

4.2 Resonance, Shapes & Giant Structures

Question Paper

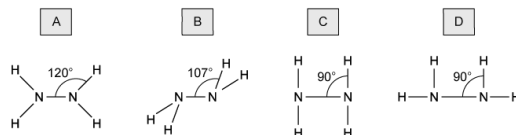
Course	DPIB Chemistry
Section	4. Chemical Bonding & Structure
Topic	4.2 Resonance, Shapes & Giant Structures
Difficulty	Easy

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

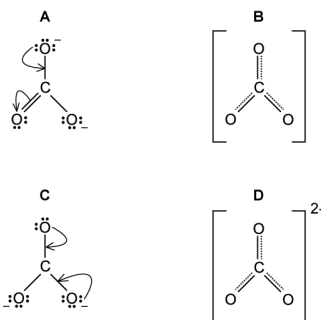
Which of the following statements about graphite is correct?

- 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]