

## CHEMICAL NAMES AND FORMULAS (Nomenclature)

### **Periodic Table**

- Arranged in rows/columns according to their similar properties
  1. Group - column of elements
  2. Family - rows of elements (period)
- Representative elements illustrate a range of chemical properties; metals and nonmetals (Groups IA - VIIIA)

### **4 Kinds of Elements:**

- A. metals - luster, malleable, high electrical conductivity, and ductile (usually located on left side of staircase)
- B. transition metals (rare earths) - Group B located in the middle of the table and last two rows
- C. nonmetals - nonlustrous and poor conductors of electricity.
- D. Metalloids/semimetals - elements with properties of metals/nonmetals.

### **ATOMS AND IONS -**

\*When forming a compound, an atom will become charged. (+ or -)

Ion - group of atoms with a positive or negative charge.

1. **cation** - positive charge (loses electrons) ; metals
2. **anion** - negative charge (gains electrons) ; nonmetals

**Why? All ions want to become stable and achieve 8 electrons in the outermost ring of the atom.**

**They will take the "shortest route" to achieve it.**

Ex. Sodium atom - Na  
Sodium ion - Na<sup>+1</sup>

Chlorine atom - Cl  
Chloride ion - Cl<sup>-1</sup>

Stable compound : Na<sup>+1</sup> Cl<sup>-1</sup> forms NaCl

**\*ALL METALS HAVE A POSITIVE CHARGE WHEN FORMING IONIC COMPOUNDS.**

## COMPOUNDS

Law of definite proportions - elements are always combined in the same proportion by mass in compounds. Ex.  $\text{MgS} = 0$  charge after ions combine

### 2 Types of Compounds:

1. **Molecular** - composed of molecules with low m.p. and b.p; Usually 2 or more nonmetallic elements. Ex.  $\text{SO}_3$
2. **Ionic** - composed of + and - ions. They are neutral and are crystalline solids at room T. ex. Metal + nonmetal like sodium fluoride.

## CHEMICAL FORMULAS

- Show kinds of numbers of atoms in the smallest representative unit of the substance. Ex.  $\text{H}_2\text{O}$
1. molecular formulas - shows number of kinds of atoms present in a molecule of a compound. A molecule is a group of atoms bonded together and act as a unit.
  2. Empirical formula - show the lowest whole number ratio of ions in an ionic compound. Ex.  $\text{MgCl}_2$

***Ternary (tertiary) compounds - composed of at least 3 different elements***

## POLYATOMIC IONS

A group of atoms that behave as a unit and have a charge (superscript)

-ite less oxygen atoms  
-ate more oxygen atoms  
ex.  $\text{NO}_2^{-1}$  and  $\text{NO}_3^{-1}$