5.24: write balanced equations for the following:

a) $2HCl_{(aq)} + CaCO_{3(s)} \longrightarrow CO_{2(g)} + H_2O_{(l)} + CaCl_{2(aq)}$

b) $2K_{(s)} + Br_{2(l)} \longrightarrow 2KBr_{(s)}$

c) $C_3H_{8(g)} + 5O_{2(g)} \longrightarrow 3CO_{2(g)} + 4H_2O_{(l)}$

5.25: balance the following equation for the synthesis of hydrazine, N_2H_4, a substance used as rocket fuel.

$4NH_{3(g)} + Cl_{2(g)} \longrightarrow N_2H_{4(l)} + 2NH_4Cl_{(s)}$

5.29: balance the following equations:

a) $8NO_{2(g)} + 2O_{2(g)} \longrightarrow 4N_2O_{5(g)}$

b) $P_4O_{10(s)} + 6H_2O_{(l)} \longrightarrow 4H_3PO_{4(aq)}$

c) $B_2H_{6(l)} + 3O_{2(g)} \longrightarrow B_2O_{3(s)} + 3H_2O_{(l)}$

d) $Cr_2O_{3(s)} + 3CCl_{4(l)} \longrightarrow 2CrCl_{3(s)} + 3COCl_{2(aq)}$

e) $2Fe_3O_{4(s)} + O_{2(g)} \longrightarrow 3Fe_2O_{3(s)}$

5.53: which element is oxidized + which is reduced in the following reactions?

a) $Si_{(s)} + 2Cl_{2(g)} \longrightarrow SiCl_{4(l)}$ — Si = oxidized ; Cl = reduced

b) $Cl_{2(g)} + 2NaBr_{(aq)} \longrightarrow Br_{2(aq)} + 2NaCl_{(aq)}$ — Cl = reduced ; Na = oxidized ; Br = reduced

c) $SbCl_{3(l)} + Cl_{2(g)} \longrightarrow SbCl_{5(s)}$ — Cl = reduced ; Sb = oxidized