AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.3.1.4

Chemical measurements

Past-paper questions

Tier	**Foundation**
Question groups	**11**
Available paper years	**2018–2025**

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.

5.3.1.4 Chemical measurements

Question 01

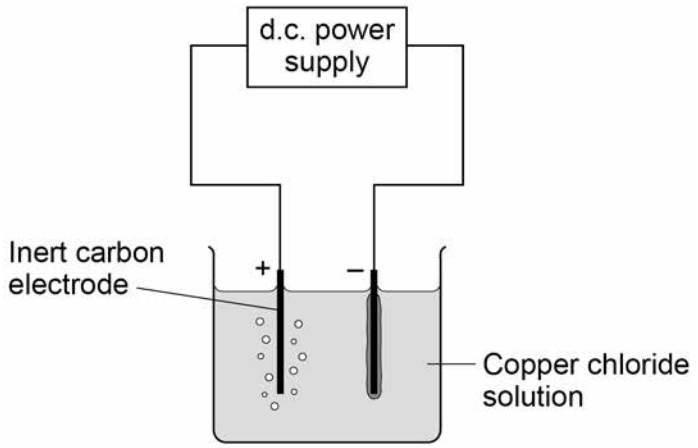
June 2018 | 8464/C/1F | Original Q5

0 5 This question is about electrolysis.

A student investigates the mass of copper produced during electrolysis of copper chloride solution.

Figure 12 shows the apparatus.

Figure 12



0 5 . 1 Which gas is produced at the positive electrode (anode)?

[1 mark]

Tick **one** box.

- carbon dioxide ☐
- chlorine ☐
- hydrogen ☐
- oxygen ☐

Question 01 · continued

0 5 . 2 Copper is produced at the negative electrode (cathode).

What does this tell you about the reactivity of copper?

[1 mark]

Tick **one** box.

Copper is less reactive than hydrogen ☐

Copper is less reactive than oxygen ☐

Copper is more reactive than carbon ☐

Copper is more reactive than chlorine ☐

Table 4 shows the student's results.

Table 4

	Total mass of copper produced in mg			
Time in mins	**Experiment 1**	**Experiment 2**	**Experiment 3**	**Mean**
1	0.60	0.58	0.62	0.60
2	1.17	1.22	1.21	1.20
4	2.40	2.41	2.39	2.40
5	3.02	**X**	3.01	3.06

0 5 . 3 Determine the **mean** mass of copper produced after 3 minutes.

[1 mark]

Mass = _____ mg

Question 5 continues on the next page

5.3.1.4 Chemical measurements

Question 01 · continued

0 5 . 4 Calculate the mass **X** of copper produced in **Experiment 2** after 5 minutes.

Use **Table 4** on page 19

[2 marks]

Mass **X** = _____ mg

0 5 . 5 The copper chloride solution used in the investigation contained 300 grams per dm^3 of solid $CuCl_2$ dissolved in 1 dm^3 of water.

The students used 50 cm^3 of copper chloride solution in each experiment.

Calculate the mass of solid copper chloride used in each experiment.

[3 marks]

Mass = _____ g

8

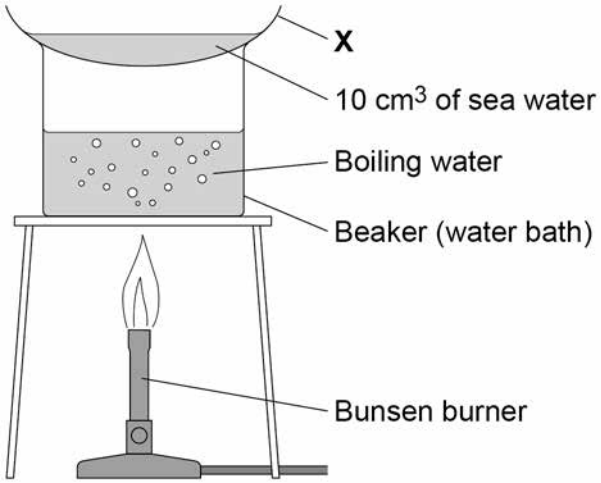
5.3.1.4 Chemical measurements

Question 02

0 3 A student tested a sea water sample for dissolved solids.

Figure 6 shows the apparatus.

Figure 6



0 3 . 1 What is apparatus **X** on **Figure 6**?

[1 mark]

Tick **one** box.

- Boiling tube ☐
- Condenser ☐
- Funnel ☐
- Watch glass ☐

5.3.1.4 Chemical measurements

Question 02 · continued

0 3 . 2 The student did the test four times.

The student calculated the mass of solid on apparatus **X** after heating.

Table 3 shows the student's results.

Table 3

	Test 1	Test 2	Test 3	Test 4
Mass of solid in grams	0.12	0.29	0.14	0.15

Calculate the mean mass of solid.

Do not include the anomalous result in your calculation.

Give your answer to 2 significant figures.

[3 marks]

Mean mass = _____ g

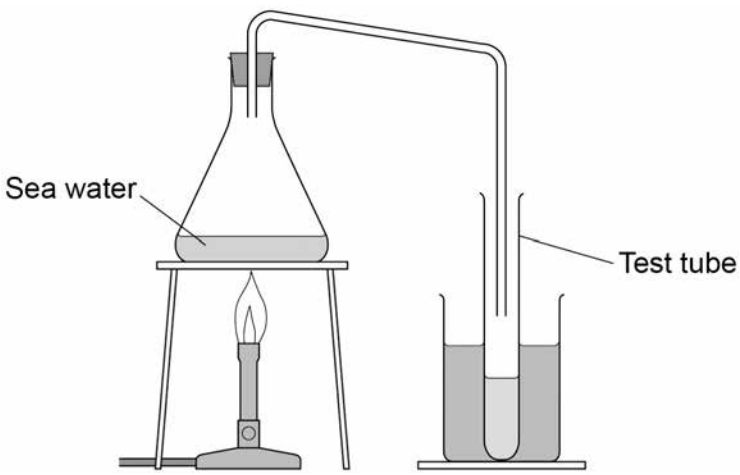
Question 3 continues on the next page

5.3.1.4 Chemical measurements

Question 02 · continued

The student distilled a sample of sea water in the apparatus shown in **Figure 7**

Figure 7



0 3 . 3 What change of state is happening at the surface of the sea water in **Figure 7**?

[1 mark]

0 3 . 4 Describe how the water in the test tube in **Figure 7** is different from the sea water.

[1 mark]

0 3 . 5 Why does producing drinking water from sea water using distillation cost a lot of money?

[1 mark]

5.3.1.4 Chemical measurements

Question 02 · continued

0 3 . 6 River water is filtered then sterilised to make drinking water.

Why are these **two** processes done?

[2 marks]

Filtering _____

_____

Sterilising _____

_____

9

Turn over for the next question

5.3.1.4 Chemical measurements

Question 03

June 2018 | 8464/C/2F | Original Q5

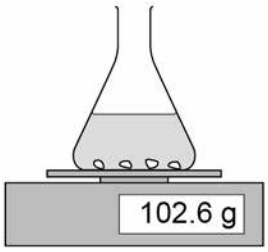
0 5 A student investigated the effect of the size of marble chips on the rate of the reaction between marble chips and hydrochloric acid.

