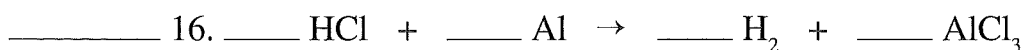
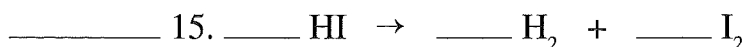
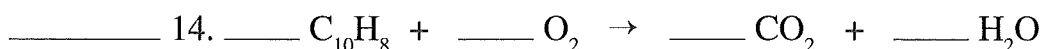
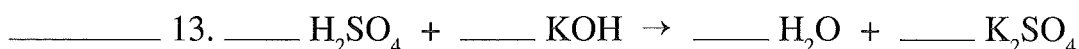
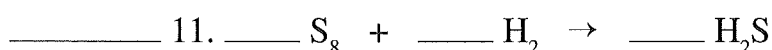
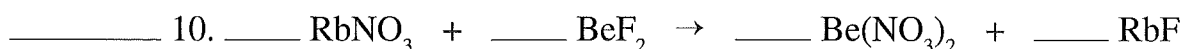
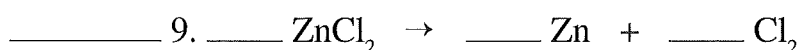
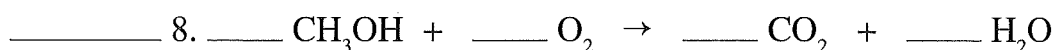
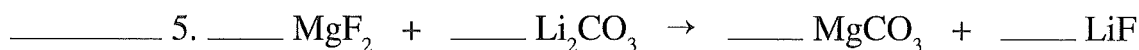
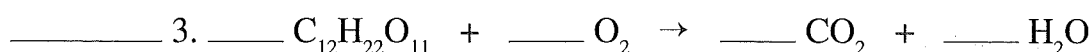
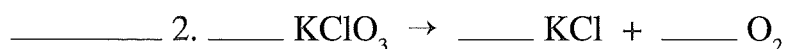
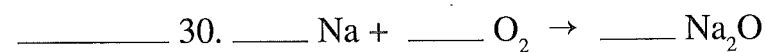
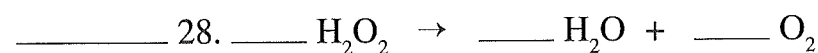
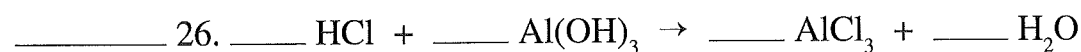
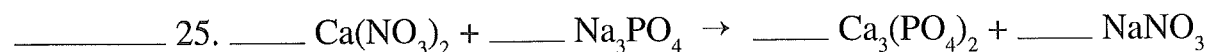
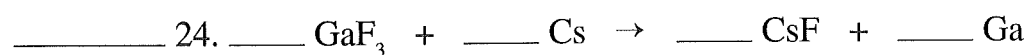
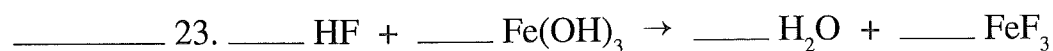
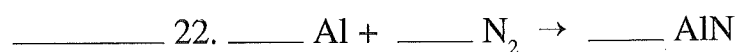
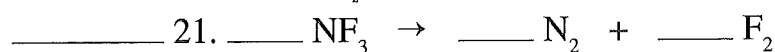
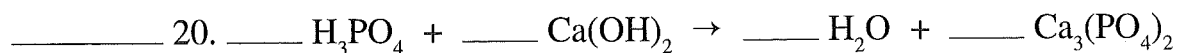
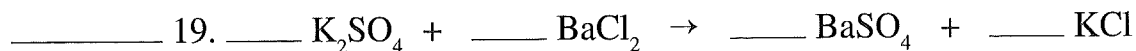
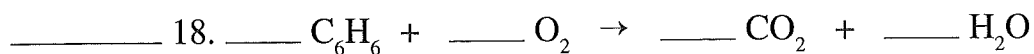
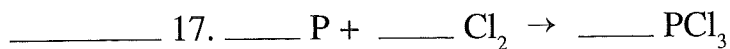


Use with textbook pages 256-267.

## Classifying chemical reactions

Classify each of the following reactions as synthesis (S), decomposition (D), single replacement (SR), double replacement (DR), neutralization (N), or combustion (C). Place the correct letter representing the reaction type in the space provided. Then balance the chemical equation by placing the correct coefficients in the equation.





Use with textbook pages 256-267.

## Types of chemical reactions—Word equations

Classify each of the following chemical reactions as synthesis (S), decomposition (D), single replacement (SR), double replacement (DR), or neutralization (N). Then write a **balanced equation** for each word equation.

