BEGINNING CHEMICAL NOMENCLATURE

Ionic, covalent, and acids are three types of chemical compounds, and the naming conventions are different for each. There are other types of chemical compounds, but you will probably encounter these three the most as you get started.

Ionic Formula Units:

- An ionic formula unit contains a positively charged ion (cation) and a negatively charged ion (anion).
- Ionic formula units are held together by the attraction of the opposite charges. The net charge on the ionic formula unit must be 0.
- Monoatomic Metals
  - Form cations.
  - In an ionic formula unit name, the metal will be the first name.
  - A majority of elements are metals located on the left side of the periodic table.
    - Many transition metals (center section of periodic table) and larger metal in groups 13-16 can form more than one ion.
    - When naming a compound with them in it, name the metal and then put charge of ion in parenthesis after it.
      - Example: iron (II) is Fe^{2+}
- Monoatomic Nonmetals
  - Form anions.
  - Found on the right side of the periodic table.
  - Charge is group number – 18.
  - In an ionic formula unit name, the nonmetal will be named second. The root of the element name will be used with the suffix –ide.
    - Examples: phosphide, iodide
- Polyatomic ions
  - Atoms covalently bound to each other that have a charge.
  - Names, formulas, and charges should be memorized for quick recall. Flashcards would be a good method for studying this information. Consider putting the formula and charge on one side of the card and the name on the other side.
    - They usually end in an –ate or –ite with some exceptions, such as cyanide and ammonium.

Covalent Compounds:

- A covalent compound is made from two nonmetals.
- The name is usually element root of element-plus-ide.
- Greek prefixes are used to indicate how many of each element is in the formula.
- Mono is not typically used except with oxygen.
  - For example, SO_2 is sulfur dioxide.
- There are no charges.

Acids:

- An acid is an ionic compound that releases an H+ in solution.
- Binary acid
  - The formula is HX where X represents a nonmetal element.
  - The name of a binary acid is Hydro-x-ic acid where the "X" represents the root of the name of the element.
    - Example: HCl is hydrochloric acid.
- Oxyacid
  - The formula is written as H-polyatomic ion.
    - If polyatomic ion ends in -ate → --ic acid.
    - If polyatomic ion ends in -ite → --ous acid.
    - Examples:
      - If the polyatomic ion was nitrate (NO_3^-) the acid would be HNO_2 and would be called nitric acid.
      - If the polyatomic acid was sulfite (SO_3^{2-}) the acid would be H_2SO_3 and would be called sulfurous acid.

For more information, visit a [tutor](). All appointments are available in-person at the Student Success Center, located in the Library, or online.