

AQA - Atomic structure and the periodic table – GCSE Combined Science Chemistry

1. [May/2020/Paper_8464/1F/No.3.4](#)

What are Group 7 elements known as?

[1 mark]

Tick (✓) **one** box.

Alkali metals

Halogens

Noble gases

2. [May/2020/Paper_8464/1F/No.3.5](#)

Fluorine, chlorine and bromine react with gold.

Which element will be the most reactive with gold?

[1 mark]

Tick (✓) **one** box.

Fluorine

Chlorine

Bromine

3. May/2020/Paper_8464/1F/No.5

This question is about elements in the periodic table.

What property was used to arrange elements in early periodic tables?

[1 mark]

Tick (✓) **one** box.

Atomic number

Atomic weight

Mass number

In early periodic tables, iodine (I) was placed before tellurium (Te).

Mendeleev placed iodine after tellurium.

Figure 7 shows part of Mendeleev's periodic table.

Figure 7

16 O	19 F
32 S	35.5 Cl
79 Se	80 Br
128 Te	127 I

Suggest **one** reason why Mendeleev placed iodine in the column shown in **Figure 7**.

[1 mark]

Table 3 shows the melting points of three Group 1 metals.

Table 3

Metal	Melting point in °C
Lithium	180
Sodium	98
Potassium	63

What state is lithium at 100 °C?

Use **Table 3**.

[1 mark]

Tick (✓) **one** box.

Gas

Liquid

Solid

Complete the graph in **Figure 8**.

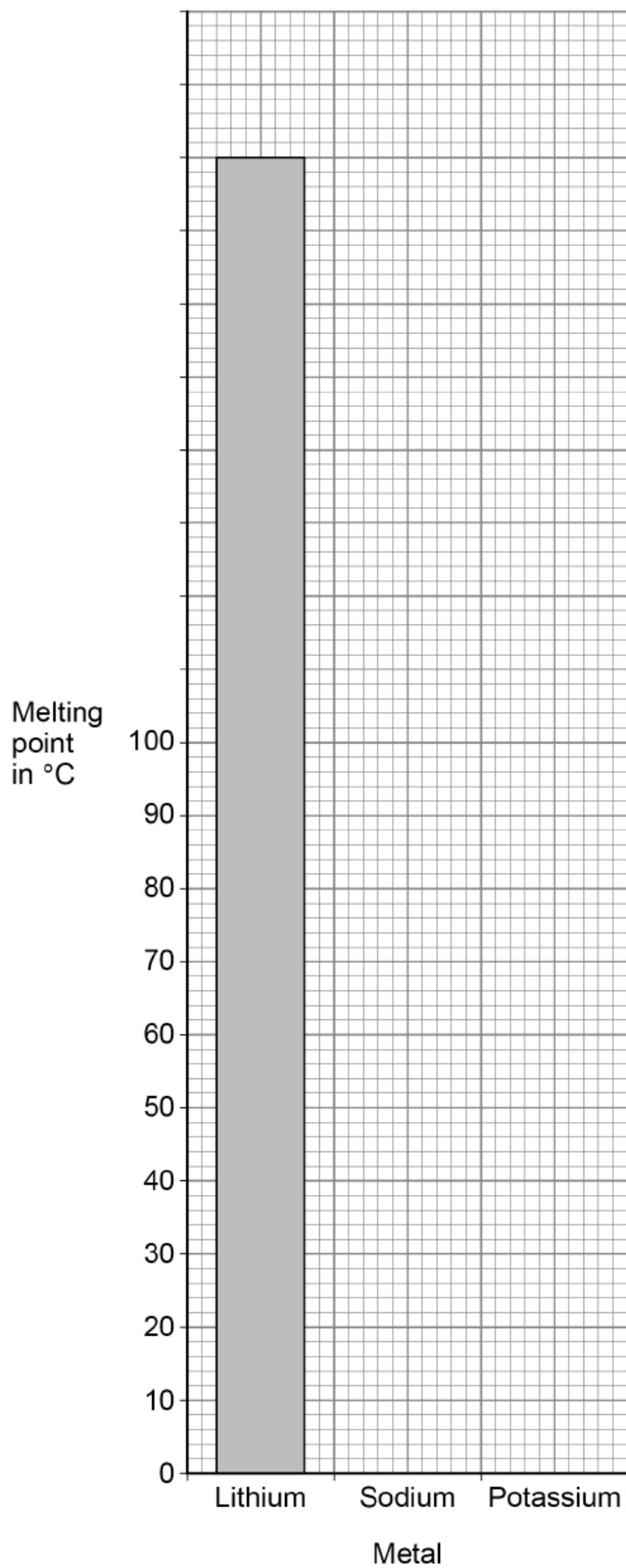
Use **Table 3**.

You should:

- complete the scale on the y-axis
- draw bars to show the melting points of sodium and potassium.

