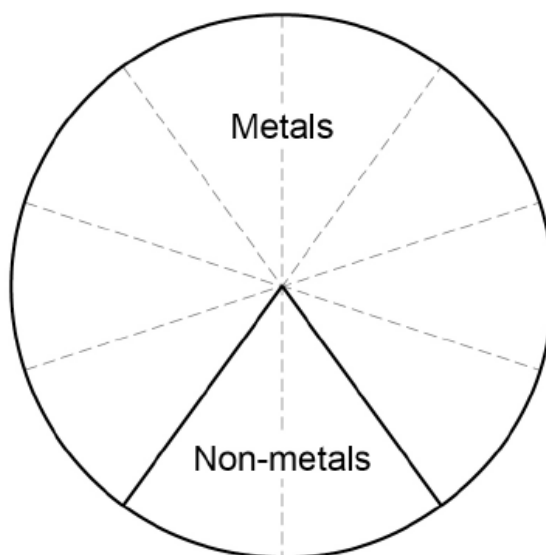


Chemical bonds, ionic, covalent and metallic – GCSE Combined Science Chemistry1. **No.4**

This question is about elements and compounds.

Figure 5 shows the proportion of elements in the periodic table that are metals and non-metals.

Figure 5



Determine the percentage of the elements in **Figure 5** that are metals.

[2 marks]

Percentage = _____ %

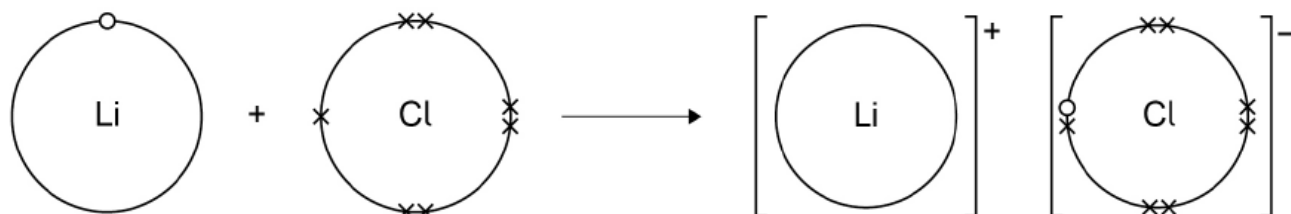
2. No.5.5

Lithium reacts with chlorine to produce lithium chloride.

Figure 9 shows what happens to the electrons in the outer shells when a lithium atom reacts with a chlorine atom.

The dots (o) and crosses (x) represent electrons.

Figure 9



Describe what happens to a lithium atom and to a chlorine atom when they react.

Use **Figure 9** to answer in terms of electrons.

[3 marks]

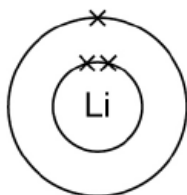
3. No.5.6

Lithium and potassium are in the same group of the periodic table.

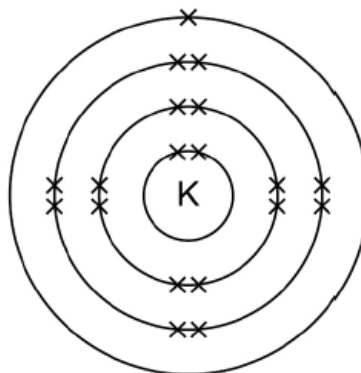
Figure 10 represents the electronic structures of a lithium atom and of a potassium atom.

Figure 10

Lithium atom



Potassium atom



Give **two** reasons why potassium is more reactive than lithium.

[2 marks]

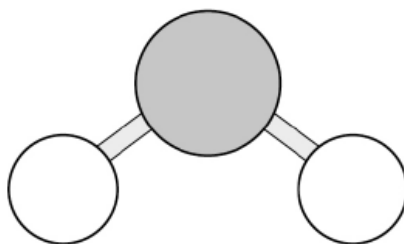
1 _____

2 _____

4. No.7.1-7.3

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]

Ice has a low melting point.

Water molecules in ice are held together by intermolecular forces.

Complete the sentence.

