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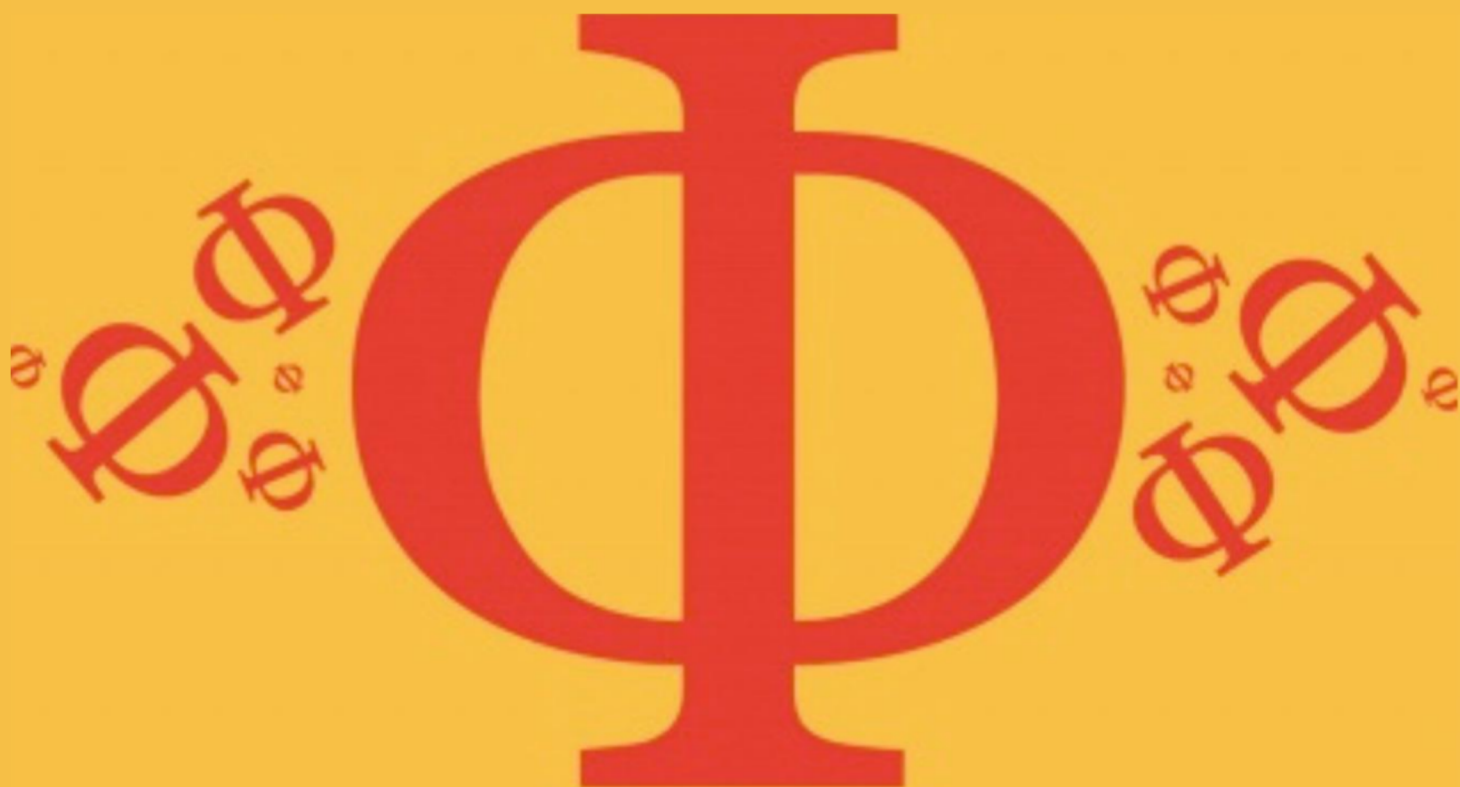
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IB Chemistry: SL

4.1 Ionic & Covalent Bonding



CHEMISTRY

SL

4.1 Ionic & Covalent Bonding

Question Paper

Course	DP IB Chemistry
Section	4. Chemical Bonding & Structure
Topic	4.1 Ionic & Covalent Bonding
Difficulty	Hard

