AQA GCSE Chemistry | 8462

SPECIFICATION POINT 4.3.1.4

Chemical measurements

Past-paper questions

Tier	**Higher**
Question groups	**15**
Available paper years	**2008–2025**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

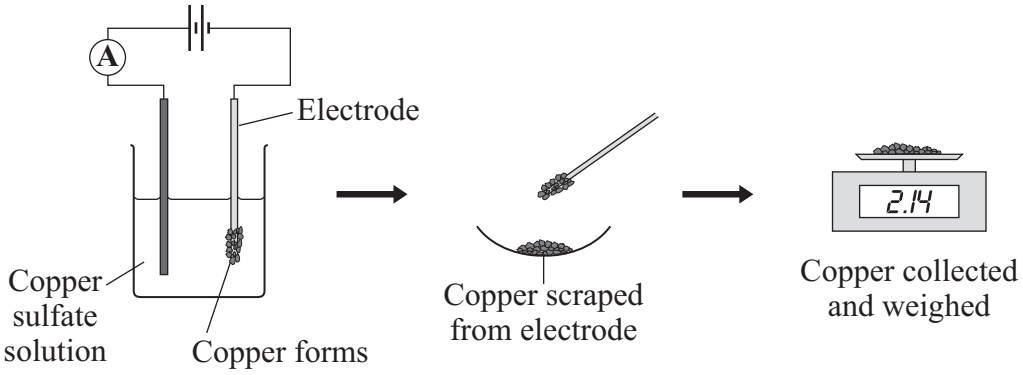
4.3.1.4 Chemical measurements

Question 01

March 2008 | CHY1AP | Original Q5 | Legacy

QUESTION FIVE

The diagram shows how copper can be extracted from a solution of copper sulfate using electrolysis.



The table shows how the mass of copper extracted in one minute changes with the current used in the experiment.

Current in amps	Mass of copper extracted in g per minute
1.0	0.12
1.5	0.14
2.0	0.24
2.5	0.30
3.0	0.36

5A There is an anomalous result at a current of . . .

1 1.5 A

2 2.0 A

3 2.5 A

4 3.0 A

4.3.1.4 Chemical measurements

Question 01 · continued

5B All the results in the experiment were slightly higher than expected.

To provide more accurate results, the experiment could be repeated . . .

1 using a balance measuring to three decimal places.

2 using a wider range of currents.

3 drying the copper to constant mass before the final weighing.

4 carrying out the experiment three times at each current.

5C The results show that generally the amount of copper produced is . . .

1 directly proportional to the current used.

2 indirectly proportional to the current used.

3 independent of the current used.

4 inversely proportional to the current used.

5D The copper scraped from the electrode may **not** be 100% pure.

This is because . . .

1 it may contain some copper sulfate.

2 it still contains some of its original ore.

3 the copper produced quickly forms an alloy.

4 the electricity contaminates it.

4.3.1.4 Chemical measurements

Question 02

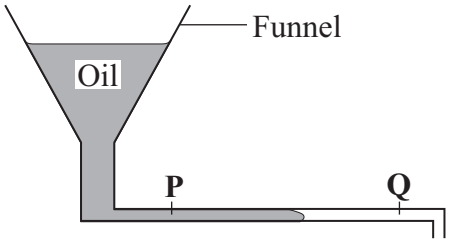
June 2008 | CHY1BP | Original Q4 | Legacy

QUESTION FOUR

Viscosity is the ease with which a liquid flows.

The more viscous an oil is, the more slowly it will flow.

A student compared the viscosity of four different oils, **W**, **X**, **Y** and **Z**, at different temperatures. He used the apparatus shown in the diagram.



First he used oil **W**.

- Oil **W** was heated to 20 °C and was then poured into the funnel.
- The time taken for oil **W** to flow from **P** to **Q** was recorded.
- The student repeated the procedure for oil **W** at temperatures of 30 °C, 40 °C and 50 °C.

The student then used oils **X**, **Y** and **Z** in the same way.

The results are shown in the table.

Oil	Time taken for the oil to travel between points P and Q in seconds			
	at 20 °C	at 30 °C	at 40 °C	at 50 °C
W	55	50	45	40
X	35	32	29	26
Y	85	75	80	55
Z	110	100	90	80

4A When testing oil **W** at the four temperatures shown, the dependent variable is . . .

1 the choice of oil.

2 the time the oil takes to travel between **P** and **Q**.

3 the temperature of the oil.

4 the distance between **P** and **Q**.

4.3.1.4 Chemical measurements

Question 02 · continued

4B A measurement that appears to be anomalous is for . . .

1 oil **W** at 40 °C.

2 oil **X** at 30 °C.

3 oil **Y** at 40 °C.

4 oil **Z** at 30 °C.

4C The most viscous oil is . . .

1 **W**

2 **X**

3 **Y**

4 **Z**

4D The accuracy of the results would be improved by . . .

1 using a wider range of temperatures.

2 repeating each procedure.

3 maintaining the apparatus at the same temperature as the oil.

4 using more oils.

4.3.1.4 Chemical measurements

Question 03

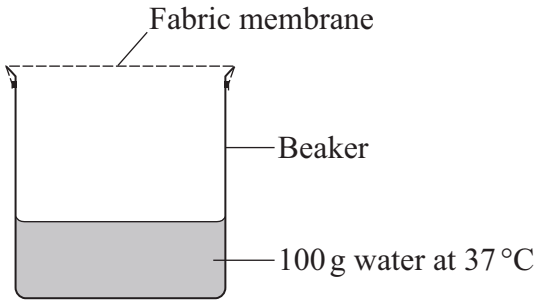
November 2008 | CHY1BP | Original Q5 | Legacy

QUESTION FIVE

Some waterproof coats have fabric membranes that are breathable. This means that the fabric membrane allows body perspiration to escape, while the person wearing the coat stays dry.

A scientist tested four types of fabric membrane, **W**, **X**, **Y** and **Z**.

100 g of water in a beaker was kept at a constant 37 °C (body temperature). The top of the beaker was covered with a piece of fabric membrane **W**. After 24 hours, the membrane was removed and the mass of water remaining in the beaker was measured.



The test was carried out three more times using fabric membrane **W**.

The experiment was then repeated using fabric membranes **X**, **Y** and **Z**.

