AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.2.2.1

The three states of matter

Past-paper questions

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

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

5.2.2.1 The three states of matter

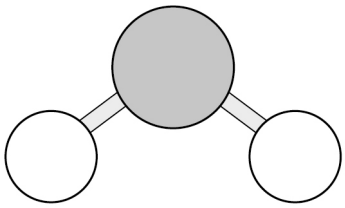
Question 01

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

0 7 This question is about substances with covalent bonding.

0 7 . 1 **Figure 12** shows a ball and stick model of a water molecule (H_2O).

Figure 12



Suggest **one** limitation of using a ball and stick model for a water molecule.

[1 mark]

_____

_____

_____

0 7 . 2 Ice has a low melting point.

Water molecules in ice are held together by intermolecular forces.

Complete the sentence.

[1 mark]

Ice has a low melting point because the

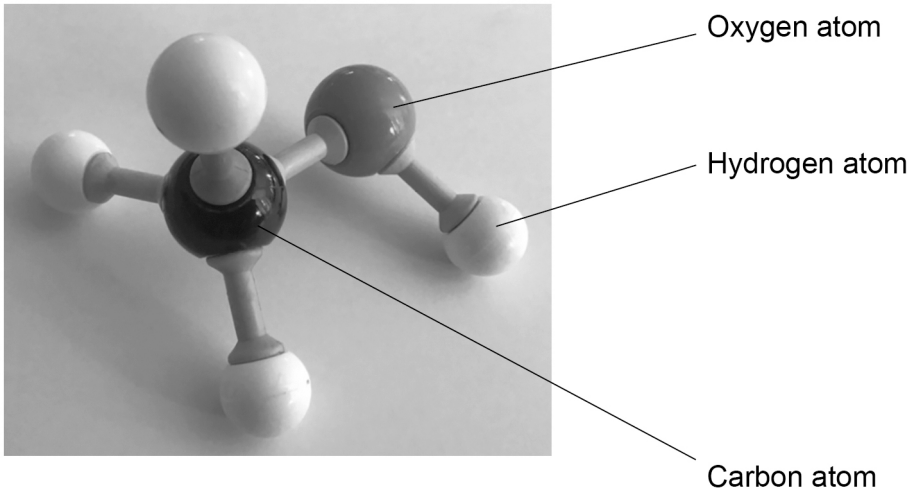
intermolecular forces are _____.

5.2.2.1 The three states of matter

Question 01 · continued

0 7 . 3 **Figure 13** shows the structure of a molecule.

Figure 13



What is the molecular formula of the molecule in **Figure 13**?

[1 mark]

Question 7 continues on the next page

5.2.2.1 The three states of matter

Question 01 · continued

Diamond has a giant covalent structure.

0 7 . 4 What is the number of bonds formed by each carbon atom in diamond?

[1 mark]

Tick (✓) **one** box.

2 ☐ 3 ☐ 4 ☐ 8 ☐

0 7 . 5 Give **two** physical properties of diamond.

[2 marks]

1 _____

2 _____

0 7 . 6 Name **two** other substances with giant covalent structures.

[2 marks]

1 _____

2 _____

8

5.2.2.1 The three states of matter

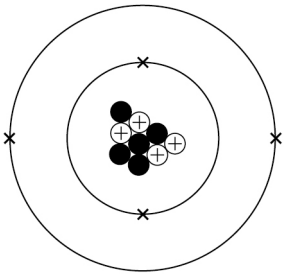
Question 02

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

0 1 All substances are made from atoms.

0 1 . 1 **Figure 1** represents a beryllium atom.

Figure 1



What is the number of protons and the number of neutrons in the beryllium atom?

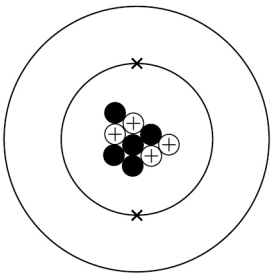
[2 marks]

Number of protons _____

Number of neutrons _____

0 1 . 2 **Figure 2** represents a beryllium **ion**.

Figure 2



What is the relative charge on a beryllium ion?

[1 mark]

Tick (✓) **one** box.

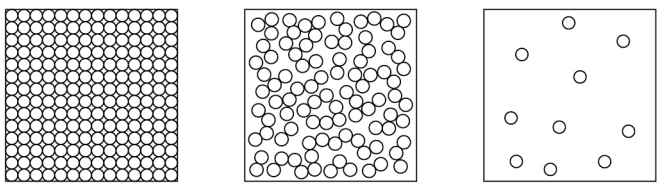
0 ☐ +1 ☐ +2 ☐

5.2.2.1 The three states of matter

Question 02 · continued

Figure 3 shows the arrangement of atoms in the three states of matter.