This is the method used.

1. Add 10.0 g of marble chips into the flask.
2. Add 50 cm^3 of hydrochloric acid and start a timer.
3. Record the mass lost from the flask every 10 seconds.
4. Repeat steps 1 to 3 with different sizes of marble chips.

Figure 10 shows the apparatus.

Figure 10



0 5 . 1 Draw **one** line from each type of variable to the correct example of the variable.

[2 marks]

Type of variable	Example of variable
	Mass lost from flask
Independent	Size of flask
	Size of marble chips
Control	
	Time taken
	Volume of acid

5.3.1.4 Chemical measurements

Question 03 · continued

0 5 . 2 The equation for the reaction is:

$$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + H_2O(l) + CO_2(g)$$

Name the **three** products.

[2 marks]

1 _____

2 _____

3 _____

0 5 . 3 Another student suggests putting some cotton wool in the top of the flask.

Suggest why this improves the investigation.

[1 mark]

_____

_____

0 5 . 4 The reaction produces 1.6 g of gas in 30 seconds.

Calculate the mean rate of the reaction in the first 30 seconds.

Use the equation:

$$\text{mean rate of reaction} = \frac{\text{mass of product produced in grams}}{\text{time in seconds}}$$

[1 mark]

_____

_____

Mean rate of reaction = _____

0 5 . 5 What is the unit for the mean rate of reaction calculated in question **05.4**?

[1 mark]

Tick **one** box.

g ☐ g/s ☐ s ☐ s/g ☐

0 5 . 6 **Table 5** shows the student's results.

Table 5

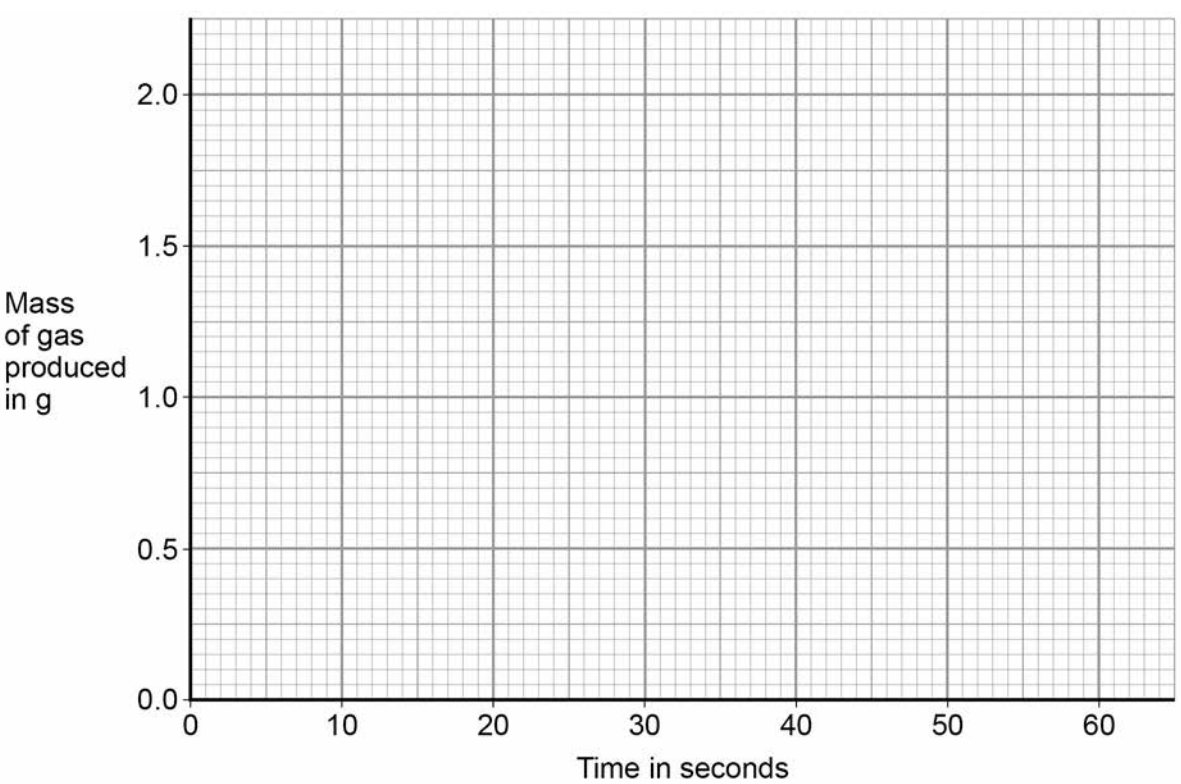
Time in seconds	Mass of gas produced in g
0	0.0
10	0.8
20	0.6
30	1.6
40	1.8
50	2.0
60	2.0

Plot the data from **Table 5** on **Figure 11**

Draw a line of best fit.

[3 marks]

Figure 11

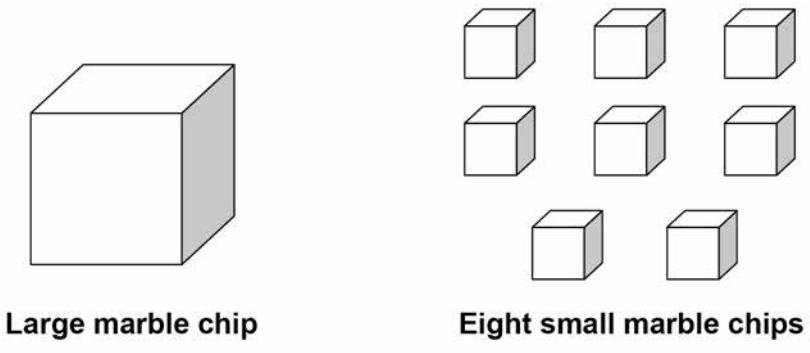


5.3.1.4 Chemical measurements

Question 03 · continued

0 5 . 7 **Figure 12** shows a large marble chip and eight small marble chips.

Figure 12



The large marble chip has the same total volume as the eight small marble chips, but a different surface area.

Why do the eight small marble chips react faster than the large marble chip?

[1 mark]

Tick **one** box.

- The eight small marble chips have a larger surface area, so less frequent collisions. ☐
- The eight small marble chips have a larger surface area, so more frequent collisions. ☐
- The eight small marble chips have a smaller surface area, so less frequent collisions. ☐
- The eight small marble chips have a smaller surface area, so more frequent collisions. ☐

11

5.3.1.4 Chemical measurements

Question 04

June 2019 | 8464/C/1F | Original Q5

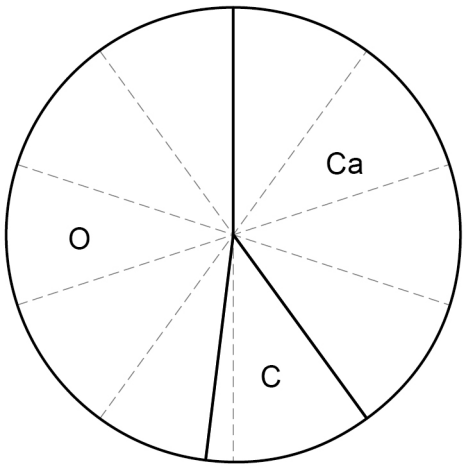
0 5 This question is about oxygen and compounds of oxygen.