[3 marks]

Figure 8

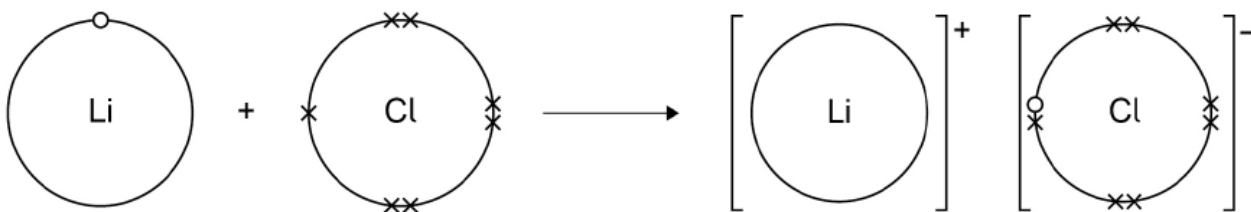


Lithium reacts with chlorine to produce lithium chloride.

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.

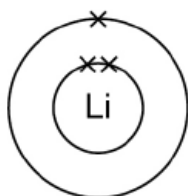
[3 marks]

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

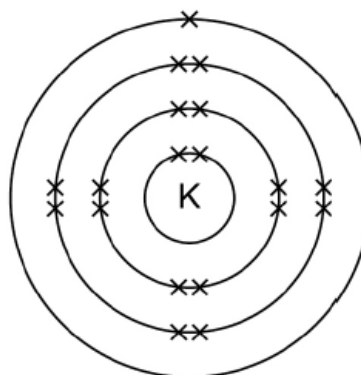
Figure 10 represents the electronic structures of a lithium atom and of a potassium atom.

Figure 10

Lithium atom



Potassium atom



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

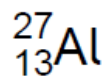
[2 marks]

1 _____

2 _____

4. [May/2020/Paper_8464/1F/No.6.1](#)

An aluminium atom is represented as:



Give the number of electrons and neutrons in the aluminium atom.

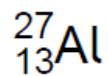
[2 marks]

Number of electrons _____

Number of neutrons _____

5. [May/2020/Paper_8464/1H/No.1.1](#)

An aluminium atom is represented as:



Give the number of electrons and neutrons in the aluminium atom.

[2 marks]

Number of electrons _____

Number of neutrons _____

6. [May/2020/Paper_8464/1H/No.7.3](#)

Figure 6 shows part of Mendeleev's periodic table.

Figure 6

16 O	19 F
32 S	35.5 Cl
79 Se	80 Br
128 Te	127 I

Explain why the early periodic tables placed iodine (I) before tellurium (Te), but then Mendeleev placed tellurium before iodine.

[3 marks]

7. Jun/2019/Paper_8464/1F/No.3

This question is about the periodic table and argon.

What order did scientists use to arrange elements in early periodic tables?

[1 mark]

Tick (✓) **one** box.

Atomic weight of element

Number of neutrons in an atom of element

Size of atoms of element

Year element was discovered

In early periodic tables some elements were placed in the wrong groups.

Mendeleev overcame some of these problems in his periodic table.

Complete the sentence.

[1 mark]

Mendeleev did this by leaving _____ for elements that had not been discovered.

What is the name of the group that contains argon?

[1 mark]

Tick (✓) **one** box.

Alkali metals

Halogens

Noble gases

An atom of argon is represented as ${}_{18}^{40}\text{Ar}$

Determine the number of protons and the number of neutrons in one atom of argon.

[2 marks]

Number of protons _____

Number of neutrons _____

Different atoms of argon are, ${}_{18}^{39}\text{Ar}$ and ${}_{18}^{38}\text{Ar}$

What is the name given to these different atoms of argon?

[1 mark]

Tick (✓) **one** box.

Fullerenes

Ions

Isotopes

Molecules

What is the electronic structure of an argon atom, ${}_{18}^{40}\text{Ar}$?

[1 mark]

Tick (✓) **one** box.

2

2, 8

2, 8, 2

2, 8, 8

Why is argon unreactive?

[1 mark]

8. [Jun/2019/Paper_8464/1F/No.4.6](#)

How does the size of a potassium atom compare with the size of a sodium atom?

Give a reason for your answer.

[2 marks]

Reason _____

9. Jun/2019/Paper_8464/1H/No.4

This question is about elements in the periodic table.

What order did scientists use to arrange elements in early periodic tables?

[1 mark]

In the early periodic tables some elements were placed in the wrong groups.

Mendeleev overcame this in his periodic table.

Give **one** way Mendeleev did this.

[1 mark]

Table 2 shows the boiling points of fluorine, chlorine and bromine.

Table 2

Element	Boiling point in °C
Fluorine	-186
Chlorine	-34
Bromine	+59

Explain why the boiling points in **Table 2** are low.

[2 marks]

Explain the trend in the boiling points in **Table 2**.

[3 marks]

Explain why neon is unreactive.

Give the electronic structure of neon in your answer.

[2 marks]

How many atoms are there in 1 g of argon?

The Avogadro constant is 6.02×10^{23} per mole.

Relative atomic mass (A_r): Ar = 40

[2 marks]

Number of atoms in 1 g = _____