Test	Mass of water left in the beaker after 24 hours in g			
	Fabric W	Fabric X	Fabric Y	Fabric Z
1	92.45	98.78	95.46	99.12
2	92.45	98.89	94.67	94.56
3	93.56	98.23	95.12	94.83
4	94.23	98.65	94.56	95.01

4.3.1.4 Chemical measurements

Question 03 · continued

5A The most *breathable* fabric membrane was . . .

1 **W**

2 **X**

3 **Y**

4 **Z**

5B In these tests, temperature is . . .

1 an independent variable.

2 a dependent variable.

3 a categoric variable.

4 a control variable.

5C For which fabric membrane is the range of results largest?

1 Fabric **W**

2 Fabric **X**

3 Fabric **Y**

4 Fabric **Z**

5D Which one of the following may have caused an anomalous result?

1 Using a beaker with thicker glass.

2 Some water may have spilled.

3 Water only evaporates at 100 °C.

4 Carrying out the tests more than three times.

4.3.1.4 Chemical measurements

Question 04

March 2009 | CHY1AP | Original Q5 | Legacy

QUESTION FIVE

This question is about heating some metal carbonates.

A student heated exactly 1.00 g of four different metal carbonates. He heated them strongly for exactly the same amount of time. He used the same balance for each measurement.

After heating with a Bunsen burner, the masses remaining were:

calcium carbonate	0.56 g
copper carbonate	0.64 g
magnesium carbonate	0.48 g
sodium carbonate	1.00 g

5A What is the most likely reason why sodium carbonate had the same mass after heating?

1 The balance was not working properly.

2 Sodium carbonate does not decompose at Bunsen burner temperatures.

3 The student did not heat the sodium carbonate long enough.

4 The student used too much sodium carbonate so it was not all heated.

5B When copper carbonate is heated, it changes from a green powder to a black powder.

What is the black powder?

1 carbon

2 copper

3 copper hydroxide

4 copper oxide

Question 04 · continued

Four students, **A**, **B**, **C** and **D**, heated copper carbonate. The table shows their results.

Student	Mass of copper carbonate used in g	Mass after heating in g
A	0.50	0.32
B	0.60	0.38
C	0.70	0.40
D	0.80	0.51

5C Which student obtained an anomalous result?

1 Student **A**

2 Student **B**

3 Student **C**

4 Student **D**

5D The student with the anomalous result thought that he had not heated the copper carbonate long enough for the reaction to finish. He repeated the experiment.

What is the best method he could use to make sure that the reaction had finished?

1 heat the copper carbonate for twice as long

2 heat the copper carbonate until he could not see any more green colour

3 heat the copper carbonate until it did not lose any more mass

4 heat the copper carbonate until carbon dioxide is detected coming from the tube

4.3.1.4 Chemical measurements

Question 05

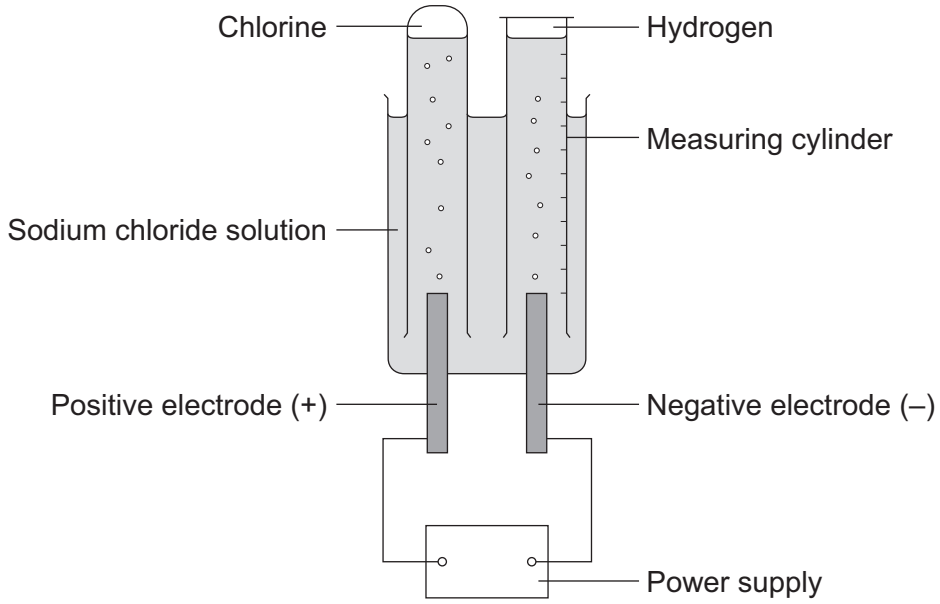
1 A student investigated the electrolysis of sodium chloride solution.

Five sodium chloride solutions were made. Each solution had a different concentration.

To make each solution the student:

- weighed the amount of sodium chloride needed
- dissolved it in water
- added more water until the total volume was one cubic decimetre (1 dm^3).

The solutions were placed one at a time in the apparatus shown below.



The student measured the volume of hydrogen gas produced in ten minutes.

The results are shown on the graph on the next page.

1 (a) Sodium chloride does not conduct electricity when it is solid.

Explain, in terms of ions, why sodium chloride solution conducts electricity.

.....

.....

(1 mark)

1 (b) Chlorine is produced at the positive electrode.

Why are chloride ions attracted to the positive electrode?

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(1 mark)

