AQA GCSE Chemistry | 8462

SPECIFICATION POINT 4.8.2.2

Test for oxygen

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**5**
Available paper years	**2010–2024**

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.

4.8.2.2 Test for oxygen

Answer 01 · Mark scheme

June 2010 | CHY1BP | Original Q5 | Legacy

Five	**A**	Burn in oxygen	**4**	
	B	Test for unsaturation	**2**	
	C	Add water and shake vigorously	**3**	
	D	React with hydrogen	**1**	
	A	**B**	**C**	**D**

Answer 02 · Mark scheme

June 2010 | CHY1BP | Original Q7 | Legacy

Seven	**1**	**2**	**3**	**4**

4.8.2.2 Test for oxygen

Answer 03 · Mark scheme

June 2019 | 8462/2F | Original Q7

Question 7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	a glowing splint		1	AO1 4.8.2.2
07.2	student **A** should measure the mass of manganese dioxide.		1	AO3 4.6.1.1 4.6.1.2
07.3	calculate a mean but do not include any anomalous results.		1	AO3 4.6.1.1 4.6.1.2
07.4		an answer of 0.173 (cm^3/s) scores **4** marks		AO2 4.6.1.1
	(volume of oxygen formed =) (58 - 20 =) 38 (cm^3)	allow values between 36 (cm^3) and 40 (cm^3) inclusive	1	
	(time taken = 250 – 30 =) 220 (s)		1	
	$\frac{38}{220}$ **or** 0.1727 (cm^3/s)	allow a correct calculation using an incorrectly determined value for volume and / or time	1	
	= 0.173 (cm^3/s)	allow a correctly calculated answer given to 3 significant figures from an incorrect attempt at the rate equation	1	
07.5	line starts at the origin **and** steeper than existing line final volume same as existing line	 allow a tolerance of ± ½ a small square	1 1	AO2 4.6.1.1
07.6	fine manganese dioxide powder has a larger surface area		1	AO3 4.6.1.2 4.6.1.3
Total			**10**	

4.8.2.2 Test for oxygen

Answer 04 · Mark scheme

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	Mars		1	AO1 4.9.1.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.2	20%		1	AO1 4.9.1.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3	algae and plants evolved photosynthesis took place		1 1	AO1 4.9.1.3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.4	(*y*-axis labelled) 5, 10, 15, (20) oxygen bar drawn to 16%	allow (*y*-axis labelled) 4, 8, 12, 16, (20) ignore correct intermediate values allow a tolerance of ± ½ a small square	1 1	AO2 4.9.1.3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.5	test tube **A**		1	AO2 4.6.1.2

4.8.2.2 Test for oxygen

Answer 04 · Mark scheme

June 2023 | 8462/2F | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.6	a glowing splint		1	AO1 4.8.2.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.7	manganese dioxide is a catalyst in this reaction		1	AO2 4.6.1.4

Total Question 1	9

4.8.2.2 Test for oxygen

Answer 05 · Mark scheme

June 2024 | 8462/2F | Original Q9

Question 9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.1	to recycle (remaining) nitrogen and hydrogen	allow to recycle unreacted gases allow to return nitrogen and hydrogen to the reactor	1	AO1 4.10.4.1

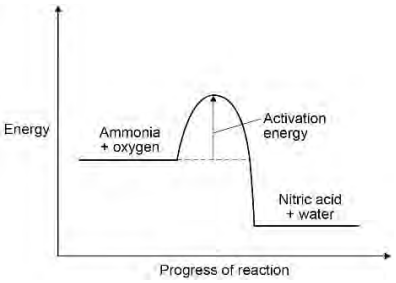
Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.2	iron	allow Fe	1	AO1 4.6.1.4 4.10.4.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.3	(test) glowing splint (result) (splint) relights	 MP2 is dependent upon MP1 being awarded	 1 1	AO1 4.8.2.2

