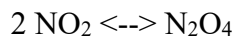


Chemistry 146 – Van Bramer
Spring Problem Set – Week 5

The equilibrium for the following chemical reaction is very temperature dependent.



1. Write the equilibrium expression for this reaction.
2. Calculate the equilibrium constant given the equilibrium conditions at 320 K where:
 - a. $P_{\text{NO}_2} = 0.10 \text{ atm}$
 - b. $P_{\text{N}_2\text{O}_4} = 0.018 \text{ atm}$
3. Given the following initial conditions, predict the direction of the reaction.

NO₂ (atm)	N₂O₄ (atm)
0.10	0.10
0.010	0.010
1.0	2.0
2.0	7.0
0.01	1.8*10 ⁻⁴
0.5	0.5

4. Given the initial, non-equilibrium, conditions. Calculate the equilibrium pressure of NO₂ and N₂O₄.
 - a. $P_{\text{NO}_2} = 0.20 \text{ atm}$; $P_{\text{N}_2\text{O}_4} = 0.00 \text{ atm}$
 - b. $P_{\text{NO}_2} = 0.00 \text{ atm}$; $P_{\text{N}_2\text{O}_4} = 0.20 \text{ atm}$
 - c. $P_{\text{NO}_2} = 0.20 \text{ atm}$; $P_{\text{N}_2\text{O}_4} = 0.20 \text{ atm}$