# **Types of Chemical Reactions**

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- 5 Types of Chemical Reactions:
  - Synthesis
  - Decomposition
  - Single Replacement
  - Double Replacement
  - Combustion



Multiple reactants with one single product

### Generalized Reaction: A + B $\rightarrow$ AB

Example: 2 Na +  $Cl_2 \rightarrow 2$  NaCl

### Decomposition

#### One ingle reactant with multiple products

### Generalized Reaction: AB $\rightarrow$ A + B

### Example: 2 NaOH $\rightarrow$ Na<sub>2</sub>O + H<sub>2</sub>O

# **Single Replacement**

 One free element replaces an element in the compound

### Generalized Reaction: A + BC $\rightarrow$ AC + B

Example: 2 Al + CuCl<sub>2</sub>  $\rightarrow$  2 AlCl<sub>3</sub> + 3 Cu

## **Double Replacement**

 Exchange of ions between compounds (anion and anion switch places)

### Generalized Reaction: AB + CD $\rightarrow$ AD + CB

Example: 2 KI + Pb(NO<sub>3</sub>)<sub>2</sub>  $\rightarrow$  PbI<sub>2</sub> + 2 KNO<sub>3</sub>

# Combustion

O<sub>2</sub> reacts with a second compound (which contains carbon and hydrogen) producing CO<sub>2</sub> and H<sub>2</sub>O

### Generalized Reaction: $C_xH_y + O_2 \rightarrow CO_2 + H_2O$

Example:  $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O_2$