

Section 6.7

Types of chemical reactions:

Synthesis and decomposition

Elements can be classified into different chemical families. All members of a chemical family react in a similar way.

Most chemical reactions can be grouped into four categories:

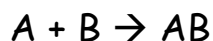
1. Synthesis
2. Decomposition
3. Single displacement
4. Double displacement

Knowledge of these types of reactions is useful for two reasons:

1. We can better understand experimental observation of the behavior of substances in chemical reactions.
2. We can predict the products of unknown reactions

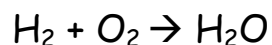
Combination reactions

1. Synthesis reactions involve the combination of smaller atoms / molecules into larger molecules. Synthesis reaction general formula:

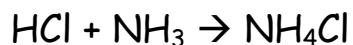


Example :

hydrogen + oxygen \rightarrow water

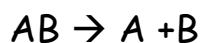


hydrogen chloride + ammonia \rightarrow ammonium chloride



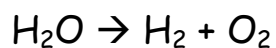
Decomposition reactions

1. Involve the splitting of a large molecule into elements or smaller molecules. The general formula is



Example:

Water \rightarrow Hydrogen + Oxygen



Nitrogen tri iodide \rightarrow nitrogen + iodine



Ammonium nitrate \rightarrow nitrous oxide + water

