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Chemistry (Math Notes)

Module #2

Memorize this material:

1. Abbreviations & names for Elements 1-20 on the periodic table (spelling counts!)
2. Prefixes for naming covalent compounds (p.91)
3. Ion name (-ide) ending for common elements (handout)

Definitions:

Atom is the smallest chemical unit of matter

Element is a substance that can't be broken down into less massive substances. The same atom is repeated throughout. All atoms in the substance are identical to each other.

molecule is more than one atom bound together to form a compound and is one part of a compound

compound is a substance that can be decomposed into its elements by chemical means.

atom:element :: molecule:compound

Periodic Table: Elements symbols are located on the periodic table. The jagged stair step line separated metals from nonmetals. Metals are to the left; nonmetals are to the right.

EXCEPTION: hydrogen

Metal

Malleable

Shiny

Conduct electricity

Nonmetal

Brittle

Dull

Don't conduct electricity

ONE OF THE MOST FUNDAMENTAL DISTINCTIONS IN CHEMISTRY!! MUST KNOW AND UNDERSTAND THE DIFFERENCES AND THEIR LOCATION ON THE PERIODIC TABLE!

Law of the Conservation of Mass states that matter cannot be created or destroyed; it can only change forms. Basically the sum of the reactants must equal the sum of the products.

Example:

10.0 grams nitrogen + 2.1 grams hydrogen = 12.1 grams ammonia
10.0 grams nitrogen + 3.1 grams hydrogen = 12.1 grams ammonia AND 1.0 grams hydrogens

Law of Definite Proportions states the proportion of elements in any compound is always the same. It is the recipe for that compound.

Example:

H₂O There are two hydrogen molecules for every one oxygen molecule.

Law of Multiple Proportions states that some elements can combine to form 2 or more totally different compounds, but the ratio of masses in the 2nd element react with a fixed mass of the 1st element in a simple whole # ratio.

Example:

H₂O - 2:1
H₂O₂ - 2:2 or 1:1

Naming Compounds:

1. Decide if the compound is ionic (metal + nonmetal) or covalent (nonmetal + nonmetal). Ionic compounds conduct electricity because they have a metal.

2. If it is ionic, write the metal first then the nonmetal with the -ide ending added.

Metal + Nonmetal (ide) *This is also called: Cation + Anion*

3. If it is covalent, name the elements in the order they appear in the chemical formula but you must add the covalent prefixes based on the # of atoms for each element. Add -ide ending to the last element listed in the formula. *Note: The mono- prefix is never added to the 1st element.*

Element	Symbol	-ide Ending
Hydrogen	H	hydride
Carbon	C	carbide
Nitrogen	N	nitride
Oxygen	O	oxide
Bromine	Br	bromide
Phosphorus	P	phosphide
Sulfur	S	sulfide
Chlorine	Cl	chloride
Iodine	I	iodide