

## Reminders

- \_\_\_\_\_ indicate how many atoms of an element are present.
  - $\text{H}_2\text{O}$  = 2 Hydrogen, 1 Oxygen
  - $\text{CO}_2$  = 1 Carbon, 2 Oxygen
- *Note that subscripts only apply to the letter next to them (unless there are parentheses).*
- Cations (*formed by metals*) and anions (*formed by nonmetals*) attract one another and form \_\_\_\_\_ bonds.

## Binary Ionic Compounds

- Binary means a compound contains \_\_\_\_\_ elements.
- Ionic compounds are formed between a \_\_\_\_\_ and a \_\_\_\_\_.

## Naming Binary Ionic Compounds

- **Elements to Formulas**

**Example**  
**Potassium and Fluorine**

- Identify cation/anion (with charges)
- \_\_\_\_\_ are necessary for transition & other multivalent metals!
- Put the \_\_\_\_\_ symbol first, then the \_\_\_\_\_.
  
- **Drop & Cross** to balance charges.
  
- **Practice:**
  - Calcium and Bromine
  - Copper(II) and Oxygen
  - Lithium and Sulfur
  - Mercury(I) and Oxygen
  - Aluminum and Chlorine
  - Lead(IV) and Sulfur
  - Potassium and Sulfur
  - Beryllium and Bromine
  - Cobalt(II) and Phosphorus
  - Tin(IV) and Chlorine

- **Formulas to Names**

Example  
KF

- Write the name of the \_\_\_\_\_
  - *Uncross to find the Roman numerals with transition & multivalent metals.*
- Write the name of the anion.
  - Drop the ending
  - Add \_\_\_\_\_.
- **Practice:**
  - $\text{CaBr}_2$
  - $\text{Hg}_2\text{O}$
  - $\text{NaCl}$
  - $\text{CoCl}_2$
  - $\text{AlCl}_3$
  - $\text{K}_2\text{S}$
  - $\text{CrCl}_2$
  - $\text{Na}_3\text{P}$

### Naming Ternary Ionic Compounds

- **Elements/Polyatomics to Formulas**

Example  
Sodium and Carbonate

- Identify cation/anion (with charges)
- Identify the polyatomic ion (with charges)
- Put the \_\_\_\_\_ or \_\_\_\_\_ symbol first, then the \_\_\_\_\_ or \_\_\_\_\_.
- **Drop & Cross** to balance charges.
  - *Put polyatomics in ( ) if more than 1.*
- **Practice:**
  - Ammonium and Oxygen
  - Potassium and Nitrate
  - Lead(IV) and Dichromate

- Calcium and Hydroxide
- Lithium and Sulfate
- Calcium and Permanganate
- Sodium and Chlorate
- Magnesium and Phosphate

- **Formulas to Names**

**Example**  
**Na<sub>2</sub>CO<sub>3</sub>**

- Look for the polyatomic – *it can be first or second!*
  - *Uncross to find charge of the polyatomic ion or the Roman numerals with transition & multivalent metals.*
- Write the name.
  - If the polyatomic is 1<sup>st</sup>, end the anion with **-ide**
  - If the polyatomic is 2<sup>nd</sup>, cation is written as normal and polyatomic is normal
- **Practice:**
  - NH<sub>4</sub>Cl
  - KNO<sub>3</sub>
  - Ca(OH)<sub>2</sub>
  - Pb(Cr<sub>2</sub>O<sub>7</sub>)<sub>2</sub>
  - Li<sub>2</sub>SO<sub>4</sub>
  - Ca(MnO<sub>4</sub>)<sub>2</sub>
  - NaClO<sub>3</sub>
  - Mg<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>

- **All Ionic Practice**

- NaOH
- Beryllium Sulfate
- Tin(II) Iodide
- Aluminum Cyanide
- Zinc Hydroxide
- Co<sub>3</sub>N<sub>2</sub>
- Ag<sub>2</sub>SO<sub>3</sub>
- Mg<sub>3</sub>P<sub>2</sub>
- Beryllium Acetate
- Fe<sub>3</sub>N<sub>2</sub>
- Ga(NO<sub>2</sub>)<sub>3</sub>
- Silver Sulfide

## Acids

- **Formula to Name**

- All acids contain 1 or more H atoms.
- H will be the first element listed!

**Example**  
HCl

- **If the anion ends with -ide (halogens)**

- Acid name begins with \_\_\_\_\_
- Stem of anion ends with \_\_\_\_\_
- End the name by writing \_\_\_\_\_

- **Example:**

- **If polyatomics are present**

- \_\_\_\_\_ endings become \_\_\_\_\_, followed by \_\_\_\_\_.
- **Example:**
- \_\_\_\_\_ endings become \_\_\_\_\_, followed by \_\_\_\_\_.

- **Example:**

- **Names to Formulas**

- H will be the first element listed!
  - List H with a \_\_\_\_\_ charge.
- Identify the anion (halogen or polyatomic)
  - Write the formula with charge

**Example**  
Nitric acid

- **Drop & Cross**

- **Example:**

- **Practice:**

- Bromic Acid
- Hydroiodic Acid
- Carbonous Acid
- Nitrous Acid

- **All Acid Practice**

- $\text{H}_2\text{CO}_3$
- Hydroiodic acid
- $\text{HC}_2\text{H}_3\text{O}_2$
- HBr
- Chloric acid
- $\text{H}_2\text{CO}_3$
- Hydrofluoric acid
- $\text{H}_3\text{PO}_3$

## Binary Molecular Compounds

- Binary means a compound contains \_\_\_\_\_ elements.
- Molecular compounds are formed between a \_\_\_\_\_ and a \_\_\_\_\_.
  - *Not IONS – No Charges!*
- \_\_\_\_\_ are used to indicate how many atoms of an element are present in the compound.
- **Prefixes to Memorize**

Prefix	Meaning
Mono –	1
Di –	2
Tri –	3
Tetra –	4
Penta –	5
Hexa –	6
Hepta –	7
Octa –	8
Nona –	9
Deca –	10

## Naming Binary Molecular Compounds

- **Formula to Name**

Example  
CO

- Confirm that the two elements are nonmetals
- Name the 1<sup>st</sup> element
  - If only 1 of the 1<sup>st</sup> element omit prefix
  - If more than 1 of the 1<sup>st</sup> element use prefix
- Name the 2<sup>nd</sup> element (the more EN element)
  - Always use a prefix
  - Add **-ide** ending
- **Practice:**
  - N<sub>2</sub>O<sub>4</sub>
  - SO<sub>3</sub>
  - NO
  - NO<sub>2</sub>

- $\text{As}_2\text{O}_5$
- $\text{PCl}_3$
- $\text{CCl}_4$
- $\text{SeF}_6$

- **Name to Formula**

**Example**  
**Dinitrogen monoxide**

- Write the symbol for the first element
  - The prefix tells you what to write as a subscript
  - *If no prefix, the element symbol will not have a subscript*
- Write the symbol for the second element
  - The prefix tells you what to write as the subscript
- **Practice:**
  - Dinitrogen triiodide
  - Diphosphorus pentoxide
  - Dinitrogen monoxide
  - Silicon dioxide
  - Carbon tetrabromide
  - Sulfur dioxide
  - Phosphorus pentabromide
  - Iodine trichloride

- **All Molecular Practice**

- $\text{PCl}_3$
- Diphosphorus trioxide
- $\text{SF}_6$
- Carbon dioxide
- $\text{C}_2\text{H}_6$
- $\text{CCl}_4$
- Dichlorine octoxide
- $\text{N}_2\text{O}$