AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.1.2.3

Metals and non-metals

Mark schemes and examiner comments

Tier	**Higher**
Question groups	**1**
Available paper years	**2022–2022**

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.

5.1.2.3 Metals and non-metals

Answer 01 · Mark scheme

June 2022 | 8464/C/1H | Original Q5

Question 5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	fullerene	allow (carbon) nanotube do **not** accept Buckministerfullerene	1	AO1 5.2.3.3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.2	any **one** from: • conducts heat • conducts electricity • very high length to diameter ratio	 allow large surface area to volume ratio allow high tensile strength allow can trap other molecules / atoms / ions	1	AO2 5.2.3.3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.3	other metal atoms have different sizes to aluminium atoms (so) the layers of aluminium atoms are distorted (so) the layers cannot slide (which) makes the alloy harder	 allow (so) the atoms cannot slide over each other allow (which) makes the alloy stronger	1 1 1 1	AO1 5.2.2.7

5.1.2.3 Metals and non-metals

Answer 01 · Mark scheme

June 2022 | 8464/C/1H | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.4	covalent bonds (between atoms) in the chain		1	AO1 5.2.2.5
	intermolecular forces between the chains		1	
	covalent bonds are strong **and** intermolecular forces are weak		1	

Total Question 5		**9**

5.1.2.3 Metals and non-metals

Answer 01 · Examiner comments June 2022 | 8464/C/1H | Original Q5

Question 5 (Standard/high and high demand)

05.1 This question discriminated well with a third of students recognising the structure of a fullerene.

05.2 Students struggled to suggest a property of the fullerene molecule, with just over 30% gaining a mark.

05.3 More than half the students scored one mark or more in their explanation of why metals are added to aluminium to produce an alloy. However students found developing an explanation challenging. The most commonly awarded mark was for the alloy being harder or stronger. In some responses there was confusion about layers sliding over each other when many talked about ‘metals’ or ‘molecules’ rather than ‘atoms’. The marking point stating that atoms of other metals have different sizes was the least often awarded.

Answer 01 · Examiner comments June 2022 | 8464/C/1H | Original Q5

05.4 This question required students to use correct scientific terminology. This question discriminated well with 30% of students gaining at least one mark though many students seemed to know that the bonds in the chains were strong and between chains were weak, but they did not name them correctly and therefore failed to score.