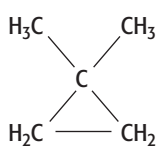


Test yourself

Chapter 4

- 1 Which one of the following is the most likely Cl–C–Cl bond angle in tetrachloromethane, CCl₄?
- A 90°
 - B 107.5°
 - C 109°
 - D 120°
- 2 Which one of these statements about boron trifluoride, BF₃, is correct?
- A The boron atom in boron trifluoride has a lone pair of electrons
 - B Boron trifluoride has a tetrahedral structure
 - C The F–B–F bond angle in boron trifluoride is approximately 107°
 - D Boron trifluoride can form a co-ordinate bond with ammonia
- 3 Which one of the following pairs of substances do **not** form hydrogen bonds with each other?
- A CH₃Cl and CH₃COCH₃
 - B CH₃OH and CH₃CH₂OH
 - C NH₃ and CH₃OH
 - D H₂O and CH₃CH₂OH

- 4 Which one of these statements about the bonding between the carbon atoms in ethene is correct?
- A The σ bond is formed by the sideways overlap of modified p orbitals
 - B The π bond is formed by the sideways overlap of modified p orbitals
 - C The π bond is formed by the end-on (linear) overlap of modified p orbitals
 - D The π bond contains two pairs of electrons
- 5 In which one of the following substances would you expect the total van der Waals' forces between the molecules to be the greatest?
- A $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_3$
 - B $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
 - C CH_3Br
 - D 
- 6 Which one of the following statements about metallic bonding is **false**?
- A The strength of metallic bonding increases with increasing size of the metal ions
 - B The strength of metallic bonding increases with increasing number of delocalised electrons in the metallic structure
 - C In metallic bonds, the ions are held together by electrostatic attractions between the ions and the delocalised electrons
 - D The strength of metallic bonding increases with the increasing positive charge on the metal ions

7 Which one of the following substances is very soluble in water?

- A Iodine, I_2
- B Carbon monoxide, CO
- C Sodium nitrate, $NaNO_3$
- D Propane, $CH_3CH_2CH_3$

8 Which one of the following substances has the highest boiling point?

- A $CH_3CH_2CH_2CH_3$
- B CH_3CH_2Cl
- C CH_3COCH_3
- D $CH_3CH_2CH_2OH$

9 Which one of the following describes the shape of a PCl_3 molecule?

- A Linear
- B Octahedral
- C Planar
- D Pyramidal

- 10 Which one of these statements about covalent bonding is **false**?
- A The bond energy of a C=C bond is numerically greater than the bond energy of a C–C bond
 - B The bond energy of H–I is numerically greater than the bond energy of H–Br
 - C Once a co-ordinate bond is formed, it cannot be distinguished from a covalent bond formed in the normal way
 - D Sulfur has more than eight electrons in its outer principal energy level when it forms covalent bonds with more than two fluorine atoms