

Ch 100: Fundamentals for Chemistry

Chapter 3: Elements & Compounds Lecture Notes

Chemical Symbols & Formulas

- Each element has a unique chemical symbol
- Examples of chemical symbols:
 - Hydrogen: H
 - Oxygen: O
 - Aluminum: Al
- Each molecule has a unique chemical formula
- The chemical formula of a molecule indicates
 1. the chemical symbol for each of the elements present
 2. The # of atoms of each element present in the molecule

Examples of chemical formulas:

- Elemental oxygen: O_2 (2 O atoms per molecule)
- Water: H_2O (2 H atoms & 1 O atom)
- Aluminum sulfate: $Al_2(SO_4)_3$ (2 Al, 3 S & 12 O atoms)

Elements and the Periodic Table

The elements can be categorized as:

1. Metals

- The leftmost elements in the periodic table
- Roughly 70% of all of the elements are metals

2. Nonmetals

- The rightmost elements of the periodic table

3. Semimetals (metalloids)

- The elements that reside along the “stair step” between the metals and nonmetals in the Periodic Table
- The properties of semimetals are not quite metallic or non-metallic, but rather somewhere in between

Dmitri Mendeleev (1834-1907)

- Russian born chemist
- Considered one of the greatest science teachers of his era
- He organized the known elements of his time into the first “periodic table”
 - Elements were organized by chemical properties (& by weight) -> called periodic properties
 - Surprisingly, his periodic table predicted the existence of 3 new elements (*which were subsequently discovered*)

