

## Chemical Equilibrium -1

- 1) The equilibrium constant for the reaction  $\text{N}_2 + \text{O}_2 \rightleftharpoons 2\text{NO}$  is  $K_1$  and for the reaction  $2\text{NO} + \text{O}_2 \rightleftharpoons 2\text{NO}_2$  is  $K_2$ . The equilibrium constant  $K$  for the reaction  $\text{NO}_2 \rightleftharpoons \frac{1}{2}\text{N}_2 + \text{O}_2$  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  $\Delta H$  for the reaction  $\text{X}_2(\text{g}) + 4\text{Y}_2(\text{g}) \rightleftharpoons 2\text{XY}_4(\text{g})$  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  $\text{AB}(\text{g}) \rightleftharpoons \text{A}(\text{g}) + \text{B}(\text{g})$ , 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)  $P = 8 K_p$

Ans: 4

- 4) At 3000K, the equilibrium pressures of  $\text{CO}_2$ , CO and  $\text{O}_2$  are 0.6, 0.4 and 0.2

atm respectively.  $K$  for the reaction  $2\text{CO}_2(\text{g}) \rightleftharpoons 2\text{CO}(\text{g}) + \text{O}_2(\text{g})$  is [BHU2010]

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

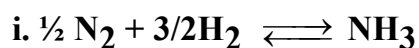
Ans: 1

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

- 1)  $2\text{NO}(\text{g}) \rightleftharpoons \text{N}_2(\text{g}) + \text{O}_2(\text{g})$       2)  $\text{SO}_2(\text{g}) + \text{NO}_2(\text{g}) \rightleftharpoons \text{SO}_3(\text{g}) + \text{NO}(\text{g})$   
 3)  $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$       4)  $2\text{C}(\text{s}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{CO}(\text{g})$

Ans: 4

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



- 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.  $\text{A}(\text{g}) + 3\text{B}(\text{g}) \rightleftharpoons 4\text{C}(\text{g})$  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  $\text{PCl}_5$  at equilibrium is 40% and the initial amount is 5 moles. The value of equilibrium constant in mole  $\text{lit}^{-1}$  for the decomposition of  $\text{PCl}_5$  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  $27^\circ C$  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