AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.6.2.1

Reversible reactions

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**5**
Available paper years	**2018–2024**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

5.6.2.1 Reversible reactions

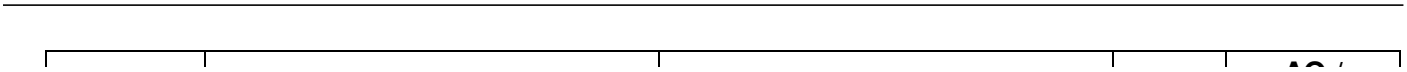
Answer 01 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	80		1	AO1 5.9.1.1
04.2	volcanoes	allow ammonia allow meteorites	1	AO1 5.9.1.2
04.3	⇌	ignore any extra words	1	AO1 5.6.2.1
04.4	rate	allow speed allow pace do **not** accept time do **not** accept amount do **not** accept level do **not** accept point	1	AO1 5.6.2.3
04.5	a mixture designed as a useful product		1	AO1 5.8.1.2
04.6	bar for K to 5.8%	allow ± ½ a small square	1	AO2 5.8.1.2
04.7	$\frac{0.225 \times 100}{3.0}$		1	AO2 5.8.1.2
04.8	use has increased (increase is) less in country B **or** (increase is) less in country D example of data	 allow (increase is) more in country A **or** (increase is) more in country C 	1 1 1	AO2 5.8.1.2 AO3 5.8.1.2 AO3 5.8.1.2
Total			**10**	

