4.2 Resonance, Shapes & Giant Structures

Question Paper

Course	DP IB Chemistry
Section	4. Chemical Bonding & Structure
Topic	4.2 Resonance, Shapes & Giant Structures
Difficulty	Easy

Time allowed: 20

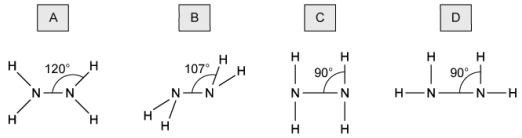
Score: /10

Percentage: /100

Question 1

Hydrazine, N_2H_4, is a precursor for multiple pharmaceutical compounds.

Which of the diagrams below illustrate the most likely structure and bond angle of hydrazine?



[1 mark]

Question 2

Two boron-containing species, boron trifluoride (BF_3) and the borohydride ion (BH_4^-), have different molecular shapes.

What are the shapes around the boron atom in these molecules?

	boron trifluoride (BF_3)	borohydride ion (BH_4^-)
A	pyramidal	tetrahedral
B	pyramidal	square planar
C	trigonal planar	tetrahedral
D	trigonal planar	square planar

[1 mark]

Question 3

Graphite has a structure containing layers of carbon atoms in hexagonal rings.

Why is graphite a good conductor of electricity?

A. It has delocalised ions which can move and carry charge

B. It has delocalised electrons which are mobile

C. There are only weak London forces between the layers

D. Each carbon atom in the layers has only three covalent bonds

[1 mark]

Question 4

What is the correct bond angle in a trigonal planar molecule?

A. 107°

B. 120°

C. 180°

D. 109.5°

[1 mark]

Question 5

Which of the following is correct?

	Shape of SF_6 molecule	Bond angle in SF_6 molecule
A	Octahedral	90°
B	Square planar	90°
C	Trigonal bipyramidal	120°
D	Tetrahedral	109.5°

[1 mark]

Question 6

Which statement about the physical properties of substances is correct?

A. Covalent structures always have high melting points

B. Metals only conduct electricity when solid

C. Metals always have high melting points

D. Ionic substances conduct electricity when liquid

[1 mark]

Question 7

Which of the following statements about graphite is correct?

A. The bond angle in graphite is 109.5 °

B. There are only London forces between the layers of graphite

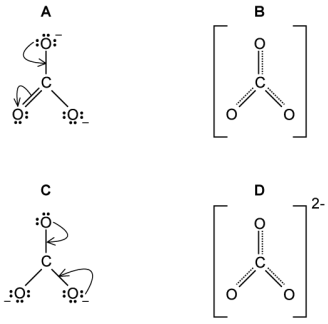
C. Graphite has a higher melting point than diamond

D. Graphite is soluble in water

[1 mark]

Question 8

Which of the following is the correct resonance hybrid structure of the carbonate ion, CO_3^{2-}?



[1 mark]

Question 9

Which of the following is correct?

	Shape of CCl_4 molecule	Bond angle in CCl_4 molecule
A	Octahedral	90°
B	Square planar	90°
C	Trigonal bipyramidal	120°
D	Tetrahedral	109.5°

[1 mark]

Question 10

Which substance is described in the table below?

Melting point	Electrical Conductivity	Solubility
Very high	Non-conductor	Does not dissolve

A. Silicon dioxide

B. Buckminsterfullerene

C. Graphite

D. Sodium chloride

[1 mark]