C2 The Periodic Table Homework task 1

Q1.

This question is about the periodic table.

(a) **Figure 1** shows part of Mendeleev's version of the periodic table.

Figure 1

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

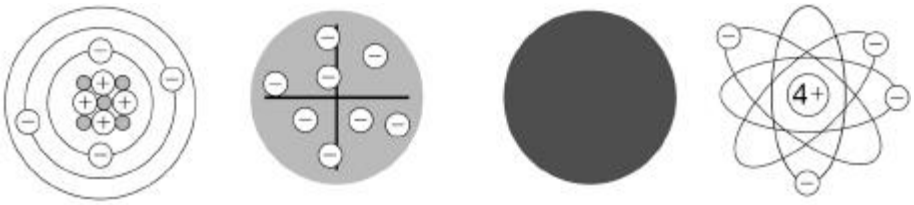
Which group of elements had **not** been discovered when Mendeleev's version of the periodic table was published?

_____

(1)

Figure 2 represents different models of the atom.

Figure 2



A **B** **C** **D**

(b) Which model represents the plum pudding model?

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

(1)

(c) Which model resulted from Chadwick's experimental work?

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

(1)

Potassium has different isotopes.

(d) What is meant by 'isotopes'?

You should refer to subatomic particles.

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_____

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(2)

(e) The table below shows the mass numbers and the percentage abundance of two isotopes of potassium.

Mass number	**Percentage abundance**
39	93.1
41	6.9

Calculate the relative atomic mass (A_r) of potassium.

Give your answer to 1 decimal place.

_____

_____

_____

_____

_____

Relative atomic mass (1 decimal place) = _____

(3)

(Total 8 marks)

Q2. This question is about groups in the periodic table.

Neon and argon are Group 0 elements.

(a) What name is given to Group 0?

_____

(1)

(b) Give **one** similarity of the electronic structure of neon and the electronic structure of argon.

_____

_____ **(1)**

(c) Give **one** difference between the electronic structure of neon and the electronic structure of argon.

_____

_____

(1)

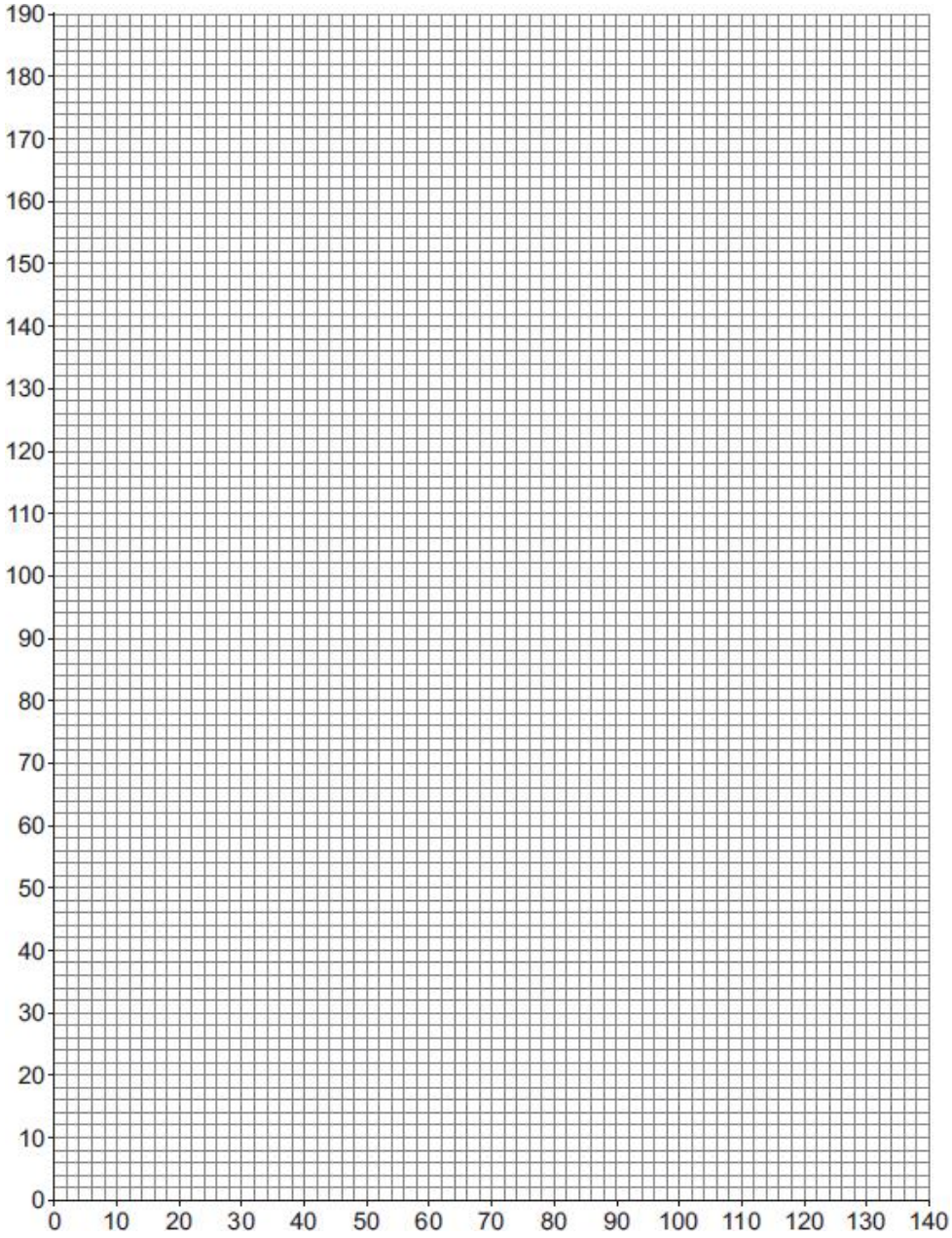
(d) The table below shows information about elements in Group 1.

Element	**Relative atomic mass**	**Melting point in °C**
Lithium	7	181
Sodium	23	98
Potassium	39	64
Rubidium	85	39
Caesium	133	29

Complete the graph below.

You should:

- label both axes
- plot the data from the table above.



(3)

(e) Give **one** conclusion from the data in the graph above.

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_____

(1)

(Total 7 marks)

Higher Tier Questions

Q3.

This question is about halogens.

Bromine reacts with sodium to produce sodium bromide.

(a) Describe the structure of and bonding in sodium bromide.

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_____

_____

_____

(2)

(b) The equation for the reaction is:

$$2\ Na + Br_2 \rightarrow 2\ NaBr$$

1 g of bromine reacts with sodium.

Calculate the number of bromine molecules in 1 g of bromine.

1 mole of bromine contains 6.02×10^{23} bromine molecules.

Relative formula mass (M_r) of bromine = 160

_____

_____

_____

_____

_____

Number of bromine molecules = _____

(3)

(c) The table below shows the boiling points of some halogens.

Halogen	Boiling point in °C
Bromine	60
Chlorine	−34
Fluorine	−188

Explain the trend in the boiling points of the halogens.

(4)

(Total 9 marks)

Q4.

This question is about elements in the periodic table.

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

(1)

(b) 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)

The table shows the boiling points of fluorine, chlorine and bromine.

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

(c) Explain why the boiling points in the table are low.

(2)

(d) Explain the trend in the boiling points in the table above.

(3)

(e) Explain why neon is unreactive.

Give the electronic structure of neon in your answer.

(2)

(f) 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

Number of atoms in 1 g = _____

(2)

(Total 11 marks)