

Chapter 3 Naming Chemical Formulas

Naming Binary Ionic compounds:

General discussion of ionic and covalent compounds:

Ionic: Metal and a Non-Metal

Covalent: Non-Metal with Non-Metal

Type I Ionic compounds, only one type of cation charge. From column 1, 2, and 3 Ex. Na^+ , Ba^{2+} , Al^{3+}

Contains two ions: a positive *cation* metal with a negative *anion* non-metal

Practice from memorized ions on the periodic table.

The cation is always named first and the anion second

The anion takes its name from the element name and adding ide

Practice Worksheet Sample 1

Type II compounds, metal cation can have more than one charge.

Generally from Transition Series. Except, Zn^{2+} , Cd^{2+} , Ag^+

Cation charge can be determined by looking at the anion.

Compare FeCl_3 with FeCl_2 , What is charge on Fe in each case?

Name: Iron(III) chloride vs. Iron(II) chloride

Hint: Higher charge has -“ic” compared to lower charge with -“ous” (Ferrous wheel drawing)

Practice Worksheet Sample 2

Naming Binary Molecular Compounds:

Type III Contains two non-metals.

See Rules on P. 135

First element in formula is named first. Use full name of element

Second element is named as an anion (ide)

Prefixes denote number of atoms present. Prefixes P. 135

1 -mono

6 -hexa

2 -di

7 hepta

3 -tri

8 -octa

4 -tetra

9 -nona

5 -penta

10 -deca

Mono is never used for naming first element

Practice Worksheet Sample 3

Naming Compounds that contain Polyatomic Ions: (usually only two words)

Ex. with Cl and O. Same charge is retained as oxygen atoms are increased or removed

Ex. ClO^- hypochlorite

ClO_2^- chlorite

ClO_3^- chlorate

ClO_4^- perchlorate

If need to indicate more than one polyatomic ion, use parenthesis.

Practice Worksheet Sample 4

Naming Acids: Formulas always begin with H (hydrogen)

Binary Acids

Name always begins with “hydro”

Format: “hydro” stem “ic”

Ex. HCl = hydrochloric acid

Oxyacids

Ternary or oxyanions usually involve a polyatomic ion.

The prefix “hydro” is never used

If the ion ends in “ate” it is named as “ic”

If the ion ends in “ite” it is named as “ous”

Ex. HClO_3 = chloric acid

HClO_2 = chlorous acid