Chapter 6 **Chemical Bonds**

Section 6.2 Covalent Bonding

(pages 165-169)

This section discusses the formation of covalent bonds and the factors that determine whether a molecule is polar or nonpolar. It also discusses attractions between molecules.

Reading Strategy (page 165)

Relating Text and Visuals As you read the section, look closely at Figure 9. Complete the table by describing each type of model shown. For more information on this Reading Strategy, see the Reading and Study Skills in the Skills and Reference Handbook at the end of your textbook.

Molecular Models	
Model	Description
Electron dot diagram	Dots represent valence electrons
Structural formula	A line represents a pair of shared valence electrons.
Space-filling	Three-dimensional spheres represent atoms.
Electron cloud	Electron clouds represent atoms.

30	valent Bonds (pages 165–167)	
1.	Define a covalent bond. A covalent bond is a chemical bond in which two	
	atoms share a pair of valence electrons.	
2.	A molecule is a group of atoms that are joined together by one or more covalent bonds. Circle the correct answer.	
	negative neutral positive	
3.	Is the following sentence true or false? In a covalent bond, the atoms are held together by the attractions between the shared electrons and the	
4.	protons in each nucleustrue Circle the correct answer. Nitrogen has five valence electrons. How many pairs of electrons must two nitrogen atoms share in order for each atom to have eight valence electrons?	
	a. one	
	b. two	
	(c.) three	

Chapter 6 Chemical Bonds

Unequal Sharing of Electrons (pages 167-168)

5. Use the words in the box to fill in the blanks.

chlorine hydrogen

oxygen

In a hydrogen chloride molecule, the shared electrons spend more time

near the <u>chlorine</u> atom than near the <u>hydrogen</u> atom.

6. Define a polar covalent bond. A polar covalent bond is a covalent bond

in which electrons are not shared equally.

7. When atoms form a polar covalent bond, the atom with the greater attraction for electrons has a partial ______ charge. Circle the correct answer.

neutral

positive

negative

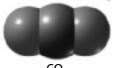
8. Is the following sentence true or false? In a molecule of a compound,

electrons are always shared equally by both atoms. ______

- **9.** Circle the letter of each factor that determines whether a molecule is polar or nonpolar.
 - a. the number of atoms in the molecule
 - (b) the type of atoms in the molecule
 - (c.) the shape of the molecule
- **10.** Compare the shapes of carbon dioxide and water molecules. Circle the letter of the polar molecule.

a. carbon dioxide

(b) water





Attraction Between Molecules (page 169)

11. Water has a higher boiling point than carbon dioxide because

attractions between polar molecules are attractions between nonpolar molecules.

12. Is the following sentence true or false? Attractions among nonpolar molecules explain why nitrogen can be stored as a liquid at low

temperatures and high pressures. _____true