0 5 . 1 What is the state symbol of oxygen at room temperature?

[1 mark]

0 5 . 2 **Figure 4** shows the percentage by mass of the elements calcium, carbon and oxygen in calcium carbonate.

Figure 4



What is the percentage by mass of calcium in calcium carbonate?

[1 mark]

Percentage = _____ %

5.3.1.4 Chemical measurements

Question 04 · continued

0 5 . 3 At high temperature, sodium nitrate decomposes into sodium nitrite and oxygen.

A student heats three samples of sodium nitrate.

The mass of each sample was 4.50 g

The mass of solid after heating was recorded.

Table 2 shows the mass of solid after heating in each experiment.

Table 2

Experiment	Mass of solid after heating in g
1	3.76
2	3.98
3	4.09

Calculate the mean mass of solid after heating.

Give your answer to 3 significant figures.

[3 marks]

Mean mass of solid after heating = _____ g

Question 5 continues on the next page

0 5 . 4 **Table 3** shows the electronic structure of hydrogen and oxygen.

Table 3

Element	Electronic structure
Hydrogen	1
Oxygen	2,6

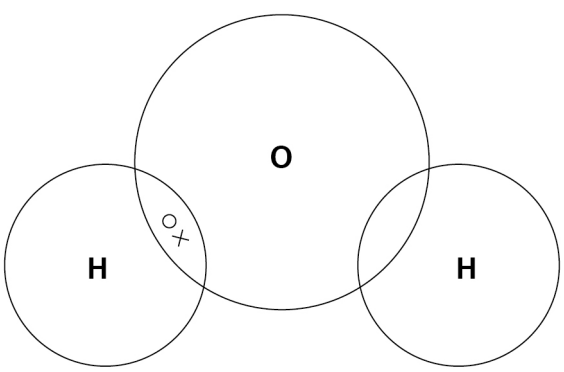
Figure 5 shows part of a dot and cross diagram of a molecule of water (H_2O).

Complete the dot and cross diagram.

You should show only the electrons in the outer energy levels.

[2 marks]

Figure 5



Oxygen and sulfur are examples of simple molecules.

0 5 . 5 Complete the sentence.

Choose the answer from the box.

[1 mark]

covalent	ionic	metallic

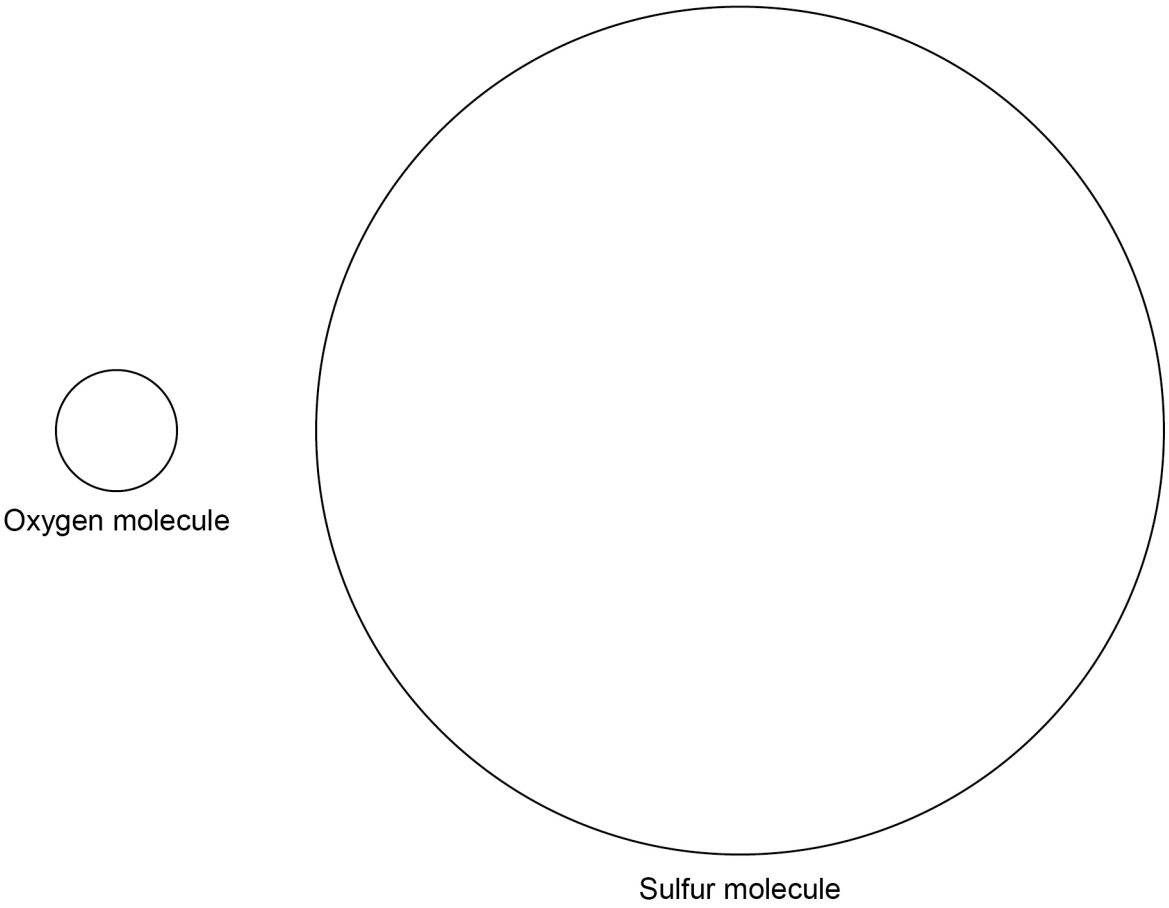
There are _____ bonds between the atoms of oxygen in an oxygen molecule.

5.3.1.4 Chemical measurements

Question 04 · continued

0 5 . 6 **Figure 6** shows the relative sizes of an oxygen molecule and a sulfur molecule.

Figure 6



How does the boiling point of sulfur compare with the boiling point of oxygen?

Complete the sentences.

[2 marks]

The boiling point of sulfur is _____ the boiling point of oxygen.

This is because in sulfur the intermolecular forces are _____ than the intermolecular forces in oxygen.

10

5.3.1.4 Chemical measurements

Question 05

November 2020 | 8464/C/1F | Original Q2

0 2 A student investigated the temperature change when metal **X** was added to copper sulfate solution.

This is the method used.

1. Add 25 cm^3 of copper sulfate solution to a beaker.
2. Measure the temperature of the copper sulfate solution.
3. Add 1.0 g of metal **X** and stir.
4. Measure the highest temperature reached when metal **X** is added to copper sulfate solution.
5. Repeat steps 1 to 4 with different metals.