Question 1 continues on the next page

4.3.1.4 Chemical measurements

Question 05 · continued

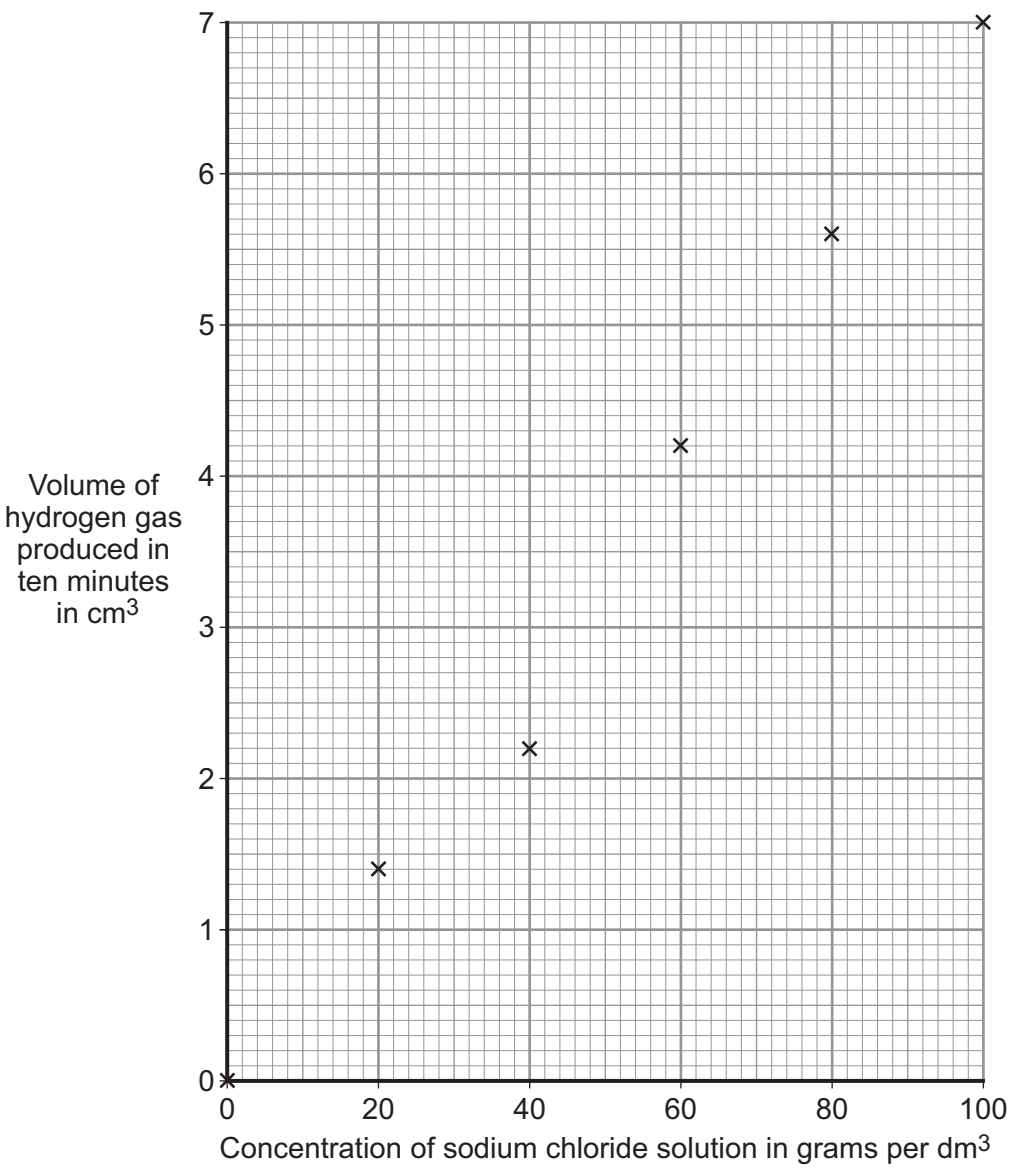
1 (c) The solution left at the end of each experiment contains sodium hydroxide.

Draw a ring around **one** number which could be the pH of this solution.

2 **5** **7** **13**

(1 mark)

1 (d) The results for the experiment on the previous page are shown on the graph.



4.3.1.4 Chemical measurements

Question 05 · continued

1 (d) (i) Draw a line of best fit on the graph.

(1 mark)

1 (d) (ii) The result for one concentration is anomalous.
Which result is anomalous?

The result at concentration ..... grams per dm^3

(1 mark)

1 (d) (iii) Suggest **two** possible causes of this anomalous result.

1 .....

.....

2 .....

.....

(2 marks)

1 (d) (iv) Suggest how the student could check the reliability of the results.

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(1 mark)

1 (d) (v) How did an increase in the concentration of the sodium chloride solution affect the volume of hydrogen gas produced in ten minutes?

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(1 mark)

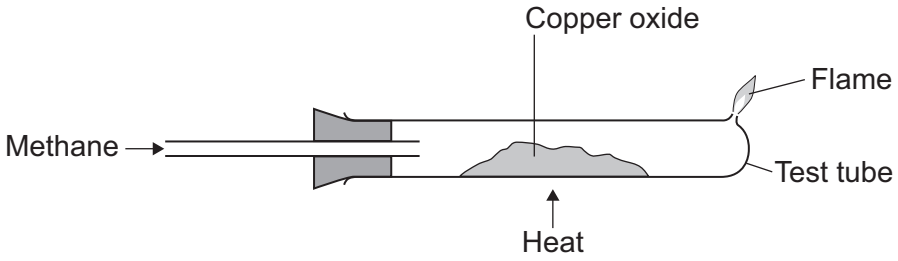
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4.3.1.4 Chemical measurements

Question 06

June 2011 | CHY2H | Original Q2 | Legacy

2 An experiment was done on the reaction of copper oxide (CuO) with methane (CH_4).



2 (a) The equation for this reaction is shown below.

$$4CuO(s) + CH_4(g) \rightarrow 4Cu(s) + 2H_2O(g) + CO_2(g)$$

The water and carbon dioxide produced escapes from the test tube.

Use information from the equation to explain why.

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(1 mark)

2 (b) (i) Calculate the relative formula mass (M_r) of copper oxide (CuO).

Relative atomic masses (A_r): O = 16; Cu = 64.

.....

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.....

Relative formula mass (M_r) = ...

(2 marks)

2 (b) (ii) Calculate the percentage of copper in copper oxide.

.....

.....

.....

Percentage of copper = ... %

(2 marks)

4.3.1.4 Chemical measurements

Question 06 · continued

2 (b) (iii) Calculate the mass of copper that could be made from 4.0 g of copper oxide.

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.....

Mass of copper = ... g

(1 mark)

2 (c) The experiment was done three times.
The mass of copper oxide used and the mass of copper made was measured each time.
The results are shown in the table.

	Experiment		
	1	**2**	**3**
Mass of copper oxide used in g	4.0	4.0	4.0
Mass of copper made in g	3.3	3.5	3.2

2 (c) (i) Calculate the mean mass of copper made in these experiments.

.....

.....

Mean mass of copper made = ... g

(1 mark)

2 (c) (ii) Suggest how the results of these experiments could be made more precise.

.....

.....

(1 mark)

2 (c) (iii) The three experiments gave slightly different results for the mass of copper made.
This was caused by experimental error.

Suggest **two** causes of experimental error in these experiments.

1 .....

.....

2 .....

.....

(2 marks)

10

4.3.1.4 Chemical measurements

Question 07

June 2014 | CH1HP | Original Q5 | Legacy

5 Limestone contains calcium carbonate ($CaCO_3$).

5 (a) Name the type of reaction that takes place when calcium carbonate is heated strongly.

