Chemical Bonds - Ionic, Covalent and Metallic

Total mark – 16

Question: 1

This question is about carbon and its compounds.

Fullerenes are molecules of carbon atoms.

The first fullerene to be discovered was Buckminsterfullerene (C_{60}).

(a) What shape is a Buckminsterfullerene molecule?

_____

(1)

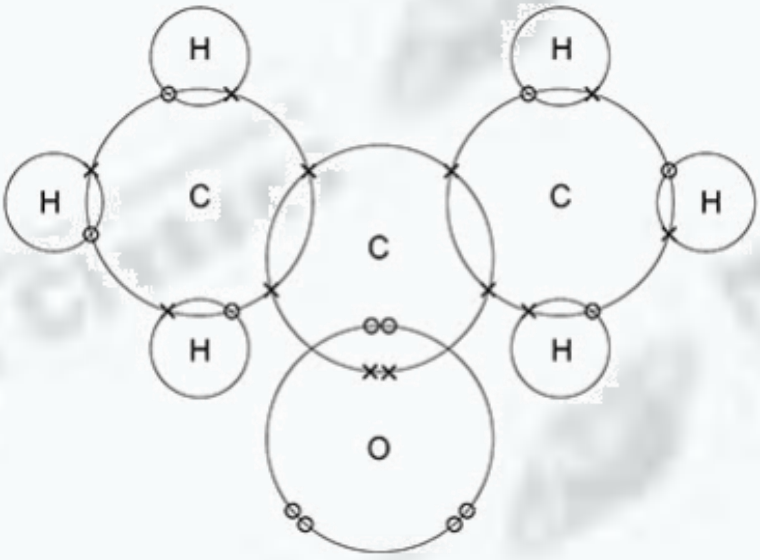
(b) Give **one** use of a fullerene.

(1)

Propanone is a compound of carbon, hydrogen and oxygen.

Figure 1 shows the dot and cross for a propanone molecule.

Figure 1

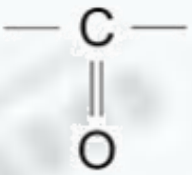


(c) Complete **Figure 2** to show a propanone molecule.

Use a line to represent each single bond.

Use **Figure 1**.

Figure 2



(1)

(d) Determine the molecular formula of propanone.

Use **Figure 1**.

Molecular formula = _____

(1)

(e) Propanone is a liquid with a low boiling point.

Why does propanone have a low boiling point?

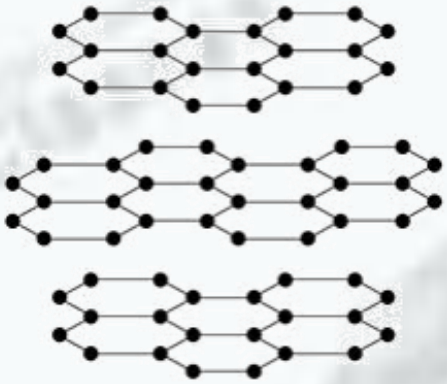
Tick (✓) **one** box.

- The covalent bonds are strong. ☐
- The covalent bonds are weak. ☐
- The intermolecular forces are strong. ☐
- The intermolecular forces are weak. ☐

(1)

(f) **Figure 3** represents the structure of graphite.

Figure 3



Explain why graphite is:

- a good electrical conductor
- soft and slippery.

You should answer in terms of structure and bonding.

(6)

Question: 2

Figure 1 shows the outer electrons in an atom of the Group 1 element potassium and in an atom of the Group 6 element sulfur.

Figure 1

(a) Potassium forms an ionic compound with sulfur.

Describe what happens when **two** atoms of potassium react with **one** atom of sulfur.

Give your answer in terms of electron transfer.

Give the formulae of the ions formed.

(5)