

Use with textbook pages 202–203, 206–211.

Chemical reactions and chemical equations

Rewrite the following sentences as chemical word equations. Then write the skeleton equation and balance the equation.

1. Iron combines with oxygen to form rust, which is also known as iron(II) oxide.

Word equation: iron + oxygen $\rightarrow$ iron(II) oxide

Balanced equation: $2\text{Fe} + \text{O}_2 \rightarrow 2\text{FeO}$

2. A solution of hydrogen chloride reacts with sodium carbonate to produce carbon dioxide, sodium chloride, and water.

Word equation: hydrogen chloride + sodium carbonate $\rightarrow$ carbon dioxide + sodium chloride + water

Balanced equation: $2\text{HCl} + \text{Na}_2\text{CO}_3 \rightarrow \text{CO}_2 + 2\text{NaCl} + \text{H}_2\text{O}$

3. When aluminum metal is exposed to oxygen, a metal oxide called aluminum oxide is formed.

Word equation: aluminum + oxygen $\rightarrow$ Al_2O_3

Balanced equation: $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$

4. Water reacts with powered sodium oxide to produce a solution of sodium hydroxide.

Word equation: water + sodium oxide $\rightarrow$ sodium hydroxide

Balanced equation: $\text{H}_2\text{O} + \text{Na}_2\text{O} \rightarrow 2\text{NaOH}$

5. Hydrogen gas reacts with nitrogen trifluoride gas to form nitrogen gas and hydrogen fluoride.

Word equation: hydrogen + nitrogen trifluoride $\rightarrow$ nitrogen + hydrogen fluoride

Balanced equation: $3\text{H}_2 + 2\text{NF}_3 \rightarrow \text{N}_2 + 6\text{HF}$

6. Chromium(III) sulphate reacts with potassium carbonate to form chromium(III) carbonate and potassium sulphate.

Word equation: chromium(III) sulphate + potassium carbonate $\rightarrow$ chromium(III) carbonate + potassium sulphate

Balanced equation: $\text{Cr}_2(\text{SO}_4)_3 + 3\text{K}_2\text{CO}_3 \rightarrow \text{Cr}_2(\text{CO}_3)_3 + 3\text{K}_2\text{SO}_4$

7. Potassium chlorate when heated becomes oxygen gas and potassium chloride.

Word equation: potassium chlorate $\rightarrow$ oxygen + potassium chloride

Balanced equation: $2\text{KClO}_3 \rightarrow 3\text{O}_2 + 2\text{KCl}$

8. A piece of metallic zinc is placed in a blue solution of copper(II) sulphate. A reddish brown layer of metallic copper forms in a clear solution of zinc sulphate.

Word equation: zinc + copper(II) sulphate $\rightarrow$ copper + zinc sulphate

Balanced equation: $\text{Zn} + \text{CuSO}_4 \rightarrow \text{Cu} + \text{ZnSO}_4$