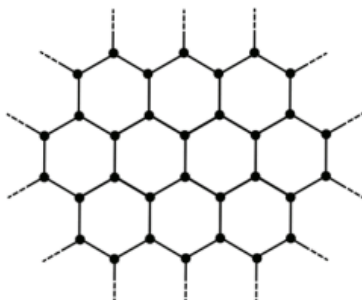


Structure and Bonding

- 22 Graphene is a new material composed of carbon atoms arranged in tightly bound hexagons just one atom thick.

The diagram shows a simplified structure of graphene.



Considering its structure, which of the properties below could be predicted about graphene?

- | | |
|---|------------------------------|
| 1 | high melting point |
| 2 | good electrical conductivity |
| 3 | soluble in water |
| | |
| A | 1 only |
| B | 2 only |
| C | 3 only |
| D | 1 and 2 only |
| E | 1 and 3 only |
| F | 2 and 3 only |
| G | 1, 2 and 3 |

2014

- 18 Vanadium is a metal that lies just above zinc in the reactivity series.

Which one of the following could **not** be used to obtain the metal from its ore?

- | | |
|---|--|
| A | electrolysis of the molten chloride |
| B | heating of the chloride with metallic sodium |
| C | heating the oxide with metallic aluminium |
| D | treating a solution of vanadium sulfate with metallic iron |
| E | treating a solution of vanadium chloride with metallic magnesium |

2012



Structure and Bonding

- 2 A metal, X, is in group III of the periodic table. A non-metal, Y, is in group VI of the periodic table. They react together to form a compound.

What is the formula of the compound?

- A X_2Y
- B X_2Y_3
- C X_3Y_2
- D X_3Y_6
- E X_6Y_3

2011

- 14 Which of the following (A-E) correctly identifies **all** of the compounds from the list below that contain covalent bonds in their structure?

$CO_2(g)$ $Ca(OH)_2(s)$ $H_2SO_4(l)$ $MgCO_3(s)$ $NaCl(s)$ $Na_2O(s)$ $Na_3PO_4(s)$ $SO_2(g)$ $SiO_2(g)$

- A $CO_2(g)$, $SO_2(g)$, $SiO_2(g)$
- B $Ca(OH)_2(s)$, $H_2SO_4(l)$, $MgCO_3(s)$, $NaCl(s)$, $Na_2O(s)$, $Na_3PO_4(s)$
- C $CO_2(g)$, $Ca(OH)_2(s)$, $H_2SO_4(l)$, $MgCO_3(s)$, $Na_3PO_4(s)$, $SO_2(g)$, $SiO_2(g)$
- D $NaCl(s)$, $Na_2O(s)$
- E All of the compounds

2011

- 6 Which one of the following covalent substances could exist as a giant structure?

- A $SiCl_4$
- B SiO_2
- C ICl
- D Cl_2O
- E H_2S
- F CF_4

2009