5.6.2.1 Reversible reactions

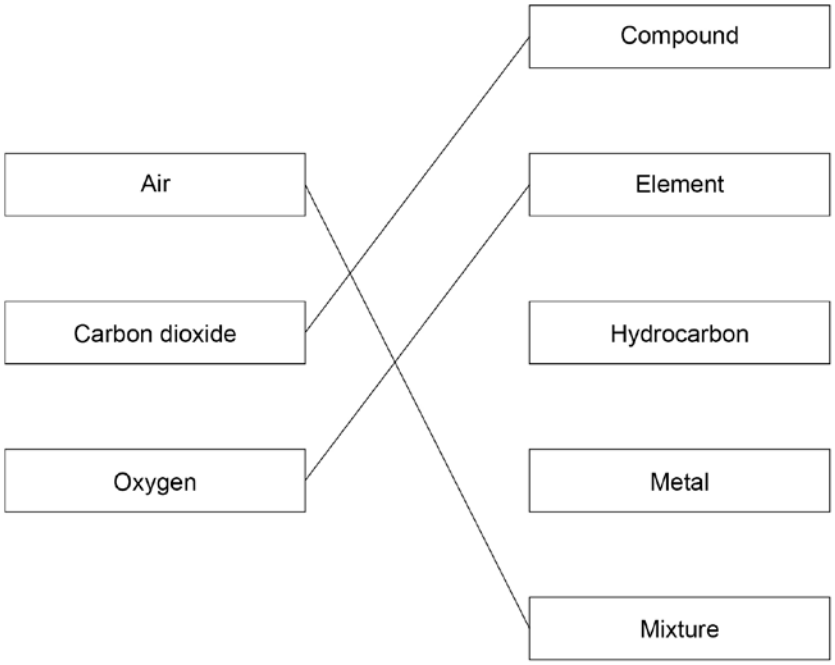
Answer 01 · Mark scheme

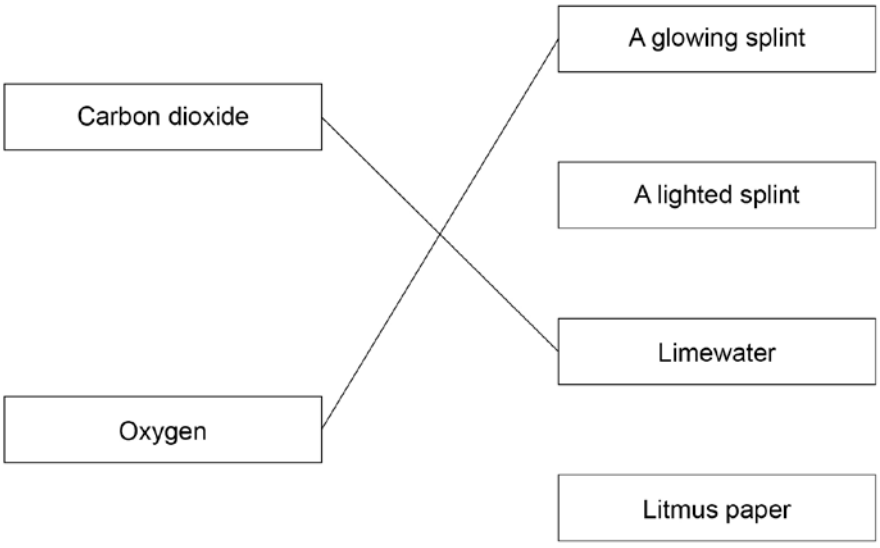
June 2018 | 8464/C/2F | Original Q4



5.6.2.1 Reversible reactions

Answer 02 · Mark scheme June 2019 | 8464/C/2F | Original Q1

01.1	 If more than one line is drawn from any one substance and not crossed out, no mark is given for that substance. The other marks can be awarded.	1 1 1	AO2.1 5.1.1.2 5.8.1.1 5.1.1.1

01.2	 If more than one line is drawn from any one gas and not crossed out, no mark is awarded for that gas. The other mark can be awarded.	1 1	AO1.1 5.8.2.2 5.8.2.3

01.3	dissolved in oceans photosynthesis		1 1	AO1 5.9.1.2 5.9.1.4

5.6.2.1 Reversible reactions

Answer 02 · Mark scheme

01.4	⇌	ignore any other words, formulae or symbols	1	AO1.1 5.6.2.1
01.5	endothermic (reaction)	spelling must be correct do **not** accept exothermic	1	AO1.1 5.6.2.2
01.6	rate (of reaction)	allow speed or velocity do **not** accept any other response	1	AO1 5.6.2.3
Total			**10**	

5.6.2.1 Reversible reactions

Answer 02 · Mark scheme

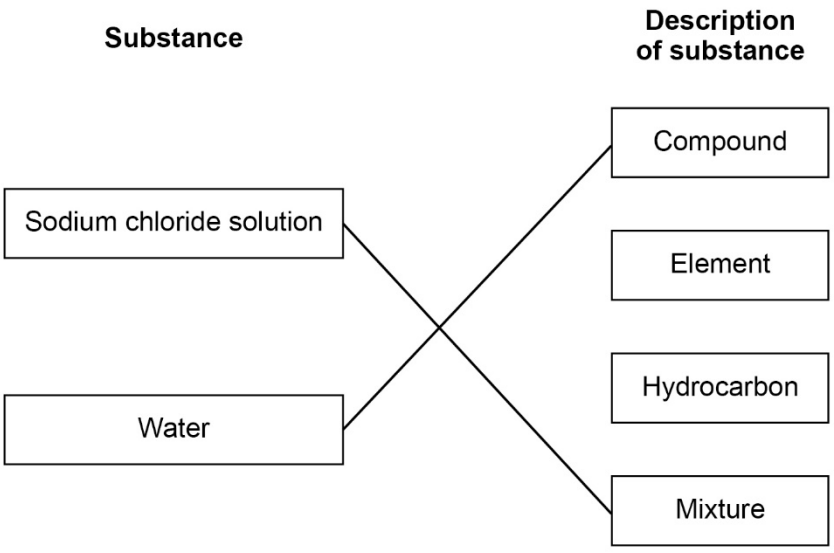
June 2019 | 8464/C/2F | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.

