**Equilibrium Constant Worksheet**

1.Consider the following reaction: 2SO2 (g)+O2 (g)🡨🡪 2SO3 (g)

Write the equilibrium expression with the equilibrium constant

2.Consider the following reaction: CaCO3 (s)🡨🡪 CaO (s) + O2 (g)

Write the equilibrium expression with the equilibrium constant

3.Consider the following reaction: 2NO(g)+2H2 (g) 🡨🡪N2 (g)+2H2O(g)

Write the equilibrium expression with the equilibrium constant

4.Consider the following reaction: H2O(g)+C(s) 🡨->H2 (g)+CO(g)

Write the equilibrium expression with the equilibrium constant

5. **SO3(g)  + H2O(g)** ⇄ **H2SO4(l)**

At equilibrium [SO3] = 0.400M, [H2O] = 0.480M, [H2SO4] = 0.600M

Calculate the value of the equilibrium constant.

6. At equilibrium at 100oC, a 2.0L flask contains:

0.075 mol of PCl5 , 0.050 mol of H2O, 0.750 mol of HCl, 0.500 mol of POCl3

Calculate the Keq for the reaction:

**PCl5 (s) + H2O (g)** ⇄ **2HCl (g) + POCl3 (g)**

7. Keq= 798 at 25oC for the reaction: **2SO2 (g) + O2 (g)** ⇄ **2SO3 (g).**

In a particular mixture at equilibrium, [SO2]= 4.20 M and [SO3]=11.0M. Calculate the equilibrium [O2] in this mixture at 25oC.

8. Consider the following equilibrium:

**2SO2 (g) + O2 (g)** ⇄ **2SO3 (g)**

0.600 moles of SO2 and 0.600 moles of O2 are present in a 4.00 L flask at equilibrium at 100oC. If the Keq = 680.0, calculate the SO3 concentration at 100oC.

9. If initially [H2] = 0.200M and [I2] = 0.200M and at equilibrium the[H2]= 0.150M calculate the Keq  for the following reaction

**H2 (g) + I2 (g)** ⇄ **2HI (g)**

10. 1.60 moles N2 and 1.60 moles H2 are placed in an 8.00 L container and allowed to reach equilibrium. The equilibrium concentration of NH3 is 0.050M. Calculate the Keq.

**N2(g) + 3H2 (g) 🡨🡪 2NH3**

Calculate the value of the equilibrium constant.