

**AQA – Periodic table – GCSE 2022 Chemistry**

1. June/2022/Paper\_8462/1F/No.4

0 4

This question is about the periodic table.

Figure 6 shows an early version of the periodic table published by a scientist.

**Figure 6**

H																
Li	Be	B	C	N	O	F										
Na	Mg	Al	Si	P	S	Cl										
K	Cu	Ca	Zn	? ?	Ti ?	V	As	Cr	Se	Mn	Br	Fe	Co	Ni		
Rb	Ag	Sr	Cd	Y	In	Zr	Sn	Nb	Sb	Mo	Te	?	I	Ru	Rh	Pd

0 4 . 1

The scientist left gaps in the periodic table in **Figure 6**.

Each gap is represented by a question mark (?).

Give **one** reason why the scientist left gaps in this periodic table.**[1 mark]**


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0 4 . 2

Which scientist published the periodic table in **Figure 6**?**[1 mark]**Tick (✓) **one** box.

- Bohr
- Chadwick
- Mendeleev

0 4 . 3

The modern periodic table is different from the periodic table in **Figure 6**.

One extra group of elements has been added.

What is the name of the extra group of elements in the modern periodic table?

[1 mark]

Tick (✓) **one** box.

Alkali metals

Halogens

Noble gases

0 4 . 4

Why do the elements in Group 1 of the modern periodic table have similar chemical properties?

[1 mark]

Tick (✓) **one** box.

The elements all form negative ions.

The elements all have one electron in the outer shell.

The elements all have the same number of shells.

0 4 . 5 Table 3 shows the melting points of the first five elements going down Group 1.

Table 3

Element	Melting point in °C
Lithium	181
Sodium	98
Potassium	X
Rubidium	39
Caesium	29

Predict value X.

[1 mark]

X = \_\_\_\_\_ °C

0 4 . 6 Give **one** observation you would see when a small piece of potassium is added to water.

[1 mark]

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0 4 . 7 Table 4 shows information about the first five elements going down Group 7.

Table 4

Element	State at 150 °C	Symbol	Formula of the compound with hydrogen
Fluorine	gas	F	HF
Chlorine	_____	Cl	HCl
Bromine	gas	Br	HBr
Iodine	liquid	I	HI
Astatine	solid	At	_____

Complete Table 4.

[2 marks]

0 4 . 8 The elements in Group 7 consist of molecules.

What is the formula of a molecule of bromine?

[1 mark]

Tick (✓) **one** box.

Br

Br<sub>2</sub>

Br<sup>2</sup>

2Br

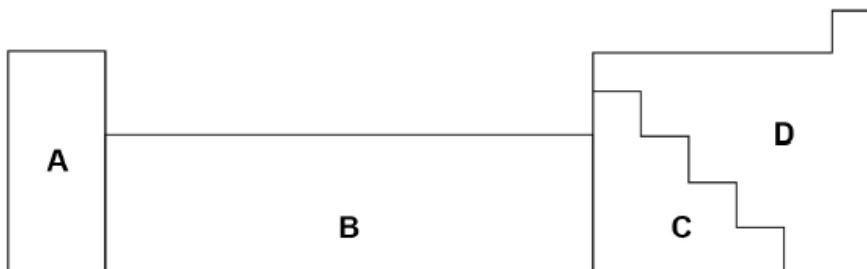
## 2. June/2022/Paper\_8462/1F/No.9

0 9

This question is about metals and non-metals.

Figure 15 shows an outline of part of the periodic table.

Figure 15



0 9 . 1

Element **Q** is a dull solid with a melting point of 44 °C.Element **Q** does not conduct electricity.Which section of the periodic table in **Figure 15** is most likely to contain element **Q**?

[1 mark]

Tick (✓) **one** box.A B C D 

0 9 . 2

Element **R** forms ions of formula  $R^{2+}$  and  $R^{3+}$ Which section of the periodic table in **Figure 15** is most likely to contain element **R**?

[1 mark]

Tick (✓) **one** box.A B C D 

0 9 . 3

Give **two** differences between the physical properties of the elements in Group 1 and those of the transition elements.

[2 marks]

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

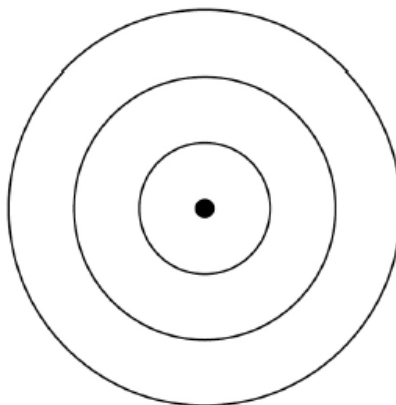
\_\_\_\_\_

09.4 Complete **Figure 16** to show the electronic structure of an aluminium atom.

Use the periodic table.

