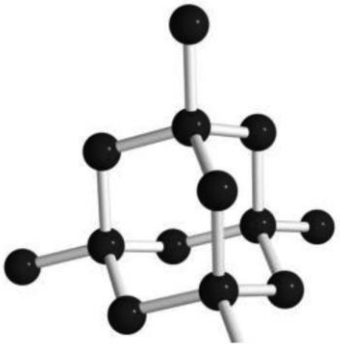
GCSE Chemistry A (Gateway Science)

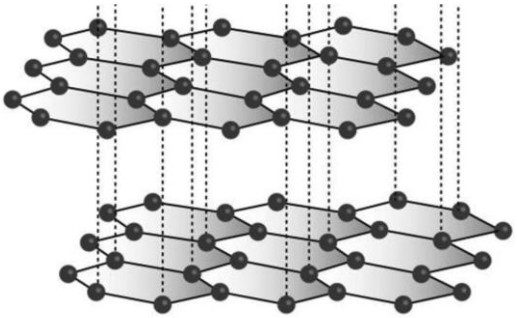
J248/01 Chemistry A C1-C3 and C7 (Foundation Tier)

Question Set 13

1 **(a)** The diagrams show the structures of two forms of carbon.



diamond



graphite

- Graphite is a good conductor of electricity.
- Diamond does **not** conduct electricity.

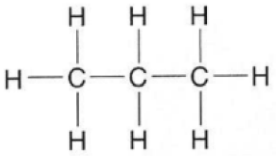
Use ideas about structure and bonding in diamond and graphite to explain these observations.

In graphite, each carbon is bonded to 3 other carbons covalently leaving one free electron which can delocalise and move between layers to conduct electricity. The carbons in diamond have no free electron (covalently bonded to other 4 carbons tetrahedrally)

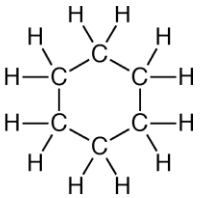
[3]

(b) Carbon can form many thousands of different compounds.

Two examples are shown below.



propane



cyclohexane

Why can carbon form many thousands of different compounds?

Because it has 4 electrons on the outer shell, it can form 4 bonds with other atoms.

[1]

(c) Ethanol contains carbon.

Look at some information about ethanol.

- Melting point = –114 °C
- Boiling point = 78 °C

Predict the state of ethanol at 25 °C. How can you tell?

25°C is higher than melting point but lower than boiling point thus ethanol is melted but not evaporated yet. As a result, ethanol is in liquid state at 25°C. **[2]**

Total Marks for Question Set 13: 6

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