Figure 3



A **B** **C**

0 1 . 3 What state of matter is represented by state **C** in **Figure 3**?

[1 mark]

Tick (✓) **one** box.

Gas ☐

Liquid ☐

Solid ☐

5.2.2.1 The three states of matter

Question 02 · continued

0 1 . 4 What is the name of the process when state **B** changes into state **A**?

Use **Figure 3**.

[1 mark]

Tick (✓) **one** box.

Condensing ☐

Freezing ☐

Melting ☐

0 1 . 5 How can state **B** be changed into state **C**?

Use **Figure 3**.

[1 mark]

Question 1 continues on the next page

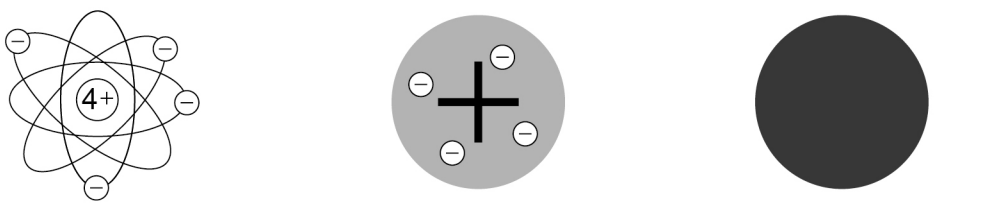
5.2.2.1 The three states of matter

Question 02 · continued

Experimental evidence led to the scientific model of the atom changing over time.

0 1 . 6 **Figure 4** shows three models for the atom.

Figure 4

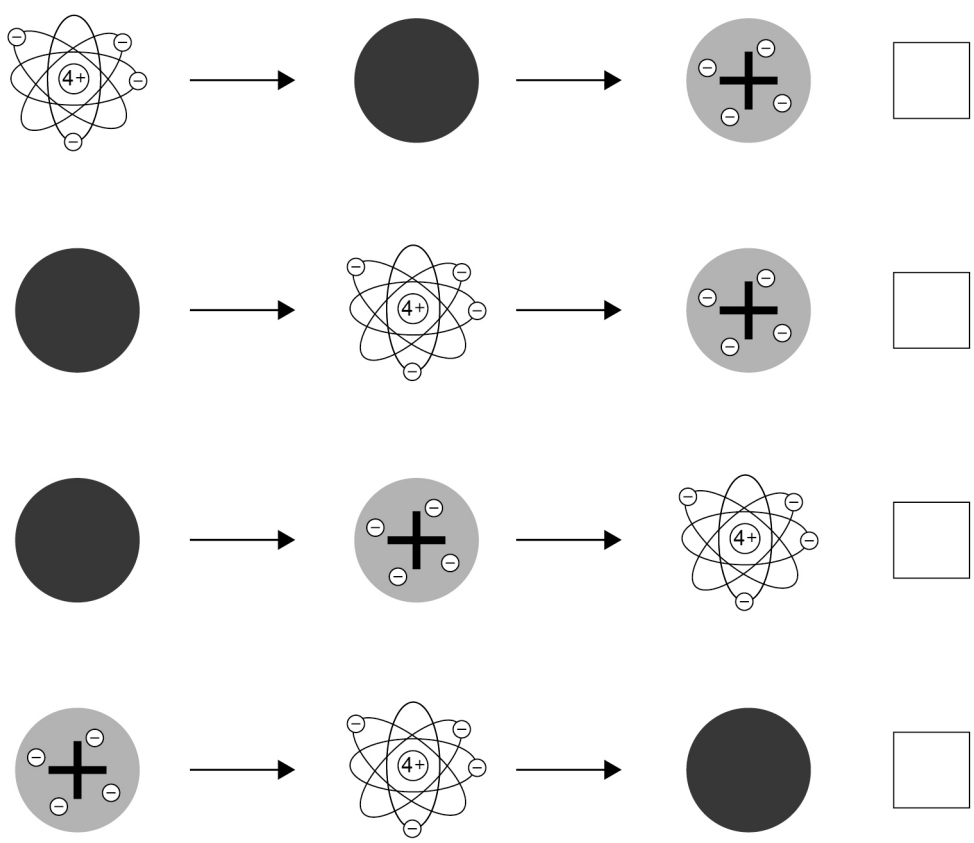


Nuclear model **Plum pudding model** **Tiny spheres model**

What is the order for the development of the model of the atom?

[1 mark]

Tick (✓) **one** box.



5.2.2.1 The three states of matter

Question 02 · continued

0 1 . 7 Complete the sentence.

Choose the answer from the box.

[1 mark]

Bohr	**Chadwick**	**Mendeleev**

The existence of neutrons was discovered by _____.

8

Turn over for the next question