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 if 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:

A + B 🡪 AB

Example :

hydrogen + oxygen 🡪 water

H2 + O2 🡪 H2O

hydrogen chloride + ammonia 🡪 ammonium chloride

HCl + NH3 🡪 NH4Cl

Decomposition reactions

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

AB 🡪 A +B

Example:

Water 🡪 Hydrogen + Oxygen

H2O 🡪 H2 + O2

Nitrogen tri iodide 🡪 nitrogen + iodine

NI3 🡪 N2 + I2

Ammonium nitrate 🡪 nitrous oxide + water

NH4NO3 🡪 N2O + H2O