

## Chemistry (Math Notes) Tristan

### Module #5

#### Ionic Compounds

A more accurate definition of an ionic compound is a compound that carries ions, which are bound together because of charges, like magnets.

Ionic Compounds can be formed in 4 ways.

1. Metal + nonmetal
2. Polyatomic + nonmetal
3. Metal and polyatomic
4. Polyatomic + polyatomic

#### EXAMPLES:

MgO - magnesium oxide

NH<sub>4</sub>F - ammonium fluoride

Mg(ClO<sub>3</sub>)<sub>2</sub> - magnesium chlorate

(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> - ammonium sulfate

#### Covalent Compounds

There are 2 types.

A **polar** covalent compound has fractional (partial) charges on some or all of its atoms because the electrons are shared unevenly between the atoms involved.

A **purely** covalent compound has no no fractional charges on any of its atoms because the electrons are shared evenly between the atoms involved.

In order to be polar, a compound must have polar bonds AND these bonds cannot be of equal polarity and equal distribution in space.

The polarity of the bonds is determined by the difference in electronegativity of the atoms involved.

EXAMPLES: H<sub>2</sub>O - Oxygen (on the right) has higher electronegativity

Hangs on to electrons a little longer so Oxygen has a slight negative charge and hydrogens have slight positive charge

Slight/fractional charge - polar covalent

In general, polar covalent mix with other polar covalent or ionic compounds. e.g., water and oil

Purely covalent mix only with other purely covalent compounds. e.g., water and salt

**Polar** covalent compounds share electrons **unequally**.

**Purely** covalent compounds share electrons **equally**.

### Molecular Geometry

Molecules are not flat, but 3D. Lewis Structures represent a flat picture. A molecule's shape is defined by its electrons, which want to repel each other because they are the same charge. We use a dash (--) to represent the electrons.