AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.2.1.2

Ionic bonding

Past-paper questions

Tier	**Higher**
Question groups	**3**
Available paper years	**2018–2025**

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.

5.2.1.2 Ionic bonding

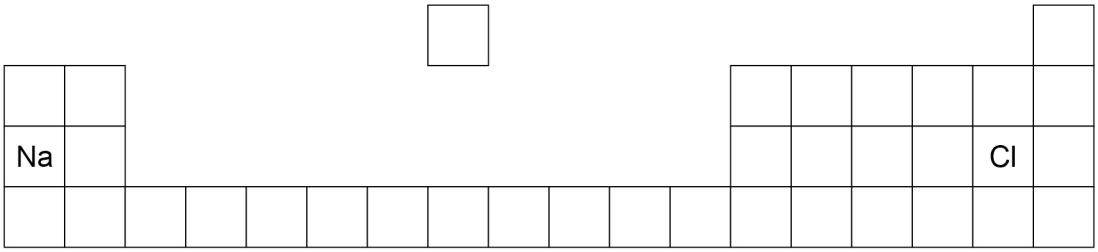
Question 01

June 2018 | 8464/C/1H | Original Q2

0 2 This question is about sodium and chlorine.

Figure 2 shows the positions of sodium and chlorine in the periodic table.

Figure 2



0 2 . 1 State **one** difference and **one** similarity in the electronic structure of sodium and of chlorine.

[2 marks]

Difference _____

_____

Similarity _____

_____

0 2 . 2 Sodium atoms react with chlorine atoms to produce sodium chloride (NaCl).

Describe what happens when a sodium atom reacts with a chlorine atom.

Write about electron transfer in your answer.

[4 marks]

_____

_____

_____

_____

_____

_____

_____

_____

5.2.1.2 Ionic bonding

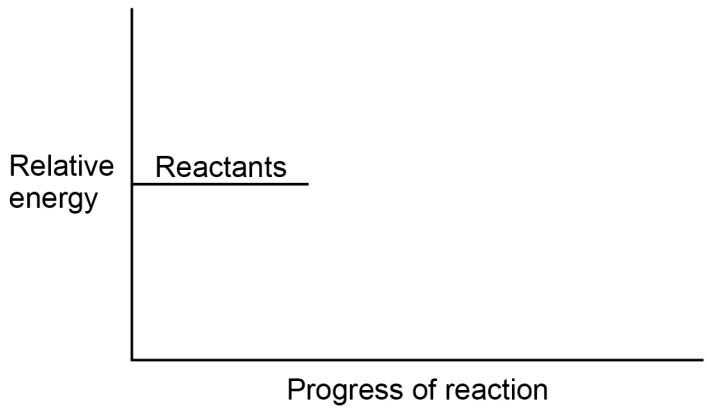
Question 01 · continued

0 2 . 3 The reaction between sodium and chlorine is an exothermic reaction.

Complete the reaction profile for the reaction between sodium and chlorine.

[2 marks]

Figure 3



8

5.2.1.2 Ionic bonding

Question 02

June 2023 | 8464/C/1H | Original Q3

0 3 Sodium is in Group 1 of the periodic table.

Sodium reacts with oxygen to produce sodium oxide.

0 3 . 1 Balance the equation for the reaction.

[1 mark]

____ Na + O_2 → ____ Na_2O

0 3 . 2 Explain what happens to sodium atoms and to oxygen atoms when sodium reacts with oxygen to produce sodium oxide (Na_2O).

Answer in terms of electrons.

[4 marks]

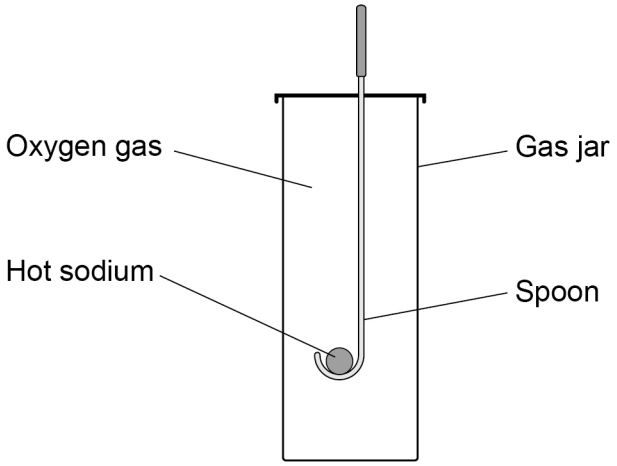
5.2.1.2 Ionic bonding

Question 02 · continued

0 3 . 3 Sodium burns in a gas jar of oxygen.

Figure 3 shows the apparatus.

Figure 3



Give **two** observations seen during the reaction.

[2 marks]

1 _____

_____

2 _____

_____

0 3 . 4 Describe **two** differences in the observations if potassium is used instead of sodium.

[2 marks]

1 _____

_____

2 _____

_____

9

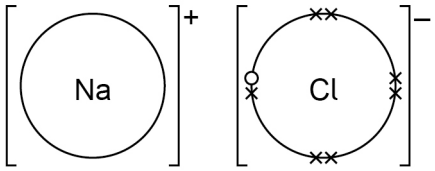
5.2.1.2 Ionic bonding

Question 03

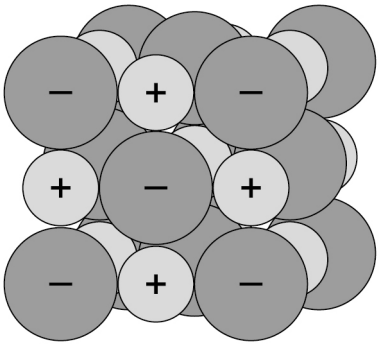
0 7 This question is about bonding and structures.

0 7 . 1 **Figure 10** represents two models of sodium chloride.

Figure 10



Model **A**



Model **B**

Give **two** limitations of model **A** compared with model **B**.

[2 marks]

1 _____

_____

2 _____

_____

0 7 . 2 Aluminium sulfate consists of the ions:

- Al^{3+}
- SO_4^{2-}

What is the formula of aluminium sulfate?

[1 mark]

_____

5.2.1.2 Ionic bonding

Question 03 · continued

0 7 . 3 Metals have metallic bonding.

Suggest **one** reason why aluminium metal conducts electricity better than sodium metal.

[1 mark]

0 7 . 4 Silicon dioxide and the polymer poly(ethene) are solid substances.

Compare silicon dioxide with the polymer, poly(ethene).

Answer in terms of structure and bonding.

[4 marks]

Extra space

8