Chapter 13
Chemical-Reaction Equilibria

Problem 13.1 Develop expressions for the mole fractions of reacting species as functions of the reaction coordinate for:

(a) A system initially containing 2 mol NH_3 and 5 mol O_2 and undergoing the reaction:

$$4\,NH_3(g) + 5\,O_2(g) \longrightarrow 4\,NO(g) + 6\,H_2O(g)$$

(b) A system initially containing 3 mol H_2S and 5mol O_2 and undergoing the reaction:

$$2\,H_2S(g) + 3\,O_2(g) \longrightarrow 2\,H_2O(g) + 2\,SO_2(g)$$

(c) A system initially containing 3 mol NO_2, 4 mol NH_3, and 1 mol N_2 and undergoing the reaction:

$$6\,NO_2(g) + 8\,NH_3(g) \longrightarrow 7\,N_2(g) + 12\,H_2O(g)$$