AQA GCSE Chemistry

Using resources mark scheme · goes with “Using resources · Higher tier” · whiteboardchemistry.com/revision/gcse-chemistry/exam-questions

Mark schemes

Using resources · Higher tier · 5 questions

Q1 · June 2024 · Paper 2 Foundation · Q8 · Paper 2 Higher · Q1 · [10 marks]

08.1

(test)

flame test

(result)

yellow (flame)

OR

(test)

flame emission spectroscopy (1)

allow FES

(result)

lines match sodium spectrum (1)

[2 marks]

08.2

(test)

(add acidified) silver nitrate (solution)

(result)

white precipitate

MP2 is dependent upon the award of MP1

[2 marks]

08.3

to ensure that all the water has evaporated

[1 mark]

08.4

mass of evaporating dish and dry contents – mass of empty evaporating dish

[1 mark]

08.5

(mean concentration of NaCl =)

$$\frac{35.2 + 34.6 + 36.4 + 33.8}{4}$$

or

$$\frac{140}{4}$$

*allow **1** mark for*

$$\frac{35.2 + 34.6 + 33.8}{3} = 34.5$$

= 35.0 (g/dm^3)

(mean concentration of Na^+ =)

$$35.0 \times \frac{39.3}{100}$$

allow correct use of an incorrectly determined mean concentration of sodium chloride

= 13.8 (g/dm^3)

allow 13.755 correctly rounded to at least 3 significant figures

alternative approach 1:

(total concentration of NaCl = 35.2 + 34.6 + 36.4 + 33.8 = 140

total concentration of Na^+ =)

$$140 \times \frac{39.3}{100}$$ (1)

*allow **1** mark for*

(35.2 + 34.6 + 33.8 = 103.6)

$$103.6 \times \frac{39.3}{100} = 40.71$$

= 55.02 (g/dm^3) (1)

(mean concentration of Na^+ =)

$$\frac{55.02}{4}$$ (1)

allow correct use of an incorrectly determined total concentration of Na^+

=13.8 (g/dm^3) (1)

allow 13.755 correctly rounded to at least 3 significant figures

alternative approach 2:

(concentrations of Na^+ =)

$$35.2 \times \frac{39.3}{100}$$

$$34.6 \times \frac{39.3}{100}$$

$36.4 \times \frac{39.3}{100}$

*allow **1** mark if a concentration of 36.4 is treated as an anomaly and not used*

$33.8 \times \frac{39.3}{100}$ (1)

= 13.83 13.60 14.31 13.28 (1)

(mean concentration of Na^+ =)

$\frac{13.83 + 13.60 + 14.31 + 13.28}{4}$

(1)

allow correct use of incorrectly determined concentration(s) of Na^+

=13.8 (g/dm^3) (1)

allow 13.755 correctly rounded to at least 3 significant figures

[4 marks]

Q2 · June 2024 · Paper 2 Foundation · Q9 · Paper 2 Higher · Q2 · [8 marks]

09.1

to recycle (remaining) nitrogen and hydrogen

allow to recycle unreacted gases

allow to return nitrogen and hydrogen to the reactor

[1 mark]

09.2

iron

allow Fe

[1 mark]

09.3

(test)

glowing splint

(result)

(splint) relights

MP2 is dependent upon MP1 being awarded

[2 marks]

09.4

labelled vertical arrow from dotted line to peak

ignore arrow heads

ammonia **and** oxygen on left

and

nitric acid **and** water on right

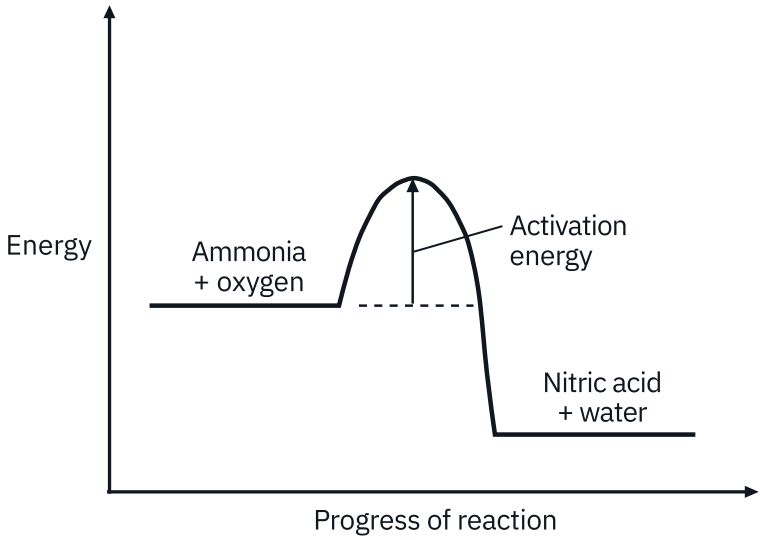
allow NH_3 for ammonia

allow O_2 for oxygen

allow HNO_3 for nitric acid

allow H_2O for water

an answer of



scores 2 marks

[2 marks]

09.5

the line would reach a higher peak

[1 mark]

09.6

fertilisers

allow explosives

allow sports injury packs

[1 mark]

Q3 · June 2025 · Paper 2 Foundation · Q10 · Paper 2 Higher · Q3 · [9 marks]

10.1

Level 3 (5–6 marks): A judgement, strongly linked and logically supported by a sufficient range of correct reasons, is given.

