

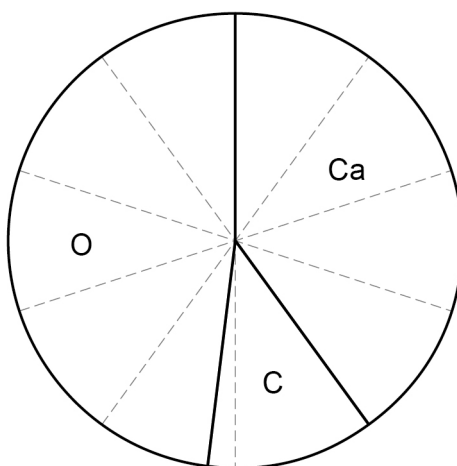
0 5

This question is about oxygen and compounds of oxygen.

0 5 . 1

What is the state symbol of oxygen at room temperature?

[1 mark]

0 5 . 2**Figure 4** shows the percentage by mass of the elements calcium, carbon and oxygen in calcium carbonate.**Figure 4**

What is the percentage by mass of calcium in calcium carbonate?

[1 mark]

Percentage = _____ %



0 5 . 3

At high temperature, sodium nitrate decomposes into sodium nitrite and oxygen.

A student heats three samples of sodium nitrate.

The mass of each sample was 4.50 g

The mass of solid after heating was recorded.

Table 2 shows the mass of solid after heating in each experiment.

Table 2

Experiment	Mass of solid after heating in g
1	3.76
2	3.98
3	4.09

Calculate the mean mass of solid after heating.

Give your answer to 3 significant figures.

[3 marks]

Mean mass of solid after heating = _____ g

Question 5 continues on the next page

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0 5 . 4

Table 3 shows the electronic structure of hydrogen and oxygen.

Table 3

Element	Electronic structure
Hydrogen	1
Oxygen	2,6

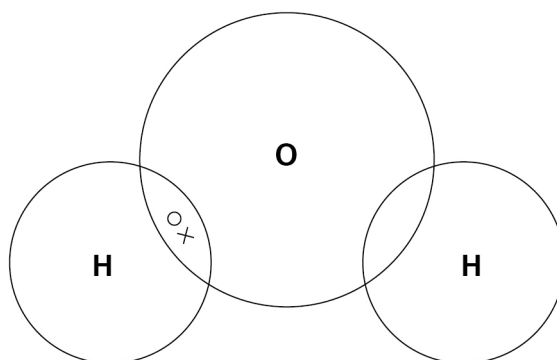
Figure 5 shows part of a dot and cross diagram of a molecule of water (H_2O).

Complete the dot and cross diagram.

You should show only the electrons in the outer energy levels.

[2 marks]

Figure 5



Oxygen and sulfur are examples of simple molecules.

0 5 . 5

Complete the sentence.

Choose the answer from the box.

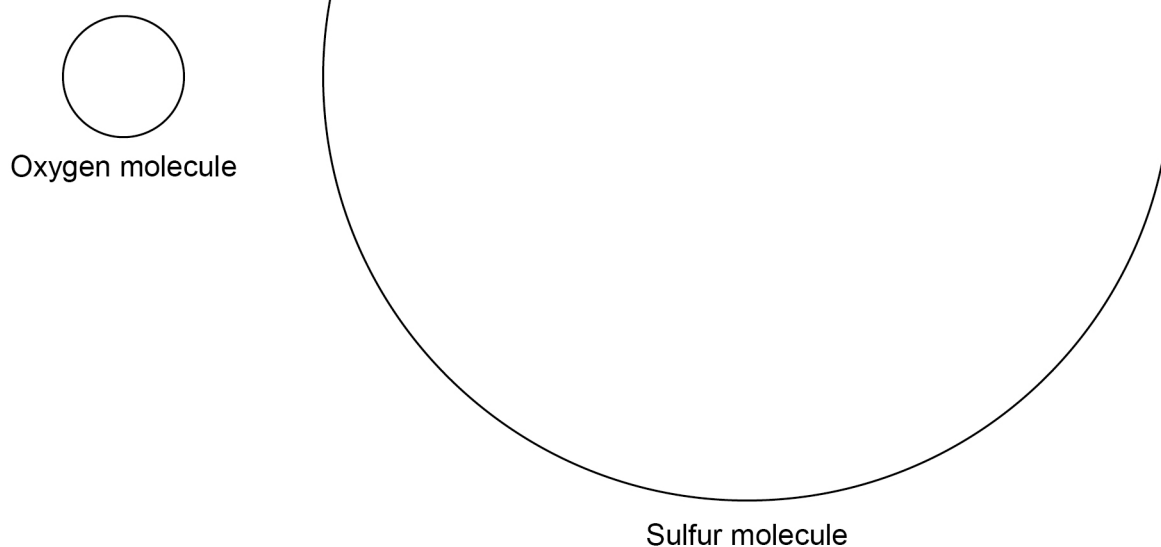
[1 mark]

covalent	ionic	metallic
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There are _____ bonds between the atoms of oxygen in an oxygen molecule.



0 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]

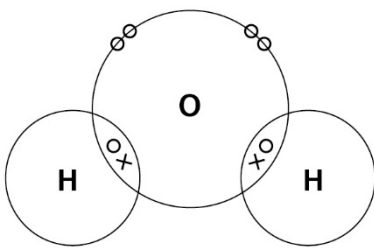
The boiling point of sulfur is _____ the boiling point of oxygen.

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

10

Turn over ►



Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	(g)	allow g ignore formulae	1	AO1 5.2.2.2
05.2	40 (%)		1	AO2 5.1.1.1
05.3	$\frac{3.76 + 3.98 + 4.09}{3} \quad \text{or} \quad \frac{11.83}{3}$ $= 3.943(33333333333333333333)$ $= 3.94 \text{ (g)}$	an answer of 3.94 (g) scores 3 marks allow a correctly written answer to 3 significant figures from an incorrectly calculated mean	1 1 1	AO2 5.3.1.3
05.4	one shared pair in each overlap 4 non-bonding electrons in outer shell of oxygen	allow combination of circles, dots, crosses or e ⁽⁻⁾ do not accept extra electron(s) on outer shell of hydrogen ignore any inner shell electrons  diagram scores 2 marks	1 1	AO1 5.2.1.4

05.5	covalent		1	AO1 5.2.2.1 5.2.2.4
05.6	higher (than) stronger (than between oxygen molecules)		1 1	AO2 5.2.2.4
Total			10	