

How you name inorganic compounds depends on whether the compound is binary ionic, ternary ionic or covalent:

## Binary Ionic Compounds

**Contain: one metal and one nonmetal**

**E.g., NaCl, Mg<sub>3</sub>P<sub>2</sub>, Fe<sub>2</sub>O<sub>3</sub>**

To name the compound:

- Name the cation.
  - Remember to include roman numerals, if appropriate.
  - Cross the subscripts back up to get the charges, if needed.

- Name the anion.
  - Anions end in "ide".

e.g., Mg<sub>3</sub>P<sub>2</sub> = magnesium phosphide

Fe<sub>2</sub>O<sub>3</sub> = iron(III) oxide

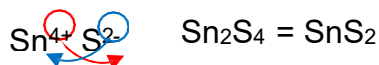
To write the chemical formula:

- Write the symbol for the cation.
- Write the symbol for the anion.
- Cross the numbers of the ionic charges so that they become subscripts for the opposite element.
- Reduce to lowest terms.

e.g., aluminum oxide



tin(IV) sulfide



## Ternary Ionic Compounds

**Contain either:**

- One metal and one polyatomic ion
- One polyatomic ion and one nonmetal
- Two polyatomic ions

**E.g., Na<sub>3</sub>PO<sub>4</sub>, (NH<sub>4</sub>)<sub>2</sub>S, (NH<sub>4</sub>)<sub>3</sub>PO<sub>4</sub>**

To name the compound:

- Name the same as for binary ionic.

e.g., Au<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> = gold(III) sulfate

To write the chemical formula:

- Write the formula the same as for binary ionic.

e.g., ammonium carbonate



### Covalent/Molecular Compounds

**Contain: two nonmetals**

**E.g., CO<sub>2</sub>, N<sub>2</sub>S<sub>3</sub>, P<sub>4</sub>O<sub>7</sub>**

To name the compound:

- Write the prefixes that correspond to the subscripts.
  - Do not use “mono” for the first element, only the second.
- Write the names of the elements after each prefix.
  - The second element ends in “ide”.

e.g., AsCl<sub>3</sub> = arsenic trichloride

N<sub>2</sub>O<sub>5</sub> = dinitrogen pentoxide

To write the chemical formula:

- Write the element symbols.
- Write the subscripts that correspond to the prefixes.

e.g., carbon tetrachloride = CCl<sub>4</sub>

disilicon trioxide = Si<sub>2</sub>O<sub>3</sub>

#### Molecular prefixes

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

There are three **common names** to remember:

- CH<sub>4</sub> = methane
- NH<sub>3</sub> = ammonia
- H<sub>2</sub>O = water

For practice with nomenclature, visit SALS ONLINE – Chemistry in DC Connect.

For help with nomenclature or any chemistry concept, email [sals@durhamcollege.ca](mailto:sals@durhamcollege.ca) to request an appointment with the chemistry specialist.