Figure 1 shows the apparatus used.

Figure 1

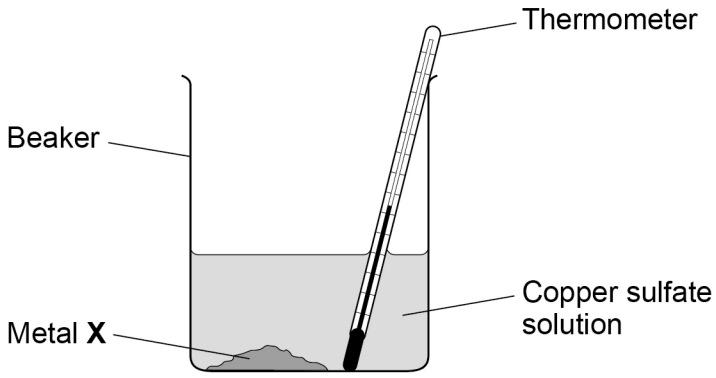
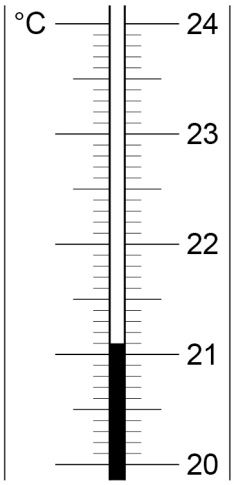


Figure 2 shows the thermometer reading of the copper sulfate solution at the start of the investigation.

Figure 2



Question 05 · continued

0 2 . 1 The highest temperature reached when metal **X** was added to copper sulfate solution was 35.5 °C

Determine the temperature change when metal **X** is added to copper sulfate solution.

Use **Figure 2**.

[2 marks]

Highest temperature = 35.5 °C

Temperature at start = _____ °C

Temperature change = _____ °C

0 2 . 2 Give **two** variables the student should keep the same in this investigation.

[2 marks]

1 _____

_____

2 _____

_____

0 2 . 3 The student repeated the experiment with metal **Y**.

Table 1 shows four results for metal **Y**.

Table 1

	Test 1	Test 2	Test 3	Test 4
Temperature change in °C	9.2	7.3	9.5	9.2

Calculate the mean temperature change for metal **Y**.

Do **not** include the anomalous result in your calculation.

[2 marks]

_____

_____

_____

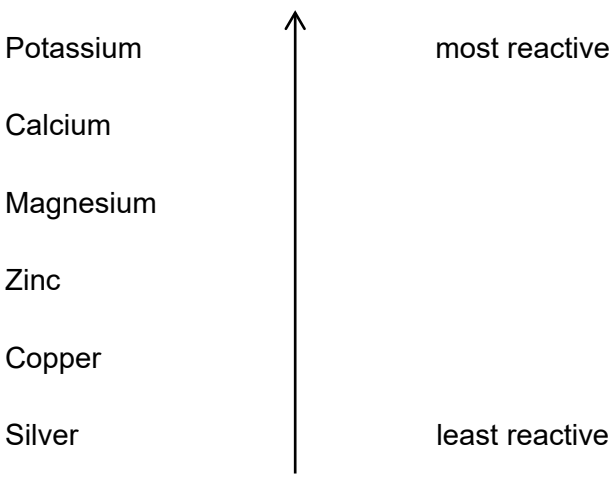
_____

Mean temperature change = _____ °C

The more reactive the metal added to copper sulfate solution, the greater the temperature change.

Figure 3 shows a reactivity series.

Figure 3



0 2 . 4 The student repeated the experiment.

The student added:

- magnesium to copper sulfate solution
- an unknown metal **A** to copper sulfate solution.

Table 2 shows the results.

Table 2

Metal	**Temperature change in °C**
Magnesium	12
Metal **A**	8

The student concludes metal **A** is zinc.

Give **one** reason why the student is correct.

Use **Figure 3** and **Table 2**.

[1 mark]

5.3.1.4 Chemical measurements

Question 05 · continued

0 2 . 5 The student did the experiment with silver and copper sulfate solution.

What happens to the temperature of the mixture?

Use **Figure 3**.

[1 mark]

Tick (✓) **one** box.

Decreases ☐

Increases ☐

Stays the same ☐

0 2 . 6 Suggest **one** reason why the student should **not** add potassium metal to copper sulfate solution.

[1 mark]

0 2 . 7 100 cm^3 of the copper sulfate solution contains 1.8 g of copper sulfate.

Calculate the mass of copper sulfate in 25 cm^3 of this copper sulfate solution.

[2 marks]

Mass = _____ g

11

5.3.1.4 Chemical measurements

Question 06

0 7 Some students investigated the effect of temperature on the rate of reaction.

0 7 . 1 The students reacted sodium thiosulfate solution with hydrochloric acid.

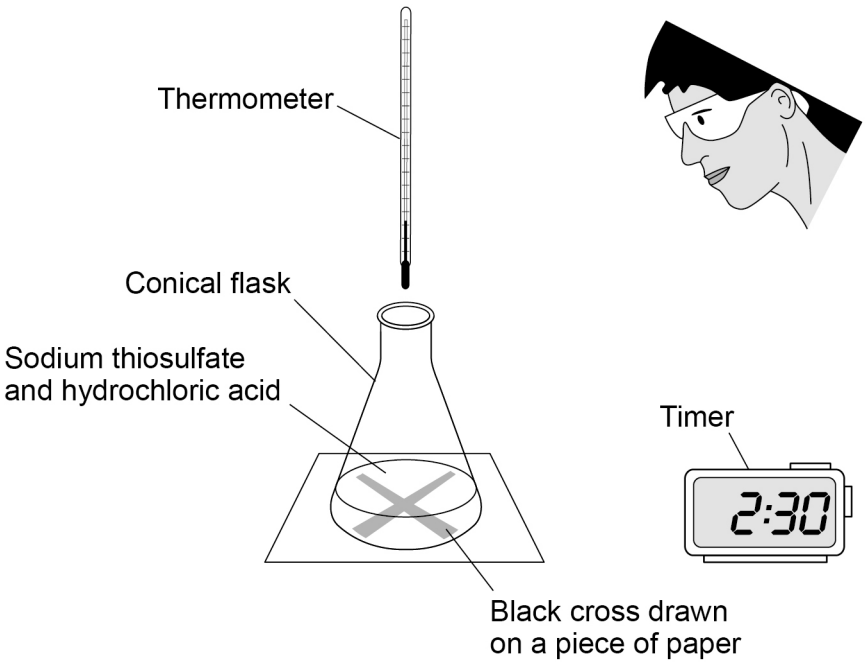
This is the method used.

1. Use a beaker to measure 50 cm^3 of heated sodium thiosulfate solution into a conical flask.
2. Measure the temperature of the room.
3. Put the conical flask on a black cross drawn on a piece of paper.
4. Start a timer.
5. Use the same beaker to measure 10 cm^3 of hydrochloric acid into the conical flask.
6. Stop the timer when the cross is no longer visible.

The students repeated the experiment at a different room temperature.

Figure 10 shows the apparatus.

