ASSIGNMENT - 2

For the equilibrium,

$2NOCl(g) \rightleftharpoons 2NO(g) + Cl_2(g)$

the value of the equilibrium constant, K_c is 3.75×10^{-6} at 1069 K. Calculate the K_p for the reaction at this temperature?

Ans) $K_P = K_C . (RT)^{\Delta ng}$

$\Rightarrow K_C = 3.75 \times 10^{-4}$

$\Rightarrow T = 1069K$

Δng= moles of product- moles of reactant

$\Delta ng = 3 - 2 = 1$

$\Rightarrow K_P = 3.75 \times 10^{-4} \times (8.314 \times 1069)^1$

$\Rightarrow K_P = 3.33$

The value of K_c for the reaction $2A \rightleftharpoons B + C$ is 2×10^{-3}. At a given time, the composition of reaction mixture is $[A] = [B] = [C] = 3 \times 10^{-4}$ M. In which direction the reaction will proceed?

Ans) For this reaction

$$2A \rightleftharpoons B + C$$

$$K_c = 2 \times 10^{-3} [[A] = [B] = [C]]$$

$$Q_c = \frac{[B][C]}{[A]^2}$$

$$= \frac{[3 \times 10^{-4}][3 \times 10^{-4}}{[3 \times 10^{-4}]^4}$$

$$Q_c = 1$$

value of $K_c = 2 \times 10^{-3}$

Since $Q_c > K_c$ the direction of reaction is bckwards