5.6.2.1 Reversible reactions

Answer 03 · Mark scheme

November 2021 | 8464/C/2F | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	(the symbol) ⇌	allow description of reversible sign	1	AO1 5.6.2.1
01.2	white blue	must be in this order	1 1	AO1 5.6.2.2
01.3	to prevent reaction with water vapour (in the air)	allow to prevent reaction with moisture allow to keep water out	1	AO3 5.6.2.2
01.4	 do **not** accept more than one line from a box on the left		1 1	AO2 5.1.1.2
01.5	evaporation **or** crystallisation		1	AO1 RPA 13
01.6	(filtering) to remove solids (sterilising) to kill bacteria	 allow to kill microbes	1 1	AO1 5.10.1.2

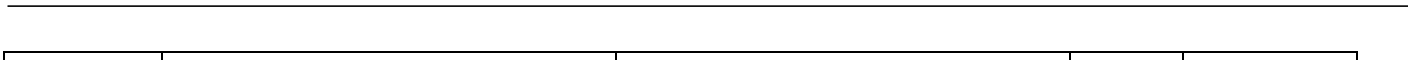
5.6.2.1 Reversible reactions

01.7	ground water		1	AO1 5.10.1.3
01.8	screening and removal of grit		1	AO1 5.10.1.3
Total			**11**	

5.6.2.1 Reversible reactions

Answer 03 · Mark scheme

November 2021 | 8464/C/2F | Original Q1



5.6.2.1 Reversible reactions

Answer 04 · Mark scheme

June 2022 | 8464/C/2F | Original Q3

Question 3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	hydrogen chloride	allow hydrochloric acid	1	AO1 5.6.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.2	(g)		1	AO1 5.2.2.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.3	⇌	allow reversible sign / arrow	1	AO1 5.6.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.4	exothermic		1	AO1 5.6.2.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.5	rate		1	AO1 5.6.2.3

5.6.2.1 Reversible reactions

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.6	C		1	AO1 5.6.1.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.7	any **one** from: • increases rate of reaction • reduces energy required • lower temperature can be used		1	AO1 5.6.1.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.8	formulation		1	AO1 5.8.1.2

Total Question 3		**8**

5.6.2.1 Reversible reactions

Answer 05 · Mark scheme

June 2024 | 8464/C/2F | Original Q2

Question 2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	(substance) **B** (**B**) has a specific melting point	allow 61 (°C) allow all the other substances melted over a range of temperatures MP2 is dependent on MP1 being awarded	1 1	AO3 5.8.1.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.2	(from) white (to) blue	 allow **1** mark from blue to white	1 1	AO1 5.6.2.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.3	(the symbol / sign) ⇌	allow the symbol with arrows both ways	1	AO2 5.6.2.1 5.6.2.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.4	6		1	AO2 5.1.1.1 5.6.2.2

5.6.2.1 Reversible reactions

Answer 05 · Mark scheme

June 2024 | 8464/C/2F | Original Q2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.5	(test) damp (blue / red) litmus paper (result) (litmus paper) is bleached **or** (litmus paper) turns white	 ignore paper turns red	1 1	AO1 5.8.2.4

Total Question 2	**8**

5.6.2.1 Reversible reactions

Answer 03 · Examiner comments — November 2021 | 8464/C/2F | Original Q1

Question 1 (low and standard demand)

The reversible symbol was well known, but many students did not recognise that the starting point for the reaction was the anhydrous form of copper sulfate, so were unable to identify the colours of the salts. They did not appreciate the link between the reversible reaction and the storage of the anhydrous salt. Most students referred incorrectly to the toxicity of the salt.

The topic of water treatment was not well understood. Credit was given for the idea of filtering removing large insoluble solid material from the water and sterilising removing bacteria and pathogens, but not germs.

Answer 04 · Examiner comments — June 2022 | 8464/C/2F | Original Q3

Question 3

The equilibrium identified in this question is detailed in the specification, however, many students found the questions challenging.

03.1 Around half of the students were able to identify hydrogen chloride or hydrochloric acid as the other product.

03.2 Students were told that ammonia is a gas in the stem of the question. However only half of the students gained the mark on this item.

03.3 Nearly two thirds of students were able to either draw the equilibrium symbol or describe the symbol with sufficient clarity.

03.4 Three quarters of students identified the reverse reaction as exothermic.

03.5 Approximately 60% of students were able to identify rate in this item. Nearly all the incorrect responses were concentration.

Answer 04 · Examiner comments — June 2022 | 8464/C/2F | Original Q3

03.6 Less than a third of students identified C correctly. The most common incorrect responses were B and D with similar numbers identifying each.

