

# CHAPTER 8 STUDY GUIDE

## Covalent Bonding

### Section 8.1 The Covalent Bond

In your textbook, read about the nature of covalent bonds.

Use each of the terms below just once to complete the passage.

covalent bond	molecule	sigma bond	exothermic	pi bond
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When sharing of electrons occurs, the attachment between atoms that results is called a(n) (1) \_\_\_\_\_. When such an attachment is formed, bond dissociation energy is released, and the process is (2) \_\_\_\_\_. When two or more atoms bond by means of electron sharing, the resulting particle is called a(n) (3) \_\_\_\_\_. If the electrons shared are centered between the two atoms, the attachment is called a(n) (4) \_\_\_\_\_. If the sharing involves the overlap of parallel orbitals, the attachment is called a(n) (5) \_\_\_\_\_.

In your textbook, read about single and multiple bonds and bond strength.

Circle the letter of the choice that best completes the statement or answers the question.

- In what form do elements such as hydrogen, nitrogen, and oxygen normally occur?
  - as single atoms
  - as molecules containing two atoms
  - as molecules containing three atoms
  - as molecules containing four atoms
- How many electrons are shared in a double covalent bond?
  - none
  - one
  - two
  - four
- Bond length is the distance between
  - two molecules of the same substance.
  - the electrons in two attached atoms.
  - the nuclei of two attached atoms.
  - the orbitals of two attached atoms.
- Which of the following relationships relating to bond length is generally correct?
  - the shorter the bond, the stronger the bond
  - the shorter the bond, the weaker the bond
  - the shorter the bond, the fewer the electrons in it
  - the shorter the bond, the lower the bond dissociation energy

## Section 8.2 Naming Molecules

In your textbook, read about how binary compounds and acids are named from their formulas.

For each statement below, write *true* or *false*.

- \_\_\_\_\_ 1. Binary molecular compounds are generally composed of a metal and a nonmetal.
- \_\_\_\_\_ 2. The second element in the formula of a binary compound is named using the suffix *-ite*.
- \_\_\_\_\_ 3. The prefix *tetra-* indicates three atoms.
- \_\_\_\_\_ 4. The prefix *hexa-* indicates six atoms.
- \_\_\_\_\_ 5. In naming the first element in a formula, the prefix *mono-* is not used.
- \_\_\_\_\_ 6. For binary acids, the hydrogen part of the compound is named using the prefix *hydro-*.
- \_\_\_\_\_ 7. An oxyacid contains only two elements.
- \_\_\_\_\_ 8. If the name of the anion of an oxyacid ends in *-ate*, the acid name contains the suffix *-ous*.

In your textbook, read about naming molecular compounds and oxyacids.

For each item in Column A, write the letter of the matching item in Column B.

- | Column A                                 | Column B                |
|--|-------------------------|
| _____ 9. CO                              | a. hydrobromic acid     |
| _____ 10. CO <sub>2</sub>                | b. dinitrogen tetroxide |
| _____ 11. H <sub>2</sub> CO <sub>3</sub> | c. carbon monoxide      |
| _____ 12. NH <sub>3</sub>                | d. nitrous acid         |
| _____ 13. N <sub>2</sub> O <sub>4</sub>  | e. ammonia              |
| _____ 14. HNO <sub>2</sub>               | f. nitric acid          |
| _____ 15. HNO <sub>3</sub>               | g. carbonic acid        |
| _____ 16. HBr                            | h. bromic acid          |
| _____ 17. HBrO <sub>3</sub>              | i. carbon dioxide       |