**Synthesis/composition Reactions**

1. Reactions of elements with oxygen and sulfur

 ex: 8Ba + S8 🡪 8 BaS

 ex: 2Zn + O2 🡪 2 ZnO

2. Reactions of metals with halogens.

 ex: 2Al + 3Cl2 🡪 2 AlCl3

3. Synthesis reactions with oxides

 a. metallic oxide + water 🡪 metallic hydroxide

 ex: CaO + H2O 🡪 Ca(OH)2

 b. nonmetallic oxide + water 🡪 acid

 ex: SO2 + H2O 🡪 H2SO3

 c. metallic oxide + nonmetallic oxide 🡪 salt

 ex: CaO + CO2 🡪 CaCO3

**Decomposition Reactions**

1. Binary compounds

 ex:

2. Metallic carbonates 🡪 metallic oxide and carbon dioxide

 ex:

3. Metallic hydroxides 🡪 metallic oxide and water

 ex:

4. Metallic chlorates 🡪 metallic chloride and oxygen

 ex:

5. Acids 🡪 nonmetallic oxide and water

 ex:

**Single-Replacement Reactions**

1. Replacement of a metal in a compound by another metal

 ex:

2. Replacement of hydrogen in water by a metal

 a. active metals (Li, K, Ba, Ca, and Na) – produce hydroxides

 ex:

 b. less active metals (Mg, Al, Mn,Zn,Cr,Fe, and Cd) - produce oxides

 ex:

3. Replacement of hydrogen in an Acid by a metal

 ex:

4. Replacement of Halogens

 ex:

**Double-Replacement Reactions**

 ex:

**Combustion Reactions**

1. Organic compound + oxygen 🡪 carbon dioxide and water

 ex: C3H8 + 5O2 🡪 3CO2 + 4H2O