\_\_\_\_\_ 1. magnesium + sulphur  $\rightarrow$  magnesium sulphide

---

\_\_\_\_\_ 2. potassium hydroxide + sulphuric acid  $\rightarrow$  water + potassium sulphate

---

\_\_\_\_\_ 3. chlorine + potassium iodide  $\rightarrow$  potassium chloride + iodide

---

\_\_\_\_\_ 4. aluminum chloride + sodium hydroxide  $\rightarrow$  aluminum hydroxide + sodium chloride

---

\_\_\_\_\_ 5. lead(II) oxide  $\rightarrow$  lead + oxygen

---

\_\_\_\_\_ 6. magnesium + silver nitrate  $\rightarrow$  silver + magnesium nitrate

---

\_\_\_\_\_ 7. cadmium(II) nitrate + ammonium sulphide  $\rightarrow$  cadmium(II) sulphide + ammonium nitrate

---

\_\_\_\_\_ 8. tin(IV) hydroxide + hydrogen bromide  $\rightarrow$  water + tin(IV) bromide

---

\_\_\_\_\_ 9. sodium + oxygen  $\rightarrow$  sodium oxide

---

\_\_\_\_\_ 10. sodium nitride  $\rightarrow$  sodium + nitrogen

---

\_\_\_\_\_ 11. calcium hydroxide + phosphoric acid  $\rightarrow$  water + calcium phosphate

\_\_\_\_\_ 12. barium chloride + sodium carbonate  $\rightarrow$  barium carbonate + sodium chloride

\_\_\_\_\_ 13. zinc + nickel(II) nitrate  $\rightarrow$  zinc nitrate + nickel

\_\_\_\_\_ 14. antimony + iodine  $\rightarrow$  antimony(III) iodide

\_\_\_\_\_ 15. carbon dioxide  $\rightarrow$  carbon + oxygen

\_\_\_\_\_ 16. iron(III) sulphate + lead  $\rightarrow$  lead(II) sulphate + iron

\_\_\_\_\_ 17. barium nitrate + ammonium carbonate  $\rightarrow$  ammonium nitrate + barium carbonate

\_\_\_\_\_ 18. zinc hydroxide + hydrochloric acid  $\rightarrow$  water + zinc chloride

\_\_\_\_\_ 19. ammonium carbonate + magnesium chloride  $\rightarrow$  ammonium chloride + magnesium carbonate

\_\_\_\_\_ 20. rubidium hydroxide + sulphuric acid  $\rightarrow$  water + rubidium sulphate

Use with textbook pages 256–267.

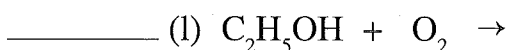
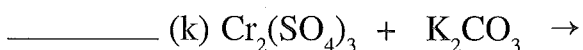
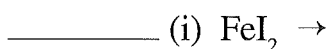
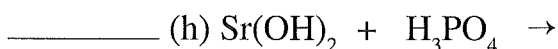
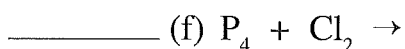
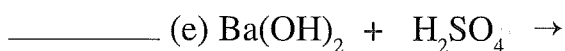
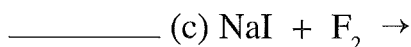
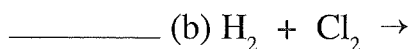
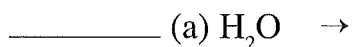
## Predicting the products

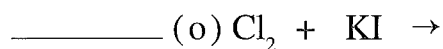
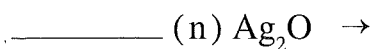
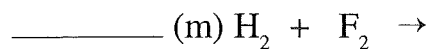
1. For each of the following:

I. predict the products

II. classify the reaction as synthesis (S), decomposition (D), single replacement (SR), double replacement (DR), neutralization (N), or combustion (C)

III. write a balanced equation



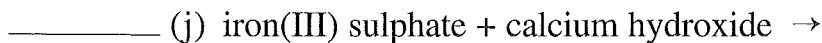
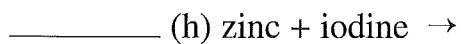
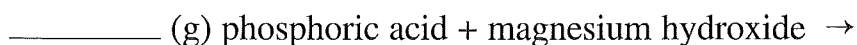
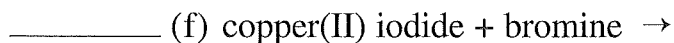
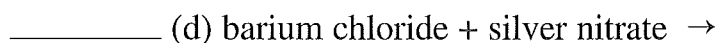
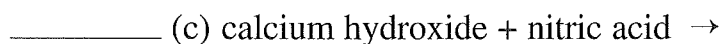
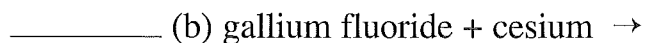
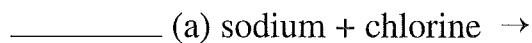


2. For each of the following:

I. complete the word equation by predicting the products

II. classify the reaction as synthesis (S), decomposition (D), single replacement (SR), double replacement (DR), or neutralization (N)

III. write a balanced equation for each word equation



Use with textbook pages 256–267.

