

Types of chemical reactions

Type of reaction		Equation	Examples
1	Synthesis	$A + B \rightarrow AB$	Synthesis of ammonia $N_2 + 3 H_2 \rightarrow 2 NH_3$
Two or more substances combine to form only one product.			
2	Decomposition	$AB \rightarrow A + B$	Decomposition of water $2 H_2O \rightarrow 2 H_2 + O_2$ Decomposition of calcium carbonate $CaCO_3 \rightarrow CaO + CO_2$
One reactant breaks down to form two or more simpler products. Basically, synthesis and decomposition reactions are opposites.			
3	Combustion (burning)	$\dots + O_2 \rightarrow CO_2 + H_2O$	Combustion of methane $CH_4 + 2 O_2 \rightarrow CO_2 + 2 H_2O$ Combustion of ethanol $C_2H_6O + 3 O_2 \rightarrow 2 CO_2 + 3 H_2O$
A reactant (an organic compound in most cases) combines with oxygen and produces carbon dioxide and water.			

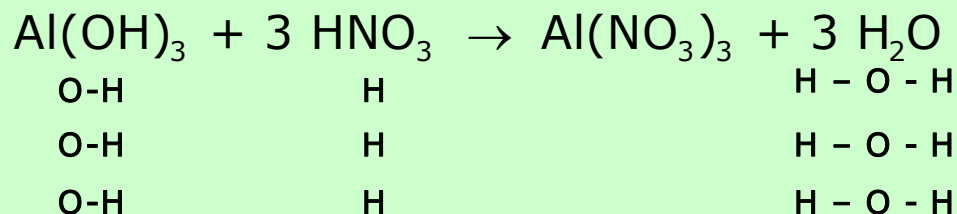
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4	Replacement	$AB + C \rightarrow AC + B$	Metal + acid reaction
<p>One element replaces another one from a compound.</p> <p>Very often, hydrogen is replaced from an acid by a metallic element.</p>			$Ca + 2 HCl \rightarrow CaCl_2 + H_2$ $2 Al + 6 HNO_3 \rightarrow 2 Al(NO_3)_3 + 3 H_2$

5	Neutralization (acid-base)	<p>acid + hydroxide \rightarrow salt + H_2O</p>	$Ca(OH)_2 + 2 HCl \rightarrow CaCl_2 + 2 H_2O$
<p>An acid and a hydroxide react to form a salt and water.</p>			$Al(OH)_3 + 3 HNO_3 \rightarrow Al(NO_3)_3 + 3 H_2O$

Bear in mind that...

...in order to get a balanced equation and to know which salt is produced, it is interesting to think about how water is formed. The OH group of the hydroxide and the H of the acid react to form a water molecule.



How must be written an ELEMENT in a chemical equation?

- Metallic elements: without any subscript Na, Fe, Cu, Al ...
- Some non-metallic elements: H_2 , O_2 , N_2 , Cl_2 , F_2 , Br_2