Unit 7 Notes

Nomenclature (Naming)

**I. Terms:**

**Oxidation number** (oxidation state) – the number of electrons lost or gained (charge for ions)

**Examples:**

Element Oxidation #

Fe2+ 2

Fe3+ 3

O2**-**2

**Polyatomic ion** – charged group of covalently bonded atoms

Examples: (OH)**-** Hydroxide

(SO4)2**-** Sulfate

These atoms stay together as a group when forming an ionic bond. When learning, it is helpful to always keep the polyatomic groups in parentheses.

**Chemical formula** – Element symbols with subscripts that show how many atoms of each element are in a compound. If a subscript is 1, you don’t need to write it; it is assumed.

A chemical formula has no charge; If ionic, the ion charges balance and equal 0.

**II. Writing ionic formulas and naming ionic compounds (using words)**

A. Writing ionic formulas

Cation always goes first.

Fe2O3

Two iron atoms Three oxygen atoms

Note: **subscripts are not charges**.

**Short cut for writing balanced IONIC chemical formulas:**

Crisscross charges to subscripts (and back to get charges).

**Example:**

3+ 2- 2+ 1-

Fe?O? becomesFe2O3 Ca(OH) becomes Ca(OH)2

Reduce subscripts if possible. Example: Fe2O2 = FeO

B. Naming ionic compounds

Cation always goes first.

|  |  |
| --- | --- |
|  |  |
| **Cation** | **Anion** |
| 1. Write the name of the cation or polyatomic cation | 1. If a monatomic anion (one element) –  Write the root (usually the first syllable) of the anion and then end in “ide” |
|  | **Examples:** Cl- chloride O2- oxide |
| **AND** | **Or** |
|  |  |
| 2. If there is more than one possible charge for the cation, use roman numerals in parentheses to denote the oxidation number. | 2. If a polyatomic anion (a group of elements), write the name of the polyatomic anion (refer to list) |
| **Examples:** Fe­2+ Iron (II)  Fe3+ Iron (III) | **Example:** (SO4)2**-** Sulfate |

**Examples:** NaCl Sodium Chloride

Fe2O3 Iron (III) Oxide

K2(SO4) Potassium Sulfate

**III. Naming Covalent Compounds with and Writing Covalent Formulas** (Two Elements)

A. Naming covalent compounds: Use your prefix list for numbers.

1. When naming, follow this pattern: **prefix, 1st element, prefix, 2nd element**

2. If the first element does not have a subscript, do not use a prefix**:**

**Do not start a name with “mono”**

3. The second element ends in “ide” as with monatomic anions in ionic compounds.

**Examples:**

**prefix 1st element prefix 2nd element ending in “ide”**

N2O3 dinitrogen trioxide

CO carbon monoxide (**do not use the mono prefix with the first element**)

CO2 carbon dioxide

B. Writing covalent formulas

1. Write the element symbol of the first element and use the prefix to determine the subscript.

2. Write the element symbol of the second element and use the prefix to determine the subscript.

**DO NOT REDUCE COVALENT COMPOUND SUBSCRIPTS!! H2O2  stays H2O2**