

Atomic structure and the periodic table – GCSE Chemistry Paper 1

1. No.3

0 3

Carbon can exist in a number of different structures.

0 3 . 1

What is the approximate radius of a carbon atom?

[1 mark]

Tick (✓) **one** box.

0.1 m

☐

0.1 mm

☐

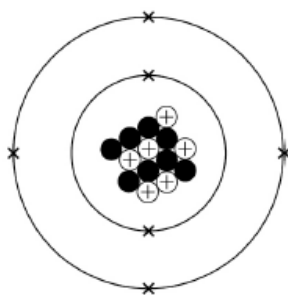
0.1 nm

☐

0 3 . 2

Figure 3 shows an atom of carbon.

Figure 3



Describe the atomic structure of this carbon atom.

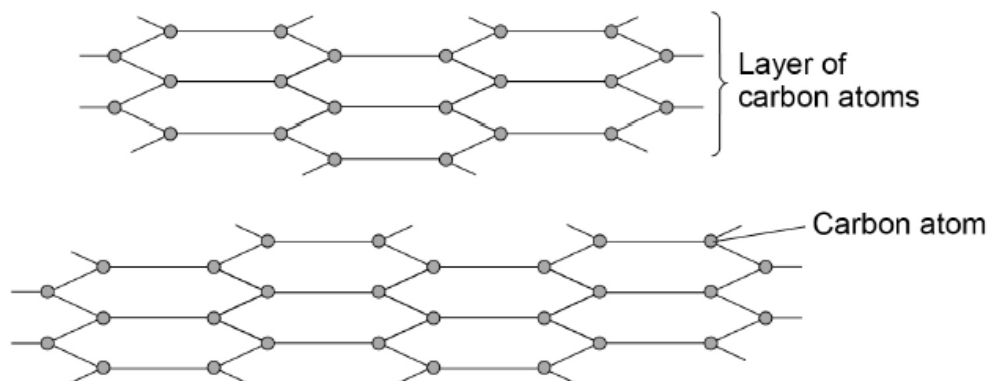
You should include the number of electrons, neutrons and protons.

[6 marks]

In graphite the carbon atoms are held together by bonds.

Figure 4 represents part of the structure of graphite.

Figure 4



0 3 . 3

How many bonds does each carbon atom have in graphite?

Use Figure 4.

[1 mark]

Tick (✓) **one** box.

1	☐	2	☐	3	☐	4	☐
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0 3 . 4

What type of bonds hold the carbon atoms together in graphite?

[1 mark]

Tick (✓) **one** box.

Covalent	☐
Ionic	☐
Metallic	☐

0 3 . 5 Lubricants allow objects to slide over each other easily.

Suggest why graphite can be used as a lubricant.

Use Figure 4.

[1 mark]

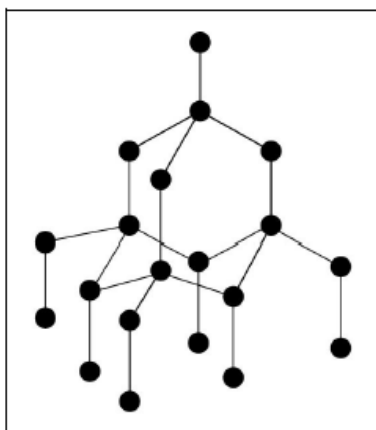
0 3 . 6 The two structures represent different forms of carbon.

Draw **one** line from each structure to the form of carbon.

[2 marks]

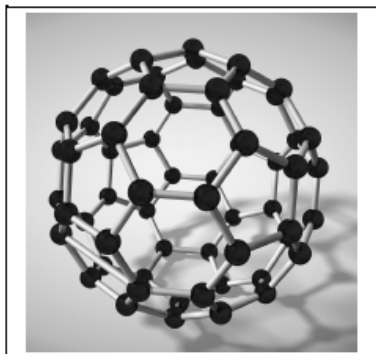
Structure

Form of carbon



Buckminsterfullerene

Diamond



Graphene

Nanotube

2. No.6

0 6

This question is about the periodic table.

