

# Chemical Reactions



# Chemical Reaction Types

- A chemical reaction is a process that is usually characterized by a chemical change in which the starting materials (reactants) are different from the products.
- Chemical reactions tend to involve the motion of electrons, leading to the formation and breaking of chemical bonds.
- There are several different types of chemical reactions and many ways of classifying them.

# Synthesis Reaction

- In a synthesis reaction, two or more chemical reactants combine to form a more complex product.



- The combination of iron and sulfur to form iron (II) sulfide is an example of a synthesis reaction:

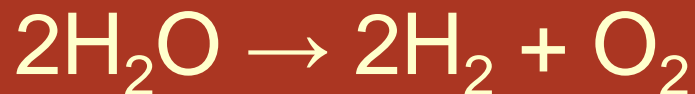


# Decomposition Reaction

- In a decomposition reaction, a compound is broken into smaller chemical components.



- The electrolysis of water into oxygen and hydrogen gas is an example of a decomposition reaction:



# Single Displacement or Substitution Reaction

- A substitution or single displacement reaction is characterized by one element being displaced from a compound by another element.



- An example of a substitution reaction occurs when zinc combines with hydrochloric acid. The zinc replaces the hydrogen:



# Double Displacement Reaction

- In a double displacement reaction two compounds exchange bonds or ions in order to form different compounds.



- An example of a double displacement reaction occurs between sodium chloride and silver nitrate to form sodium nitrate and silver chloride.



# Combustion

- A combustion reaction is a type of redox reaction in which a combustible material combines with an oxidizer to form oxidized products and generate heat (exothermic reaction).
- Usually, in a combustion reaction oxygen (O<sub>2</sub>) combines with another organic compound to form carbon dioxide and water.
- An example of a combustion reaction is the burning of naphthalene:



# Hydrolysis Reaction

- A hydrolysis reaction involves the breakdown of a water molecule. The general form for a hydrolysis reaction is:

