

Chapter 18: Elements and Their Properties

Section 1: Stability in Bonding

Elements: substance that contains only one kind of atom

Compounds: substance in which the atoms of two or more elements combine in a fixed proportion

Chemical formula: shows what elements a compound contains and the exact number of the atoms of each element in a unit of that compound

- Review counting atoms:
 - Subscript tells the quantity
 - No number means #1
 - Parathesis mean to multiply the quantity inside times the number outside
 - Examples:
 - H_2O
 - NaCl
 - CaCO_3
 - NH_4OH
 - $\text{Ca}_3(\text{PO}_4)_2$

Chemical bond formation

- Atoms in group 18 are chemically stable. Why?
 - Its outer energy electrons are full with 8 valence electrons
 - Chemically stable = outer energy level is complete
 - Ne, Ar, Kr, Xe, and Rn all have 8 valence electrons

- *Sharing electrons*
 - Typically, between 2 nonmetals
 - Here atoms share its valence electrons with the other atom to achieve the magic number 8 (or 2 for smaller atoms)
 - Draw Water

Chemical bond: the force that holds atoms together in a compound

- When atoms gain, lose, or share electrons, an attraction forms between the atoms, pulling each atom together to form a compound