

(Ch. 21) Types of Chemical Reactions

- Many chemical reactions have defining _____ which allow them to be classified as to type.

**Types of Chemical Reactions**

The four types of chemical reactions in this unit that you need to know are:

- _____
- _____
- _____
- _____

**Synthesis Reactions**

Two or more substances _____ to form _____.

- The general form is _____

Example:

- Magnesium + oxygen \rightarrow _____
- $2\text{Mg} + \text{O}_2 \rightarrow$ _____

Synthesis Reactions Example:

- Write the ions: Balance the charges: _____
- _____
- Balance the equation: $\text{K} + \text{Cl}_2 \rightarrow$ _____

More Synthesis Reactions...

- $\text{SO}_2 + \text{H}_2\text{O} \rightarrow$ _____
- $\text{BaO} + \text{H}_2\text{O} \rightarrow$ _____

**Decomposition Reactions**

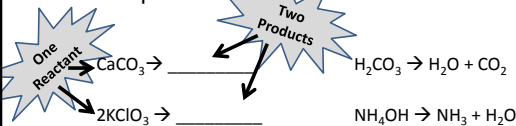
_____ substance reacts to form _____ substances.

- The general form is $\text{AX} \rightarrow$ _____

Example:

- Water can be decomposed by electrolysis.
- $2\text{H}_2\text{O} \rightarrow$ _____

More Decomposition Reactions...

**Single Replacement Reactions**

A _____ will replace a _____ ion in a compound.

- The general form is $\text{A} + \text{BX} \rightarrow$ _____

A _____ will replace a _____ ion in a compound.

- The general form is $\text{Y} + \text{BX} \rightarrow$ _____

Single Replacement Reactions

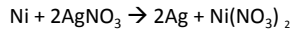
Example:



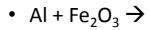
- _____ replaces the metallic ion Ag^+ .



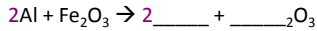
- Balance the equation:



Another Example:



_____ will replace iron(III).



Single Replacement Reactions

An active nonmetal can replace a less active nonmetal.

- The _____ (F_2 , Cl_2 , Br_2 , I_2) reactions are good examples.
- _____ is the most active and _____ is the least.
- $\text{Cl}_2 + 2\text{NaI} \rightarrow 2\text{NaCl} + \text{I}_2$

Double Replacement Reactions

Ions of two compounds _____ with each other.

- The general form is $\text{AX} + \text{BY} \rightarrow \text{_____}$

Double Replacement Reactions

- $\text{NaOH} + \text{CuSO}_4 \rightarrow$
 - The _____ and _____ switch places.
 - Na^+ combines with SO_4^{2-} to form _____.
 - Cu^{2+} combines with OH^- to form _____.
- $$\text{NaOH} + \text{CuSO}_4 \rightarrow \text{_____}$$
- $$2\text{NaOH} + \text{CuSO}_4 \rightarrow \text{_____}$$

Double Replacement

- $\text{CuSO}_4 + \text{Na}_2\text{CO}_3 \rightarrow$
 - Cu^{2+} combines with CO_3^{2-} to form _____.
 - Na^+ combines with SO_4^{2-} to form _____.
- $$\text{CuSO}_4 + \text{Na}_2\text{CO}_3 \rightarrow \text{_____}$$
-
- $\text{Na}_2\text{CO}_3 + \text{HCl} \rightarrow$
 - Na^+ combines with Cl^- to form _____.
 - H^+ combines with CO_3^{2-} to form _____.
- $$\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow \text{_____}$$

Practice

Classify each of the following as to type:

- $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$
- $\text{Ca} + 2\text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{H}_2$
- $2\text{CO} + \text{O}_2 \rightarrow 2\text{CO}_2$
- $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$
- $\text{FeS} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2\text{S}$

Complete the equation and classify:

- $\text{Zn} + \text{HCl} \rightarrow ?$