03.7 Approximately one third of students gained a mark here. The most common correct response was for increasing the rate. Responses such as catalysts were not used up or catalysts could be reused did not answer the question.

03.8 In this open question only 1 in 20 students were able to identify a formulation. Bleach was the most seen incorrect response.

5.6.2.1 Reversible reactions

Answer 05 · Examiner comments

June 2024 | 8464/C/2F | Original Q2

Question 2 (low demand)

02.1 Just over half of students correctly identified the pure substance in this AO3 question for 1 mark. Three-quarters of those students went on to give the reason. We were looking for the idea that B did not have a range of melting points or that it was a specific value. Where students did not achieve this mark, it was due to reasons not being clear enough.

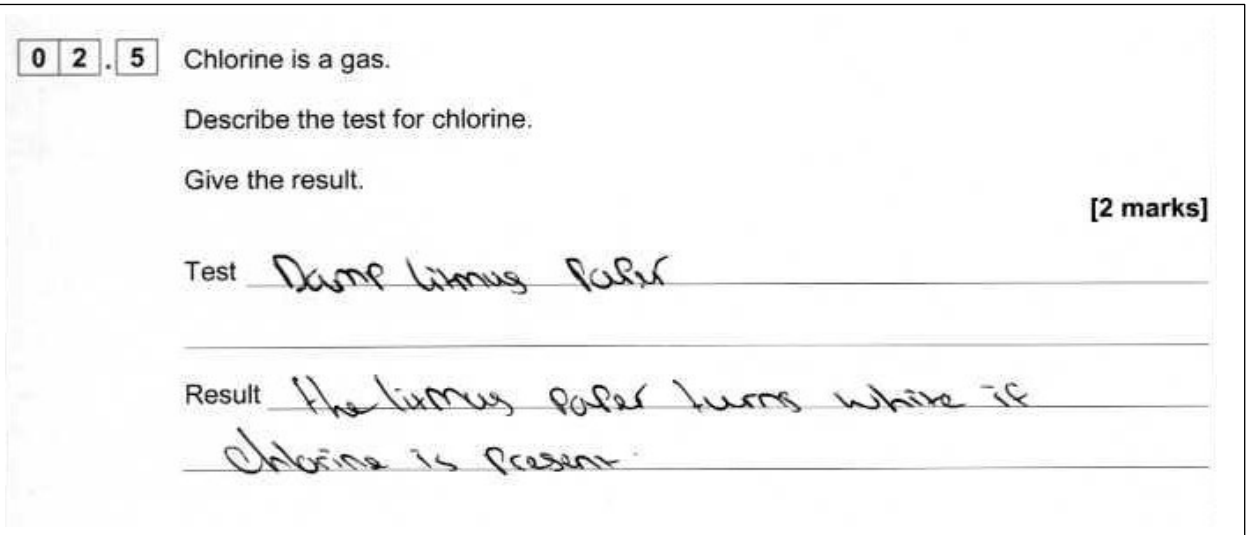
The most common wrong answer was D, with the main reason being that it had the highest melting point, followed by C because it had the lowest melting point or because it was closest to room temperature. The response of A was very rare.

02.2 Both marking points were not scored very often. White was the colour seen as one of the answers the greatest number of times, either correctly or incorrectly, but every combination of colours possible was seen with roughly equal regularity.

02.3 Most students gained the mark for this AO2 question. The most common incorrect responses simply stated 'the reversible symbol' without drawing or describing the symbol or copying out the symbol given in the question.

02.4 Just under half of all students gave the correct answer for this application question.

02.5 Very few responses showed knowledge of the test for chlorine, with nearly 80% of students not gaining any marks. Of the few that gained 1 mark many scored marking point 2 but did not describe the litmus paper as 'damp'. The tests for other gases such as hydrogen, oxygen, carbon dioxide and ammonia were all seen many times, with the 'squeaky pop test' being the most common.


0 2 . 5 Chlorine is a gas.

Describe the test for chlorine.

Give the result.

[2 marks]

Test Damp litmus paper

Result the litmus paper turns white if chlorine is present

This student has given the all the points required for both marks.

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