

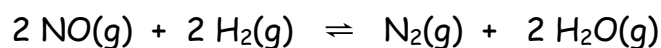
NAME:

CHM 2046

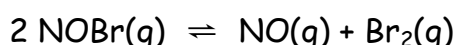
Practice Quiz 1

Answer all questions. Give your final answer with the correct units, if any, and to the correct sig. figs. **Useful Information:** $0\text{ }^{\circ}\text{C} \approx 273\text{ K}$, $R = 0.0820\text{ L}\cdot\text{atm/mol}\cdot\text{K}$

1. a) (3 points each) Balance the following reactions, if necessary, and write down their mass-action expression, Q_c



- b) (5 points) At $100\text{ }^{\circ}\text{C}$, $K_p = 60.6$ for the reaction



In a particular experiment, 0.35 atm (atmospheres) of NOBr , 4.0 atm of NO , and 2.0 atm of Br_2 are placed in a vessel. Is the reaction at equilibrium? Explain.

If not, in which direction will it proceed? Explain.

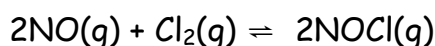
2. a) (4 points) Gaseous ammonia (NH_3) was introduced into a sealed container and heated to a certain temperature



At equilibrium, $[\text{NH}_3] = 0.0250\text{M}$, $[\text{N}_2] = 0.124\text{M}$, and $[\text{H}_2] = 0.322\text{M}$. Calculate K_c for this reaction at this temperature.

- b) (1 point) What will happen to the $[\text{NH}_3]$ if more N_2 is now added to the container?

- c) (4 points) For the following reaction, $K_p = 8.5 \times 10^4$ at a particular temperature.

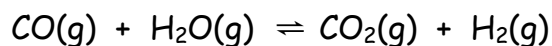


At equilibrium, $p_{\text{NO}} = 0.35\text{ atm}$ and $p_{\text{Cl}_2} = 0.10\text{ atm}$. What is the partial pressure of $\text{NOCl}(g)$ (p_{NOCl}) at equilibrium?

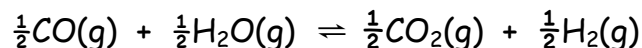
- d) (1 point) What will happen to the p_{NO} if N_2 is now added to the container?

3. (3 points each)

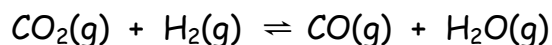
The reaction below has $K_c = 4.4$ at 300 K. Use this to answer a) and b).



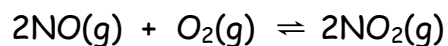
a) What is K_c for the reaction below. Explain your answer.



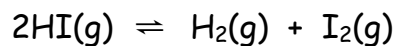
b) What is K_c for the reaction below? Explain your answer.



c) $K_c = 122$ for the reaction below at 300 K? What is K_p ?

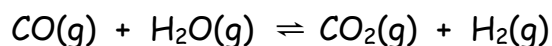


4. (10 points) Consider the following reaction at a particular temperature:



A 2.00 L flask is filled with 0.320 mol of HI and allowed to reach equilibrium. At equilibrium, $[\text{HI}] = 0.098 \text{ M}$. Calculate K_c .

5. (10 points) At a particular temperature, the reaction below has $K_c = 0.680$



In a 20.0 L vessel, 1.00 mol of CO and 1.00 mol of H₂O are allowed to reach equilibrium. Calculate the concentrations of all four species at equilibrium.