Chemical Equilibrium -1

1) The equilibrium constant for the reaction $N_2+O_2 \rightleftharpoons 2NO$ is K_1 and for the reaction $2NO+O_2 \rightleftharpoons 2NO_2$ is K_2. The equilibrium constant K for the reaction $NO_2 \rightleftharpoons 1/2N_2+O_2$ at same temperature is

[AIPMT2011]

1) $1/ K_1 K_2$ 2) $1/2 K_1 K_2$ 3) $1/4 K_1 K_2$ 4) $[1/ K_1 K_2]^{1/2}$

Ans: 4

2) The value of ΔH for the reaction $X_2(g) +4Y_2 (g) \rightleftharpoons 2XY_4 (g)$ is less than zero, formation of is favoured by **[AIPMT2011]**

1) High pressure and low temperature
2) High pressure and high temperature
3) Low pressure and low temperature
4) Low pressure and high temperature

Ans: 1

2) For the reaction $AB(g) \rightleftharpoons A(g) +B(g)$, AB is 33% dissociated at a total pressure of P. Therefore, P is related to K_P as

[AMU2010]

1) $P= K_P$ 2) $P=3 K_P$ 3) $P=4 K_P$ 4) $P= 8K_P$

Ans: 4

4) At 3000K, the equilibrium pressures of CO_2, CO and CO_2 are 0.6, 0.4 and 0.2 atm respectively. K for the reaction $2CO_2 (g) \rightleftharpoons 2CO (g) + O_2 (g)$ is [BHU2010]

1) 0.088 2) 0.0533 3) 0.133 4) 0.177

Ans: 1

5) In which of the following K_C and K_P are not equal? [PMT2010]

1) $2NO(g) \rightleftharpoons N_2(g) + O_2(g)$ 2) $SO_{2(}g) + NO_{2(}g) \rightleftharpoons SO_{3(}g) + NO_{(}g)$

3) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ 4) $2C(s) + O_2(g) \rightleftharpoons 2CO(g)$

Ans: 4

6) K_1 and K_2 are the equilibrium constants of the two reactions, given below

i. $\frac{1}{2} N_2 + 3/2H_2 \rightleftharpoons NH_3$

ii. $N_2 + 3H_2 \rightleftharpoons 2NH_3$ .Therefore K and K* are related as [PMT2009]

1) $K_1 = K_2^2$ 2) $K_1 = K_2^{1/2}$ 3) $K_1 = 2K_2$ 4) $K_1 = K_2$

Ans: 2

7. $A_{(g)} + 3B_{(g)} \rightleftharpoons 4C_{(g)}$ Initial concentration of A is equal to that of B. The equilibrium concentration of A and C are equal. K_c is equal to,

[Kerala -2005(E)]

1) 0.08 2) 8 3) 1/8 4) 80

Ans: 2

8. In a 500 ml flask, the degree of dissociation of PCl_5 at equilibrium is 40% and the initial amount is 5 moles. The value of equilibrium constant in mole lit^{-1} for the decomposition of PCl_5 is (E-2008)

1) 3.33 2) 2.66 3) 5.32 4) 4.66

Ans: 2

9. What is the effect of a ten-fold increase in pressure on K_p in the reaction at equilibrium $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$? (M-2010)

1) A ten-fold increase 2) A ten-fold decrease

3) No change 4) Equal to K_C

Ans: 3

10. In the reaction $2SO_{3\,(g)} \rightleftharpoons 2SO_{2\,(g)} + O_{2\,(g)}$, $SO_{3\,(g)}$ is 50% dissociated at 27^0C when the equilibrium pressure is 0.5 atm. Hence partial pressure of $SO_{3(g)}$ at Equilibrium is (M - 2007)

1) 0.5 atm 2) 0.3 atm 3) 0.2 atm 4) 0.1 atm

Ans: 3