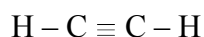


1. Which statement explains why a molecule of CH₄ is nonpolar?

- A) The bonds between the atoms in a CH₄ molecule are polar.
- B) The bonds between the atoms in a CH₄ molecule are ionic.
- C) The geometric shape of a CH₄ molecule distributes the charges symmetrically.
- D) The geometric shape of a CH₄ molecule distributes the charges asymmetrically.

2. Given the formula representing a molecule:



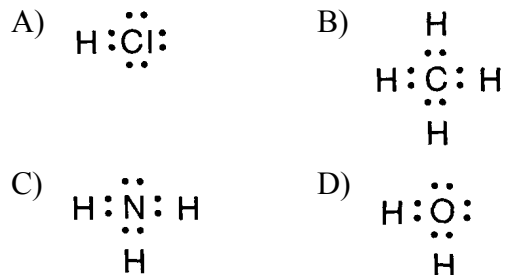
The molecule is

- A) symmetrical and polar
 - B) symmetrical and nonpolar
 - C) asymmetrical and polar
 - D) asymmetrical and nonpolar
3. Which formula represents a polar molecule?
- A) H₂ B) H₂O C) CO₂ D) CCl₄
4. Which formula represents a nonpolar molecule?
- A) HCl B) H₂O C) NH₃ D) CH₄
5. Why is a molecule of CO₂ nonpolar even though the bonds between the carbon atom and the oxygen atoms are polar?
- A) The shape of the CO₂ molecule is symmetrical.
 - B) The shape of the CO₂ molecule is asymmetrical.
 - C) The CO₂ molecule has a deficiency of electrons.
 - D) The CO₂ molecule has an excess of electrons.
6. Which formulas represent two polar molecules?
- A) CO₂ and HCl B) CO₂ and CH₄
 - C) H₂O and HCl D) H₂O and CH₄
7. Which formula represents a polar molecule?
- A) Br₂ B) CO₂ C) CH₄ D) NH₃
8. Which formula represents a nonpolar molecule?
- A) H₂S B) HCl C) CH₄ D) NH₃
9. Which formula represents a nonpolar molecule?
- A) HCl B) H₂O C) NH₃ D) CF₄

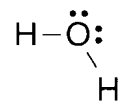
10. Which molecule is nonpolar?

- A) H₂O B) NH₃ C) CO D) CO₂

11. Which electron-dot structure represents a non-polar molecule?

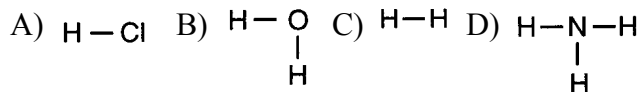


12. Base your answer to the following question on Which pair of characteristics describes the molecule illustrated below?

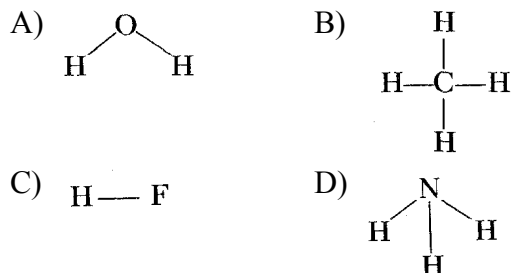


- A) symmetrical and polar
 - B) symmetrical and nonpolar
 - C) asymmetrical and polar
 - D) asymmetrical and nonpolar
13. Which structural formula represents a polar molecule?
- A) $\text{H} - \text{H}$ B) $\text{H} - \text{C} \equiv \text{C} - \text{H}$
 - C) $\begin{array}{c} \text{H} \\ | \\ \text{H} - \text{C} - \text{H} \\ | \\ \text{H} \end{array}$ D) $\begin{array}{c} \text{H} - \text{O} \\ | \\ \text{H} \end{array}$
14. Which molecule has an asymmetrical shape?
- A) N₂ B) NH₃ C) Cl₂ D) CCl₄
15. Two fluorine atoms are held together by a covalent bond. Which statement correctly describes this bond?
- A) It is polar and forms a polar molecule.
 - B) It is polar and forms a nonpolar molecule.
 - C) It is nonpolar and forms a polar molecule.
 - D) It is nonpolar and forms a nonpolar molecule.

16. Which structural formula represents a nonpolar molecule?



17. Which structural formula represents a nonpolar symmetrical molecule?



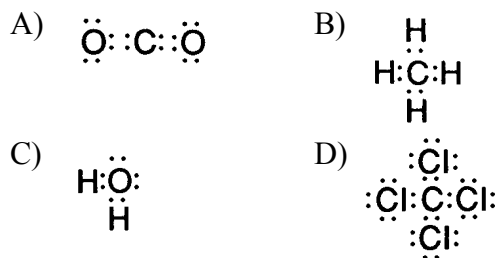
18. The diagram below represents a water molecule.



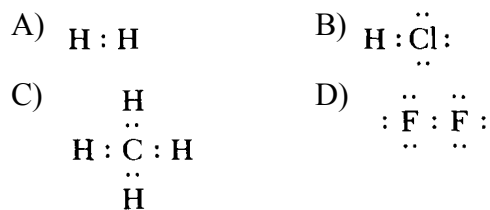
This molecule is best described as

- A) polar with polar covalent bonds
- B) polar with nonpolar covalent bonds
- C) nonpolar with polar covalent bonds
- D) nonpolar with nonpolar covalent bonds

19. Which electron dot formula represents a polar molecule?



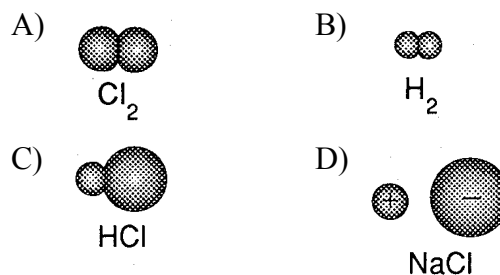
20. Which electron dot formula represents a polar molecule?



21. When two atoms form a chemical bond by sharing electrons, the resulting molecule will be

- A) polar, only
- B) nonpolar, only
- C) either polar or nonpolar
- D) neither polar nor nonpolar

22. Which diagram best represents a polar molecule?



23. Which two compounds contain only polar bonds?

- A) CCl_4 and CH_4
- B) HCl and Cl_2
- C) HCl and NH_3
- D) CO and O_2