AQA GCSE Chemistry

Bonding, structure, and the properties of matter mark scheme · goes with “Bonding, structure, and the properties of matter · Foundation tier” · whiteboardchemistry.com/revision/gcse-chemistry/exam-questions

Mark schemes

Bonding, structure, and the properties of matter · Foundation tier · 5 questions

Q1 · June 2023 · Paper 1 Foundation · Q4 · [10 marks]

04.1

(total atoms =) 30

(percentage =)

$$\frac{6}{30} \times 100$$

allow correct use of an incorrectly determined total number of atoms

= 20 (%)

[3 marks]

04.2

sizes

allow diameters

do not accept shapes

slide (over each other)

allow move over each other

[2 marks]

04.3

(as the percentage by mass of tin increases the) melting point (of solder) decreases

to 183 °C

allow a value in the range 182–184 °C

allow to 62% (tin)

then increases

[3 marks]

04.4

232 °C

[1 mark]

04.5

the atoms gain energy and their arrangement becomes less ordered

[1 mark]

Q2 · June 2024 · Paper 1 Foundation · Q4 · [10 marks]

04.1

a few hundred atoms

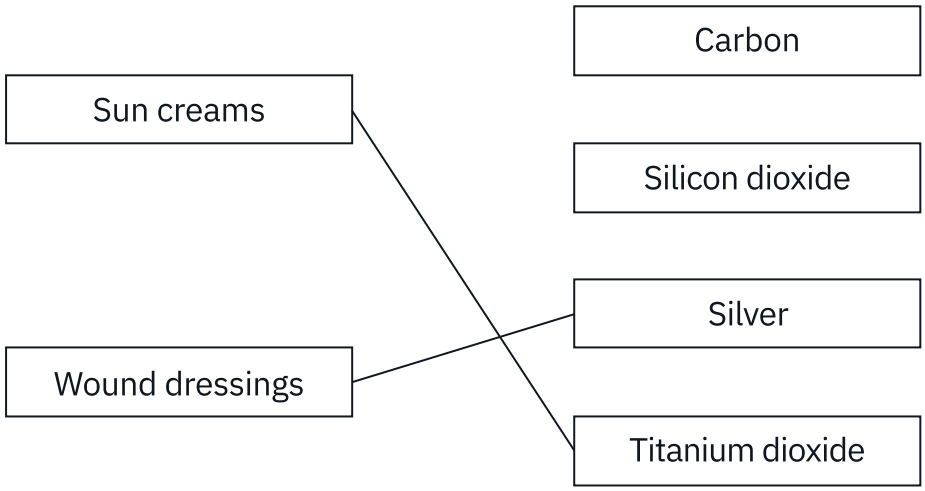
[1 mark]

04.2

iron

[1 mark]

04.3



do not accept more than one line from a box on the left

[2 marks]

04.4

(surface area =) 6×4^2

= 96 (nm^2)

(volume =) 4^3

= 64 (nm^3)

(ratio =) 96 : 64

allow correct use of incorrectly determined area and/or volume

= 3 : 2

allow correct use of an incorrectly determined ratio

[6 marks]

Q3 · June 2024 · Paper 1 Foundation · Q5 · [10 marks]

05.1

6

[1 mark]

05.2

7

[1 mark]

05.3

6

[1 mark]

05.4

C_2F_6

[1 mark]

05.5

only intermolecular forces are weak

[1 mark]

05.6

spherical

[1 mark]

05.7

3

[1 mark]

05.8

giant structure

allow lattice

(of atoms joined by) covalent bonds

each carbon / atom forms four bonds

[3 marks]

Q4 · June 2025 · Paper 1 Foundation · Q6 · [9 marks]

06.1

Buckminsterfullerene

[1 mark]

06.2

the nanoparticles are spherical

[1 mark]

06.3

10^2

[1 mark]

06.4

(volume =) 4^3

= 64 (nm^3)

(surface area : volume ratio =)

96 : 64

allow correct use of an incorrectly determined volume

= 3 : 2

allow correct use of an incorrectly determined surface area : volume ratio

[4 marks]

06.5

thinner / smaller / less

greater / more

[2 marks]

Q5 · June 2025 · Paper 1 Foundation · Q9 · Paper 1 Higher · Q2 · [11 marks]

09.1

CaS

[1 mark]

09.2

calcium (atom) loses electrons

sulfur (atom) gains electrons

reference to transfer of two electrons

calcium forms positive ions **and** sulfur forms negative ions

*allow Ca^{2+} (ions) **and** S^{2-} (ions) are formed*

*allow calcium ions **and** sulfide ions are formed*

[4 marks]

09.3

Level 2 (3–4 marks): Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.

Level 1 (1–2 marks): Facts, events or processes are identified and simply stated but their relevance is not clear.

No relevant content (0 marks)

Indicative content

- giant structure
- layers

- of hexagonal rings
- each (carbon) atom forms three bonds
- has no covalent bonds between layers
- with delocalised electrons
- one delocalised electron from each carbon atom
- the bonds are covalent
- with shared (pairs of) electrons
- the (covalent) bonds are strong

[4 marks]

09.4

the molecules do not have an (overall electric) charge

allow there are no ions

allow there are no delocalised electrons

[1 mark]

09.5

poly(ethene) has stronger intermolecular forces to overcome than methane

[1 mark]

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