

## Naming Rules Complete

### Notes:

#### 1.) Ionic chemical naming rules notes

- 1.) Always write the metal first which is a POSITIVE ion.
- 2.) Always write the non-metal second which is a NEGATIVE ion.
- 3.) Change the ending of the non-metals name to end in "ide".
  - Ex. - Table salt - sodium and chlorine becomes sodium chloride.
  - Ex. - Rust - iron and oxygen becomes iron oxide.

#### 2.) Ionic formula writing rules notes

- a. Write the symbol of the metal along with its ionic charge as a superscript.
- b. Write the symbol of the non-metal along with its ionic charge as a superscript.
- c. Criss-cross the superscripts so they become subscripts of the opposite element.
- d. We do not write the number 1 in the final answer!
  - Ex. - calcium chloride - calcium =  $\text{Ca}^{2+}$  and chlorine =  $\text{Cl}^{1-}$   $\rightarrow \text{Ca}^{2+}\text{Cl}^{1-} \rightarrow \text{CaCl}_2$
  - Ex. - rubidium sulphide -  $\text{Rb}^{1+}$  and  $\text{S}^{2-} \rightarrow \text{Rb}_2\text{S}$

#### 3.) Multivalent Ionic metals notes

- Some metals have more than one combining capacity. That is they are multivalent. They lose different amounts of electrons depending on what they are bonding with. All of the choices of combining capacities are listed in the box for each element on the periodic table.
  - Ex. - Iron has ions listed of +3 and +2.
- **Which capacity do you use?** Scientists use Roman numerals to **TELL** you which one to use in the name.
  - Ex. - chromium (IV) sulphide.
- The Roman numeral (IV) tells you the combining capacity of chromium is +4
  - Ex. 2 - copper (I) phosphide.
- The Roman numeral (I) tells you the ion of copper is +1.

#### List of Roman numerals

+1	=	I
+2	=	II
+3	=	III
+4	=	IV
+5	=	V

+6 = VI

+7 = VII

- Writing the formula for multivalent metals follows the same rules as non-multivalent metals.

- Ex. - Iron (III) sulphide =  $\text{Fe}^{3+}$  and  $\text{S}^{2-}$  so criss cross and get  $\text{Fe}_2\text{S}_3$

#### 4.) Writing Ionic names part II notes

- Write the name by first identifying the names of the elements from their symbols.
- Find the subscripts and reverse criss-cross them back up top of the opposite element.
- Look to see if the metal is multivalent.

- If "yes" then the ionic charge it now has will need to be written as a Roman numeral in brackets and the non-metal name ends in "ide".

- If "no" then just write the names of the elements with the non-metal ending in "ide".

#### 5.) Polyatomic ion in formulas notes

- Follow same rules for writing names, remembering to treat the **whole polyatomic ion like it is a single element**.

Ex. - Iron (III) Sulphide

$\text{Fe}^{+3}$  and  $\text{SO}_4^{-2}$

$\text{Fe}_2(\text{SO}_4)_3$

Don't forget brackets!!!

#### 6.) Covalent chemical name rules notes

- In covalent compounds prefixes are used to tell a person how many of element there is.

##### List of Covalent Prefixes

1 = mono

2 = di

3 = tri

4 = tetra

5 = penta

6 = hexa

7 = hepta

8 = octa

9 = nona

10 = deca

- a. Write the name of the first non-metal with the proper prefix for how many non-metals there are.
- b. Write the name of the second non-metal ending in "ide" with the proper prefix for how many non-metals there are.

- Ex. -  $N_2Cl_4$

N is nitrogen and the prefix for two is "di"

Cl is chlorine and the prefix for four is tetra

So . . .  $N_2Cl_4$  is **dinitrogen tetrachloride**

- There are seven **elements** that form covalent bonds with themselves.
- In nature you will never find the element hydrogen as H. It only exists as  $H_2$ . That is hydrogen always forms a covalent bond with another hydrogen in the elemental form. These seven elements are called the diatomic seven.

- The seven are

1.) Hydrogen ( $H_2$ )

2.) Oxygen ( $O_2$ )

3.) Nitrogen ( $N_2$ )

4.) Fluorine ( $F_2$ )

5.) Chlorine ( $Cl_2$ )

6.) Bromine ( $Br_2$ )

7.) Iodine ( $I_2$ )

\*\*\* Sulfur forms  $S_8$  and phosphorus is  $P_4$

### 7.) Covalent chemical formula rules notes

- a. Follow the instructions provided by the name.

- Ex. - sulfur trioxide

one sulfur and three oxygen

So . . .  **$SO_3$**

- Ex. - dichlorine monoxide

two chlorine and one oxygen

So . . .  **$Cl_2O$**