Date Planned : __ / __ / __	Daily Tutorial Sheet-11	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Numerical Value Type	Exact Duration :_____

126. A sample of air consisting of N_2 and O_2 was heated to 2500 K until the equilibrium $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$

As established with an equilibrium constant $K_C = 2.1 \times 10^{-3}$. At equilibrium, the mole % of NO was 1.8. Estimate the initial O_2 in air.

127. At 450°C, the equilibrium constant K_p for the reaction, $N_2 + 3H_2 \rightleftharpoons 2NH_3$, was found to be $1.6 \times 10^{-5}\,atm^{-2}$ at a pressure of 200 atm. If N_2 and H_2 are taken in 1:3 mol ratio, what is the % of NH_3 formed at this temperature ?

128. In the dissociation of HI, 20% of HI dissociated at equilibrium. Calculate K_p for.

$HI(g) \rightleftharpoons \frac{1}{2}H_2(g) + \frac{1}{2}I_2(g)$

129. An equilibrium mixture at 300 K contains N_2O_4 and NO_2 at 0.28 and 1.1 atmosphere respectively. If the volume of container is doubled, calculate the new equilibrium pressure of NO_2.

130. The degree of dissociation is 0.4 at 400 K and 1 atm for the gaseous reaction :

$PCl_5 \rightleftharpoons PCl_3 + Cl_2$

Assuming ideal behavior of gases, calculate the density of equilibrium mixture at 400 K and 1 atm.

131. For the reaction at $A(g) \rightleftharpoons B(g) + E(g);\ \Delta H° = -30\,kJ\,mol^{-1}$, the decrease in standard entropy is $0.1\,kJ\,K^{-1}\,mol^{-1}$. The equilibrium constant K for the reaction is _____.

132. For the reaction:

$2A(g) + nB(g) \rightleftharpoons 3C(g)$

If K_p and K_c are 0.0105 and 0.45 at 250°C. The value of n is _____.

133. For the reaction $AB_2(g) \rightleftharpoons AB(g) + B(g)$, the initial pressure of $AB_2(g)$ was 6 atm and at equilibrium, total pressure was found to be 8 atm at 300 K. The equilibrium constant of the reaction at 300 K is……

134. Two solids A and B shows the following equilibria in a vessel:

$A(s) \rightleftharpoons X(g) + 2Y(g);\quad K_{P_1} = 9 \times 10^{-3}$

$B(s) \rightleftharpoons Z + 2Y(g);\quad K_{P_2} = 4.5 \times 10^{-3}$

What will be the total pressure over a mixture of A and B in atm

135. How many mole of glycerine should be added to 1 litre of 1 M H_3BO_3 so that 80% of boric acid form boric acid-glycerine complex ?

$H_3BO_3 + Glycerine \rightleftharpoons Complex \qquad K_C = 0.90$

136. For the reaction, $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ at 720 K, the value of equilibrium constant is 50, when equilibrium concentration of both H_2 and I_2 is 0.5 M , K_p under the same conditions will be :

137. The reaction $A + 2B \rightleftharpoons 2C + D$ was studied using an initial concentration of B which was 1.5 times that of A. But the equilibrium concentrations of A and C were found to be equal. Then the K_c for the equilibrium is :

138. The partial pressure of $CH_3OH(g)$, $CO(g)$ and $H_2(g)$ in equilibrium mixture for the reaction, $CO(g) + 2H_2(g) \rightleftharpoons CH_3OH(g)$ are 2.0,1.0 and 0.1 atm respectively at $427°C$. The value of K_p for the decomposition of CH_3OH to CO and H_2 is :

139. A definite mass of solid NH_4HS is placed in a flask already containing ammonia gas at a certain temperature and 0.50 atm pressure. NH_4HS decomposes to give NH_3 and H_2S and at equilibrium total pressure in flask is 0.84 atm. The equilibrium constant for the reaction is :

140. For the reversible reaction $PtCl_4^{2-} + H_2O \rightleftharpoons \left[Pt(H_2O)Cl_3\right]^- + Cl^-$;

The rate of change of $PtCl_4^{2-}$ was found to change according to the equation

$$\frac{\Delta[PtCl_4^{2-}]}{\Delta t} = 3.9 \times 10^{-5}[PtCl_4^{2-}] - 2.1 \times 10^{-3}\left[Pt(H_2O)Cl_3\right]^-[Cl^-]$$

Calculate the equilibrium constant for the backward reaction.