



6. Which of the following would definitely lead to a polar covalent bond? (There could be more than one.)
- An atom with a high electronegativity is involved in a covalent bond.
  - An atom with a low electronegativity is involved in a covalent bond.
  - A metal and a nonmetal bond together.
  - Two nonmetals bond together.
  - An atom with high and an atom with a low electronegativity bond covalently.

7. Why do nonpolar substances tend to have lower boiling points than polar substances?

Nonpolar molecules have weaker intermolecular forces than polar substances. Thus, the molecules don't attract each other as much and are easier to separate during boiling.

8. Which of the following bonds is the most polar?  
 A) H—C    B) C—O    C) O—F    **D) H—O**    E) H—N

9. The more polar the molecules, the stronger the intermolecular forces.  
(stronger or weaker)

10. Which molecule would you expect to have the highest melting point: water or CH<sub>4</sub>? Explain.  
 H<sub>2</sub>O, because it has stronger intermolecular forces

11. Which molecule would you expect to have the lowest freezing point—F<sub>2</sub> or Cl<sub>2</sub>? Explain.  
 F<sub>2</sub> because it is lighter and therefore its dispersion forces are weaker than those of Cl<sub>2</sub>.

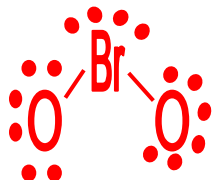
12. Consider the molecules in the previous question. Which one would have the strongest surface tension when in the liquid state?  
 Cl<sub>2</sub> because it is heavier and would therefore have stronger dispersion forces than F<sub>2</sub>.

13. Consider two molecules: CH<sub>2</sub>OH and C<sub>2</sub>H<sub>6</sub>. Only one of them will dissolve well in water. Which one? Explain.  
 CH<sub>2</sub>OH dissolves better in water because it has O and H so it will be polar and have hydrogen bonding just like water. And "like dissolves like."

14. Draw Lewis structures for the following substances. Circle the structures that allow for polarity and list bond angles and the name of the geometry (tetrahedral, bent, etc).



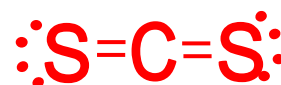
180°  
Linear



109°  
Bent



n/a  
n/a



180°  
Linear