0 6

. 1

Figure 11 shows part of Mendeleev's version of the periodic table.

Figure 11

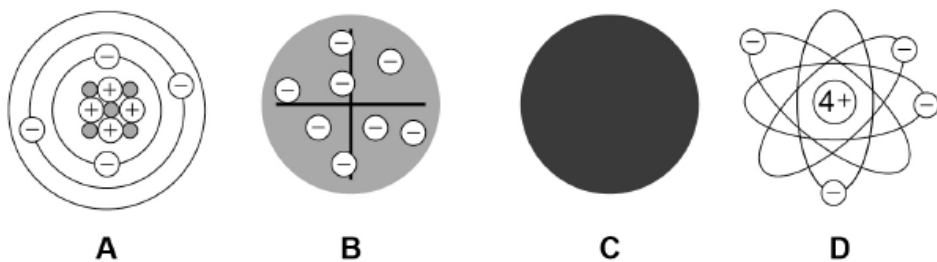
H							
Li	Be	B	C	N	O	F	
Na	Mg	Al	Si	P	S	Cl	
K	Cu	Ca	Zn		Ti	V	As
						Cr	Se
						Mn	Br
							Fe Co Ni
Rb	Ag	Sr	Cd	Y	In	Zr	Sn
						Nb	Sb
						Mo	Te
							I
							Ru Rh Pd

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

[1 mark]

Figure 12 represents different models of the atom.

Figure 12



0 6 . 2

Which model represents the plum pudding model?

[1 mark]

Tick (✓) **one** box.

A ☐

 B ☐

 C ☐

 D ☐

0 6 . 3

Which model resulted from Chadwick's experimental work?

[1 mark]

Tick (✓) **one** box.

A ☐

 B ☐

 C ☐

 D ☐

Potassium has different isotopes.

0 6 . 4 What is meant by 'isotopes'?

You should refer to subatomic particles.

[2 marks]

0 6 . 5 **Table 2** shows the mass numbers and the percentage abundance of two isotopes of potassium.

Table 2

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.

[3 marks]

Relative atomic mass (1 decimal place) = _____

3. No.6

0 1

This question is about the periodic table.

0 1 . 1

Figure 1 shows part of Mendeleev's version of the periodic table.

Figure 1

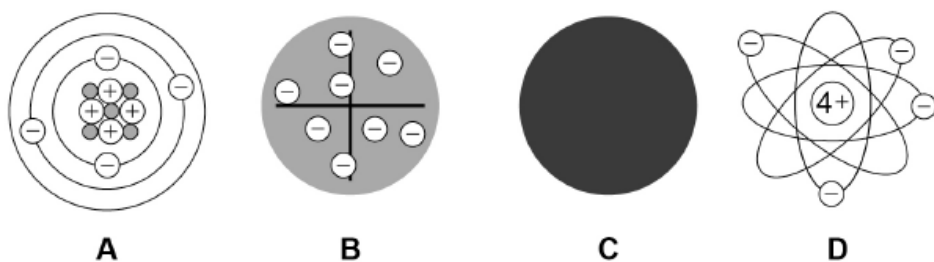
H							
Li	Be	B	C	N	O	F	
Na	Mg	Al	Si	P	S	Cl	
K	Cu	Ca	Zn		Ti	V	As
						Cr	Se
						Mn	Br
							Fe Co Ni
Rb	Ag	Sr	Cd	Y	In	Zr	Sn
						Nb	Sb
						Mo	Te
							I
							Ru Rh Pd

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

[1 mark]

Figure 2 represents different models of the atom.

Figure 2



0 1 . 2 Which model represents the plum pudding model?

[1 mark]

Tick (✓) one box.

A ☐ B ☐ C ☐ D ☐

0 1 . 3 Which model resulted from Chadwick's experimental work?

[1 mark]

Tick (✓) one box.

A ☐ B ☐ C ☐ D ☐

Potassium has different isotopes.

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[3 marks]

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