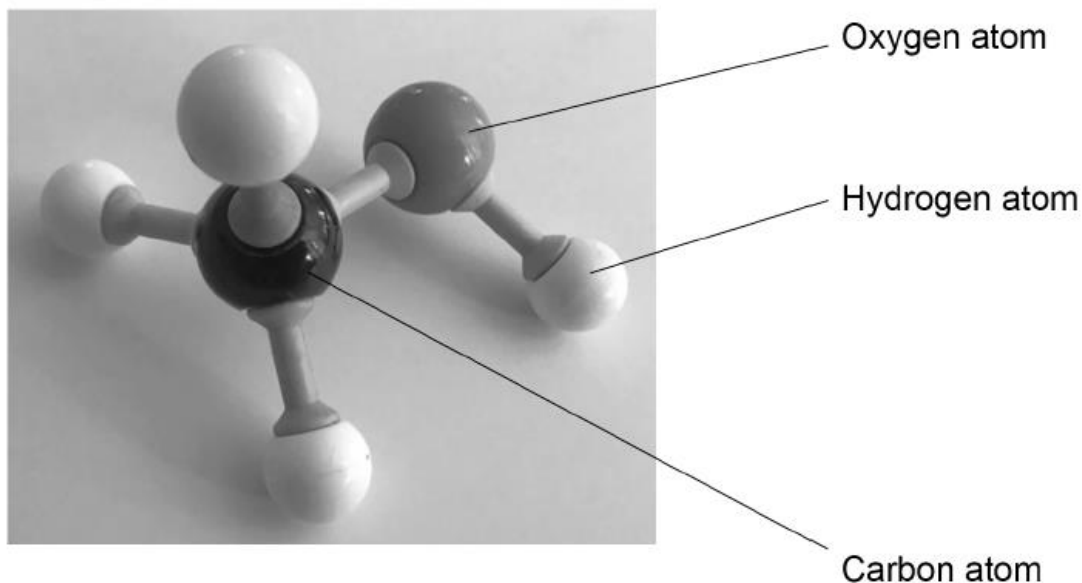
[1 mark]

Ice has a low melting point because the

intermolecular forces are _____.

Figure 13 shows the structure of a molecule.

Figure 13



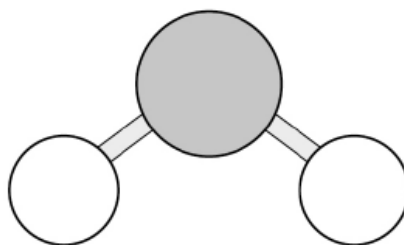
What is the molecular formula of the molecule in **Figure 13**?

[1 mark]

5. No.2.1-2.3

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]

Ice has a low melting point.

Water molecules in ice are held together by intermolecular forces.

Complete the sentence.

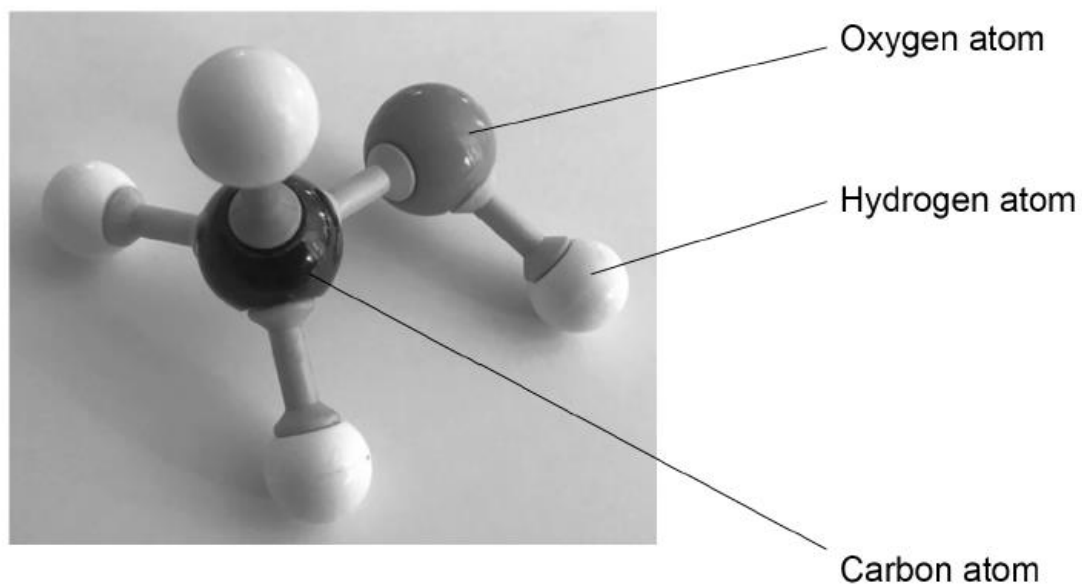
[1 mark]

Ice has a low melting point because the

intermolecular forces are _____.

Figure 3 shows the structure of a molecule.

Figure 3



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

[1 mark]

6. No.7.1-7.2

Explain what happens to caesium atoms and to oxygen atoms when caesium reacts with oxygen to produce caesium oxide.

You should answer in terms of electrons.

[4 marks]

Explain why caesium is more reactive than sodium.

You should answer in terms of electrons.

