ROSEDALE ACADEMY

SCH4U: 4-2: Equilibrium Constant Practice

Write the equilibrium constant expression for the following reactions:

1) $2CO_{(g)} + O_{2(g)} \leftrightarrow 2CO_{2(g)}$

2) $2H_2O_{(g)} \leftrightarrow 2H_{2(g)} + O_{2(g)}$

3) $C_{(s)} + 2\ H_{2(g)} \leftrightarrow CH_{4(g)}$

4) $4NH_{3(g)} + 5\ O_{2(g)} \leftrightarrow 4NO_{(g)} + 6\ H_2O_{(g)}$

5) Calculate the Keq given the following information:
$N_{2(g)} + 3H_{2(g)} \leftrightarrow 2NH_{3(g)}$

At equilibrium:
$[NH_{3(g)}] = 2.00 \times 10^{-4}$ mol/L
$[N_{2(g)}] = 1.50 \times 10^{-5}$ mol/L
$[H_{2(g)}] = 3.54 \times 10^{-1}$ mol/L

6. When 0.40 moles of PCl_5 are placed in a 10.0 L container, an equilibrium is established in which 0.25 moles of Cl_2 are measured.

$$PCl_5(g) <====> PCl_3(g) + Cl_2(g)$$

a) What is the number of moles of PCl_5 and PCl_3 at equilibrium?
b) What are the equilibrium concentrations of all three components?
C) Calculate K_{eq}

7. When 1.00 mole of NH_3 gas and 0.40 moles of N_2 gas are placed in a 5.0 L container and allowed to reach an equilibrium at 50 ˚C, it is found that 0.78 moles of NH_3 are present.

$$2\ NH_{3(g)} <======> 3\ H_{2(g)} + N_{2(g)}$$

a) What are the number of moles of H_2 and N_2 at equilibrium?
b) What is the equilibrium concentration in moles/L of each species?
c) Calculate K_{eq}