

3.2.4 Macromolecules

Question Paper

Level	IGCSE
Subject	Chemistry (0620)
Exam Board	Cambridge International Examinations (CIE)
Topic	Atoms Elements and Compounds
Sub-Topic	3.2.4 Macromolecules
Booklet	Question Paper

Time Allowed: 14 minutes

Score: /11

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

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1 Diamond and graphite are macromolecules.

Which statement about diamond and graphite is **not** correct?

- A They are giant structures with high melting points.
- B They are non-conductors of electricity.
- C They contain only atoms of a non-metal.
- D They have covalent bonds between the atoms.

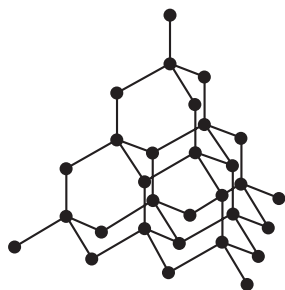
2 Two statements about diamond are given.

- 1 Diamond has a giant three-dimensional covalent structure of carbon atoms.
- 2 Diamond is one of the hardest substances known.

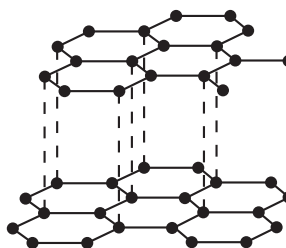
Which is correct?

- A Both statements are correct and statement 1 explains statement 2.
- B Both statements are correct but statement 2 does not explain statement 1.
- C Statement 1 is correct but statement 2 is incorrect.
- D Statement 2 is correct but statement 1 is incorrect.

- 3 The structures of diamond and graphite are shown.



diamond



graphite

Which statement about diamond and graphite is **not** correct?

- A Diamond is used in cutting tools because the strong covalent bonds make it very hard.
 - B Graphite acts a lubricant because of the weak bonds between the layers.
 - C Graphite conducts electricity because the electrons between the layers are free to move.
 - D Graphite has a low melting point because of the weak bonds between the layers.
- 4 Rescuers are drilling through fallen rock in order to rescue some men trapped in a cave. The drill needs lubricating from time to time.

The following statements were made about the materials used for the drill tip and the lubricant and the reasons for their use.

- 1 Diamond was used for the drill tip as it does not conduct electricity.
- 2 Diamond was used for the drill tip as it is very hard.
- 3 Graphite was used as the lubricant as it conducts electricity.
- 4 Graphite was used as the lubricant as it is soft and flaky.

Which statements are correct?

- A 1 and 3 B 1 and 4 C 2 and 3 D 2 and 4

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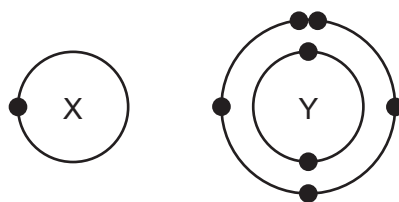
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5 Graphite is a form of carbon.

Why can graphite be used as a lubricant?

- A Graphite contains delocalised electrons which move throughout the structure.
- B Graphite contains weak covalent bonds so the atoms move easily.
- C Graphite has a low melting point so it easily turns into a liquid.
- D Graphite has weak forces of attraction between layers so they can move.

6 The electronic structures of atoms X and Y are shown.



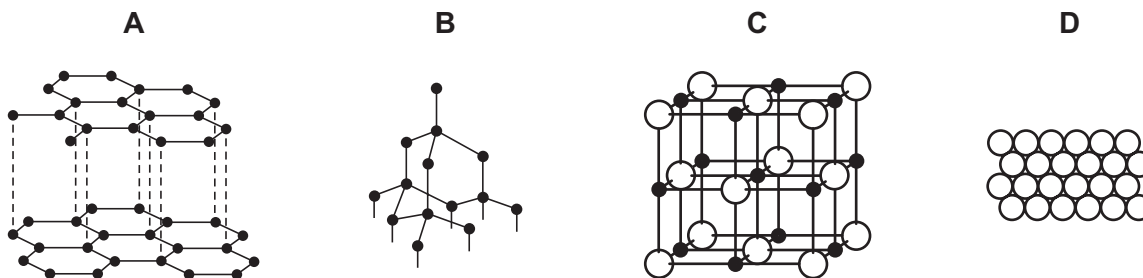
X and Y form a covalent compound.

What is its formula?

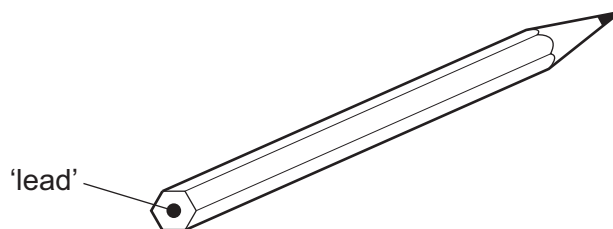
- A XY_5
- B XY_3
- C XY
- D X_3Y

7 Slate has a layered structure and can easily be split into thin sheets.

Which diagram shows a structure most like that of slate?



- 8 The 'lead' in a pencil is made of a mixture of graphite and clay.



When the percentage of graphite is increased, the pencil slides across the paper more easily.

Which statement explains this observation?

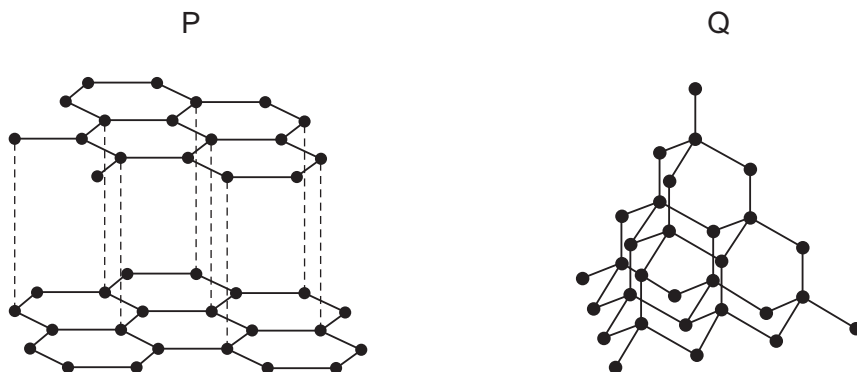
- A Graphite has a high melting point.
 - B Graphite is a form of carbon.
 - C Graphite is a lubricant.
 - D Graphite is a non-metal.
- 9 Solid F is an element.
Solid G is a compound.
Neither solid conducts electricity but G conducts electricity when dissolved in water.

These properties suggest that F is1..... and that G is2..... with3..... bonds.

Which words correctly complete gaps 1, 2 and 3?

	1	2	3
A	diamond	AgCl	covalent
B	diamond	NaCl	ionic
C	graphite	AgCl	ionic
D	graphite	NaCl	covalent

10 The diagrams show the structures of two forms, P and Q, of a solid element.



What are suitable uses of P and Q, based on their structures?

	use of solid P	use of solid Q
A	drilling	drilling
B	drilling	lubricating
C	lubricating	drilling
D	lubricating	lubricating

11 Statements 1, 2 and 3 are about diamond and graphite.

- 1 They are different solid forms of the same element.
- 2 They each conduct electricity.
- 3 They have atoms that form four equally strong bonds.

Which statements are correct?

- A** 1 only **B** 3 only **C** 1 and 3 **D** 2 and 3