AQA GCSE Chemistry | 8462

SPECIFICATION POINT 4.8.1.2

Formulations

Mark schemes and examiner comments

Tier	**Higher**
Question groups	**2**
Available paper years	**2019–2025**

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.

4.8.1.2 Formulations

Answer 01 · Mark scheme

June 2019 | 8462/2H | Original Q2

Question 2

Question	Answers	Mark	AO/ Spec. Ref
02.1	**Level 3**: The design/plan would lead to the production of a valid outcome. All key steps are identified and logically sequenced.	5–6	AO1 4.8.2.3 4.8.3.1 4.8.3.3
	Level 2: The design/plan would not necessarily lead to a valid outcome. Most steps are identified, but the plan is not fully logically sequenced.	3–4	
	Level 1: The design/plan would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.	1–2	
	No relevant content	0	
	Indicative content lithium: • crush tablets or dissolve tablet (in water or acid) • clean wire • place on wire • place in (roaring / blue / non-luminous) flame • observe flame colour • crimson flame carbonate: • add hydrochloric acid • effervescence / fizzing • bubble gas through limewater • limewater becomes cloudy		
02.2	formulation(s)	1	AO1 4.8.1.2

4.8.1.2 Formulations

Answer 01 · Mark scheme

June 2019 | 8462/2H | Original Q2

02.3	1.20 g = 1200 mg **or** 700 mg = 0.700 g	an answer of 58.3333333 (%) correctly rounded to at least 2 significant figures scores **3** marks	1	AO2 4.8.1.2
	$\frac{700}{1200} \times 100$ **or** $\frac{0.700}{1.20} \times 100$	allow correct use of incorrectly or not converted values from step 1	1	
	= 58.3 (%)	allow 58.3333333 (%) correctly rounded to at least 2 significant figures	1	
Total			**10**	

4.8.1.2 Formulations

Question 3

Question	Answers	Mark	AO / Spec. Ref.
03.1	**Level 3:** A judgement, strongly linked and logically supported by a sufficient range of correct reasons, is given.	5–6	AO3 4.10.1.1 4.10.1.2 4.10.2.2 4.10.3.1
	Level 2: Some logically linked reasons are given. There may also be a simple judgement.	3–4	
	Level 1: Relevant points are made. They are not logically linked.	1–2	
	No relevant content	0	
	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		

4.8.1.2 Formulations

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.2	(the oxide coating) acts as a barrier (that) prevents air / oxygen / water reaching the aluminium / metal	do **not** accept sacrificial protection do **not** accept references to rusting do **not** accept sacrificial protection	1 1	AO1 4.10.3.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.3	a fixed mass of pigment and a fixed mass of liquid		1	AO1 4.8.1.2

Total Question 3	9

4.8.1.2 Formulations

Answer 02 · Examiner comments June 2025 | 8462/2H | Original Q3

Question 3

03.1 Fewer than 1% of students gained no marks on this evaluation extended response question. Around two fifths of students achieved a Level 3 response. There were many excellent answers, with a large number of reasons linked to the table and to other knowledge, accompanied by a judgement. The space allowed was sufficient to score full marks, but many students unnecessarily used additional pages.
The most common linked reasons, which added information not in the table, were that aluminium ore is finite and that trees are renewable. Links to mining and deforestation were also common, as were various consequences of the disposal methods. The lack of a need for maintenance of aluminium doors was less commonly noted, as was the idea that wooden doors could be damaged more easily.
Weaker responses, which merely gave comparisons from information in the table and added no consequences, were limited to level 1. Answers which merely requoted information from the table were not creditworthy.

03.2 Fewer than 1 in 5 students achieved both marks on this item. There was much confusion, with many referring to aluminium oxide as a form of sacrificial protection rather than a physical unreactive barrier. Many also referred to corrosion of aluminium as rusting. Some referred to protecting aluminium from contact with unspecified particles. Some referred to galvanizing, which is incorrect on two levels; it is a coating with zinc not aluminium oxide, and it is a method of sacrificial protection rather than just a barrier.

03.3 Half of students identified that a formulation must contain fixed quantities of all components.