

# CHEMICAL NAMES AND FORMULAS

## Vocabulary Review

Match the correct vocabulary term to each numbered statement. Write the letter of the correct term on the line.

### Column A

- \_\_\_\_\_ 1. compounds that contain one or more hydrogen atoms and produce hydrogen ions in solution
- \_\_\_\_\_ 2. an ionic compound that produces hydroxide ions when dissolved in water
- \_\_\_\_\_ 3. any atom or group of atoms that has a positive charge
- \_\_\_\_\_ 4. compounds composed of metal cations and nonmetal anions
- \_\_\_\_\_ 5. composed of two elements and can be either ionic or molecular
- \_\_\_\_\_ 6. an ion consisting of a single atom with a positive or negative charge
- \_\_\_\_\_ 7. a tightly bound group of atoms that behaves as a unit and carries a charge
- \_\_\_\_\_ 8. any atom or group of atoms that has a negative charge

### Column B

- a. anion
- b. acids
- c. base
- d. ionic compounds
- e. binary compound
- f. monatomic ion
- g. cation
- h. polyatomic ion

## 9

**CHEMICAL NAMES AND FORMULAS****Practice Problems****SECTION 9.1 NAMING IONS**

- What is the charge on the ion typically formed by each element?
  - oxygen
  - iodine
  - sodium
  - aluminum
  - nickel, 2 electrons lost
  - magnesium
- How many electrons does the neutral atom gain or lose when each ion forms?
  - $\text{Cr}^{3+}$
  - $\text{P}^{3-}$
  - $\text{Li}^+$
  - $\text{Ca}^{2+}$
  - $\text{Cl}^-$
  - $\text{O}^{2-}$
- Identify each as a cation or an anion.
  - $\text{Sn}^{2+}$
  - $\text{Co}^{3+}$
  - $\text{Br}^-$
  - $\text{K}^+$
  - $\text{H}^-$
  - $\text{Mn}^{2+}$
- Write the formula (including charge) for each ion. Use Table 9.3 if necessary.
  - carbonate ion
  - nitrite ion
  - sulfate ion
  - hydroxide ion
  - chromate ion
  - ammonium ion
- Name the following ions. Identify each as a cation or an anion.
  - $\text{CN}^-$
  - $\text{HCO}_3^-$
  - $\text{PO}_4^{3-}$
  - $\text{Cl}^-$
  - $\text{Ca}^{2+}$
  - $\text{SO}_3^{2-}$

**SECTION 9.2 NAMING AND WRITING FORMULAS FOR IONIC COMPOUNDS**

- Write the formulas for these binary ionic compounds.
  - magnesium oxide
  - tin(II) fluoride
  - potassium iodide
  - aluminum chloride
  - sodium sulfide
  - ferric bromide
- Write the formulas for the compounds formed from these pairs of ions.
  - $\text{Ba}^{2+}$ ,  $\text{Cl}^-$
  - $\text{Ag}^+$ ,  $\text{I}^-$
  - $\text{Ca}^{2+}$ ,  $\text{S}^{2-}$
  - $\text{K}^+$ ,  $\text{Br}^-$
  - $\text{Al}^{3+}$ ,  $\text{O}^{2-}$
  - $\text{Fe}^{2+}$ ,  $\text{O}^{2-}$
- Name the following binary ionic compounds.
  - $\text{MnO}_2$
  - $\text{Li}_3\text{N}$
  - $\text{CaCl}_2$
  - $\text{SrBr}_2$
  - $\text{NiCl}_2$
  - $\text{K}_2\text{S}$
  - $\text{CuCl}_2$
  - $\text{SnCl}_4$
- Write formulas for the following ionic compounds.
  - sodium phosphate
  - magnesium sulfate
  - sodium hydroxide
  - potassium cyanide
- Write formulas for compounds formed from these pairs of ions.
  - $\text{NH}_4^+$ ,  $\text{SO}_4^{2-}$
  - $\text{K}^+$ ,  $\text{NO}_3^-$
  - barium ion and hydroxide ion
  - lithium ion and carbonate ion
- Name the following compounds.
  - $\text{NaCN}$
  - $\text{FeCl}_3$
  - $\text{Na}_2\text{SO}_4$
  - $\text{K}_2\text{CO}_3$
  - $\text{Cu}(\text{OH})_2$
  - $\text{LiNO}_3$

## SECTION 9.3 NAMING AND WRITING FORMULAS FOR MOLECULAR COMPOUNDS

1. Name the following molecular compounds.

- |                   |                           |                           |                            |
|-------------------|---------------------------|---------------------------|----------------------------|
| a. $\text{PCl}_5$ | c. $\text{NO}_2$          | e. $\text{P}_4\text{O}_6$ | g. $\text{SiO}_2$          |
| b. $\text{CCl}_4$ | d. $\text{N}_2\text{F}_2$ | f. $\text{XeF}_2$         | h. $\text{Cl}_2\text{O}_7$ |

2. Write the formulas for the following binary molecular compounds.

- |                        |                             |
|------------------------|-----------------------------|
| a. nitrogen tribromide | c. sulfur dioxide           |
| b. dichlorine monoxide | d. dinitrogen tetrafluoride |

## SECTION 9.5 THE LAWS GOVERNING FORMULAS AND NAMES

1. Write the formulas for these compounds.

- |                       |                         |                        |
|-----------------------|-------------------------|------------------------|
| a. potassium sulfide  | e. hydrobromic acid     | i. sulfur hexafluoride |
| b. tin(IV) chloride   | f. aluminum fluoride    | j. magnesium chloride  |
| c. hydrosulfuric acid | g. dinitrogen pentoxide | k. phosphoric acid     |
| d. calcium oxide      | h. iron(III) carbonate  | l. nitric acid         |

2. Name the following compounds.

- |                             |                     |                           |                                 |
|-----------------------------|---------------------|---------------------------|---------------------------------|
| a. $\text{K}_3\text{PO}_4$  | c. $\text{NaHSO}_4$ | e. $\text{N}_2\text{O}_5$ | g. $\text{PI}_3$                |
| b. $\text{Al}(\text{OH})_3$ | d. $\text{HgO}$     | f. $\text{NBr}_3$         | h. $(\text{NH}_4)_2\text{SO}_4$ |

