GCSE Additional Science Chemistry 2

Higher Tier

Chemistry 2H

SPECIMEN MARK SCHEME

Version 1.0

Quality of Written Communication and levels marking

In Question 3(a) candidates are required to produce extended written material in English, and will be assessed on the quality of their written communication as well as the standard of the scientific response.

Candidates will be required to:

- use good English
- organise information clearly
- use specialist vocabulary where appropriate.

The following general criteria should be used to assign marks to a level:

Level 1: basic

- Knowledge of basic information
- Simple understanding
- The answer is poorly organised, with almost no specialist terms and their use demonstrating a general lack of understanding of their meaning, little or no detail
- The spelling, punctuation and grammar are very weak.

Level 2: clear

- Knowledge of accurate information
- Clear understanding
- The answer has some structure and organisation, use of specialist terms has been attempted but not always accurately, some detail is given
- There is reasonable accuracy in spelling, punctuation and grammar, although there may still be some errors.

Level 3: detailed

- Knowledge of accurate information appropriately contextualised
- Detailed understanding, supported by relevant evidence and examples
- Answer is coherent and in an organised, logical sequence, containing a wide range of appropriate or relevant specialist terms used accurately.
- The answer shows almost faultless spelling, punctuation and grammar.

In order to attain a mark within a certain level, **both** the science **and** the QWC must be of a standard appropriate to that level.

COMPONENT NUMBER: CH2HP

COMPONENT NAME: GCSE Additional Science Chemistry 2H

STATUS: Specimen V1.0

question	answers	extra information	mark
1(a)(i)	curve missing anomalous point		1
1(a)(ii)	answer in the range of 100.35 to 100.5		1
1(a)(iii)	reaction goes quickly at first		1
	reaction stops	accept reaction slows down	1
1(b)	because carbon dioxide is produced	accept gas is produced	1
	carbon dioxide / gas escapes, therefore the mass of the flask and contents decreases		1
1(c)(i)	balance B		1
1(c)(ii)	because during the experiment a gas / carbon dioxide escapes from the flask		1
	therefore the balance needs a high resolution to measure the small changes in the mass		1
1(d)	the (marble) powder has a larger surface area than the (marble) chips		1
	therefore there can be more collisions with the acid particles (within the same amount of time)		1
Total			**11**

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STATUS: Specimen V1.0

question	answers	extra information	mark
2(a)(i)	column		1
2(a)(ii)	mass spectrometer		1
2(b)(i)	165	if answer is not correct then evidence of correct working gains **one** mark eg (10x12) + 15 + 14 + 16	2
2(b)(ii)	10.37 (%)	accept 10 / 10.4 / 10.37..... if answer is not correct then evidence of correct working gains **one** mark eg minimum evidence would be 14 / 135	2
2(c)	any **two** from: • faster • more accurate • detects smaller amounts		2
2(d)	to avoid bias to improve reliability	accept to check / compare the result	1 1
Total			**10**

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3(a)			
Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 2.			
0 marks	**Level 1 (1-2 marks)**	**Level 2 (3-4 marks)**	**Level 3 (5-6 marks)**
No relevant content.	There is a brief description of the electrolysis of aluminium oxide.	There is some description of the electrolysis of aluminium oxide.	There is a clear, balanced and detailed description of the electrolysis of aluminium oxide.

examples of the chemistry points made in the response

- aluminium oxide is melted / made liquid
- aluminium ions are attracted to the negative electrode
- at the negative electrode aluminium is formed **or** aluminium ions gain electrons
- oxide ions are attracted to the positive electrode
- oxygen is formed at the positive electrode **or** oxide ions lose electrons
- the oxygen reacts with carbon to make carbon dioxide **or** carbon dioxide formed at positive electrode

3(b)	there are delocalised electrons / free electrons / electrons which move within the aluminium / metallic structure therefore these electrons are able to carry the current / charge	if the candidates use the terms covalent / ionic / molecules / intermolecular incorrectly in the answer this will limit the mark to a maximum of 1	1 1
Total			**8**

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STATUS: Specimen V1.0

question	answers	extra information	mark
4(a)	3	accept correct multiples	1
4(b)	sodium hydroxide / potassium hydroxide / alkali / a hydroxide		1
4(c)	the chromium ions form a precipitate which can be removed by filtration	accept the chromium ions form a solid which can be removed by filtration	1
Total			**3**

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STATUS: Specimen V1.0

question	answers	extra information	mark
5(a)	one nitrogen atom joined to three hydrogen atoms		1
	correct pairs of electron		1
5(b)	because ammonia is made of small molecules / simple molecules / simple molecular structures		1
	and so there are weak forces between the molecules **or** and so the intermolecular forces are weak	incomplete answers that link only size of molecule or strength of intermolecular forces with boiling point only gain **1** mark	1
5(c)(i)	hydroxide		1
5(c)(ii)	nitric		1
5(d)	because this is an endothermic reaction		1
	that takes in energy from the surroundings as the ammonium nitrate dissolves		1
Total			**8**

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STATUS: Specimen V1.0

question	answers	extra information	mark
6	in pure copper the atoms are arranged in layers	accept a correct diagram	1
	therefore copper is soft because copper atoms can slide over each other		1
	in bronze the tin atoms disrupt / distort the structure	accept a correct diagram	1
	therefore bronze is harder than copper because the metal atoms cannot slide over each other		1
Total			**4**

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STATUS: Specimen V1.0

question	answers	extra information	mark
7	used plastic bottles are heated	accept used plastic bottles are melted	1
	then moulded / extruded into a new shape / object		1
	because the polymer chains / molecules in the plastic have weak intermolecular forces		1
	that allow these polymer chains / molecules to become mobile when heated		1
Total			**4**

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STATUS: Specimen V1.0

question	answers	extra information	mark
8(a)	the sodium atom loses / transfers an / one electron		1
	the chlorine atom gain(s) this / an / one electron		1
	involves electrons in the outer energy levels / shells of both the sodium atom and the chlorine atom		1
8(b)	sodium chloride has a giant structure / lattice of oppositely charged ions / positive and negative ions		1
	the electrostatic forces of attraction / bonds between ions are strong		1
	therefore sodium chloride has a high melting point because a large amount of energy is needed to make the ions mobile		1
Total			**6**

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STATUS: Specimen V1.0

question	answers	extra information	mark
9(a)	130.4	accept 130 to 130.43478…… correct answer gains two marks with or without working an answer of 131 would gain **one** mark. if answer is not correct then: moles of salicylic acid = 0.7 ……. (1 mark) **or** mass of aspirin = moles of salicylic acid x 180 (1 mark) **or** 100 x (180/138) (1 mark)	2
9(b)(i)	62.5%	accept 63% correct answer gains two marks with or without working if answer is not correct then: 250/400 x 100 (1 mark)	2
9(b)(ii)	any **one** from: • reversible reaction • some of product lost	accept not all of the reactant converted to product	1
9(c)	use lower temperatures **or** less energy needed	allow product made faster or more product made in a given time	1
Total			**6**