



## Word Equations

In a chemical equation, substances are represented by their chemical formulas. In a word equation, substances are represented in words, using the proper nomenclature. An arrow ( $\rightarrow$ ) shows the progression from reactants to products. The  $\Delta$  symbol in  $\xrightarrow{\Delta}$  means that heat must be applied to initiate the reaction. A plus sign (+) is used to separate one reactant (or product) from another.

*Example 1:* Write as a word equation:  $4 \text{Al} + 3 \text{O}_2 \xrightarrow{\Delta} 2 \text{Al}_2\text{O}_3$

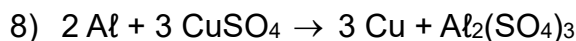
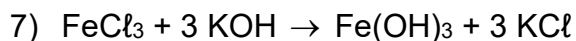
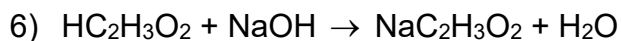
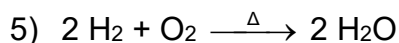
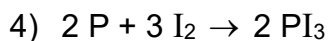
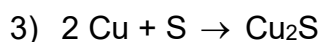
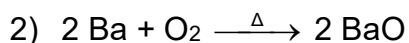
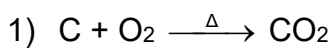
*Solution:* aluminum + oxygen  $\xrightarrow{\text{heat}}$  aluminum oxide

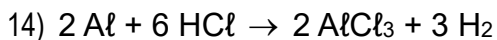
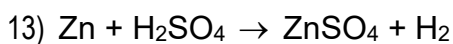
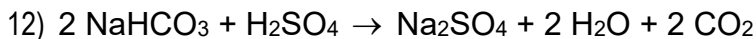
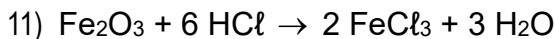
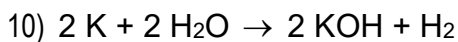
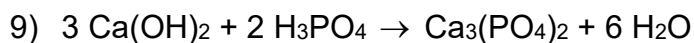
Note that we do not need to include coefficients in a word equation.

### EXERCISES

Express the following chemical equations as word equations:

*\*\* In the case of any chemicals that have different names in gas form versus aqueous form, assume the reaction is happening in aqueous solution. \*\**





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## SOLUTIONS

(1) carbon + oxygen  $\xrightarrow{\text{heat}}$  carbon dioxide

(2) barium + oxygen  $\xrightarrow{\text{heat}}$  barium oxide

(3) copper + sulphur  $\rightarrow$  copper (I) sulphide

(4) phosphorus + iodine  $\rightarrow$  phosphorus triiodide

(5) hydrogen + oxygen  $\xrightarrow{\text{heat}}$  water

(6) acetic acid + sodium hydroxide  $\rightarrow$  sodium acetate + water

(7) iron (III) chloride + potassium hydroxide  $\rightarrow$  iron (III) hydroxide + potassium chloride

(8) aluminum + copper (II) sulphate  $\rightarrow$  copper + aluminum sulphate

(9) calcium hydroxide + phosphoric acid  $\rightarrow$  calcium phosphate + water

(10) potassium + water  $\rightarrow$  potassium hydroxide + hydrogen

(11) iron (III) oxide + hydrochloric acid  $\rightarrow$  iron (III) chloride + water

(12) sodium bicarbonate + sulphuric acid  $\rightarrow$  sodium sulphate + water + carbon dioxide

(13) zinc + sulphuric acid  $\rightarrow$  zinc sulphate + hydrogen

(14) aluminum + hydrochloric acid  $\rightarrow$  aluminum chloride + hydrogen