Figure 10



5.3.1.4 Chemical measurements

Question 06 · continued

The method contains errors and does **not** produce accurate results.

Describe a method the students should use to produce accurate results.

You do **not** need to write about safety precautions.

[6 marks]

Question 7 continues on the next page

5.3.1.4 Chemical measurements

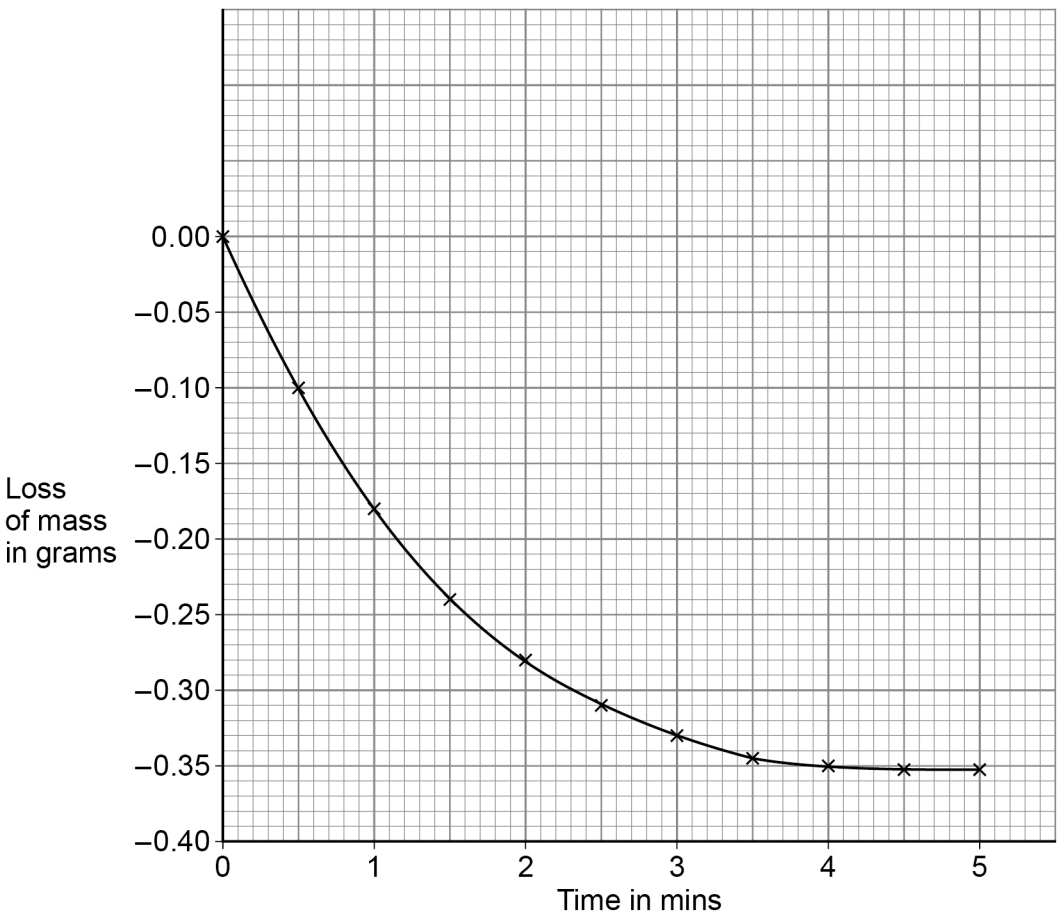
Question 06 · continued

Some students investigated the effect of temperature on the rate of a different reaction.

They recorded the loss of mass from their apparatus at 40 °C

Figure 11 shows the results.

Figure 11



5.3.1.4 Chemical measurements

Question 06 · continued

0 7 . 2 Calculate the mean rate of reaction between 1 minute and 3 minutes at 40 °C

Use **Figure 11** and the equation:

$$\text{Mean rate of reaction} = \frac{\text{change in mass of gas in g}}{\text{time in mins}}$$

[3 marks]

Mean rate of reaction = _____ g/min

0 7 . 3 Draw a curve on **Figure 11** for the results you would expect at a temperature of 50 °C instead of 40 °C

[2 marks]

11

5.3.1.4 Chemical measurements

Question 07

0 1 Magnesium is in Group 2 of the periodic table.

1.0 g of magnesium reacted with chlorine to produce magnesium chloride.

0 1 . 1 Which types of element react when magnesium reacted with chlorine?

[1 mark]

Tick (✓) **one** box.

- A metal and a metal ☐
- A metal and a non-metal ☐
- A non-metal and a non-metal ☐

0 1 . 2 Write the word equation for the reaction when magnesium reacts with chlorine.

[1 mark]

_____ + _____ → _____

0 1 . 3 What apparatus was used to measure the mass of 1.0 g of magnesium?

[1 mark]

Tick (✓) **one** box.

- Balance ☐
- Beaker ☐
- Ruler ☐

Question 07 · continued

0 1 . 4 What mass of magnesium chloride was produced?

[1 mark]

Tick (✓) **one** box.

Less than 1.0 g ☐

1.0 g ☐

More than 1.0 g ☐

0 1 . 5 Magnesium reacts with oxygen to produce magnesium oxide.

Calculate the percentage mass of magnesium in magnesium oxide (MgO).

Relative atomic mass (A_r): Mg = 24

Relative formula mass (M_r): MgO = 40

[2 marks]

Percentage mass of magnesium = _____ %

Question 1 continues on the next page

Question 07 · continued

Magnesium carbonate decomposes to produce magnesium oxide and carbon dioxide.

The word equation for the reaction is:

magnesium carbonate → magnesium oxide + carbon dioxide

Four students heated 2.00 g of magnesium carbonate for 10 minutes.

Table 1 shows the results.

Table 1

Mass of carbon dioxide produced in g				
Student 1	**Student 2**	**Student 3**	**Student 4**	**Mean**
0.97	0.91	0.50	0.95	**X**

0 1 . 6 What is the most likely reason for **Student 3**'s anomalous result?

[1 mark]

Tick (✓) **one** box.

The student heated more than 2.00 g of magnesium carbonate. ☐

The student heated the magnesium carbonate for less than 10 minutes. ☐

The student used a higher temperature. ☐

0 1 . 7 Calculate value **X** in **Table 1**.

Do **not** use the anomalous result.

Give your answer to 2 significant figures.