Name the products formed.

[3 marks]

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5 (b) A student investigated what happens when limestone is heated strongly.

This is the method the student used:

- measure the mass of limestone before heating
- measure the mass of solid product after heating
- repeat the experiment three more times.

The student's results are shown in **Table 3**.

Table 3

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Mass of limestone before heating in g	5.0	5.0	5.0	5.0
Mass of solid product after heating in g	3.2	4.0	3.1	3.3
Mass lost in g	1.8	1.0	1.9	1.7

5 (b) (i) Calculate the mean mass lost, taking account of any anomalies.

[2 marks]

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.....

Mean mass lost = ... g

4.3.1.4 Chemical measurements

Question 07 · continued

5 (b) (ii) The student used the chemical equation to calculate the maximum mass lost by 5.0 g of calcium carbonate when heated.

The maximum mass lost is 2.2 g.

Suggest and explain **two** reasons why the mean mass lost in the experiments to heat limestone is less than 2.2 g.

Do **not** include any reference to weighing errors in your answer.

[4 marks]

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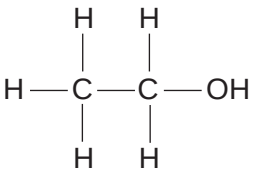
4.3.1.4 Chemical measurements

Question 08

June 2014 | CH3HP | Original Q2 | Legacy

2 (a) The structure of an alcohol is shown in **Figure 2**.

Figure 2



2 (a) (i) Draw a circle around the functional group in the structure of the alcohol.

[1 mark]

2 (a) (ii) What is the chemical name of this alcohol?

[1 mark]

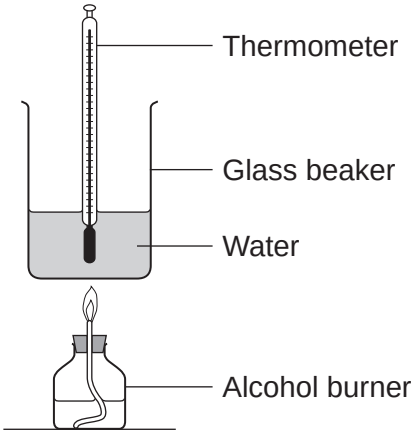
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2 (b) Alcohols are used as fuels.

A student plans an experiment to find the energy released per gram of alcohol burned.

The student uses the apparatus shown in **Figure 3**.

Figure 3



2 (b) (i) Suggest **two** ways that this apparatus could be improved to obtain accurate results.

[2 marks]

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4.3.1.4 Chemical measurements

Question 08 · continued

2 (b) (ii) In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Describe how the student should do this experiment.

You should include any measurements the student should make.

Do **not** describe any improvements to the apparatus.

Do **not** describe how to do any calculations.

[6 marks]

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Extra space .....

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4.3.1.4 Chemical measurements

Question 09

June 2015 | CH1HP | Original Q2 | Legacy

2 Limestone is used to make many different materials.

2 (a) Heating limestone produces calcium oxide and carbon dioxide.

Complete the sentences.

2 (a) (i) The main compound in limestone is calcium ..... .
[1 mark]

2 (a) (ii) The reaction to produce calcium oxide from limestone is thermal ..... .
[1 mark]

2 (a) (iii) Calcium hydroxide is produced when calcium oxide reacts with ..... .
[1 mark]

2 (a) (iv) Calcium hydroxide is used to neutralise acids because it is an ..... .
[1 mark]

Question 2 continues on the next page

Question 09 · continued

2 (b) Cement is made from limestone and clay.

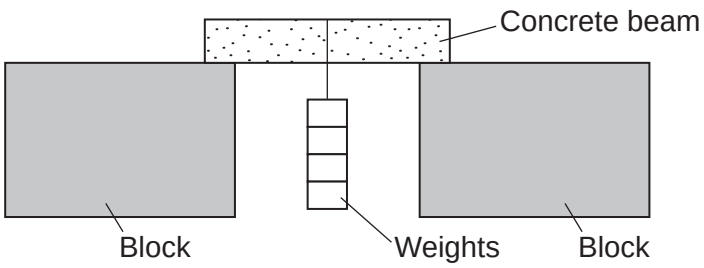
Concrete is made by mixing cement with water, sand and aggregate (small pieces of rock).

A group of students did an investigation on the amount of aggregate needed to make the strongest concrete beam.

The students used this method:

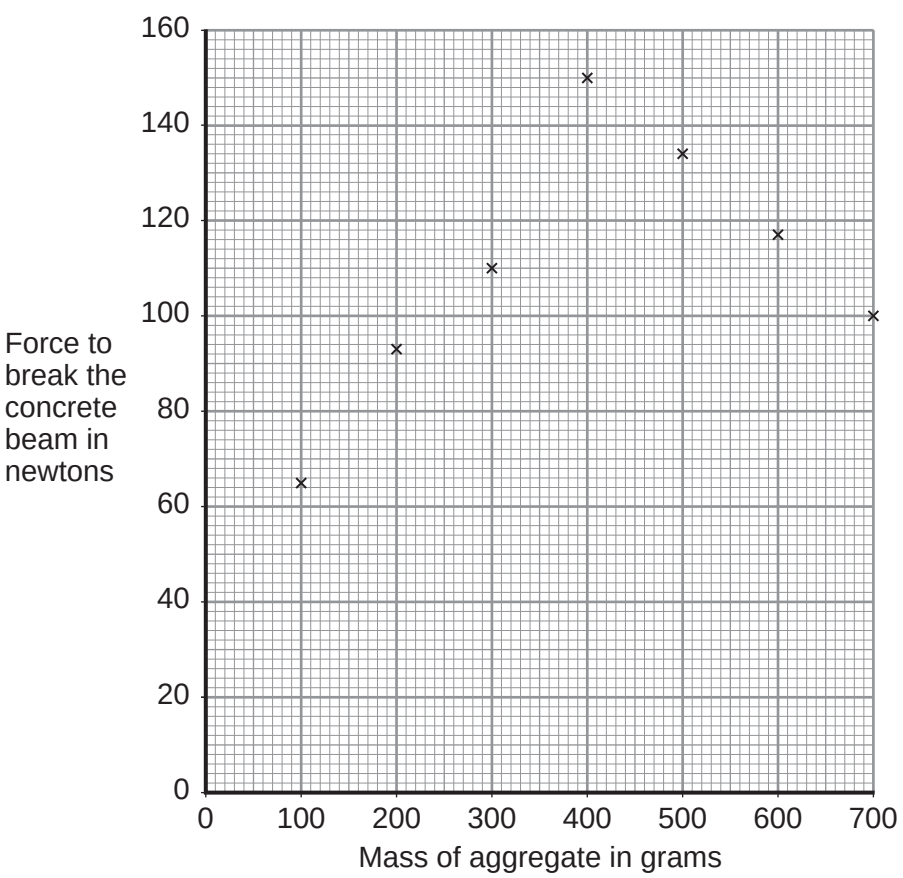
- use the same mass of cement and the same mass of sand but change the mass of aggregate to make seven different concrete mixtures
- use the different concrete mixtures to make beams of the same size
- add weights, as shown in **Figure 2**, until the concrete beam breaks.

