AQA GCSE Chemistry | 8462

SPECIFICATION POINT 4.8.2.1

Test for hydrogen

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**3**
Available paper years	**2010–2023**

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.

4.8.2.1 Test for hydrogen

Answer 01 · Mark scheme

June 2010 | CHY1AP | Original Q6 | Legacy

Six	**2**	**3**	**1**	**1**

4.8.2.1 Test for hydrogen

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

4.8.2.1 Test for hydrogen

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**

4.8.2.1 Test for hydrogen

Answer 03 · Mark scheme

June 2023 | 8462/2F | Original Q8

Question 8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.1	to reduce the escape of gas		1	AO3 4.6.1.1 RPA5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.2	(mean rate =) $\frac{0.78 + 0.81 + 0.81}{3}$	allow $\frac{0.78 + 0.81 + 0.68 + 0.81}{4}$	1	AO3
	0.80 (cm^3/s)	= 0.77 (cm^3/ s) for **1** mark	1	AO2
	$0.80 = \frac{20}{\text{mean time taken}}$	allow correct use of incorrectly determined mean rate	1	AO2
	(mean time taken =) $\frac{20}{0.80}$		1	AO2
	= 25 (s)		1	AO2 4.6.1.1 RPA5
	alternative approach: $0.78 = \frac{20}{\text{time}}$ **or** $0.81 = \frac{20}{\text{time}}$ (1)			
	(trial 1 time = $\frac{20}{0.78}$ =) 25.6 (1)			
	(trial 2 and 4 time = $\frac{20}{0.81}$ =) 24.7 (1)			

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	(mean time =) $\frac{25.6 + (2 \times 24.7)}{3}$ (1) = 25 (s) (1)	allow correct use of incorrectly determined value(s) for time allow $\frac{25.6 + 29.4 + (2 \times 24.7)}{4}$ = 26.1 (s) for **1** mark		

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.3	use a lower temperature use sulfuric acid of a lower concentration		1 1	AO1 4.6.1.2 RPA5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.4	(test) burning / lit splint (result) burns with a (squeaky) pop sound	MP2 is dependent upon MP1 being awarded allow flame do **not** accept glowing splint allow pops	 1 1	AO1 4.8.2.1

Total Question 8	**10**

4.8.2.1 Test for hydrogen

Answer 02 · 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 02 · 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.

4.8.2.1 Test for hydrogen

Answer 03 · Examiner comments

June 2023 | 8462/2F | Original Q8

Question 8 (Standard demand)

08.1 Around 10% of students gained this mark by recognising that adding the stopper would reduce the loss of gas. Weaker responses tended to be absolutes including stating that no gas would escape.

08.2 The calculation discriminated well. Approximately 30% of students successfully completed the calculation, usually showing full details of their working. Most students gained the first 2 marking points by discarding the anomalous result and calculating the mean. The alternative approach detailed in the mark scheme was seldom seen.

08.3 25% of students gained both marks and more than 45% gained 1 mark. The most frequently seen incorrect responses were those that identified factors that would increase rather than decrease the rate of reaction.

Answer 03 · Examiner comments

June 2023 | 8462/2F | Original Q8

08.4 Only 25% of students were able to give the correct test and result for hydrogen gas. Weaker responses failed to include the test and only described the result usually as a squeaky pop and gained no marks. Incorrect tests were less commonly seen but the most frequent incorrect test used was a glowing splint.