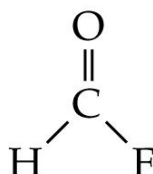


Quiz (Polarity of Molecules)

Section A: Multiple-choice

- Which of the following covalent bonds is the most polar?
 A. H–N
 B. H–O
 C. H–F
 D. H–Cl
- Which of the following molecules is polar?
 A. SiCl₄
 B. SO₃
 C. CS₂
 D. SCl₂
- A student used a charged rod to test the polarity of liquids. Which of the following jets of liquids would be deflected by the charged rod?
 (1) Dichloromethane (2) Trichloromethane (3) Tetrachloromethane
 A. (1) and (2) only
 B. (1) and (3) only
 C. (2) and (3) only
 D. (1), (2) and (3)
- Which of the following statements about a hydrogen sulphide molecule is INCORRECT?
 A. Its chemical formula is H₂S.
 B. It has two polar bonds.
 C. It is symmetrical in shape.
 D. It is a non-polar molecule.
- Formyl fluoride has the following structure:



- Which of the following statements about a formyl fluoride molecule is INCORRECT?
- The molecule is trigonal planar in shape.
 - The fluorine atom has a partial negative charge.
 - The oxygen atom has a partial positive charge.
 - The molecule is polar.
- Which of the following factors affect the polarity of a molecule?
 (1) The presence of polar covalent bonds
 (2) The presence of non-polar covalent bonds
 (3) The shape of the molecule
 A. (1) and (2) only
 B. (1) and (3) only
 C. (2) and (3) only
 D. (1), (2) and (3)
 - Which of the following molecules are non-polar?
 (1) OCl₂ (2) PCl₅ (3) CH₂Cl₂
 A. (1) only
 B. (2) only
 C. (1) and (3) only
 D. (2) and (3) only

8. Boron trifluoride is a non-polar molecule because
- A. it does not have polar bonds.
 - B. it is symmetrical in shape.
 - C. the electronegativity difference between boron and fluorine is small.
 - D. the polarities of the bonds cancel out each other.

Section B: Structured questions

Hydrogen peroxide is the simplest peroxide (a compound with an oxygen-oxygen single bond).

- (a) Write the empirical formula of hydrogen peroxide.
- (b) Draw the electron diagram for a hydrogen peroxide molecule, showing electrons in the outermost shells only.
- (c) How many polar bonds are there in a hydrogen peroxide molecule? Explain how the polar bonds arise.
- (d) Sketch the three-dimensional structure of a hydrogen peroxide molecule.
- (e) State and explain whether hydrogen peroxide is a polar molecule.

Suggested Answer

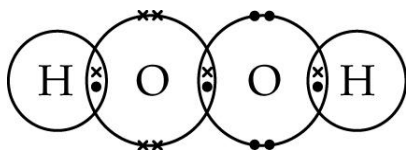
Section A

1.	C	5.	C
2.	D	6.	D
3.	A	7.	B
4.	D	8.	D

Section B

(a) HO

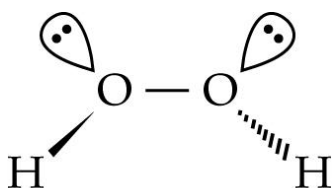
(b)



(c) There are two polar bonds in a hydrogen peroxide molecule.

The formation of the polar bond is due to the electronegativity difference between the oxygen atom and hydrogen atom.

(d)



(e) Hydrogen peroxide is a polar molecule.

The polarities of the two polar H–O bonds cannot cancel out each other.