Figure 2



The students' results are plotted on the graph in **Figure 3**.

Figure 3



4.3.1.4 Chemical measurements

Question 09 · continued

2 (b) (i) One of the points is anomalous.

Complete the graph in **Figure 3** by drawing **two** straight lines of best fit.

[2 marks]

2 (b) (ii) Describe **one** way the students could improve the method so that their results are more accurate for each graph point.

[2 marks]

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2 (b) (iii) What force is needed to break a concrete beam containing no aggregate?

Show your working on the graph.

[2 marks]

Force = ... newtons

2 (b) (iv) One of the students concluded that:

'The force needed to break a concrete beam increases as the mass of aggregate increases.'

The student's conclusion is **not completely** correct. Use values from the graph to explain why.

[3 marks]

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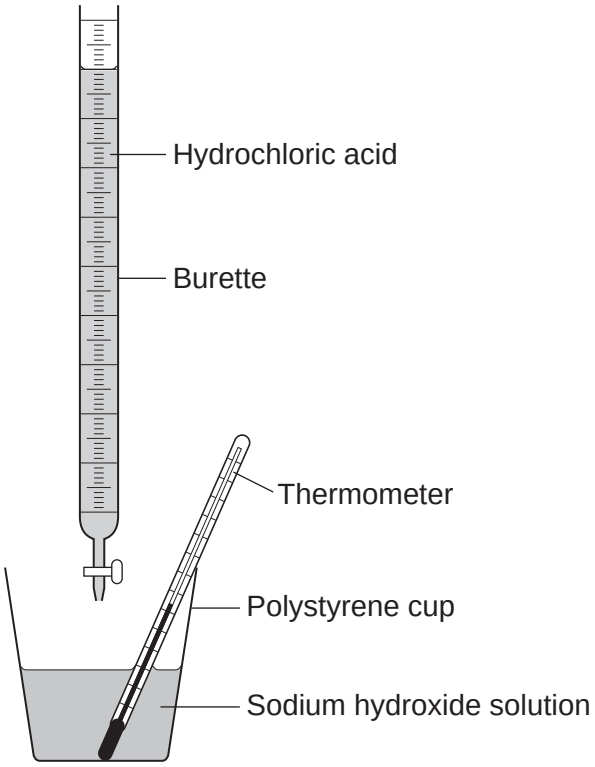
4.3.1.4 Chemical measurements

Question 10

June 2015 | CH3HP | Original Q8 | Legacy

8 A student investigates the energy released when hydrochloric acid completely neutralises sodium hydroxide solution.
The student uses the apparatus shown in **Figure 4**.

Figure 4



The student:

- measures 25 cm^3 sodium hydroxide solution into a polystyrene cup
- fills a burette with hydrochloric acid
- measures the temperature of the sodium hydroxide solution
- adds 5 cm^3 hydrochloric acid to the sodium hydroxide solution in the polystyrene cup
- stirs the mixture and measures the highest temperature of the mixture
- continues to add 5 cm^3 portions of hydrochloric acid, stirring and measuring the highest temperature of the mixture after each addition.

Question 8 continues on the next page

4.3.1.4 Chemical measurements

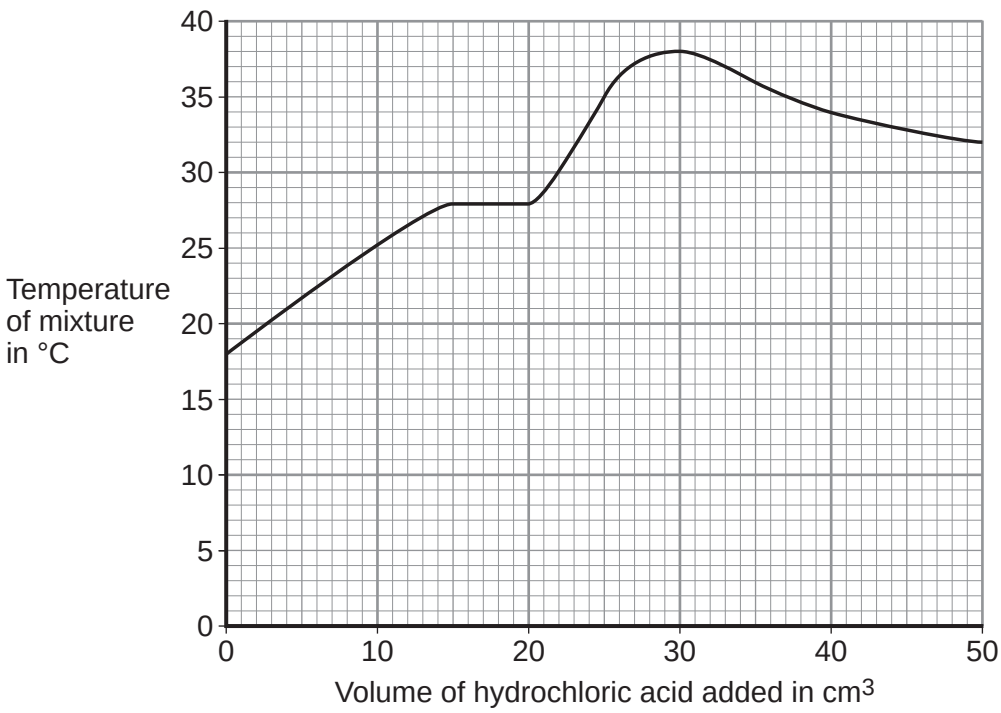
Question 10 · continued

8 (a) The student has plotted a graph of the results.

The graph line has been incorrectly drawn by including an anomalous result.

The graph is shown in **Figure 5**.

Figure 5



8 (a) (i) Suggest a cause for the anomalous result when 20 cm^3 of hydrochloric acid is added.

