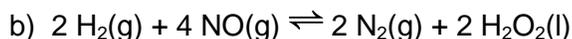
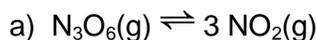
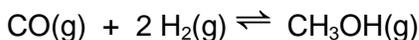


1. Write the equilibrium law expression for:



2. Use the equilibrium concentrations given below to calculate of K_{eq} for: **(0.400)**

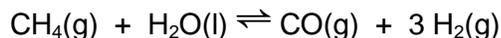


$$[\text{CO}(\text{g})] = 3.79 \text{ mol/L}$$

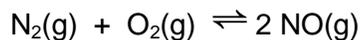
$$[\text{H}_2(\text{g})] = 0.150 \text{ mol/L}$$

$$[\text{CH}_3\text{OH}(\text{g})] = 0.0341 \text{ mol/L}$$

3. At equilibrium, 2.2 mol of $\text{CH}_4(\text{g})$, 2.2 mol of $\text{H}_2\text{O}(\text{l})$, 0.12 mol of $\text{CO}(\text{g})$ and 0.36 mol of $\text{H}_2(\text{g})$ are present in a closed 1.0 L container. What is the value of K_{eq} for this equilibrium? **(0.0025)**



4. Use the equilibrium concentrations given below to calculate K_{eq} for: **(0.00045)**

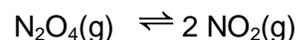


$$[\text{N}_2(\text{g})] = 0.10 \text{ mol/L}$$

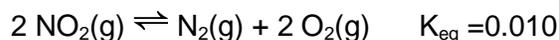
$$[\text{O}_2(\text{g})] = 0.20 \text{ mol/L}$$

$$[\text{NO}(\text{g})] = 0.0030 \text{ mol/L}$$

5. Calculate K_c for the equilibrium below if the concentrations at equilibrium are 0.85 mol/L for dinitrogen tetraoxide and 0.18 mol/L for nitrogen dioxide. **(0.038)**



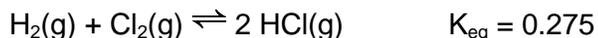
6. What is the equilibrium concentration of $\text{N}_2(\text{g})$, given the reaction and equilibrium concentrations below? **(0.0025 mol/L)**



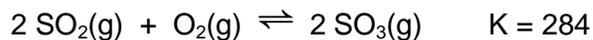
$$[\text{NO}_2(\text{g})] = 5.0 \text{ mol/L}$$

$$[\text{O}_2(\text{g})] = 10.0 \text{ mol/L}$$

7. What is $[\text{HCl}(\text{g})]$ in the equilibrium below, if $[\text{H}_2(\text{g})]$ and $[\text{Cl}_2(\text{g})]$ are both 0.250 mol/L ?
(0.131 mol/L)



8. At $825 \text{ }^\circ\text{C}$, sulfur dioxide is converted into sulfur trioxide as shown below:



Is the system at equilibrium when $[\text{SO}_2(\text{g})] = 0.0110 \text{ mol/L}$, $[\text{O}_2(\text{g})] = 0.0250 \text{ mol/L}$, and $[\text{SO}_3(\text{g})] = 0.0400 \text{ mol/L}$? Justify your answer.

9. Which would cause an increase in the value of K_{eq} for the equilibrium below?



- a) decreasing temperature
- b) increasing temperature
- c) decreasing volume
- d) increasing volume

10. Explain what happens to the value of K in the following equilibria when the temperature of the system is increased?

