Name _____ Date _____ Class _____

COVALENT BONDING

Vocabulary Review

Select the term from the following list that best matches each description.

polyatomic ion	VSEPR theory	bonding molecular orbital
coordinate covalent bond	bond dissociation energy	molecule

1. a bond in which one atom contributes both bonding electrons to a covalent bond

_____

2 the total energy required to break the bond between two covalently bonded atoms

_____

3. a molecular orbital whose energy is lower than that of the atomic orbitals from which it is formed

_____

4. states that because electron pairs repel, molecules adjust their shapes so that valence-electron pairs are as far apart as possible

_____

5. a tightly bound group of atoms that behaves as a unit and carries a charge

_____

6. a tightly connected group of two or more atoms of nonmetallic elements that behave as an electrically neutral unit

_____

Name _____ Date _____ Class _____

COVALENT BONDING

Practice Problems

SECTION 8.1 MOLECULAR COMPOUNDS

1. Classify each of the following as an atom or a molecule.

   a. Be **c.** N_2 **e.** Ne

   b. CO_2 **d.** H_2O

2. Which of the following are diatomic molecules?

   a. CO_2 **c.** O_2 **e.** CO

   b. N_2 **d.** H_2O

3. What types of elements tend to combine to form molecular compounds?

4. What information does a molecule's molecular structure give? What does it NOT give?

5. How do ionic compounds and molecular compounds differ in their relative melting and boiling points?

SECTION 8.2 THE NATURE OF COVALENT BONDING

1. Draw the electron dot structure for hydrogen fluoride, HF.

2. Draw the electron dot structure for phosphorus trifluoride, PF_3.

3. Draw the electron dot structure for nitrogen trichloride, NCl_3.

4. Draw the electron dot configuration for acetylene, C_2H_2.

5. How many resonance structures can be drawn for CO_3^{2-}? Show the electron dot structures for each and include the symbol that indicates resonance.

SECTION 8.4 POLAR BONDS AND MOLECULES

1. What type of bond—nonpolar covalent, polar covalent, or ionic—will form between each pair of atoms?

   a. Na and O **b.** O and O **c.** P and O

2. Explain why most chemical bonds would be classified as either polar covalent or ionic.

3. Would you expect carbon monoxide and carbon dioxide to be polar or nonpolar molecules?