

## 11.1

## DESCRIBING CHEMICAL REACTIONS

## Section Review

## Objectives

- Explain how to write a word equation
- Describe how to write a skeleton equation
- List the steps for writing a complete chemical equation

## Vocabulary

- chemical equation
- skeleton equation
- catalyst
- coefficients
- balanced equation

## Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

- A chemical reaction can be concisely represented by a chemical **1**. \_\_\_\_\_
- 1** \_\_\_\_\_. The substances that undergo a chemical change are the **2**. \_\_\_\_\_
- 2** \_\_\_\_\_. The new substances formed in a chemical reaction are the **3**. \_\_\_\_\_
- 3** \_\_\_\_\_. In accordance with the law of conservation of **4** \_\_\_\_\_, **4**. \_\_\_\_\_
- a chemical equation must be balanced. When balancing an **5**. \_\_\_\_\_
- equation, you place **5** \_\_\_\_\_ in front of reactants and products so **6**. \_\_\_\_\_
- that the same number of atoms of each **6** \_\_\_\_\_ are on each side of **7**. \_\_\_\_\_
- the equation. An equation must never be balanced by changing the **8**. \_\_\_\_\_
- 7** \_\_\_\_\_ in the chemical formula of a substance. **9**. \_\_\_\_\_
- Special symbols are used to show the physical state of a **10**. \_\_\_\_\_
- substance in a reaction. The symbol for a liquid is **8** \_\_\_\_\_; for **11**. \_\_\_\_\_
- a solid, **9** \_\_\_\_\_; and for a gas, **10** \_\_\_\_\_. A substance dissolved **12**. \_\_\_\_\_
- in water is designated **11** \_\_\_\_\_. If a **12** \_\_\_\_\_ is used to increase
- the rate of a chemical reaction, its formula is written above the arrow.

## Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

- \_\_\_\_\_ 13. In an equation, a substance is shown to be in the gaseous state by placing an upward-pointing arrow after its formula.
- \_\_\_\_\_ 14. The symbol  $\Delta$  placed over the arrow in an equation means that heat is supplied to the reaction.
- \_\_\_\_\_ 15. Atoms are destroyed in a chemical reaction.
- \_\_\_\_\_ 16. A skeleton equation is not a balanced equation.

## Part C Matching

Match each description in Column B to the correct term in Column A.

### Column A

- \_\_\_\_\_ 17. chemical equation
- \_\_\_\_\_ 18. skeleton equation
- \_\_\_\_\_ 19. catalyst
- \_\_\_\_\_ 20. coefficients
- \_\_\_\_\_ 21. balanced equation
- \_\_\_\_\_ 22. reactants
- \_\_\_\_\_ 23. products

### Column B

- a. an equation in which each side has the same number of atoms of each element
- b. a substance that speeds up the rate of a reaction
- c. a symbolic way of describing a chemical reaction
- d. substances that undergo chemical change
- e. a chemical equation that does not indicate the amounts of substances involved
- f. new substances formed in a chemical reaction
- g. numbers used to balance a chemical equation

## Part D Questions and Problems

Answer the following in the space provided.

24. Write a balanced equation for each of these chemical reactions. Include appropriate symbols from Table 11.1.
- a. Aluminum reacts with aqueous hydrochloric acid to form hydrogen gas and aqueous aluminum chloride.
- \_\_\_\_\_
- b. Acetylene gas ( $C_2H_2$ ) burns in a welding torch with oxygen to form carbon dioxide gas and water vapor.
- \_\_\_\_\_