[1 mark]

**Figure 16**



09.5 Aluminium is a metal.

Describe how metals conduct electricity.

Answer in terms of electrons.

[3 marks]

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09.6 Name the type of bonding in compounds formed between metals and non-metals.

[1 mark]

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0 9 . 7

Magnesium oxide is a compound formed from the metal magnesium and the non-metal oxygen.

Describe what happens when a magnesium atom reacts with an oxygen atom.

You should refer to electrons in your answer.

**[4 marks]**

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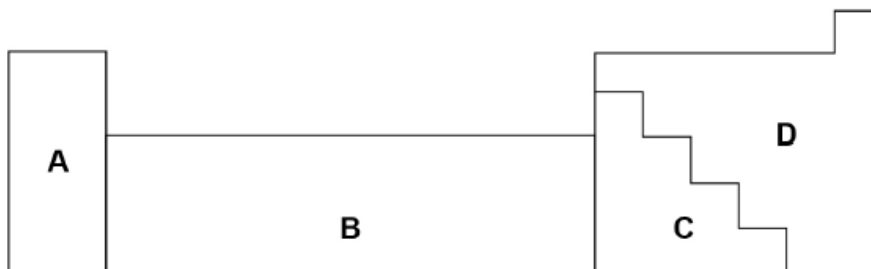
## 3. June/2022/Paper\_8462/1H/No.1

0 1

This question is about metals and non-metals.

Figure 1 shows an outline of part of the periodic table.

Figure 1



0 1 . 1

Element Q is a dull solid with a melting point of 44 °C.

Element Q does not conduct electricity.

Which section of the periodic table in Figure 1 is most likely to contain element Q?

[1 mark]

Tick (✓) one box.

A B C D 

0 1 . 2

Element R forms ions of formula  $R^{2+}$  and  $R^{3+}$ 

Which section of the periodic table in Figure 1 is most likely to contain element R?

[1 mark]

Tick (✓) one box.

A B C D 

0 1 . 3

Give two differences between the physical properties of the elements in Group 1 and those of the transition elements.

[2 marks]

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_



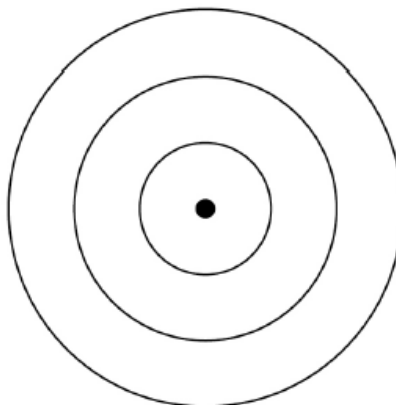
0 1 . 4

Complete **Figure 2** to show the electronic structure of an aluminium atom.

Use the periodic table.

[1 mark]

**Figure 2**



0 1 . 5

Aluminium is a metal.

Describe how metals conduct electricity.

Answer in terms of electrons.

[3 marks]

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0 1 . 6

Name the type of bonding in compounds formed between metals and non-metals.

[1 mark]

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0 1 . 7

Magnesium oxide is a compound formed from the metal magnesium and the non-metal oxygen.

Describe what happens when a magnesium atom reacts with an oxygen atom.

You should refer to electrons in your answer.

**[4 marks]**

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## 4. June/2022/Paper\_8462/1H/No.5

0 5

This question is about groups in the periodic table.

The elements in Group 1 become more reactive going down the group.

Rubidium is below potassium in Group 1.

0 5 . 1

Rubidium and potassium are added to water.

Predict **one** observation you would see that shows that rubidium is more reactive than potassium.

[1 mark]

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0 5 . 2

Explain why rubidium is more reactive than potassium.

[3 marks]

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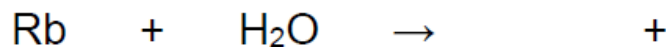
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0 5 . 3

Complete the equation for the reaction of rubidium with water.

You should balance the equation.

[3 marks]



The noble gases are in Group 0.

0 5 . 4 Which is a correct statement about the noble gases?

[1 mark]

Tick (✓) **one** box.

The noble gases all have atoms with eight electrons in the outer shell.

The noble gases have boiling points that increase going down the group.

The noble gases have molecules with two atoms.

The noble gases react with metals to form ionic compounds.

0 5 . 5 **Table 1** shows information about the three isotopes of neon.

**Table 1**

Mass number	Percentage abundance (%)
20	90.48
21	0.27
22	9.25

Calculate the relative atomic mass ( $A_r$ ) of neon.

Give your answer to 3 significant figures.

[3 marks]

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Relative atomic mass (3 significant figures) = \_\_\_\_\_