

Chapter 7

Name _____ Class _____ Date _____



CHEMICAL NAMES AND FORMULAS PRACTICE PROBLEMS

See back side!

In your notebook, solve the following problems.

SECTION 6.1 INTRODUCTION TO CHEMICAL BONDING

- Give the name and symbol of the ion formed when
 - a chlorine atom gains one electron.
 - a potassium atom loses one electron.
 - an oxygen atom gains two electrons.
 - a barium atom loses two electrons.
- How many electrons are lost or gained in forming each ion?
 - Mg^{2+}
 - Br^{-}
 - Ag^{+}
 - Fe^{3+}
- Classify each of the following as a cation, anion, or atom.
 - Be
 - Cu^{2+}
 - O^{2-}
 - Cs^{+}
 - Na^{+}
 - I^{-}
 - Ca^{2+}
 - Ne
- Classify each of the following as a molecular compound or an ionic compound.
 - CO_2
 - $NaCl$
 - $MgCl_2$
 - N_2
 - H_2O
- What types of elements tend to combine to form molecular compounds?

SECTION 6.2 REPRESENTING CHEMICAL COMPOUNDS

Use the 3-step problem solving approach you learned in Chapter 4.

- Sulfur forms two molecular compounds with oxygen. Compound A contains 3.505 g of sulfur combined with 3.810 g of oxygen. Compound B contains 6.553 g of sulfur combined with 10.743 g of oxygen. What is the lowest whole-number mass ratio of sulfur that combines with a given mass of oxygen?
- A chemistry student prepared a series of compounds containing only sulfur and fluorine. The following table shows the amount of each element in each compound.

Compound	Mass of sulfur (g)	Mass of fluorine (g)
A	20.18	47.85
B	14.44	8.53
C	16.79	59.68

- Calculate the mass of fluorine per gram of sulfur in each compound.
- How do the numbers in part a. support the law of multiple proportions?

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3. Nitrogen reacts with hydrogen to form two compounds. Compound A contains 18.8 g of nitrogen for each 2.7 g hydrogen. Compound B contains 13.3 g of nitrogen for each 2.9 g hydrogen. What is the mass ratio of nitrogen per gram of hydrogen in the two compounds?
4. Identify the number and kinds of atoms present in a molecule of each compound.
- | | |
|-----------------------------|--------------------------------|
| a. citric acid, $C_6H_8O_7$ | c. glycine, $C_2H_5NO_2$ |
| b. chloroform, $CHCl_3$ | d. sulfur hexafluoride, SF_6 |

SECTION 6.3 IONIC CHARGES

1. What is the charge on the ion typically formed by each element?
- | | | |
|-----------|-------------|-----------------------------|
| a. oxygen | c. sodium | e. nickel, 2 electrons lost |
| b. iodine | d. aluminum | f. magnesium |
2. How many electrons does the neutral atom gain or lose when each ion forms?
- | | | |
|--------------|--------------|-------------|
| a. Cr^{3+} | c. Li^+ | e. Cl^- |
| b. P^{3-} | d. Ca^{2+} | f. O^{2-} |
3. Name each ion. Identify each as a cation or anion.
- | | | |
|--------------|-----------|--------------|
| a. Sn^{2+} | c. Br^- | e. H^- |
| b. Co^{3+} | d. K^+ | f. Mn^{2+} |
4. Write the formula (including charge) for each ion. Use Table 6.4 if necessary.
- | | | |
|------------------|------------------|-----------------|
| a. carbonate ion | c. sulfate ion | e. chromate ion |
| b. nitrate ion | d. hydroxide ion | f. ammonium ion |
5. Name the following ions. Identify each as a cation or anion.
- | | | |
|--------------|----------------|----------------|
| a. CN^- | c. PO_4^{3-} | e. Ca^{2+} |
| b. HCO_3^- | d. Cl^- | f. SO_3^{2-} |

SECTION 6.4 IONIC COMPOUNDS

1. Write the formulas for these binary ionic compounds.
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|---------------------|----------------------|-------------------|
| a. magnesium oxide | c. potassium iodide | e. sodium sulfide |
| b. tin(II) fluoride | d. aluminum chloride | f. ferric bromide |
2. Write the formulas for the compounds formed from these pairs of ions.
- | | | |
|--------------------|----------------------|----------------------|
| a. Ba^{2+}, Cl^- | c. Ca^{2+}, S^{2-} | e. Al^{3+}, O^{2-} |
| b. Ag^+, I^- | d. K^+, Br^- | f. Fe^{2+}, O^{2-} |
3. Name the following binary ionic compounds.
- | | | | |
|------------|-------------|-------------|-------------|
| a. MnO_2 | e. $CaCl_2$ | e. $NiCl_2$ | g. $CuCl_2$ |
| b. I_3N | d. $SrBr_2$ | f. K_2S | h. $SnCl_4$ |