Time allowed: 20

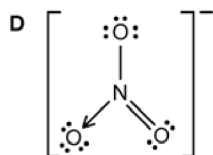
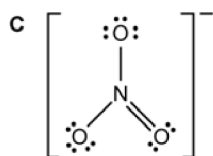
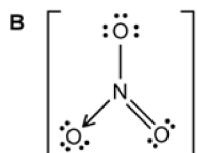
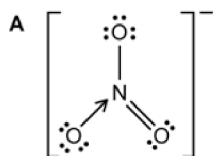
Score: /10

Percentage: /100

Question 1

The nitrate(V) ion, NO_3^- , is a polyatomic ion, bonded by covalent bonds.

Which of the following shows the correct displayed formula for the nitrate ion?



[1 mark]

Question 2

In which series of compounds does covalent character increase when going from left to right?

- A. KI , KBr , KCl
- B. NaI , KI , RbI
- C. NaCl , MgCl_2 , AlCl_3
- D. SO_2 , P_4O_{10} , SiO_2

[1 mark]

Question 3

CHCl_3 and Br_2 are both liquids at room temperature due to the existence of dipoles.

What dipoles are involved within CHCl_3 and Br_2 ?

	HCl_3	Br_2
A	induced dipoles only	induced dipoles only
B	induced dipoles only	induced dipoles and permanent dipoles
C	induced dipoles and permanent dipoles	induced dipoles and permanent dipoles
D	induced dipoles and permanent dipoles	induced dipoles and

[1 mark]

Question 4

What are the correct formulas for the following ions?

	Phosphate	Ammonium	Ethanoate	Nitrite
A	PO_4^{3-}	NH_4^+	CH_3COO^+	NO_3^-
B	PO_3^{2-}	NH_4^+	CH_3COO^-	NO_2^-
C	PO_4^{3-}	NH_4^-	CH_3COO^-	NO_2^-
D	PO_4^{2-}	NH_4^+	$\text{CH}_3\text{CH}_2\text{COO}^-$	NO_3^-

[1 mark]

Question 5

The periodic table may be needed to answer this question.

Which is the shortest bond length in the following gases?

- A. oxygen-oxygen in oxygen gas, O_2
- B. carbon-carbon in ethyne gas, C_2H_2
- C. nitrogen-nitrogen in nitrogen gas, N_2
- D. oxygen-oxygen in ozone gas, O_3

[1 mark]

Question 6

Which statement best describes the **intramolecular** bonding in a carbonate ion, CO_3^{2-}

- A. Only London forces
- B. Electrostatic attraction between pairs of electrons and positively charged nuclei
- C. Permanent dipole permanent dipole forces
- D. Electrostatic attraction between separate carbonate ions

[1 mark]

Question 7

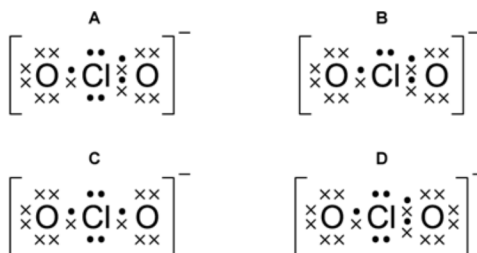
The number of electrons in the valence shell of elements X and Y are 5 and 7 respectively. What is the formula and type of compound formed from these elements?

- A. Covalent, XY_3
- B. Ionic, XY_3
- C. Covalent, X_3Y
- D. Ionic, X_3Y

[1 mark]

Question 8

What is the correct structure of the chlorite ion, ClO_2^- ?



[1 mark]

Question 9

Which of the following statements about 2-chloropropene, $\text{CH}_2\text{C}(\text{Cl})\text{CH}_3$ is **not** correct

- A. There are 3 lone pairs in the molecule
- B. There are 24 valence electrons in the molecule
- C. The molecule does obey the octet rule
- D. The molecule does not obey the octet rule

[1 mark]

Question 10

Which of the following structures do **not** obey the octet rule?

- I. BeCl_2
- II. BF_3
- III. H_2O

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

[1 mark]