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6 CHEMICAL NAMES AND FORMULAS
PRACTICE PROBLEMS

In your notebook, solve the following problems.

SECTION 6.1 INTRODUCTION TO CHEMICAL BONDING

1. Give the name and symbol of the ion formed when
   - **a.** a chlorine atom gains one electron.
   - **b.** a potassium atom loses one electron.
   - **c.** an oxygen atom gains two electrons.
   - **d.** a barium atom loses two electrons.
2. How many electrons are lost or gained in forming each ion?

   a. Mg^{2+} **b.** Br^- **c.** Ag^+ **d.** Fe^{3+}
3. Classify each of the following as a cation, anion, or atom.

   a. Be **c.** Cu^{2+} **e.** O^{2-} **g.** Cs^+

   b. Na^+ **d.** I^- **f.** Ca^{2+} **h.** Ne
4. Classify each of the following as a molecular compound or an ionic compound.

   a. CO_2 **c.** NaCl **e.** $MgCl_2$

   b. N_2 **d.** H_2O
5. What types of elements tend to combine to form molecular compounds?

SECTION 6.2 REPRESENTING CHEMICAL COMPOUNDS

1) Identify the number and kinds of atoms present in a molecule of each compound.

a. citric acid, $C_6H_8O_7$

b. chloroform, $CHCl_3$

c. glycine, $C_2H_5NO_2$

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

SECTION 6.4 IONIC COMPOUNDS

1. Write the formulas for these binary ionic compounds.
   - a. magnesium oxide
   - b. tin(II) fluoride
   - **c.** potassium iodide
   - **d.** aluminum chloride
   - **e.** sodium sulfide
   - **f.** ferric bromide
2. Write the formulas for the compounds formed from these pairs of ions.
   - **a.** Ba^{2+}, Cl^{-}
   - **b.** Ag^{+}, I^{-}
   - **c.** Ca^{2+}, S^{2-}
   - **d.** K^{+}, Br^{-}
   - **e.** Al^{3+}, O^{2-}
   - **f.** Fe^{2+}, O^{2-}
3. Name the following binary ionic compounds.
   - **a.** MnO_2
   - **b.** Li_3N
   - **c.** $CaCl_2$
   - **d.** $SrBr_2$
   - **e.** $NiCl_2$
   - **f.** K_2S
   - **g.** $CuCl_2$
   - **h.** $SnCl_4$

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4. Write formulas for the following ternary ionic compounds.

   a. sodium phosphate
   b. magnesium sulfate
   c. sodium hydroxide
   d. potassium cyanide
   e. ammonium chloride
   f. potassium dichromate

5. Write formulas for compounds formed from these pairs of ions.

   a. NH_4^+, SO_4^{2-}
   b. K^+, NO_3^-
   c. barium ion and hydroxide ion
   d. lithium ion and carbonate ion

6. Name the following compounds.

   a. NaCN
   b. $FeCl_3$
   c. Na_2SO_4
   d. K_3CO_3
   e. $Cu(OH)_2$
   f. $LiNO_3$

SECTION 6.5 MOLECULAR COMPOUNDS AND ACIDS

1. Name the following molecular compounds.

   a. PCl_5
   b. CCl_4
   c. NO_2
   d. N_2F_2
   e. P_4O_6
   f. XeF_2
   g. SiO_2
   h. Cl_2O_7

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

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

3. Give the name or formula for these common acids.

   a. HCl
   b. H_3PO_4
   c. acetic acid
   d. sulfuric acid

4. Name and give the charge of the metal cation in each of the following ionic compounds.

   a. Na_3PO_4
   b. $NiCl_2$
   c. CaS
   d. K_2S
   e. $FeCl_3$
   f. CuI

5. For each of the following binary compounds, decide whether the compound is expected to be ionic or molecular.

   a. SeF_4
   b. KBr
   c. NH_3
   d. $MgBr_2$
   e. CO_2
   f. PCl_5

SECTION 6.6 SUMMARY OF NAMING AND FORMULA WRITING

1. Write the formulas for these compounds.

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

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2. Complete this table by writing correct formulas for the compounds formed by combining positive and negative ions.

	SO_4^{2-}	NO_3^-	OH^-	PO_4^{3-}
Ca^{2+}				
Al^{3+}				
Na^+				
Pb^{4+}				

3. Name the following compounds.

a. K_3PO_4 **c.** $NaHSO_4$ **e.** N_2O_5 **g.** PI_3

b. $Al(OH)_3$ **d.** HgO **f.** NBr_3 **h.** $(NH_4)_2SO_4$