

# Chapter 7 Post to Moodle

Name STURMAN key Class \_\_\_\_\_ Date \_\_\_\_\_



## CHEMICAL NAMES AND FORMULAS PRACTICE PROBLEMS

In your notebook, solve the following problems.

See other side as well!

### SECTION 6.1 INTRODUCTION TO CHEMICAL BONDING

- Give the name and symbol of the ion formed when
  - a chlorine atom gains one electron.  $Cl^-$  chloride ion
  - a potassium atom loses one electron.  $K^+$  potassium ion
  - an oxygen atom gains two electrons.  $O^{2-}$  oxide ion
  - a barium atom loses two electrons.  $Ba^{2+}$  barium ion
- How many electrons are lost or gained in forming each ion?
  - $Mg^{2+}$  lost 2
  - $Br^-$  gained 1
  - $Ag^+$  lost 1
  - $Fe^{3+}$  lost 3
- Classify each of the following as a cation, anion, or atom.
  - Be atom
  - $Cu^{2+}$  cation
  - $O^{2-}$  anion
  - $Cs^+$  cation
  - $Na^+$  cation
  - $I^-$  anion
  - $Ca^{2+}$  cation
  - Ne atom
- Classify each of the following as a molecular compound or an ionic compound.
  - $CO_2$  molecular
  - $NaCl$  ionic
  - $MgCl_2$  ionic
  - $N_2$  molecular
  - $H_2O$  molecular
- What types of elements tend to combine to form molecular compounds?  
nonmetals

### 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?

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  $O^{2-}$                       c. sodium  $Na^+$                       e. nickel, 2 electrons lost  $Ni^{2+}$   
 b. iodine  $I^-$                       d. aluminum  $Al^{3+}$                       f. magnesium  $Mg^{2+}$
2. How many electrons does the neutral atom gain or lose when each ion forms?
- a.  $Cr^{3+}$  lost 3                      c.  $Li^+$  lost 1                      e.  $Cl^-$  gained 1  
 b.  $P^{3-}$  gained 3                      d.  $Ca^{2+}$  gained 2                      f.  $O^{2-}$  gained 2
3. Name each ion. Identify each as a cation or anion.
- a.  $Sn^{2+}$  cation                      c.  $Br^-$  anion                      e.  $H^-$  anion  
 b.  $Co^{3+}$  cation                      d.  $K^+$  cation                      f.  $Mn^{2+}$  cation
4. Write the formula (including charge) for each ion. Use Table 6.4 if necessary.
- a. carbonate ion  $(CO_3)^{2-}$                       c. sulfate ion  $(SO_4)^{2-}$                       e. chromate ion  $(CrO_4)^{2-}$   
 b. nitrate ion  $(NO_3)^-$                       d. hydroxide ion  $(OH)^-$                       f. ammonium ion  $(NH_4)^+$
5. Name the following ions. Identify each as a cation or anion.
- a.  $CN^-$  cyanide                      c.  $PO_4^{3-}$  phosphate, anions                      e.  $Ca^{2+}$  calcium ion ← cation  
 b.  $HCO_3^-$  hydrogen carbonate                      d.  $Cl^-$  chloride                      f.  $SO_3^{2-}$  sulfite ← anion

anions

### SECTION 6.4 IONIC COMPOUNDS

1. Write the formulas for these binary ionic compounds.
- a. magnesium oxide                      c. potassium iodide  $KI$                       e. sodium sulfide  $Na_2S$   
 b. tin(II) fluoride                      d. aluminum chloride  $AlCl_3$                       f. ferric bromide  $FeBr_3$
2. Write the formulas for the compounds formed from these pairs of ions.
- a.  $Ba^{2+}, Cl^-$   $BaCl_2$                       c.  $Ca^{2+}, S^{2-}$   $CaS$                       e.  $Al^{3+}, O^{2-}$   $Al_2O_3$   
 b.  $Ag^+, I^-$   $AgI$                       d.  $K^+, Br^-$   $KBr$                       f.  $Fe^{2+}, O^{2-}$   $FeO$
3. Name the following binary ionic compounds.
- a.  $MnO_2$                       c.  $CaCl_2$                       e.  $NiCl_2$                       g.  $CuCl_2$   
 b.  $Li_3N$                       d.  $SrBr_2$                       f.  $K_2S$                       h.  $SnCl_4$
- a. manganese oxide                      c. calcium chloride                      e. nickel II chloride                      g. copper II chloride  
 b. lithium nitride                      d. strontium bromide                      f. potassium sulfide                      h. tin IV chloride

$MgO_2$   
 $SnF_2$

iron  
 Ferric =  $Fe^{3+}$   
 Ferrous =  $Fe^{2+}$   
 ← not expected to know this.