[3 marks]

X (2 significant figures) = _____ g

10

5.3.1.4 Chemical measurements

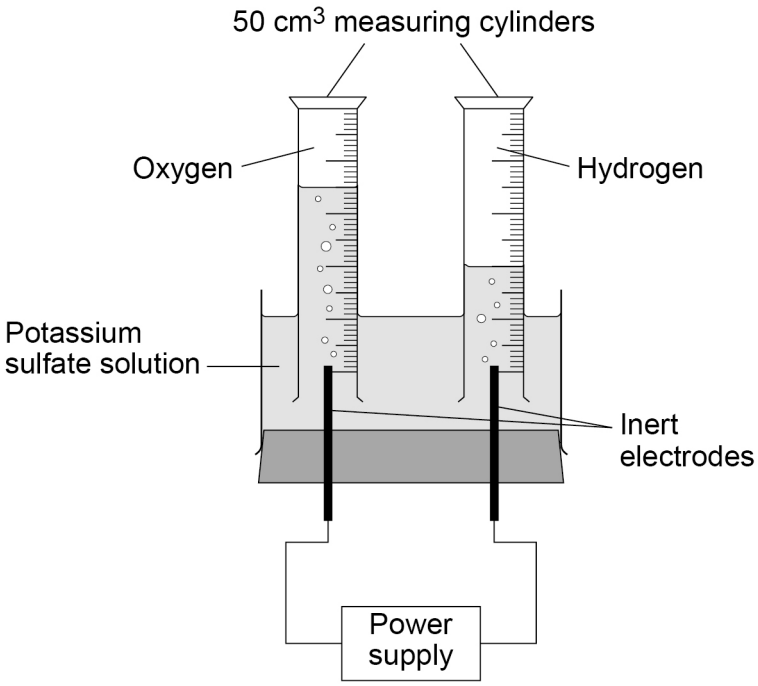
Question 08

June 2022 | 8464/C/1F | Original Q6

0 6 This question is about electrolysis.

Figure 14 shows the apparatus used to investigate the electrolysis of potassium sulfate solution.

Figure 14



0 6 . 1 Potassium sulfate contains K^+ and SO_4^{2-} ions.

What is the formula of potassium sulfate?

[1 mark]

Tick (✓) **one** box.

- KSO_4 ☐
- K_2SO_4 ☐
- $K(SO_4)_2$ ☐
- $K_2(SO_4)_2$ ☐

5.3.1.4 Chemical measurements

Question 08 · continued

0 6 . 2 What are the volumes of gases collected in the electrolysis experiment?

Use **Figure 14**.

[1 mark]

Volume of hydrogen = _____ cm^3

Volume of oxygen = _____ cm^3

0 6 . 3 A student made the following hypothesis:

'The volumes of gases collected in this electrolysis experiment are in the same ratio as hydrogen atoms to oxygen atoms in a water molecule.'

Explain how the volumes of gases collected in the experiment in **Figure 14** support the student's hypothesis.

Use your answer to Question **06.2**

[2 marks]

Question 6 continues on the next page

Question 08 · continued

0 6 . 4 The experiment is repeated 4 times.

The volumes of oxygen collected in the 4 experiments are:

6 cm^3 9 cm^3 10 cm^3 11 cm^3

The mean volume of oxygen collected in the 4 experiments is 9 cm^3

The measure of uncertainty is the range of a set of measurements about the mean.

What is the measure of uncertainty in the 4 experiments?

[1 mark]

Tick (✓) **one** box.

9 ± 1 cm^3 ☐

9 ± 2 cm^3 ☐

9 ± 3 cm^3 ☐

0 6 . 5 The potassium sulfate solution has 0.86 g of potassium sulfate dissolved in 25 cm^3 of water.

Calculate the mass of potassium sulfate needed to make 1.0 dm^3 of solution.

[3 marks]

Mass = _____ g

8

5.3.1.4 Chemical measurements

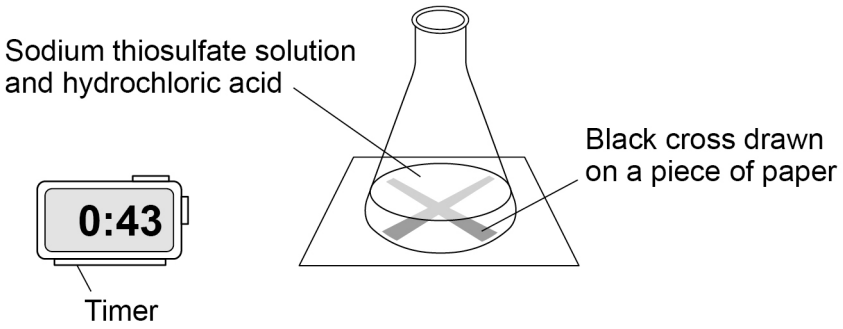
Question 09

0 4 A student investigates the effect of concentration on the rate of the reaction between sodium thiosulfate solution and hydrochloric acid.

Figure 6 shows the experiment.

The experiment was done in a fume cupboard.

Figure 6



This is the method used.

1. Pour 50 cm^3 of sodium thiosulfate solution into a conical flask.
2. Put the conical flask on a black cross drawn on a piece of paper.
3. Pour 10 cm^3 of hydrochloric acid into the conical flask and start a timer.
4. Stop the timer when the cross can no longer be seen.
5. Repeat the experiment with different concentrations of sodium thiosulfate solution.

5.3.1.4 Chemical measurements

Question 09 · continued

0 4 . 1 Draw **one** line from each type of variable to the correct example of the variable in this investigation.

[2 marks]

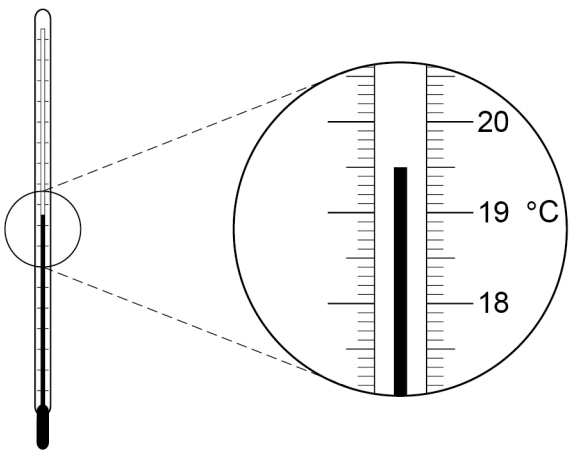
Type of variable	Example of variable
	Concentration of sodium thiosulfate solution
Dependent	
	Temperature of reaction mixture
	Time taken for the cross to no longer be seen
Independent	
	Volume of acid
	Volume of the flask

Question 4 continues on the next page

Question 09 · continued

0 4 . 2 The experiment is done at room temperature.

Figure 7



What is the temperature shown on the thermometer in **Figure 7**?

[1 mark]

Temperature = _____ °C

Table 1 shows the student's results.

