AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.2.3.1

Diamond

Past-paper questions

Tier	**Higher**
Question groups	**2**
Available paper years	**2018–2020**

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.

5.2.3.1 Diamond

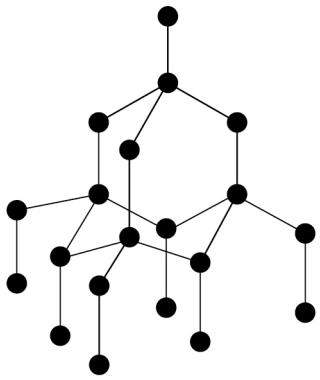
Question 01

June 2018 | 8464/C/1H | Original Q5

0 5 This question is about structure and bonding.

0 5 . 1 **Figure 5** shows part of the structure and bonding in diamond.

Figure 5



Explain why diamond has a high melting point.

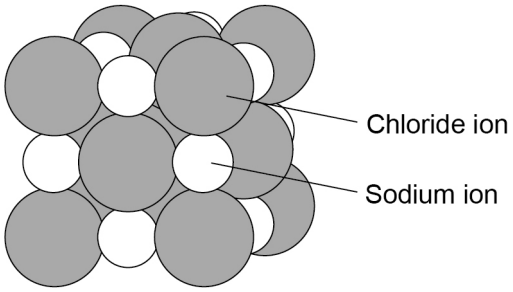
[3 marks]

5.2.3.1 Diamond

Question 01 · continued

0 5 . 2 **Figure 6** shows part of the structure and bonding in sodium chloride (NaCl).

Figure 6



Explain the conditions needed for sodium chloride to conduct electricity.

[3 marks]

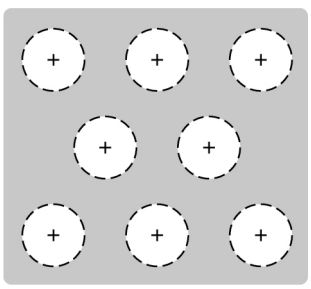
Question 5 continues on the next page

5.2.3.1 Diamond

Question 01 · continued

0 5 . 3 **Figure 7** shows the structure of sodium.

Figure 7



Describe how sodium conducts thermal energy.

[3 marks]

9

5.2.3.1 Diamond

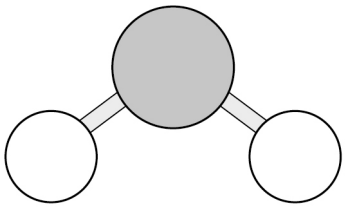
Question 02

November 2020 | 8464/C/1H | Original Q2

0 2 This question is about substances with covalent bonding.

0 2 . 1 **Figure 2** shows a ball and stick model of a water molecule (H_2O).

Figure 2



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

[1 mark]

0 2 . 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

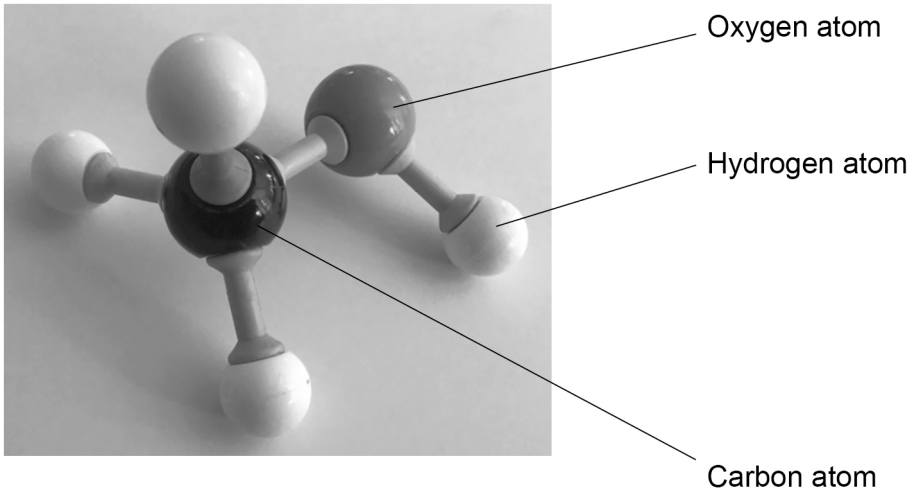
intermolecular forces are _____.

5.2.3.1 Diamond

Question 02 · continued

0 2 . 3 **Figure 3** shows the structure of a molecule.

Figure 3



What is the molecular formula of the molecule in **Figure 3**?

[1 mark]

Question 2 continues on the next page

5.2.3.1 Diamond

Question 02 · continued

Diamond has a giant covalent structure.

0 2 . 4 What is the number of bonds formed by each carbon atom in diamond?

[1 mark]

Tick (✓) **one** box.

2 ☐ 3 ☐ 4 ☐ 8 ☐

0 2 . 5 Give **two** physical properties of diamond.

[2 marks]

1 _____

2 _____

0 2 . 6 Name **two** other substances with giant covalent structures.

[2 marks]

1 _____

2 _____

8