[1 mark]

.....

.....

8 (a) (ii) Suggest the true value of the temperature of the anomalous point.

[1 mark]

Temperature = ... °C

8 (a) (iii) What was the **total** volume of the mixture when the maximum temperature was reached?

[1 mark]

.....

Total volume of the mixture = ... cm^3

4.3.1.4 Chemical measurements

Question 10 · continued

8 (a) (iv) Calculate the overall temperature increase in this experiment.

[1 mark]

.....

Overall temperature increase = ... °C

8 (a) (v) Use your answers to **8(a)(iii)** and **8(a)(iv)** and the equation to calculate the energy released in the reaction. Give the unit.

[2 marks]

Assume the volume in cm^3 is equivalent to the mass of solution in grams.

Equation: $Q = mc\Delta T$

where:
Q = energy released
m = mass of solution (g)
c = 4.2 (J per g per °C)
ΔT = change in temperature (°C)

.....

.....

Energy released = ... Unit = ...

8 (b) The student did the experiment on page 19 again, starting with 50 cm^3 of sodium hydroxide solution instead of 25 cm^3.

Explain why this would make no difference to the overall temperature increase.

[2 marks]

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8

4.3.1.4 Chemical measurements

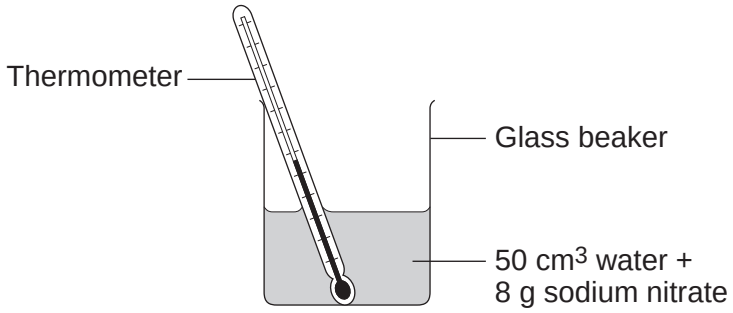
Question 11

1 This question is about temperature changes.

1 (a) A student investigated the temperature change when 8 g of sodium nitrate dissolves in 50 cm^3 of water.

Figure 1 shows the apparatus the student used.

Figure 1



The student did the experiment five times.
Table 1 shows the results.

Table 1

Experiment	Decrease in temperature of water in °C
1	5.9
2	5.7
3	7.2
4	5.6
5	5.8

4.3.1.4 Chemical measurements

Question 11 · continued

1 (a) (i) Calculate the mean decrease in temperature.
Do not use the anomalous result in your calculation.

[2 marks]

Mean decrease in temperature = _____ °C

1 (a) (ii) Suggest **one** change in the apparatus in **Figure 1** which would improve the accuracy of the results.
Give a reason for your answer.

[2 marks]

Question 1 continues on the next page

4.3.1.4 Chemical measurements

Question 11 · continued

1 (b) The student investigated the temperature change when different masses of sodium carbonate were added to 50 cm^3 of water at 20 °C.

Table 2 shows the results.

Table 2

Mass of sodium carbonate in g	Final temperature of solution in °C
2.0	21.5
4.0	23.0
6.0	24.5
8.0	26.0
10.0	26.6
12.0	26.6
14.0	26.6

Describe the relationship between the mass of sodium carbonate added and the final temperature of the solution.

Use values from **Table 2** in your answer.

[3 marks]

7

4.3.1.4 Chemical measurements

Question 12

November 2020 | 8462/1H | Original Q9

0 9 This question is about citric acid ($C_6H_8O_7$).

Citric acid is a solid.

A student investigated the temperature change during the reaction between citric acid and sodium hydrogencarbonate solution.

This is the method used.

1. Pour 25 cm^3 of sodium hydrogencarbonate solution into a polystyrene cup.

2. Measure the temperature of the sodium hydrogencarbonate solution.

3. Add 0.20 g of citric acid to the polystyrene cup.

4. Stir the solution.

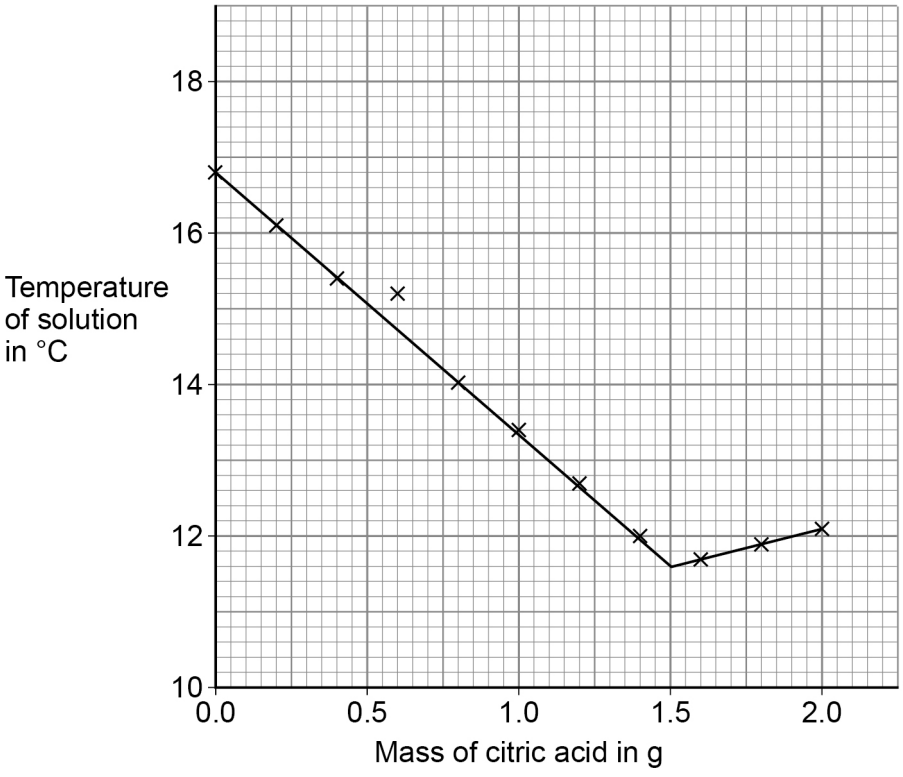
5. Measure the temperature of the solution.

6. Repeat steps 3 to 5 until a total of 2.00 g of citric acid has been added.

The student plotted the results on a graph.