Level 2 (3–4 marks): Some logically linked reasons are given. There may also be a simple judgement.

Level 1 (1–2 marks): Relevant points are made. They are not logically linked.

No relevant content (0 marks)

Indicative content

- aluminium ore is a finite resource
- wood is a renewable resource
- aluminium ore has to be mined / quarried

o which causes dust / noise pollution

- trees require land for growing

o which reduces land for farming

o which can lead to deforestation

- cost of wood is lower

o so more doors can be obtained for the same cost

- aluminium is stronger

o so less easily damaged

- aluminium doors do not need painting

o so less maintenance required

- both are recyclable

o so resources are conserved

o so less goes into landfill

o so less fossil fuels used

o so less climate change

- judgement

[6 marks]

10.2

(the oxide coating) acts as a barrier

do not accept sacrificial protection

(that) prevents air / oxygen / water reaching the aluminium / metal

do not accept references to rusting

do not accept sacrificial protection

[2 marks]

10.3

a fixed mass of pigment and a fixed mass of liquid

[1 mark]

Q4 · June 2025 · Paper 2 Foundation · Q8 · Paper 2 Higher · Q1 · [11 marks]

08.1

(a burette is) more accurate (than a measuring cylinder)

allow (a burette has) a higher resolution

ignore precise

[1 mark]

08.2

the mass of (dissolved) solids

[1 mark]

08.3

reheat (the evaporating basin and contents)

(and reweigh) until constant mass

*allow for **2** marks heat to constant mass*

[2 marks]

08.4

subtract the mass of the (empty) evaporating basin from the mass of the evaporating basin and contents (at the end of the experiment)

allow subtract initial mass from the final mass

[1 mark]

08.5

(allow mean mass =)

(0.35 + 0.37 + 0.33 + 0.34)/(4)

(allow mean mass =)

1.39

4

= 0.3475 (g)

(conversion 10 cm^3 =) 0.01 dm^3

(mean concentration =) (0.3475)/(0.01)

allow correct use of incorrectly determined mean mass

allow correct use of incorrect / no conversion of volume

= 34.75 (g/dm^3)

allow 34.75 (g/dm^3) correctly rounded to at least 2 significant figures

alternative approach 1

(conversion 10 cm^3 =)

0.01 dm^3 (1)

(concentrations =)

(0.35)/(0.01) (0.37)/(0.01) (0.33)/(0.01) (0.34)/(0.01) (1)

allow correct use of incorrect / no conversion of volume

= 35 37 33 34 (1)

(mean concentration =)

(35 + 37 + 33 + 34)/(4) (1)

(allow mean concentration =)

139

4

allow correct use of incorrectly determined concentrations

= 34.75 (g/dm^3) (1)

allow 34.75 (g/dm^3) correctly rounded to at least 2 significant figures

alternative approach 2 using total mass and total volume

(total mass = 0.35 + 0.37 + 0.33 + 0.34 =)

1.39 (g) (1)

(total volume = 10 + 10 + 10 + 10 =)

40 cm^3 (1)

(conversion 40 cm^3 =)

0.04 dm^3 (1)

(mean concentration =) (1.39)/(0.04)

allow correct use of incorrectly determined total mass

allow correct use of incorrect / no conversion of total volume

= 34.75 (g/dm^3) (1)

allow 34.75 (g/dm^3) correctly rounded to at least 2 significant figures

[5 marks]

08.6

the samples were taken from different places

[1 mark]

Q5 · June 2025 · Paper 2 Higher · Q9 · [14 marks]

09.1

the forward reaction is endothermic

(so high temperature) shifts the equilibrium (position) to the right

(which) increases the yield (of products)

allow (and a high temperature) increases the rate of reaction

[3 marks]

09.2

allow converse

(low pressure) shifts the equilibrium (position) to the right

(because) there are more moles on the right

allow (because) there are more molecules on the right

[2 marks]

09.3

no effect on equilibrium position

[1 mark]

09.4

(volume ~) (50 × 100)/(80)

allow a value in the range 78.0

to 80.0 for percentage of nitrogen

~ 62.5 (dm^3)

[2 marks]

09.5

(the reaction mixture is) cooled

(so that) ammonia condenses / liquefies

(but) nitrogen **and** hydrogen are gases

[3 marks]

09.6

any **three** from:

- nitrogen is an abundant gas (in the air)
- the use of nitrogen releases fewer greenhouse gases
- the nitrogen released replaces that used to make ammonia

allow nitrogen is renewable

- natural gas is a finite resource
- (the use of hydrogen / methane releases) carbon dioxide which contributes to climate change

allow (the use of hydrogen / methane releases) carbon dioxide contributes to global warming

[3 marks]

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