AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.2.2.1

The three states of matter

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**2**
Available paper years	**2020–2023**

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.

5.2.2.1 The three states of matter

Answer 01 · Mark scheme November 2020 | 8464/C/1F | Original Q7

07.1	any **one** from: • not to scale • not 3 dimensional / D • incorrect arrangement in space • electrons / shells not shown	allow size of atoms incorrect allow atoms are separated ignore properties of water	1	AO2 5.2.1.4
07.2	weak	allow weaker	1	AO1 5.2.2.4
07.3	CH_4O	allow CH_3OH	1	AO2 5.2.1.4
07.4	4		1	AO1 5.2.3.1
07.5	any **two** from: • (very) hard • (very) high melting point • does not conduct electricity	allow strong allow high thermal conductivity ignore shiny	2	AO1 5.2.3.1

5.2.2.1 The three states of matter

Answer 01 · Mark scheme

November 2020 | 8464/C/1F | Original Q7

07.6	graphite silicon dioxide	allow graphene allow silica allow silicon allow polymer(s) **or** allow (named) polymer(s) allow fullerene **or** allow carbon nanotubes ignore buckminsterfullerene	1 1	AO1 5.2.2.6
Total			**8**	

5.2.2.1 The three states of matter

Answer 01 · Mark scheme

November 2020 | 8464/C/1F | Original Q7

Question	Answers	Mark	AO/ Spec. Ref

5.2.2.1 The three states of matter

Answer 02 · Mark scheme

June 2023 | 8464/C/1F | Original Q1

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	(number of protons) 4 (number of neutrons) 5		1 1	AO2 5.1.1.4 5.1.1.5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.2	+2		1	AO2 5.1.1.7 5.2.1.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3	gas		1	AO1 5.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.4	freezing		1	AO1 5.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.5	heat	allow evaporate / boil	1	AO1 5.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.6			1	AO1 5.1.1.3

5.2.2.1 The three states of matter

Answer 02 · Mark scheme

June 2023 | 8464/C/1F | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.7	chadwick		1	AO1 5.1.1.3

Total Question 1	**8**

5.2.2.1 The three states of matter

Answer 02 · Examiner comments June 2023 | 8464/C/1F | Original Q1

Question 1 (low demand)

01.1 Three-quarters of the students correctly deduced the number of protons and the number of neutrons in the beryllium atom. Some students gave the numbers the opposite way around.

01.2 The relative charge on a beryllium ion was given by just over 50% of the students. A charge of 1+ proved to be a good distractor.

01.3 More than 95% of the students were able to identify the arrangement of atoms as a representation of the gas state.

01.4 More than 80% of the students were able to identify the states from the diagram and to link them to freezing, as the process when a liquid changes into a solid.

01.5 About two-thirds of the students were able to identify the states and knew that heating was required to change the states. Condensing was a very common incorrect response which is the reverse process of the direction being asked about.

01.6 Just over three-quarters of students knew the correct order for the development of the model of the atom was tiny sphere, plum pudding and then nuclear model. The most common incorrect distractor also started with the tiny sphere model.

Answer 02 · Examiner comments June 2023 | 8464/C/1F | Original Q1

01.7 Just under half of the students knew that the existence of neutrons was discovered by Chadwick. Mendeleev was the most common incorrect answer.