Chapter: Naming
Section One: Introduction to Chemical Names and Formulas

General rules to naming and writing formula.

- Electronegativity helps determine which ion is labeled first in binary compounds
- **Binary compounds:** compounds composed of two different elements
    - Cation is written first
        - Lower electronegative value
        - Written as its normal name
        - Positive (+) ion
    - Anion is written second
        - Higher electronegative value
        - Written with the ending *–ide*
        - Negative (-) ion
    - Aluminum oxide…Al_2O_3

Formula Unit: the simplest ratio of cations and anions

- $Al_2(SO_4)_3$
- 2 – Al^{+3} and 3 – SO_4^{-2}

Monatomic ions: ions formed from a single atom

- Naming Monatomic ions
    - Cation is written normally as its name
        - K^+…Potassium cation
        - Sodium = Na^+
        - Magnesium = Mg^{+2}
    - Anion is written with the ending *–ide*
        - F^-…Fluoride anion
        - Oxide = O^{-2}
- *d*-block and *p*-block metals can form several cations
    - *Stock system:* naming chemical ions with Roman numerals
    - Metals in the d-/p-block
    - Roman numerals are used to identify an ion's charge
    - Written immediately after the metal's name
    - Fe^{+2} = iron (II)
    - Fe^{+3} = iron (III)
    - Copper (I) = Cu^+ and Copper (II) = Cu^{+2}

One (1) = I	Two (2) = II	Three (3) = III
Four (4) = IV	Five (5) = V	Six (6) = VI
Seven (7) = VII		

Nomenclature: naming system

Polyatomic ions: Ions that form from many atoms

Oxyanions: polyatomic ions composed of an element, usually a nonmetal, bonded to one or more oxygen atoms

- Negative ions
- The most common ion is given the ending *–ate*
    - The greatest number of oxygen atoms
- The ion with one less oxygen atom is given the ending *–ite*
- Sometimes two elements form more than two different oxyanions
    - One less oxygen is given the ending *–ite* and the prefix *hypo-*
    - One more oxygen atom is given the ending *–ate* and the prefix *per-*
- Hypochlorite = ClO^-
- Chlorite = ClO_2^-
- Chlorate = ClO_3^-
- Perchlorate = ClO_4^-

Naming Binary compounds:

- Named by the newer system of the Stock System – metal and nonmetal
    - Roman numerals
- Named by the older system of prefixes – nonmetal and nonmetal

1 = mono	2 = di	3 = tri	4 = tetra	5 = penta
6 = hexa	7 = hepta	8 = octa	9 = nona	10 = deca

    - The rules for naming molecular compounds by the older system is
        - The less electronegative element is written first
        - The second element is written with the ending *–ide*
        - The prefix mono- is only used on the second element and all other prefixes are used for every element
        - The “o” and “a” are dropped off the prefix is the element begins with a vowel

Acid: distant type of molecular compound

- Binary acids: acids consisting of two element, usually hydrogen and one halogen
- Oxyacids: acids that contain hydrogen, oxygen, and a nonmetal/polyatomic ion

Salt: an ionic compound composed of a cation and the anion from an acid

Some salts contain hydrogen…they are named either by adding the word *hydrogen* to the name or the prefix *bi-* to the anion name