Answers to problems 41-46 in page 294-295

41. a. $Mg(s) + CuCl_2(aq) \longrightarrow MgCl_2(aq) + Cu(s)$

b. $Pb(NO_3)_2(aq) + Zn(s) \longrightarrow Zn(NO_3)_2(aq) + Pb(s)$

c. $2KI(aq) + Cl_2(g) \longrightarrow 2KCl(aq) + I_2(s)$

d. no reaction

42. a. $2H_2O(l) + Ba(s) \longrightarrow Ba(OH)_2(s) + H_2(g)$

b. $4Ca(s) + O_2(g) \longrightarrow 2CaO(s)$

c. no reaction

d. $4Al(s) + 3O_2(g) \longrightarrow 2Al_2O_3(s)$

43. a. combustion; $2C_2H_6 + 7O_2 \longrightarrow 4CO_2 + 6H_2O$

b. displacement; $3H_2SO_4 + 2Al \longrightarrow Al_2(SO_4)_3 + 3H_2$

c. synthesis; $N_2 + 3Mg \longrightarrow Mg_3N_2$

d. decomposition; $Na_2CO_3 \longrightarrow Na_2O + CO_2$

e. double-displacement; no reaction

44. a. displacement; $2H_2O + 2Li \longrightarrow 2LiOH + H_2$

b. synthesis; $Ca + Br_2 \longrightarrow CaBr_2$

c. double-displacement; $AgNO_3 + HCl \longrightarrow AgCl(s) + HNO_3$

d. decomposition; $2HI \longrightarrow H_2 + I_2$

45. a. combustion; $C_2H_5OH + 3O_2 \longrightarrow 2CO_2 + 3H_2O$

b. double-displacement; $HNO_3 + LiOH \longrightarrow LiNO_3 + HOH(l)$

c. double-displacement; no reaction

d. double-displacement; $Pb(NO_3)_2 + Na_2CO_3 \longrightarrow PbCO_3(s) + 2NaNO_3$

46. a. total: $H^+(aq) + Cl^-(aq) + Na^+(aq) + OH^-(aq) \longrightarrow Na^+(aq) + Cl^-(aq) + H_2O(l)$; net: $H^+(aq) + OH^-(aq) \longrightarrow H_2O(l)$

b. total: $Mg(s) + 2H^+(aq) + 2Cl^-(aq) \longrightarrow Mg^{2+}(aq) + 2Cl^-(aq) + H_2(g)$; net: $Mg(s) + 2H^+(aq) \longrightarrow Mg^{2+}(aq) + H_2(g)$