## Types of chemical reactions

Match each Chemical Equation to a Reaction Type below. Each Reaction Type may be used only once.

### Chemical Equation

- \_\_\_\_\_  $2 \text{KClO}_3 \rightarrow 2 \text{KCl} + 3 \text{O}_2$
- \_\_\_\_\_  $16 \text{Al} + 3 \text{S}_8 \rightarrow 8 \text{Al}_2\text{S}_3$
- \_\_\_\_\_  $\text{LiOH} + \text{HNO}_3 \rightarrow \text{H}_2\text{O} + \text{LiNO}_3$
- \_\_\_\_\_  $2 \text{C}_6\text{H}_{14} + 19 \text{O}_2 \rightarrow 14 \text{H}_2\text{O} + 12 \text{CO}_2$
- \_\_\_\_\_  $2 \text{AgNO}_3 + \text{Cu} \rightarrow \text{Cu}(\text{NO}_3)_2 + 2 \text{Ag}$
- \_\_\_\_\_  $\text{Pb}(\text{NO}_3)_2 + \text{K}_2\text{CrO}_4 \rightarrow \text{PbCrO}_4 + 2 \text{KNO}_3$

### Reaction Type

- synthesis
- combustion
- neutralization
- decomposition
- single replacement
- double replacement

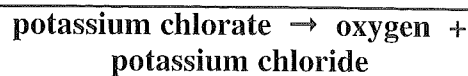
7. What type of chemical reaction involves two smaller molecules reacting to produce one larger molecule?

- synthesis
- combustion
- decomposition
- single replacement

8. Carbon dioxide gas can be broken down into solid carbon and oxygen gas. What type of reaction is this?

- synthesis
- combustion
- neutralization
- decomposition

Use the following word equation to answer question 9.



9. What type of reaction is represented by the word equation?

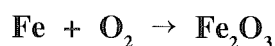
- synthesis
- decomposition
- single replacement
- double replacement

10. Which of the following represents a single replacement reaction?

I.	$\text{Sn} + 2 \text{AgNO}_3 \rightarrow \text{Sn}(\text{NO}_3)_2 + 2 \text{Ag}$
II.	gold(II) cyanide + zinc $\rightarrow$ gold + zinc cyanide
III.	Magnesium iodide reacts with bromine gas to produce magnesium bromide and iodine.

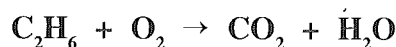
- I and II only
- I and III only
- II and III only
- I, II, and III

11. Which set of ordered coefficients balances the following equation?



- 2, 1, 1
- 2, 2, 2
- 4, 2, 3
- 4, 3, 2

12. What coefficient is needed for water in order to balance the following equation?



- 2
- 3
- 4
- 6

13. Hydrochloric acid can be used to neutralize barium hydroxide. What is the formula for the salt produced by this neutralization?

- $\text{BaCl}_2$
- $\text{Ba}(\text{ClO})_2$
- $\text{Ba}(\text{ClO}_2)_2$
- $\text{Ba}(\text{ClO}_3)_2$

14. Which reactants form the salt  $\text{MgSO}_4$  in a neutralization reaction?

- A.  $\text{SO}_2$  and  $\text{MgO}_2$
- B.  $\text{H}_2\text{S}$  and  $\text{MgOH}$
- C.  $\text{H}_2\text{O}$  and  $\text{Mg}(\text{OH})_2$
- D.  $\text{H}_2\text{SO}_4$  and  $\text{Mg}(\text{OH})_2$

15. Given the incomplete equation of a chemical reaction:  $\text{C}_9\text{H}_6\text{O}_4 + \text{O}_2 \rightarrow$

Which of the following are the products formed from this reaction?

I.	$\text{H}_2$
II.	$\text{H}_2\text{O}$
III.	$\text{CO}_2$

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II, and III

16. Given the incomplete equation of a chemical reaction:

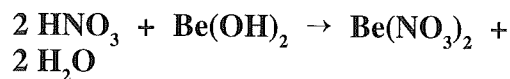
barium chloride + ammonium carbonate  $\rightarrow$

Which of the following are the products formed from this reaction?

I.	$\text{H}_2\text{O}$
II.	$\text{NH}_4\text{Cl}$
III.	$\text{BaCO}_3$

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II, and III

Use the following chemical reaction to answer question 17.



17. Which of the following statements is true?

I.	$\text{HNO}_3$ is an acid.
II.	$\text{Be}(\text{NO}_3)_2$ is a base.
III.	This is a neutralization reaction.
IV.	The products of this reaction are a salt and water.

- A. I, II, and III only
- B. I, II, and IV only
- C. I, III, and IV only
- D. II, III, and IV only

18. Sodium nitrate is produced as a result of mixing a solution of cadmium(II) nitrate with a solution of sodium sulphide. What is the other compound formed from this reaction?

- A.  $\text{CdS}$
- B.  $\text{CdSO}_4$
- C.  $\text{NaS}_2$
- D.  $\text{CdNO}_4$