6. **Inorganic Nomenclature**

a. ionic compounds - cation and anion combinations

i. Single-charge cations with elemental anions

1. The single charge cations include: groups 1, 2, 13, Ag^{1+}, and Zn^{2+}

2. To name, given the formula: NaCl

- Use name of the cation: (Sodium)

- Use the name of the anion dropping the ending and add -ide: (Chloride)

NaCl = Sodium Chloride

6. **Inorganic Nomenclature**

a. ionic compounds - cation and anion combinations

i. Single-charge cations with elemental anions

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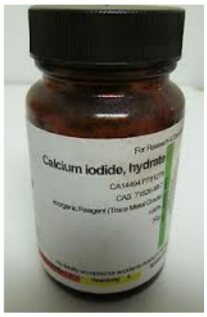
3. To write the formula, given the name: Calcium Iodide



- Write the symbols for the two ions: Ca^{2+} and I^{1-}

- Balance the charges to write the formula.

Ca^{2+} I^{1-} CaI_2

4. Note: the names that end in -ide are talking about a specific element, the names that do not are usually talking about a polyatomic ion.

Sodium Sulfide
Na_2S
Vs.
Sodium Sulfate
Na_2SO_4

Examples:

K_2O

$MgCl_2$

Magnesium Fluoride

Cesium Sulfide

6. **Inorganic Nomenclature**

a. ionic compounds - cation and anion combinations

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ii. Multiple-charge cations with elemental anions

1. The multiple charge cations include:
   Pb^{2+}/Pb^{4+}, Sn^{2+}/Sn^{4+}, transition metals
   (except Ag and Zn)

* Need to know roman numerals for this:

1 = I	5 = V	9 = IX
2 = II	6 = VI	10 = X
3 = III	7 = VII	
4 = IV	8 = VIII	

2. To name, given the formula: FeO

- Figure out the charge of the cation
  (you know the charge of the anion) --> $Fe^{?}$ and O^{2-}

  *If you know the ratio of Fe to O is 1:1 and the charge of O is 2 negative, then Fe must be 2 positive.

- Write the name of the cation: Iron

- Write roman numerals in ( ) to show the charge of the cation: Iron (II)

- Write the name of the anion with -ide ending

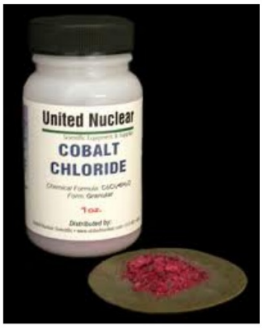
FeO = Iron(II) Oxide

3. To find the formula, knowing the name: Cobalt(III) Chloride

- write the symbols of the ions: Co^{3+} and Cl^{1-}

- balance the charges to write the formula

Co^{3+} Cl^{1-} $CoCl_3$



Examples:

Fe_2O_3

$CuBr_2$

tin(IV)oxide

tin(II)oxide

6. **Inorganic Nomenclature**

b. covalent compounds (molecules)

1. between non-metals

2. forget the charge

3. What to do:

- Use greek prefixes to indicate how many atoms of each element.

*If the first type of atom only has one atom, mono is not needed.

- The last element ends in -ide.

- The Greek prefixes are:

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

Examples:

CO_2 = carbon dioxide

CO = carbon monoxide

N_2O_5 = dinitrogen pentaoxide

Examples:

CCl_4

C_2Cl_6

SiO_2

NI_3

H_2O

SO

P_3Br_9

6. **Inorganic Nomenclature**

c. acid nomenclature

1. **binary acids** - acids with hydrogen and one other element

i. How to name, given the formula:

- write the prefix "hydro"

- write the prefix of the other element followed by "-ic acid"

Examples: HCl --> hydrochloric acid
HF -->
HBr -->

6. **Inorganic Nomenclature**

c. acid nomenclature

1. **binary acids** - acids with hydrogen and one other element

ii. How to write the formula, given the name:

- write the atomic symbols of the atoms in acid

- the charge of the other element tells you how many hydrogens you need

Examples: hydrochloric acid --> HCl
hydrosulfuric acid --> H_2S
hydroxic acid → H_2O

6. **Inorganic Nomenclature**

c. acid nomenclature

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2. **oxy-acids** - acids containing hydrogen, oxygen, and another element

i. common oxyanions: $(NO_3)^{1-}$, $(PO_4)^{3-}$, $(SO_4)^{2-}$, $(CO_3)^{2-}$
- polyatomic ions that contain oxygen
- combine with hydrogen to form oxyacids

ii. How to name, given the formula:

- write the prefix of the oxyanion followed by "-ic acid"

- Example: H_2CO_3 --> carbonic acid

6. **Inorganic Nomenclature**

c. acid nomenclature

2. **oxyacids acids** - acids containing hydrogen, oxygen, and another element

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iii. How to write the formula, given the name:

- write the atomic symbols of the atoms in acid

- the charge of the oxyanion tells you how many hydrogens you need

Examples: sulfuric acid --> H_2SO_4
chloric acid --> $HClO_3$

Hydrosulfuric acid

arsenic acid

nitric acid

$HBrO_3$

H_3P

H_2CO_3

hydroiodic acid

H_3PO_4