Figure 6 shows the student's graph.

Figure 6



4.3.1.4 Chemical measurements

Question 12 · continued

0 9 . 1 **Figure 6** shows an anomalous point when 0.60 g of citric acid was added. This was caused by the student making an error.

The student correctly:

- measured the mass of the citric acid
- read the thermometer
- plotted the point.

Suggest **one** reason for the anomalous point.

[1 mark]

0 9 . 2 Explain the shape of the graph in terms of the energy transfers taking place.

You should use data from **Figure 6** in your answer.

[3 marks]

0 9 . 3 A second student repeated the investigation using a metal container instead of the polystyrene cup. The container and the cup were the same size and shape.

Sketch a line on **Figure 6** to show the second student's results until 1.00 g of citric acid had been added. The starting temperature of the solution was the same.

Explain your answer.

[3 marks]

Question 12 · continued

The student used a solution of citric acid to determine the concentration of a solution of sodium hydroxide by titration.

0 9 . 4 The student made 250 cm^3 of a solution of citric acid of concentration 0.0500 mol/dm^3

Calculate the mass of citric acid ($C_6H_8O_7$) required.

Relative atomic masses (A_r): H = 1 C = 12 O = 16

[3 marks]

Mass = _____ g

This is part of the method the student used for the titration.

1. Measure 25.0 cm^3 of the sodium hydroxide solution into a conical flask using a pipette.
2. Add a few drops of indicator to the flask.
3. Fill a burette with citric acid solution.

0 9 . 5 Describe how the student would complete the titration.

[3 marks]

4.3.1.4 Chemical measurements

Question 12 · continued

0 9 . 6 Give **two** reasons why a burette is used for the citric acid solution.

[2 marks]

1 _____

_____

2 _____

_____

0 9 . 7 13.3 cm^3 of 0.0500 mol/dm^3 citric acid solution was needed to neutralise 25.0 cm^3 of sodium hydroxide solution.

The equation for the reaction is:

$$3\,NaOH + C_6H_8O_7 \rightarrow C_6H_5O_7Na_3 + 3\,H_2O$$

Calculate the concentration of the sodium hydroxide solution in mol/dm^3

[3 marks]

_____

_____

_____

_____

_____

_____

Concentration = _____ mol/dm^3

18

4.3.1.4 Chemical measurements

Question 13

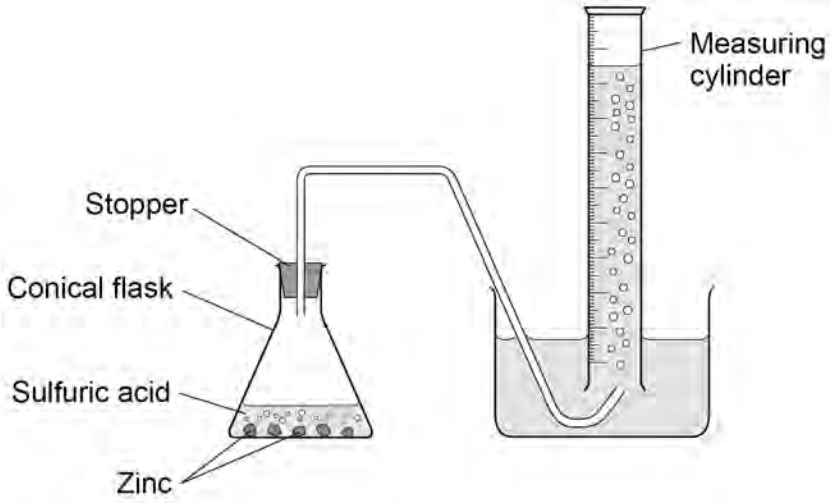
June 2023 | 8462/2H | Original Q1

0 1 A student investigated the rate of the reaction between zinc and sulfuric acid.

Hydrogen gas is produced during this reaction.

Figure 1 shows the apparatus.

Figure 1



This is the method used.

1. Add 50 cm^3 of sulfuric acid to a conical flask.

2. Add 2.0 g of zinc to the conical flask.

3. Quickly put a stopper in the conical flask and start a timer.

4. Measure the time taken to collect 20 cm^3 of gas.

5. Repeat steps 1 to 4 three more times.

0 1 . 1 Suggest why the stopper must be put in the conical flask as quickly as possible in **step 3**.

[1 mark]

0 1 . 2 The student calculated the rate of the reaction for each trial.

Table 1 shows the results of the calculations.

Table 1

	Trial 1	Trial 2	Trial 3	Trial 4
Rate of reaction in cm^3/s	0.78	0.81	0.68	0.81

Determine the mean time taken to collect 20 cm^3 of gas.

Do **not** include any anomalous results.

Use the equation:

$$\text{mean rate of reaction} = \frac{\text{volume of gas collected}}{\text{mean time taken}}$$

[5 marks]

Mean time taken = _____ s

Question 1 continues on the next page

4.3.1.4 Chemical measurements

Question 13 · continued

0 1 . 3 The student changed the investigation so that the mean time taken to collect 20 cm^3 of gas was greater.

Which **two** changes would increase the mean time taken to collect 20 cm^3 of gas?

[2 marks]

Tick (✓) **two** boxes.

- Use a catalyst ☐
- Use a larger conical flask ☐
- Use a lower temperature ☐
- Use smaller pieces of zinc ☐
- Use sulfuric acid of a lower concentration ☐

0 1 . 4 Hydrogen gas is produced during this reaction.

Describe the test for hydrogen gas.

Give the result of the test.

