

Chapter 7 - Language of Chemistry

Text Problems: 3, 16, 21, 27, 29, 33, 35, 39, 45, 47, 49, 53, 57, 62, 71, 73

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|-----|--|-----------------------|--|-----------------------|
| 3.  | <u>Ion</u>   | <u>Classification</u> | <u>Ion</u>                             | <u>Classification</u> |
|     | (a) $\text{NH}_4^+$                                | polyatomic cation     | (b) $\text{Ni}^{2+}$                   | monoatomic cation     |
|     | (c) $\text{Br}^-$                                  | monoatomic anion      | (d) $\text{CO}_3^{2-}$                 | polyatomic anion      |
| 16. | <u>Oxyanion</u>                                    |                       | <u>Systematic Name</u>                 |                       |
|     | (a) $\text{ClO}_2^-$                               |                       | chlorite ion                           |                       |
|     | (b) $\text{NO}_3^-$                                |                       | nitrate ion                            |                       |
|     | (c) $\text{C}_2\text{H}_3\text{O}_2^-$             |                       | acetate ion                            |                       |
|     | (d) $\text{HCO}_3^-$                               |                       | hydrogen carbonate ion                 |                       |
| 21. | <u>Constituent Ions</u>                            |                       | <u>Chemical Formula</u>                |                       |
|     | (a) $\text{K}^+ + \text{NO}_3^-$                   |                       | $\text{KNO}_3$                         |                       |
|     | (b) $2 \text{NH}_4^+ + \text{Cr}_2\text{O}_7^{2-}$ |                       | $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ |                       |
|     | (c) $2 \text{Al}^{3+} + 3 \text{SO}_3^{2-}$        |                       | $\text{Al}_2(\text{SO}_3)_3$           |                       |
|     | (d) $\text{Cr}^{3+} + 3 \text{ClO}^-$              |                       | $\text{Cr}(\text{ClO})_3$              |                       |
| 27. | <u>Binary Ionic Compound</u>                       |                       | <u>Systematic Name</u>                 |                       |
|     | (a) $\text{LiBr}$                                  |                       | lithium bromide                        |                       |
|     | (b) $\text{SrI}_2$                                 |                       | strontium iodide                       |                       |
|     | (c) $\text{Na}_3\text{N}$                          |                       | sodium nitride                         |                       |
|     | (d) $\text{AlF}_3$                                 |                       | aluminum fluoride                      |                       |
| 29. | <u>Binary Ionic Compound</u>                       |                       | <u>Chemical Formula</u>                |                       |
|     | (a) copper(I) oxide                                |                       | $\text{Cu}_2\text{O}$                  |                       |
|     | (b) iron(III) nitride                              |                       | $\text{FeN}$                           |                       |
|     | (c) mercuric(II) chloride                          |                       | $\text{HgCl}_2$                        |                       |
|     | (d) lead(IV) sulfide                               |                       | $\text{PbS}_2$                         |                       |
| 33. | <u>Binary Ionic Compound</u>                       |                       | <u>Chemical Formula</u>                |                       |
|     | (a) gallium nitride                                |                       | $\text{GaN}$                           |                       |
|     | (b) aluminum arsenide                              |                       | $\text{AlAs}$                          |                       |
| 35. | <u>Ternary Ionic Compound</u>                      |                       | <u>Systematic Name</u>                 |                       |
|     | (a) $\text{LiMnO}_4$                               |                       | lithium permanganate                   |                       |
|     | (b) $\text{Sr}(\text{ClO}_2)_2$                    |                       | strontium chlorite                     |                       |
|     | (c) $\text{BaCO}_3$                                |                       | barium carbonate                       |                       |
|     | (d) $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$         |                       | ammonium dichromate                    |                       |

39. Ternary Ionic Compound Chemical Formula  
 (a) manganese(II) acetate  $Mn(C_2H_3O_2)_2$   
 (b) copper(II) chlorite  $Cu(ClO_2)_2$   
 (c) tin(II) phosphate  $Sn_3(PO_4)_2$   
 (d) iron(III) hypochlorite  $Fe(ClO)_3$
45. Binary Molecular Compound Systematic Name  
 (a) BrF bromine monofluoride  
 (b) CF<sub>4</sub> carbon tetrafluoride  
 (c) I<sub>2</sub>O<sub>4</sub> diiodine tetraoxide  
 (d) Cl<sub>2</sub>O<sub>3</sub> dichlorine trioxide
47. Binary Molecular Compound Chemical Formula  
 (a) dinitrogen pentaoxide  $N_2O_5$   
 (b) carbon tetrachloride  $CCl_4$   
 (c) iodine monobromide  $IBr$   
 (d) dihydrogen sulfide  $H_2S$
49. Binary Acid Systematic Name  
 (a) HBr(aq) hydrobromic acid  
 (b) HI(aq) hydroiodic acid
53. Ternary Oxyacid Chemical Formula  
 (a) acetic acid  $HC_2H_3O_2(aq)$   
 (b) nitric acid  $HNO_3(aq)$
57. Substance Ionic Charge  
 (a) iron metal atoms 0  
 (b) ferrous ions 2+  
 (c) iron(III) ions 3+  
 (d) iron compounds 0

(Note: The total ionic charge on a compound must be zero.)

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ions	chloride ion	sulfide ion	phosphide ion
copper(I) ion	$CuCl$ copper(I) chloride	$Cu_2S$ copper(I) sulfide	$Cu_3P$ copper(I) phosphide
cobalt(III) ion	$CoCl_3$ cobalt(III) chloride	$Co_2S_3$ cobalt(III) sulfide	$CoP$ cobalt(III) phosphide
lead(IV) ion	$PbCl_4$ lead(IV) chloride	$PbS_2$ lead(IV) sulfide	$Pb_3P_4$ lead(IV) phosphide

71.	<u>Chemical Name</u>	<u>Chemical Formula</u>
	(a) dihydrogen oxide (water)	H <sub>2</sub> O
	(b) sodium hypochlorite (bleach)	NaClO
	(c) sodium hydroxide (caustic soda)	NaOH
	(d) sodium bicarbonate (baking soda)	NaHCO <sub>3</sub>

73.	<u>Binary Compound</u>	<u>Systematic Name</u>
	(a) BF <sub>3</sub>	boron trifluoride
	(b) SiCl <sub>4</sub>	silicon tetrachloride
	(c) As <sub>2</sub> O <sub>5</sub>	diarsenic pentaoxide
	(d) Sb <sub>2</sub> O <sub>3</sub>	diantimony trioxide