[4 marks]

7. No.4.4

Sodium chloride (NaCl) is an ionic compound.

Write the formulae of the ions in sodium chloride.

[2 marks]

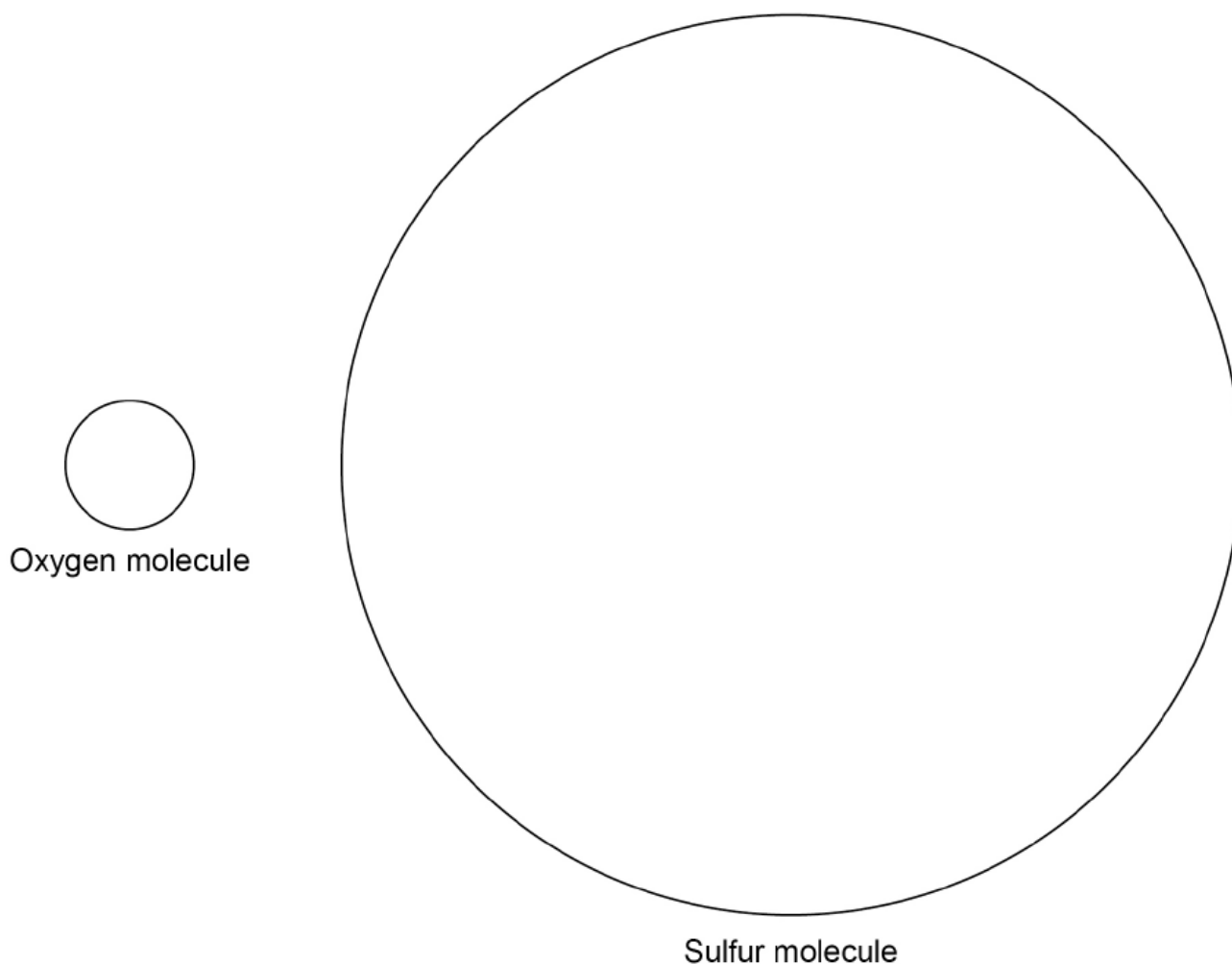
Sodium ion _____

Chloride ion _____

8. No.5.6

Figure 6 shows the relative sizes of an oxygen molecule and a sulfur molecule.

Figure 6



How does the boiling point of sulfur compare with the boiling point of oxygen?

Complete the sentences.

[2 marks]

The boiling point of sulfur is _____ the boiling point of oxygen.

This is because in sulfur the intermolecular forces are _____
than the intermolecular forces in oxygen.

9. No.3.3

Oxygen is in Group 6 of the periodic table.

Figure 3 shows the outer energy levels in one molecule of oxygen (O_2).

Draw the electrons in the outer energy levels in **Figure 3**.

[2 marks]

Figure 3

