

Unit 7 – Chapter 13: Chemical Equilibrium

Name _____

Experiment 20 Conclusion questions

Period _____

1. Calculate K_c at 303 K for:



$K_p = 34.5$ at this temperature

2. The equilibrium constant for the reaction



$K_p = 1.48 \times 10^4$ at 184°C

a) Calculate K_p for the reverse reaction

b) Does the equilibrium favor the production of NO and O_2 or does it favor NO_2 at this temperature?

3. A mixture of 1.374 g of H_2 and 70.31 g of Br_2 is heated in a 2.00-liter vessel at 700 K. The substances react as follows:

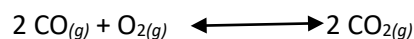


At equilibrium the vessel is found to contain 0.566 g of H_2 .

a) Calculate the equilibrium concentrations of all the reactants and products

b) Calculate the value of K_c .

4. At 100°C, K_c for the following reaction is 2.0×10^{-4}



Calculate the concentrations of all the species at equilibrium for each of the following original mixtures:
2.0 moles of CO, 2.0 mol of O₂ in a 5-liter container.

5. Using the equilibrium equation in #4, calculate the direction the reaction will go at the following concentrations: $[\text{CO}] = 1.94 \text{ M}$, $[\text{O}_2] = 0.78 \text{ M}$, $[\text{CO}_2] = 0.007 \text{ M}$

6. A mixture of 0.36 M H₂ and 0.30 M Br₂ is heated at 600 K. The equilibrium reaction is:



Calculate the equilibrium concentrations of all reactants and products.

7. A mixture of 0.200 moles of CO₂, 0.100 moles of H₂, and 0.160 moles of H₂O is placed in a 2.00-liter vessel. The following equilibrium is established at 500 K.



- Calculate the initial pressures of CO₂, H₂, and H₂O (Hint: Use $pV = nRT$)
- At equilibrium $P_{\text{H}_2\text{O}} = 3.51 \text{ atm}$, calculate the equilibrium partial pressures of CO₂, H₂, and CO.
- Calculate K_p for the reaction.