Table 1

Concentration of sodium thiosulfate solution in mol/dm^3	Time in seconds
0.1	82
0.2	40
0.3	20
0.4	13
0.5	10
0.6	8

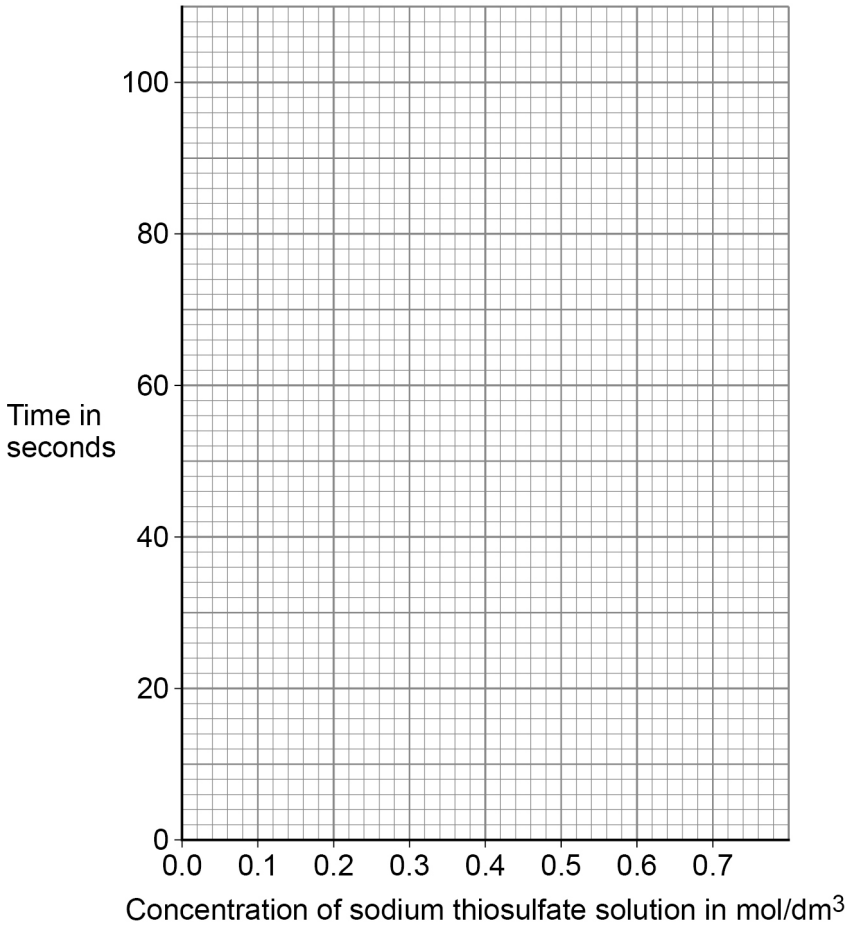
Question 09 · continued

0 4 . 3 Plot the data from **Table 1** on **Figure 8**.

Draw a line of best fit.

[3 marks]

Figure 8



0 4 . 4 Predict the time taken for the cross to no longer be seen at a concentration of 0.7 mol/dm^3

Use your graph in **Figure 8**.

[1 mark]

Time = _____ s

0 4 . 5 Complete the sentence.

[1 mark]

As the concentration of sodium thiosulfate solution increases, the time taken for the cross to no longer be seen _____ .

Question 09 · continued

0 4 . 6 In one experiment 0.725 g of sulfur is produced in 20 seconds.

Calculate the mean rate of the reaction from 0 to 20 seconds.

Use the equation:

$$\text{mean rate of reaction} = \frac{\text{mass of sulfur produced in grams}}{\text{time in seconds}}$$

[2 marks]

Mean rate of reaction = _____

0 4 . 7 What is the unit for the mean rate of reaction calculated in Question **04.6**?

[1 mark]

Tick (✓) **one** box.

g ☐ g/s ☐ s ☐ s/g ☐

5.3.1.4 Chemical measurements

Question 09 · continued

0 4 . 8 The student did the experiment with 0.15 mol/dm^3 sodium thiosulfate solution and repeated the experiment three more times.

Table 2 shows the results.

Table 2

	Test 1	Test 2	Test 3	Test 4
Time in seconds for the cross to no longer be seen	60.5	63.2	82.3	65.7

Calculate the mean time for this reaction.

Do **not** include the anomalous result in your calculation.

Give your answer to 3 significant figures.

[3 marks]

Mean time for the reaction (3 significant figures) = _____ s

14

5.3.1.4 Chemical measurements

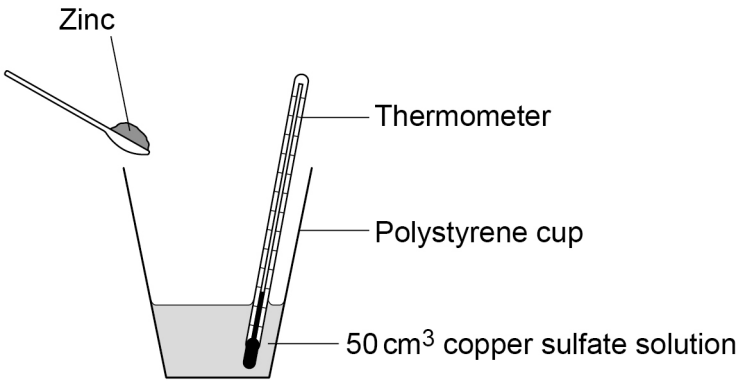
Question 10

June 2024 | 8464/C/1F | Original Q3

0 3 A student investigated the temperature change when different masses of zinc were added to copper sulfate solution.

Figure 5 shows the apparatus.

Figure 5



This is the method used.

1. Pour 50 cm^3 of copper sulfate solution into a polystyrene cup.
2. Measure the starting temperature of the copper sulfate solution.
3. Add 1.0 g of zinc.
4. Stir the mixture.
5. Measure the highest temperature reached.
6. Repeat steps 1 to 5 two more times.
7. Repeat steps 1 to 6 with different masses of zinc.

5.3.1.4 Chemical measurements

Question 10 · continued

0 3 . 1 The student varied the mass of zinc.

What type of variable is the mass of zinc?

[1 mark]

Tick (✓) **one** box.

Control ☐

Dependent ☐

Independent ☐

Question 3 continues on the next page

5.3.1.4 Chemical measurements

Question 10 · continued

Zinc reacts with copper sulfate solution to produce salt **A** and copper.

The word equation for the reaction is:

zinc + copper sulfate → salt **A** + copper

0 3 . 2 What is the name of salt **A**?

[1 mark]

0 3 . 3 The temperature of the solution increases when zinc reacts with copper sulfate solution.

Give **two** other observations that can be made when zinc reacts with copper sulfate solution.

[2 marks]

1 _____

_____

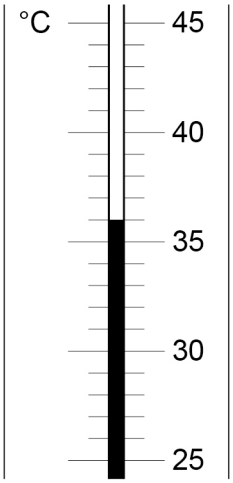
2 _____

_____

Question 10 · continued

0 3 . 4 **Figure 6** shows the highest temperature reached in one experiment.

Figure 6



Complete **Table 3**.

Use **Figure 6**.

[2 marks]

Table 3

Starting temperature in °C	21
Highest temperature reached in °C	
Temperature increase in °C	

Question 3 continues on the next page

Question 10 · continued

A teacher repeated the investigation using a digital thermometer.

Table 4 shows the results.

Table 4

Mass of zinc in grams	Temperature increase in °C			
	Experiment 1	Experiment 2	Experiment 3	**Mean**
1.0	7.8	7.3	7.7	**B**
2.0	13.1	13.8	13.3	13.4
3.0	20.4	12.9	20.2	20.3

0 3 . 5 Calculate value **B** in **Table 4**.

