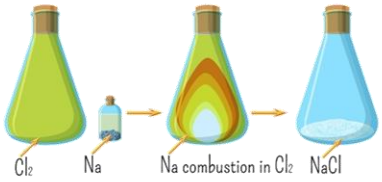
Chemical Bonds & Equations

Section 5: Chemical Reactions - Rates, Types, & Energy

There are many types of chemical reactions that can be grouped by their similar reactions. In a **synthesis reaction**, two or more substances combine to form another substance. An example of this can be seen when oxygen is combined with iron in the presence of water to form hydrated iron (II) oxide or rust.

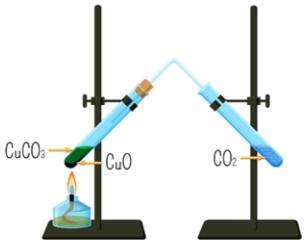
Synthesis reaction



$2Na + Cl_2 \rightarrow 2NaCl$

In a **decomposition reaction**, the reverse happens. One substance breaks down or decomposes into two or more simpler substances. Often this type of reaction requires heat, light, or electricity.

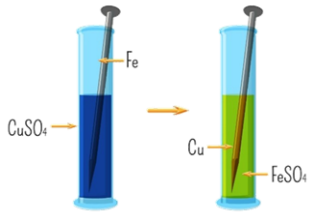
Decomposition reaction



$CuCO_3 \rightarrow CuO + CO_2$

A **single-displacement reaction** is a reaction in which one element replaces another in a compound.

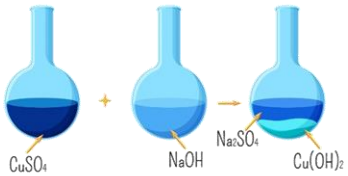
Single displacement reaction



$Fe + CuSO_4 \rightarrow Cu + FeSO_4$

A **double-displacement** reaction is one that results in a precipitate, water, or gas when a positive ion of one compound swaps with a positive ion of another compound.

Double displacement reaction



$2NaOH + CuSO_4 \rightarrow Cu(OH)_2 + Na_2SO_4$

Chemical Bonds & Equations

Section 5: Chemical Reactions - Rates, Types, & Energy Continued

Chemical reactions involve an exchange in energy. An **exothermic reaction** is a reaction in which energy is released in the form of heat. The burning of wood or exploding fireworks are examples. An **endothermic reaction** is a reaction in which the heat energy is absorbed, such as photosynthesis. A **catalyst** speeds up a chemical reaction without itself being permanently changed. An **inhibitor** prevents or slows a chemical reaction or interferes with the catalyst.

Review:

1. What happens during a synthesis reaction?
2. What happens in a single-displacement reaction?
3. Compare an exothermic reaction to an endothermic reaction.