

9

CHEMICAL NAMES AND FORMULAS

Practice Problems

In your notebook, solve the following problems.

SECTION 9.1 NAMING IONS

- 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
- 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-}
- Name each ion. Identify each as a cation or an anion.

a. Sn^{2+}	c. Br^-	e. H^-
b. Co^{3+}	d. K^+	f. Mn^{2+}
- Write the formula (including charge) for each ion. Use Table 9.3 if necessary.

a. carbonate ion	c. sulfate ion	e. chromate ion
b. nitrite ion	d. hydroxide ion	f. ammonium ion
- Name the following ions. Identify each as a cation or an anion.

a. CN^-	c. PO_4^{3-}	e. Ca^{2+}
b. HCO_3^-	d. Cl^-	f. SO_3^{2-}

SECTION 9.2 NAMING AND WRITING FORMULAS FOR IONIC COMPOUNDS

- Write the formulas for these binary ionic compounds.

a. magnesium oxide	c. potassium iodide	e. sodium sulfide
b. tin(II) fluoride	d. aluminum chloride	f. ferric bromide
- Write the formulas for the compounds formed from these pairs of ions.

a. $\text{Ba}^{2+}, \text{Cl}^-$	c. $\text{Ca}^{2+}, \text{S}^{2-}$	e. $\text{Al}^{3+}, \text{O}^{2-}$
b. Ag^+, I^-	d. K^+, Br^-	f. $\text{Fe}^{2+}, \text{O}^{2-}$
- 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

4. Write formulas for the following ionic compounds.
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|----------------------|----------------------|-------------------------|
| a. sodium phosphate | c. sodium hydroxide | e. ammonium chloride |
| b. magnesium sulfate | d. potassium cyanide | f. potassium dichromate |
5. Write formulas for compounds formed from these pairs of ions.
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|---|----------------------------------|
| a. NH_4^+ , SO_4^{2-} | c. barium ion and hydroxide ion |
| b. K^+ , NO_3^- | d. lithium ion and carbonate ion |
6. Name the following compounds.
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|--------------------|-----------------------------|-----------------------------|
| a. NaCN | c. Na_2SO_4 | e. $\text{Cu}(\text{OH})_2$ |
| b. FeCl_3 | d. K_2CO_3 | f. LiNO_3 |
7. Name and give the charge of the metal cation in each of the following ionic compounds.
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|-----------------------------|-------------------------|--------------------|
| a. Na_3PO_4 | c. CaS | e. FeCl_3 |
| b. NiCl_2 | d. K_2S | f. CuI |

SECTION 9.3 NAMING AND WRITING FORMULAS FOR MOLECULAR COMPOUNDS

1. Name the following molecular compounds.
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|-------------------|---------------------------|---------------------------|----------------------------|
| a. PCl_5 | c. NO_2 | e. P_4O_6 | g. SiO_2 |
| b. CCl_4 | d. N_2F_2 | f. XeF_2 | h. Cl_2O_7 |
2. Write the formulas for the following binary molecular compounds.
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|------------------------|-----------------------------|
| a. nitrogen tribromide | c. sulfur dioxide |
| b. dichlorine monoxide | d. dinitrogen tetrafluoride |

SECTION 9.4 NAMING AND WRITING FORMULAS FOR ACIDS AND BASES

1. Name the following compounds as acids.
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|-------------------|----------------------------|-------|----------------------------|
| a. HNO_2 | b. H_2SO_4 | c. HF | d. H_2CO_3 |
|-------------------|----------------------------|-------|----------------------------|
2. Write the formulas for the following bases.
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| a. calcium hydroxide | c. aluminum hydroxide |
| b. ammonium hydroxide | d. lithium hydroxide |

SECTION 9.5 THE LAWS GOVERNING FORMULAS AND NAMES

1. Write the formulas for these compounds.
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| 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 |