[2 marks]

B = _____ °C

0 3 . 6 The range of the results is the minimum value of temperature increase to the maximum value of temperature increase.

What is the range of temperature increase for the experiment with **2.0 g** of zinc?

[1 mark]

Range = _____ °C to _____ °C

5.3.1.4 Chemical measurements

Question 10 · continued

0 3 . 7 One of the results for **3.0 g** of zinc is anomalous.

Which result is anomalous?

Suggest **one** reason why this result is anomalous.

[2 marks]

Anomalous result _____

Reason _____

_____

_____

11

Turn over for the next question

5.3.1.4 Chemical measurements

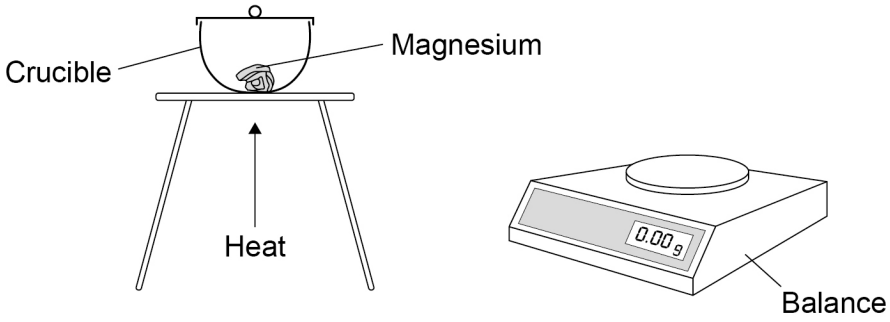
Question 11

June 2025 | 8464/C/1F | Original Q3

0 3 A student investigated the reaction of magnesium with oxygen.

Figure 6 shows the apparatus.

Figure 6



This is the method used.

1. Measure the mass of an empty crucible.
2. Add 0.10 g of magnesium to the crucible.
3. Heat the crucible and contents for 5 minutes.
4. Allow to cool and measure the mass of the crucible and contents.
5. Repeat steps 1 to 4 using different masses of magnesium.

0 3 . 1 Complete the word equation for the reaction.

[1 mark]

magnesium + oxygen ⟶ _____

0 3 . 2 Complete the sentence.

Choose the answer from the box.

[1 mark]

decomposed	**oxidised**	**reduced**

When magnesium reacts with oxygen, the magnesium is _____.

Table 3 shows the measurements for one of the experiments.

Table 3

	Mass in grams
Empty crucible	20.25
Crucible and magnesium **before** heating	20.55
Crucible and contents **after** heating	20.75

0 3 . 3 Calculate the mass of magnesium in the crucible **before** heating.

[1 mark]

Mass of magnesium = _____ g

0 3 . 4 Why does the reaction result in an increase in the mass of the contents of the crucible?

[1 mark]

Tick (✓) **one** box.

A solid reacts with a gas to produce a solid. ☐

Some of the product escapes from the crucible. ☐

The reactants have a greater mass than the product. ☐

Question 3 continues on the next page

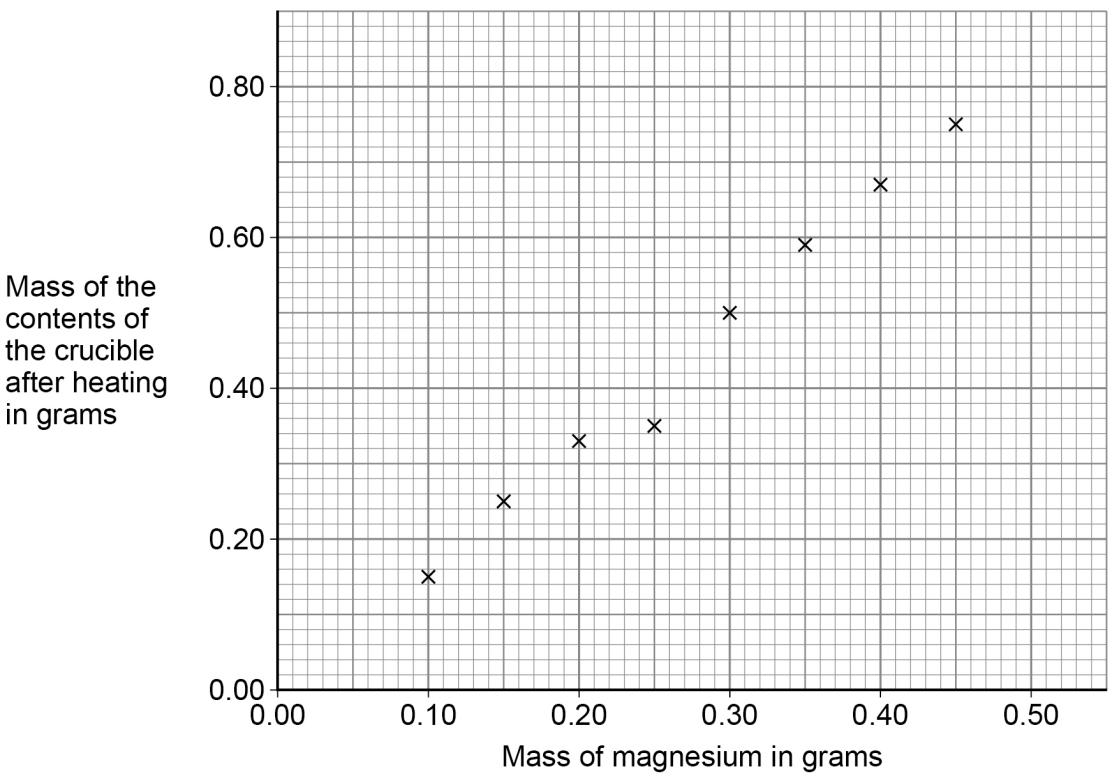
5.3.1.4 Chemical measurements

Question 11 · continued

0 3 . 5 The student determined the mass of the contents of the crucible after heating each mass of magnesium.

Figure 7 shows the results.

Figure 7



Draw a ring around the anomalous result in **Figure 7**.

[1 mark]

0 3 . 6 The student did the experiment using 0.60 g of magnesium four times.

Table 4 shows the results.

Table 4

	Test 1	Test 2	Test 3	Test 4	Mean
Mass of the contents of the crucible after heating in grams	0.96	0.93	0.92	0.95	**X**

Calculate mean value **X**.

[2 marks]

Mean value **X** = _____ g

0 3 . 7 The student used a Bunsen burner instead of a water bath to heat the crucible.

Why did the student use a Bunsen burner?

[1 mark]

Tick (✓) **one** box.

A Bunsen burner heats up the crucible more slowly. ☐

A water bath is not hot enough. ☐

The crucible would dissolve in a water bath. ☐

Question 3 continues on the next page

5.3.1.4 Chemical measurements

Question 11 · continued

0 3 . 8 A different student did the investigation.

The student heated the crucible for 1 minute instead of for 5 minutes.

The student obtained different results.

Suggest **one** reason why the student obtained different results.

[1 mark]

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