

I. Compounds

A. Molecules – are the simplest particles of a compound that maintain the properties of that compound. They are made by combining two or more atoms of any elements.

B. Examples –

H_2O	NaCl	$\text{C}_6\text{H}_{12}\text{O}_6$
K_2SO_4	TiO_2	SO_3

C. Classified as a substance because all molecules of the same compound have the same number of atoms of each element, and therefore the same properties.

II. Chemical Formulas

A. Subscripts represent the number of atoms of that particular element.

B. Parentheses indicate that the elements inside are to be considered as one unit (called a polyatomic ion). Any subscript outside the parentheses must be multiplied by the elements inside to find the total number of elements.

C. Examples

K_2SO_4	2 K	1 S	4 O = 7 atoms
$\text{C}_6\text{H}_{12}\text{O}_6$	6 C	12 H	6 O = 24 atoms
$\text{Al}(\text{OH})_3$	1 Al	3 O	3 H = 7 atoms
$(\text{NH}_4)_2\text{Cr}_2\text{O}_7$	2 N	8 H	2 Cr 7 O = 19 atoms

III. Ionic Compounds

A. definition – are formed by ionic bonds; the unequal sharing of electrons between two atoms. In fact, one atom always gives it electrons to another element.

B. formed when the metallic elements in the compound give their electrons to the nonmetals. Metals always prefer to give; nonmetals prefer to take electrons.

C. When they dissolve in water, the metal separates from the nonmetal to form two separate ions.

1. electrolytes – are ions that are formed when ionic compounds are dissolved in water. They conduct electricity in solution well.

2. dissociation – the process by which water separates ionic compounds into ions.

IV. Covalent Compounds

A. definition – are formed by covalent bonds; the equal or near equal sharing of electrons between two atoms. The only pure covalent compound is formed when two atoms of the same element bond with each other.

B. formed when nonmetals bond with other nonmetals.

V. Molecular Weight

A. definition – the mass of all the atoms of a compound summed together.

B. Examples:

1. H_2S $1.01 + 1.01 + 32.1 = 34.12$ formula units
2. $\text{C}_3\text{H}_8\text{O}$ $3(12.0) + 8(1.01) + 16.0 = 60.08$ formula units
3. $\text{Ba}(\text{NO}_3)_2$ $137.3 + 2(14.0) + 6(16.0) = 261.3$ formula units
4. $(\text{NH}_4)_3\text{PO}_4$ $3(14.0) + 12(1.01) + 31.0 + 4(16.0) = 149.12$ formula units

VI. Naming Compounds

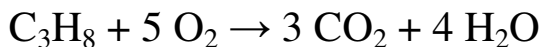
A. Covalent – Use prefixes in front of the name of each of the elements.

1. N_2O_5 dinitrogen pentoxide
2. S_2Cl_2 disulfur dichloride
3. Cl_2O_7 dichlorine heptoxide

B. Ionic – give the name of the cation (metal or positive ion) followed by the name of the anion (nonmetal or negative ion)

1. BaCl_2 barium chloride
2. K_2SO_4 potassium sulfate
3. $\text{Ca}(\text{OH})_2$ calcium hydroxide

VII. Chemical Reactions



- A. Reactants are the compounds that are used to start the reaction; listed to the left of the arrow.
- B. Products are the compounds that are made from the reactants; listed to the right of the arrow.
- C. Balancing Equations: the law of conservation of mass requires that there be the same number of elements on the reactants and products side of the equation.
- D. Examples:

