

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 Δ 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.
- _____