

Writing Chemical Equations

For every chemical reaction, reactants interact with each other to form new substances, called products. We can represent chemical reactions using equations, with the reactants on the left and products on the right side. We use the symbols below to make it easier.

chemical reaction
a process in which substances interact, causing different substances with different properties to form

Table 3.1 Symbols Used in Chemical Equations

Symbol	Purpose
+	Indicates that two or more reactants or products are involved
→	Shows the direction of the chemical change that is taking place
⇌	Indicates a reversible reaction

Symbol	Purpose
(s)	Identifies a solid state
(ℓ)	Identifies a liquid state
(g)	Identifies a gaseous state
(aq)	Identifies an aqueous solution

chemical equation
a condensed statement that expresses chemical change using symbols and chemical names or formulas

Chemical reactions can be shown in two ways:

WORD EQUATIONS	CHEMICAL EQUATIONS
- using words to describe a chemical reaction	- using chemical symbols to describe a chemical reaction
	- includes state sign
	- must be balanced
iron + oxygen → iron(III) oxide	$2\text{Fe}_{(s)} + 3\text{O}_{2(g)} \rightarrow 2\text{Fe}_2\text{O}_{3(s)}$

reactant a starting substance in a chemical reaction

product a substance that is formed in a chemical reaction

1) Solid calcium metal is placed in liquid water producing aqueous calcium hydroxide and hydrogen gas.

Word Equation:

Balanced chemical equation:

2) Solid calcium oxide and carbon dioxide gas are formed when solid calcium carbonate decomposes.

Word Equation:

Balanced chemical equation:

3) Silver oxide is produced when solid silver metal and oxygen gas are combined.

Word Equation:

Balanced chemical equation:

4) Zinc metal and lead(II)nitrate solution react to form aqueous zinc nitrate and solid lead.

Word Equation:

Balanced chemical equation:

5) Hypochlorous acid reacts with hydrochloric acid to release chlorine gas and water

Word Equation:

Balanced chemical equation: