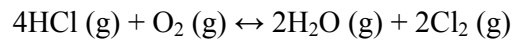


HW#13

The following reaction reaches equilibrium at 500 °C and 2 bar:



If the system initially contains 5 mol HCl for each mole of O₂, perform the following tasks:

- (a) Develop expressions for the mole fractions of each species as functions of the reaction coordinate.
- (b) Calculate the reaction equilibrium constant at the above conditions (do not assume ΔH° constant). Use this answer for parts (d) and (e)
- (c) Repeat (b) by assuming ΔH° constant.
- (d) Assuming that the reaction mixture forms an ideal solution, calculate the reaction equilibrium coordinate and the equilibrium conversion of HCl.
- (e) Repeat (d) by assuming ideal gases.