Date Planned : __ / __ / __	Daily Tutorial Sheet-9	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-2	Exact Duration :_____

106. The equilibrium constant K_{p_1} and K_{p_2} for the reaction $X \rightleftharpoons 2Y$ and $Z \rightleftharpoons P + Q$, respectively are in the ratio of 1 : 9. If the degree of dissociation of X and Z be equal, then the ratio of total pressure at these equilibria is : (All gaseous)

(A) 1 : 36 **(B)** 1 : 1 **(C)** 1 : 3 **(D)** 1 : 9

107. The equilibrium constant K_c for the reaction $P_4(g) \rightleftharpoons 2P_2(g)$ is 1.4 at 400°C. Suppose that 3 moles of $P_4(g)$ and 2 moles of $P_2(g)$ are mixed in 2 litre container at 400°C. What is the value of reaction quotient (Q) ?

(A) $\frac{3}{2}$ **(B)** $\frac{2}{3}$ **(C)** 1 **(D)** None of these

108. Formaldehyde polymerizes to form glucose according to the reaction, $6\,HCHO \rightleftharpoons C_6H_{12}O_6$. The theoretically computed equilibrium constant for this reaction is found to be 6×10^{22}. If 1M solution of glucose dissociates according to the above equilibrium, the concentration of formaldehyde in the solution will be :

(A) $1.6\times10^{-2}\,M$ **(B)** $1.6\times10^{-4}\,M$ **(C)** $1.6\times10^{-6}\,M$ **(D)** $1.6\times10^{-8}\,M$

109. The vapour density of N_2O_4 at a certain temperature is 30. Calculate the percentage dissociation of N_2O_4 at this temperature.

(A) 53.5% **(B)** 60% **(C)** 74.5% **(D)** 64.5%

110. In the following equilibrium
$N_2O_4(g) \rightleftharpoons 2NO_2(g)$

When 5 moles of each is taken and the temperature is kept at 298 k, the total pressure was found to be 20 bar

Given : $\Delta G_f^\circ(N_2O_4) = 100\,kJ$

$\Delta G_f^\circ(NO_2) = 50\,kJ$

Find ΔG° of the reaction at 298 K

(A) $-4.68\,kJ$ **(B)** $-6.04\,kJ$ **(C)** $-5.705\,kJ$ **(D)** $0.4\,kJ$

111. At a particular temperature, $PCl_5(g)$ undergoes 50% dissociation. The equilibrium constant for $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$ is 2atm. The pressure of the equilibrium mixture is

(A) 2 atm **(B)** 6 atm **(C)** 8 atm **(D)** 5 atm

112. Calculate the partial pressure of carbon monoxide from the following data's

$CaCO_3(s) \xrightarrow{\Delta} CaO(s) + CO_2(g);\ K_p = 8\times10^{-2}$

$CO_2(g) + C(s) \longrightarrow 2CO(g);\ K_p = 2$

(A) 0.2 **(B)** 0.4 **(C)** 1.6 **(D)** 4

113. Given the equilibrium system $NH_4Cl(s) \rightleftharpoons NH_4^+(aq) + Cl^-(aq)$

What change will shift the equilibrium to the right? $(\Delta H = +3.5 \text{ kcal / mol})$

(A) Decreasing the temperature

(B) Increasing the temperature

(C) Dissolving NaCl crystals in the equilibrium mixture

(D) Dissolving NH_4NO_3 crystals in the equilibrium mixture

114. The exothermic formation of ClF_3 is represented by the equation

$$Cl_2(g) + 3F_2(g) \rightleftharpoons 2ClF_3(g); \quad \Delta H = -329 \text{ kJ}$$

Which of the following will increase the quantity of ClF_3 in an equilibrium mixture of Cl_2 F_2 and ClF_3?

(A) Adding F_2 **(B)** Increasing the volume of the container

(C) Removing Cl_2 **(D)** Increasing the temperature

115. For the gaseous reaction, $C_2H_4(g) + H_2(g) \rightleftharpoons C_2H_6(g)$, $\Delta H(g) = -130 \text{ kJ mol}^{-1}$ carried in a closed vessel, the equilibrium concentration of the C_2H_6 can definitely be increased by :

(A) Increasing temperature and decreasing pressure

(B) Decreasing temperature and pressure both

(C) Increasing temperature and pressure both

(D) Decreasing temperature and increasing pressure