

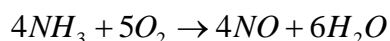
EG3029 Chemical Thermodynamics

Tutorial 8

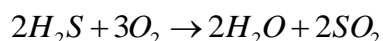
Problem 1:

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

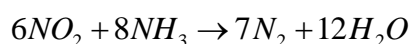
- a) A system initially containing 2 mol NH_3 and 5 mol O_2 and undergoing the reaction:



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



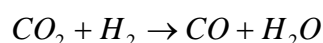
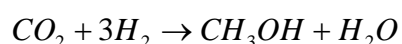
- c) A system initially containing 3 mol NO_2 , 4 mol NH_3 and 1 mol N_2 and undergoing the reaction:

**Problem 2:**

Give the equation for the stoichiometric combustion of 1 mol of a general hydrocarbon, C_xH_y , with oxygen to carbon dioxide and water and develop expressions for the gas phase mole fractions of each species as a function of the reaction coordinate. Initially, 1 mol C_xH_y and the stoichiometric amount of oxygen for complete conversion are present.

Problem 3:

In a reactor, 2 mol carbon dioxide, 5 mol hydrogen and 1 mol carbon monoxide are mixed and start to undergo the reactions:



Develop expressions for the mole fractions of the reacting species as functions of the reaction coordinates for the two reactions.