4.8.2.2 Test for oxygen

Answer 05 · Mark scheme

June 2024 | 8462/2F | Original Q9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.4	labelled vertical arrow from dotted line to peak ammonia **and** oxygen on left **and** nitric acid **and** water on right	ignore arrow heads 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	1 1	AO2 4.6.1.4 4.10.4.1 4.10.4.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.5	the line would reach a higher peak		1	AO1 4.6.1.4 4.10.4.1 4.10.4.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.6	fertilisers	allow explosives allow sports injury packs	1	AO3 4.10.4.1 4.10.4.2

Total Question 9	**8**

4.8.2.2 Test for oxygen

Answer 04 · Examiner comments — June 2023 | 8462/2F | Original Q1

Question 1 (Low demand)

01.1 Just over three quarters of students identified the correct planet, with the other distractors being roughly equally selected.

01.2 Just over half of the students correctly identified the percentage of oxygen in the atmosphere. 80% was the most common incorrect response.

01.3 Around half of the students gained two marks. 'Carbonate sediments formed in oceans' was the most common distractor. Some students did not read the rubric correctly and only ticked one box.

01.4 More than a half of the students gained 2 marks for correctly completing the scale on the *y*- axis and drawing a correct bar. The most common incorrect response was to omit the scale on the *y*-axis. A minority of students achieved no marks for the bar chart as they had included a non-linear scale.

Answer 04 · Examiner comments — June 2023 | 8462/2F | Original Q1

01.5 This question was answered very well with more than 90% of students correctly identifying which test tube was at the highest temperature. A small minority chose test tube B, which produced the fewest bubbles.

01.6 This was also very well answered, with more than two thirds of students correctly identifying the test for oxygen. 'Bromine water' was the most common distractor.

01.7 Just over 50% of students recognised that a catalyst does not appear in a chemical reaction. 'Manganese dioxide is used up during this reaction' was a powerful distractor.

Answer 05 · Examiner comments — June 2024 | 8462/2F | Original Q9

Question 9 (standard demand)

09.1 The role of the condenser and the importance of recycling unreacted gases in the Haber process is poorly understood with just over 5% of students gaining credit in this question. A large number of students stated that the ammonia or excess gases or gases alone were returned to the reactor. In addition, a number of students focused their answer on the condenser part of the flow chart and responded with the idea that uncondensed gases needed to be recycled.

09.2 Less than 25% of students correctly identified the catalyst used in the Haber process as iron, with copper, ammonia and hydrogen being frequently seen incorrect responses.

09.3 The test for oxygen gas is poorly understood with less than 25% of students being able to recall the correct test and its result. Many students referred to the splint being lit and then blown out or

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4.8.2.2 Test for oxygen

Answer 05 · Examiner comments June 2024 | 8462/2F | Original Q9

attempted to describe a glowing splint as a small or dying flame. A correct test was needed to allow award of a mark for the test result. The correct test and result for hydrogen gas was frequently seen.

09.4 Over 25% of students either correctly labelled the products and reactants or correctly drew an arrow, labelled the activation energy, and gained one mark. A further 10% of students gained two marks by doing both correctly.

There were many variations of drawing and labelling the arrow for the activation energy. Some students mistakenly labelled the peak as being the activation energy or despite the dotted line drew the arrow too short or at an angle.

Many students incorrectly identified the reactants and products from the equation or used nitrogen, hydrogen, and ammonia from the previous question. Other students were unsure where the reactants and products would be located on a reaction profile diagram.

09.5 One in five students correctly identified that if there was no catalyst used in the reaction the peak would be higher. Many students misread the question and incorrectly answered that the peak would be lower.

09.6 One in six students were able to identify the use of ammonium nitrate in a fertiliser or NPK fertiliser. A small minority stated that it was used in farming or agriculture unqualified. Only a handful of students identified its use in explosives or sports injury packs. Many students misread the question and took salt from the stem of the question and answered in terms or flavouring or preserving food or using salt to de-ice roads.