**Types of Reactions**

Synthesis (or Combination)

* Two substances (usually elements) combine to form a new compound.

A + B 🡪 AB

Ex:

2 Ca(s) + O2(g) 🡪 2 CaO(s)

Decomposition

* A compound breaks into its component parts.

AB 🡪 A + B

Ex:

2 NaCl(s) 🡪 2 Na(s) + Cl2(g)

Single Displacement (or Single Replacement)

* An element replaces an anion or cation of a compound.

A + BC 🡪 B + AC

Or

A + BC 🡪 C + BA

Ex:

Mg(s) + H2SO4(aq) 🡪 MgSO4(aq) + H2(g)

* In this example, our magnesium and hydrogen are “switching” places. Magnesium substitutes in and hydrogen substitutes out.

Double Displacement (or Double Replacement)

* Cations from two compounds exchange partners.

AB + CD 🡪 AD + CB

* A precipitate may form. This is an insoluble solid indicated by (s) or a .

Ex:

BaCl2(aq) + Na2SO4(aq) 🡪 BaSO4(s) + 2 NaCl(aq)

* In this example, barium and sodium “swap” places.

Combustion (or Oxidation)

* An organic compound (containing C, H, and/or O) burns with O2.
* Oxygen is a reactant
* Typically produces heat
* Produces carbon dioxide and water

CxHyOz + O2 🡪 CO2 + H2O

Ex:

CH4(g) + 2 O2(g) 🡪 CO2(g) + 2 H2O(g)

Neutralization

* An acid and a base react to form a salt and water.

H X + Y OH 🡪 H2O + Y X

Ex:

HCl(aq) + NaOH(aq) 🡪 H2O(l) + NaCl(aq)

\*\* Activity series is a list of elements that talks about how active an element is.\*\*

**Decreasing Activity** **Metals** **Non- Metals**

Lithium Fluorine

Potassium Chlorine

Calcium Bromine

Sodium Iodine

Magnesium

Aluminum

Zinc

Chromium

Iron

Nickel

Tin

Lead

\*\*Hydrogen\*\*

Copper

Silver

Mercury

Platinum

Gold