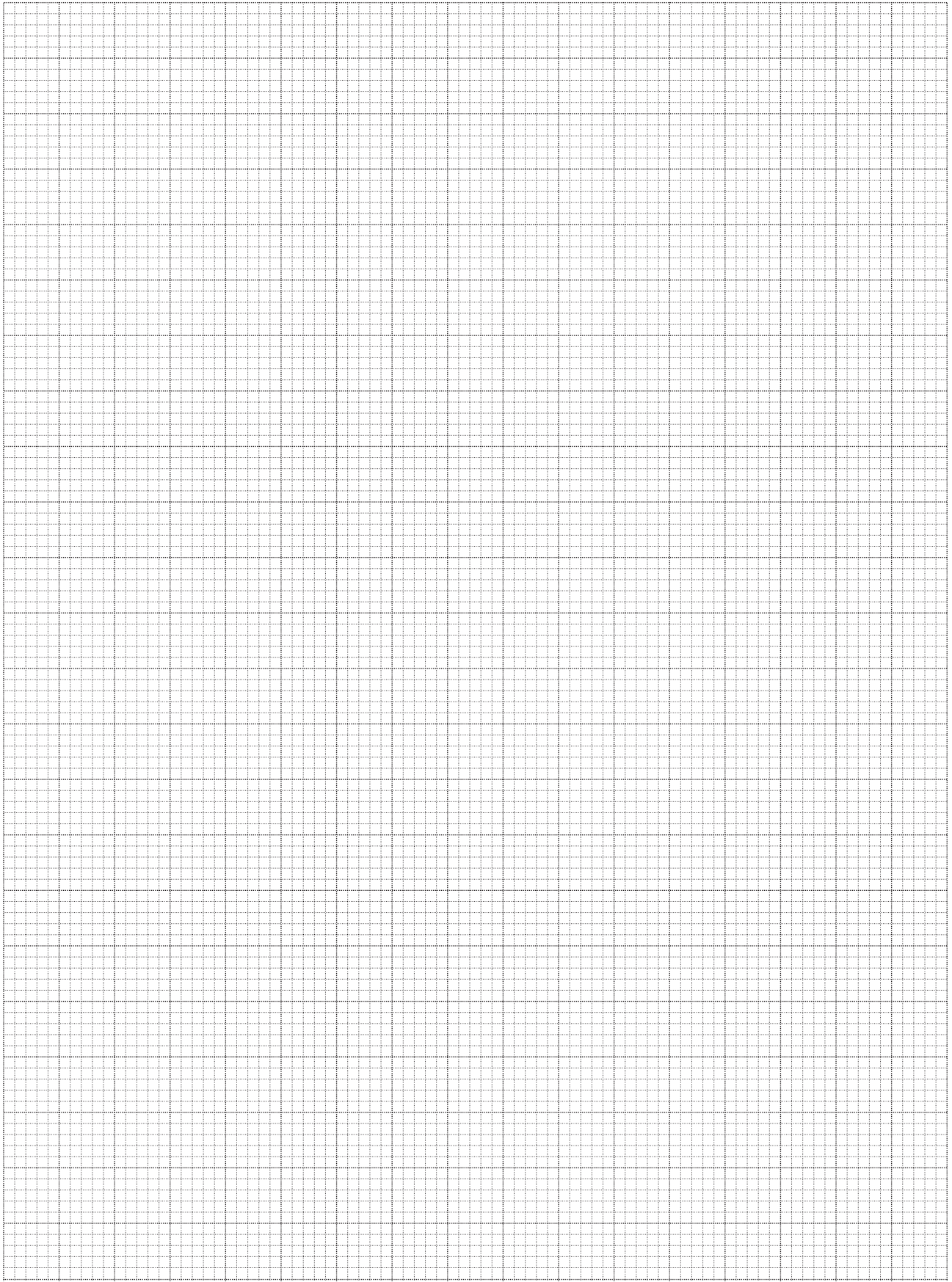
Use the graph paper to plot an appropriate graph of your data for the glucose solutions of known concentration. This graph is your reference curve.

[5 marks]

Use your graph to find the concentration of glucose in solution **A** and solution **B**.

[1 mark]Concentration of glucose in solution **A** %Concentration of glucose in solution **B** %

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



END OF TASK

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