[2 marks]

Test _____

_____

Result _____

_____

10

4.3.1.4 Chemical measurements

Question 14

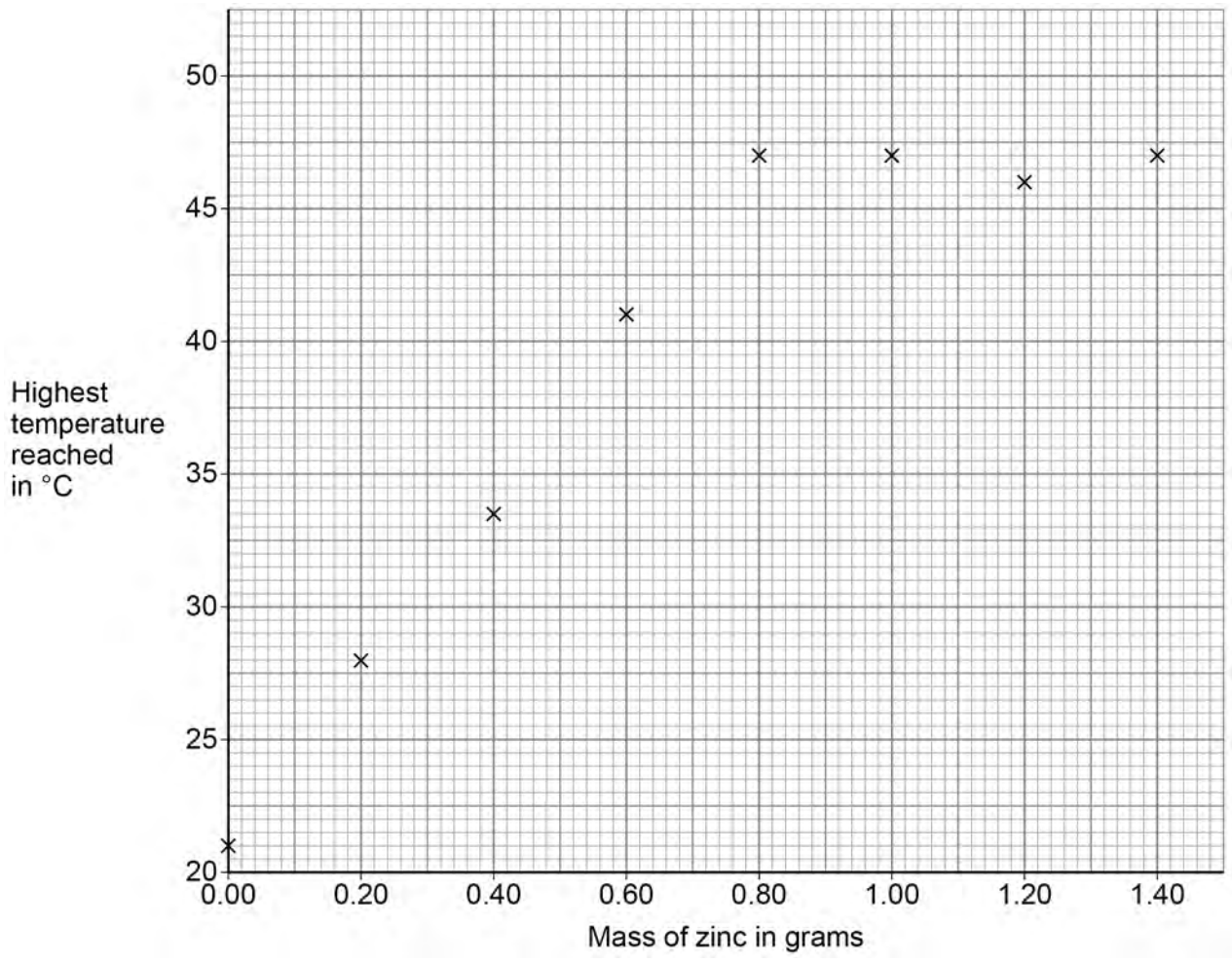
0 4 A student investigated the energy change of the reaction between zinc and copper sulfate solution.

This is the method used.

1. Measure 25 cm^3 of copper sulfate solution into a polystyrene cup.
2. Measure the temperature of the copper sulfate solution.
3. Add 0.20 g of zinc powder to the copper sulfate solution.
4. Stir the reaction mixture.
5. Record the highest temperature reached.
6. Repeat steps 1 to 5 with different masses of zinc powder.

Figure 3 shows the results.

Figure 3



Question 14 · continued

0 4 . 1 Draw **two** lines of best fit on **Figure 3**.

The lines should cross.

[2 marks]

0 4 . 2 Explain the results shown in **Figure 3**.

Do **not** refer to anomalous points.

Use data from **Figure 3**.

[4 marks]

0 4 . 3 Explain why using a polystyrene cup gives more accurate results than using a glass beaker.

[2 marks]

0 4 . 4 Complete the ionic equation for the reaction between zinc and copper sulfate solution.

Include state symbols.

[2 marks]

$$Zn(s) + Cu^{2+}(aq) \rightarrow ____(__) + ____(__)$$

Question 14 · continued

A different student repeated steps 1 to 5 of the method four times using 0.50 g of zinc powder.

Table 2 shows the results.

Table 2

	Trial 1	Trial 2	Trial 3	Trial 4
Highest temperature reached in °C	37.6	37.2	37.8	37.4

0 4 . 5 Calculate the mean highest temperature reached.

Include the uncertainty in your answer.

[3 marks]

Mean highest temperature reached = _____ ± _____ °C

0 4 . 6 The results show random errors.

The student did not make any measuring errors.

Suggest **one** reason for the random errors in this experiment.

[1 mark]

14

4.3.1.4 Chemical measurements

Question 15

June 2025 | 8462/2H | Original Q1

0 1 A student investigated the mass of dissolved solids in sea water.

This is the method used.

1. Weigh an empty evaporating basin.
2. Measure 10.0 cm^3 of sea water sample **A** into the evaporating basin using a burette.
3. Heat the evaporating basin until all the water seems to have evaporated.
4. Weigh the evaporating basin and contents.
5. Calculate the mass of dissolved solids in the sample.
6. Repeat steps 1 to 5 with sea water samples **B**, **C** and **D**.

0 1 . 1 Why did the student use a burette rather than a measuring cylinder to measure 10.0 cm^3 of each sample?

[1 mark]

0 1 . 2 What was the dependent variable in this investigation?

[1 mark]

0 1 . 3 Describe how the student could make sure **all** of the water had evaporated in **step 3**.

[2 marks]

0 1 . 4 How did the student calculate the mass of dissolved solids in each sea water sample?

[1 mark]

Question 15 · continued

Table 1 shows the results.

Table 1

Sea water sample	A	B	C	D
Mass of dissolved solids in grams	0.35	0.37	0.33	0.34

0 1 . 5 Calculate the mean concentration of dissolved solids in 10.0 cm^3 samples of sea water **A**, **B**, **C** and **D**.

Use **Table 1** and the equation:

$$\text{mean concentration of dissolved solids } (g/dm^3) = \frac{\text{mean mass of dissolved solids (g)}}{\text{volume of sample } (dm^3)}$$

Give your answer in g/dm^3.

[5 marks]

Mean concentration = _____ g/dm^3

0 1 . 6 Suggest why sea water samples **A**, **B**, **C** and **D** contain different masses of dissolved solids.

[1 mark]

11