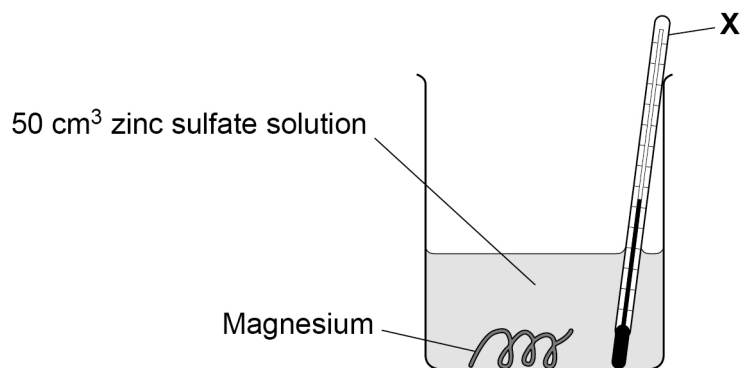


0 2

A student investigated the temperature change when magnesium was added to zinc sulfate solution.

Figure 5 shows the apparatus.

Figure 5



0 2 . 1

Which piece of equipment is labelled **X**?

[1 mark]

Tick (✓) **one** box.

Beaker

Ruler

Thermometer

0 2 . 2

Which piece of equipment is the best to use to measure volumes of solution?

[1 mark]

Tick (✓) **one** box.

Conical flask

Evaporating basin

Measuring cylinder



The student added 1.0 g of magnesium to 50 cm³ of zinc sulfate solution and measured the temperature increase.

The student repeated the experiment two more times.

Table 1 shows the results.

Table 1

Temperature increase in °C			
Experiment 1	Experiment 2	Experiment 3	Mean
7.6	7.3	7.6	Y

0 2 3 Calculate value **Y** in **Table 1**.

[2 marks]

Y = _____ °C

0 2 4 The student then added 1.2 g of magnesium to 50 cm³ of zinc sulfate solution.

The temperature increased by 9.0 °C.

Calculate the temperature increase when the student adds 0.40 g of magnesium to 50 cm³ of zinc sulfate solution.

[2 marks]

Temperature increase = _____ °C

Turn over ►



0 2 . 5 What is the name given to a reaction which causes the temperature to increase?

[1 mark]

Tick (✓) **one** box.

Endothermic

Exothermic

Thermal decomposition

0 2 . 6 The student repeated the experiment with 1.2 g of copper and 50 cm³ of zinc sulfate solution.

The temperature did **not** increase.

Give **one** reason why.

[1 mark]

8



Question 2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	thermometer		1	AO1 5.4.1.2 5.5.1.1 RPA10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.2	measuring cylinder		1	AO1 5.4.1.2 5.5.1.1 RPA10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.3	$(Y =) \frac{7.6 + 7.3 + 7.6}{3} \text{ or } \frac{22.5}{3}$ = 7.5 (°C)		1	AO2 5.4.1.2 5.5.1.1 RPA10
			1	
		allow for 2 marks $(Y =) \frac{7.6 + 7.6}{2} = 7.6 \text{ (}^\circ\text{C)}$		

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.4	(temperature increase =) $\frac{0.40}{1.2} \times 9.0$ = 3.0 (°C)		1	AO2 5.4.1.2 5.5.1.1 RPA10
			1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.5	exothermic		1	AO1 5.5.1.1 RPA10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.6	copper did not react (with zinc sulfate) or copper is less reactive (than zinc)	allow copper is less reactive (than magnesium)	1	AO3 5.4.1.2 5.5.1.1 RPA10

Total Question 2	8
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