AQA GCSE Chemistry

Energy changes mark scheme · goes with “Energy changes · Foundation tier” · whiteboardchemistry.com/revision/gcse-chemistry/exam-questions

Mark schemes

Energy changes · Foundation tier · 5 questions

Q1 · June 2023 · Paper 1 Foundation · Q10 · Paper 1 Higher · Q2 · [11 marks]

10.1

(independent variable)

mass (of ammonium nitrate)

(dependent variable)

(lowest) temperature (reached by solution)

allow change in temperature (of solution)

[2 marks]

10.2

all 6 points plotted correctly

allow a tolerance of ± ½ a small square

*allow **1** mark for 4 or 5 points plotted correctly*

line of best fit

[3 marks]

10.3

line extrapolated to y-axis

(initial temperature)

value for temperature where extrapolated line meets y-axis

allow a tolerance of ± ½ a small square

[2 marks]

10.4

temperature decreased

ignore correct references to energy transfer

[1 mark]

10.5

(0.3 °C) is the uncertainty

(because 0.3 °C) is the range about the mean value

allow values are (a maximum of)

0.3 (°C) either side of the mean

allow (because)

16.8 = 16.5 + 0.3

and

16.2 = 16.5 – 0.3

[2 marks]

10.6

random error

[1 mark]

Q2 · June 2024 · Paper 1 Foundation · Q3 · [14 marks]

03.1

displacement

[1 mark]

03.2

(percentage =)

$$\frac{63.5}{159.5} \times 100$$

= 39.81191 (%)

= 39.8 %

allow an answer correctly rounded to 3 significant figures from an incorrect calculation which uses both the values in the question

[3 marks]

03.3

volume of copper sulfate solution

[1 mark]

03.4

0.8(0) g

[1 mark]

03.5

(maximum temperature change)

= 47 – 22 (°C)

= 25 (°C)

allow correct use of incorrectly determined value(s) from the graph

[2 marks]

03.6

(conversion 25 cm^3 =)

$0.025\ dm^3$

(concentration =) $\frac{6.75}{0.025}$ (g/dm^3)

allow correct use of an incorrectly determined or unconverted volume

$= 270\ (g/dm^3)$

[3 marks]

03.7

*max **1** mark if the lines do not intersect*

line of best fit using the first five points

line of best fit using the last four points

[2 marks]

03.8

energy is **taken in from** the surroundings so the reaction is **endothermic**

[1 mark]

Q3 · June 2024 · Paper 1 Foundation · Q7 · [8 marks]

07.1

6 (V)

[1 mark]

07.2

sodium chloride solution

[1 mark]

07.3

Level 3 (5–6 marks): The method would lead to the production of a valid outcome. The key steps are identified and logically sequenced.

Level 2 (3–4 marks): The method would not necessarily lead to a valid outcome. Most steps are identified, but the method is not fully logically sequenced.

Level 1 (1–2 marks): The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.

No relevant content (0 marks)

Indicative content

- set up a cell
- **add an electrolyte**
- into a beaker
- **add two (different) metals**
- **measure the voltage**

- using a voltmeter
- **repeat using different metals**
- same volume of electrolyte
- same concentration of electrolyte
- same type of electrolyte
- one metal kept the same each time

[6 marks]

Q4 · June 2025 · Paper 1 Foundation · Q2 · [10 marks]

02.1

magnesium chloride

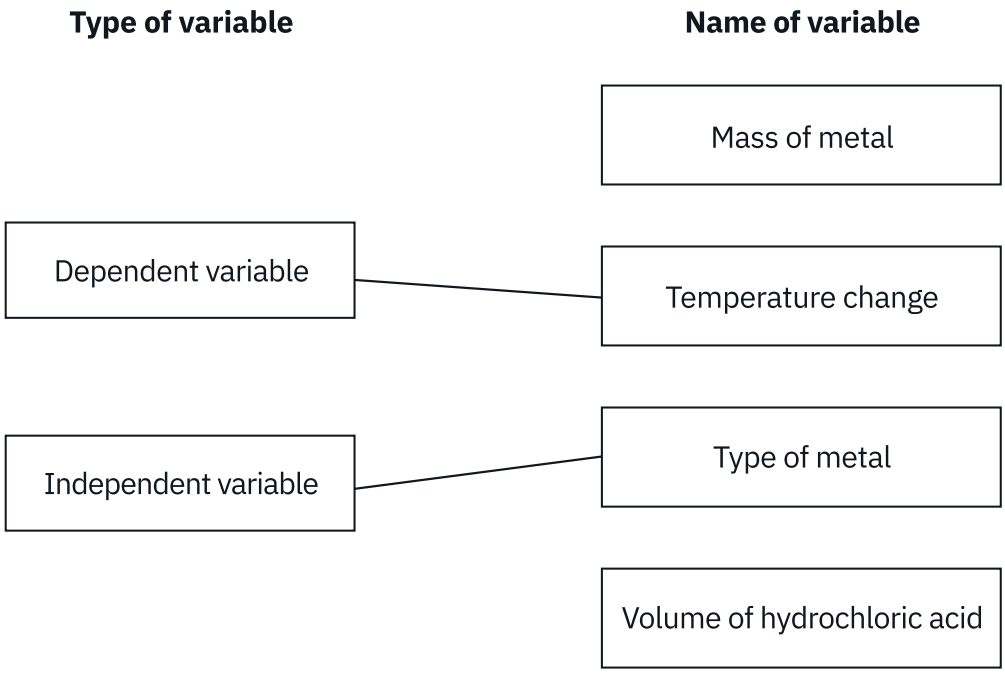
[1 mark]

02.2

hydrogen

[1 mark]

02.3



do not accept more than one line from a box on the left

[2 marks]

02.4

a polystyrene cup

[1 mark]

02.5

2 °C

[1 mark]

02.6

increases

[1 mark]

02.7

A

[1 mark]

02.8

C

[1 mark]

02.9

B

[1 mark]

Q5 · June 2025 · Paper 1 Foundation · Q3 · [8 marks]

03.1

sodium chloride solution

[1 mark]

03.2

(metal)

B

(reason)

the two metals must be different (to produce a voltage)

allow the voltage is 0.0 V

MP2 is dependent upon the award of MP1

[2 marks]

03.3

(most reactive) D

A

C

(least reactive) B

[1 mark]

03.4

(number of cells =) (14.4)/(3.6)

= 4

[2 marks]

03.5

water

[1 mark]

03.6

reversed

ignore faster

[1 mark]

Source: AQA GCSE Chemistry past papers. Reproduced for revision at whiteboardchemistry.com.