Assessment



Reviewing Content

11.1 Describing Chemical Reactions

- **36.** Identify the reactants and products in each chemical reaction.
 - a. Hydrogen gas and sodium hydroxide are formed when sodium is dropped into water.
 - b. In photosynthesis, carbon dioxide and water react to form oxygen gas and glucose.
- 37. How did John Dalton explain a chemical reaction using his atomic theory?
- **38.** What is the function of an arrow (\longrightarrow) in a chemical equation? A plus sign (+)?
- 39. Write sentences that completely describe each of the chemical reactions shown in these skeleton equations.
 - a. $NH_3(g) + O_2(g) \xrightarrow{Pt} NO(g) + H_2O(g)$
 - **b.** $H_2SO_4(aq) + BaCl_2(aq)$ —

 $BaSO_4(s) + HCl(aq)$

- c. $N_2O_3(g) + H_2O(l) \longrightarrow HNO_2(aq)$
- 40. What is the purpose of a catalyst?
- 41. Balance equations for each item. The formula for each product (object) is given.
 - a. a basketball team

center + forward + guard → team $C + F + G \longrightarrow CF_2G_2$

b. a tricycle

frame + wheel + seat + pedal \longrightarrow tricycle $F + W + S + P \longrightarrow FW_3SP_2$

- 42. The equation for the formation of water from its elements, $H_2(g) + O_2(g) \longrightarrow H_2O(l)$, can be "balanced" by changing the formula of the product to H₂O₂. Explain why this is incorrect.
- 43. Balance the following equations.

a. $PbO_2 \longrightarrow PbO + O_2$

b. $Fe(OH)_3 \longrightarrow Fe_2O_3 + H_2O$

c. $(NH_4)_2CO_3 \longrightarrow NH_3 + H_2O + CO_2$

d. $NaCl + H_2SO_4 \longrightarrow Na_2SO_4 + HCl$

11.2 Types of Chemical Reactions

- 44. What is a characteristic of every combination
- 45. Write balanced chemical equations for the following combination reactions.

a. $Mg + O_2 \longrightarrow$

b. $P + O_2 \xrightarrow{*}$ diphosphorus pentoxide c. $Ca + S \xrightarrow{*}$

- 46. What is a distinguishing feature of every decomposition reaction?
- 47.) Write a balanced chemical equation for each decomposition reaction.

a. $Ag_2O(s) \xrightarrow{\Delta} ?$

b. ammonium nitrate $\xrightarrow{\Delta}$ dinitrogen monoxide + water

48. Use the activity series of metals to write a balanced chemical equation for each singlereplacement reaction.

a. $Au(s) + KNO_3(aq)$ —

b. $Zn(s) + AgNO_3(aq)$ —

c. $Al(s) + H_2SO_4(aq) \longrightarrow$

49. Write a balanced equation for each of the following double-replacement reactions.

a. $H_2C_2O_4(aq) + KOH(aq) \longrightarrow$

b. $CdBr_2(aq) + Na_2S(aq) \longrightarrow$

(Cadmium sulfide is a precipitate.)

- **50.** What substance is common to all combustion reactions?
- 51. Write a balanced equation for the complete combustion of each compound.

a. butene (C₄H₆)

b. acetone (C_3H_6O)

52. Ralance each equation and identify its type.

a. Hf + $N_2 \longrightarrow Hf_3N_4$

b. $Mg + H_2SO_4 \longrightarrow MgSO_4 + H_2$

c. $C_2H_6 + O_2 \longrightarrow CO_2 + H_2O$

d. $Pb(NO_3)_2 + NaI \longrightarrow PbI_2 + NaNO_3$

e. Fe + $O_2 \longrightarrow Fe_3O_4$

11.3 Reactions in Aqueous Solution

53. What is a spectator ion?

54. Write a balanced net ionic equation for the following reactions.

a. $HCl(aq) + Ca(OH)_2(aq) \longrightarrow$

- **b.** $AgNO_3(aq) + AlCl_3(aq) \longrightarrow$ (Silver chloride is a precipitate.)
- 55. Complete each equation and then write a net ionic equation.

a. $Al(s) + H_2SO_4(aq)$ —

b. $HCl(aq) + Ba(OH)_2(aq)$ —

c. $Au(s) + HCl(aq) \longrightarrow$

(43)
$$\omega_1^2 Pbo_2 \longrightarrow 2Pbo + O_2$$

 $\omega_2^2 Pbo_3 \longrightarrow Pe_2 O_3 + 3H_2 O_3$

c)
$$(NH_4)_2(O_3 \rightarrow 2NH_3 + H_2O + CO_2$$

d) $2NOCI + H_2SO_4 \rightarrow NO_2SO_4 + 2HCI$

a)
$$2Mg + O_2 \rightarrow 2MgO$$

b) $4P + 5O_2 \rightarrow 2P_2O_5$

AT) DECOMPOSITION

a)
$$^{2}Ag_{2}O \rightarrow 4Ay + O_{2}$$

18) SINGLE REPLACEMENT

a) Au + KNO₃
$$\rightarrow$$
 NR c)2AI + 3H₂SU₄ \rightarrow 3H₂ + Al₂(SO₄)₃

A DOUBLE REPLACEMENT

(51) COMBUSTION

$$(52)$$
Sa) 3Hf +2N₂ \rightarrow Hf₃N₄ (68) d) Pb(NO₃)₂ +2NaI \rightarrow PbI₂ +2NaNO₃ (58) b) Mg + H₂SO₄ \rightarrow MgSO₄ +H₂Se) 3Fe +2O₂ \rightarrow Fe₃O₄