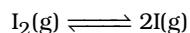


Date Planned : __ / __ / __	Daily Tutorial Sheet-7	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-2	Exact Duration : _____

86. For the reaction  $\text{H}_2(\text{g}) + \text{CO}_2(\text{g}) \rightleftharpoons \text{CO}(\text{g}) + \text{H}_2\text{O}(\text{g})$ , ▶  
 If the initial concentration of  $[\text{H}_2] = [\text{CO}_2] = 1$  and  $x$  mol/L of hydrogen is consumed at equilibrium, the correct expression of  $K_p$  is :
- (A)  $\frac{x^2}{(1-x)^2}$       (B)  $\frac{(1+x)^2}{(1-x)^2}$       (C)  $\frac{x^2}{(2+x)^2}$       (D)  $\frac{x^2}{1-x^2}$
87. Calculate the percentage dissociation of  $\text{H}_2\text{S}(\text{g})$  if 0.1 mole of  $\text{H}_2\text{S}$  is kept in 0.4 litre vessel at 1000 K for the reaction : ▶  
 $2\text{H}_2\text{S}(\text{g}) \rightleftharpoons 2\text{H}_2(\text{g}) + \text{S}_2(\text{g})$  the value of  $K_c$  is  $1.0 \times 10^{-6}$ .
- (A) 5%      (B) 2%      (C) 6%      (D) 8%
88. For the reaction equilibrium,  $\text{N}_2\text{O}_4(\text{g}) \rightleftharpoons 2\text{NO}_2(\text{g})$ , the concentrations of  $\text{N}_2\text{O}_4$  and  $\text{NO}_2$  at equilibrium are  $4.8 \times 10^{-2}$  and  $1.2 \times 10^{-2}$  mol / L respectively. The value of  $K_c$  for the reaction is : ▶
- (A)  $3 \times 10^{-3}$  mol / L      (B)  $3.3 \times 10^{-3}$  mol / L  
 (C)  $3 \times 10^{-1}$  mol / L      (D)  $3.3 \times 10^{-1}$  mol / L
89. The equilibrium constant for the reaction  $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g})$  at temperature T is  $4 \times 10^{-4}$ . The value of  $K_c$  for the reaction  $\text{NO}(\text{g}) \rightleftharpoons \frac{1}{2}\text{N}_2(\text{g}) + \frac{1}{2}\text{O}_2(\text{g})$  at the same temperature is :
- (A) 25      (B) 50      (C) 75      (D) 100
90. Which factor will shift the following equilibrium in forward direction ?  
 $\text{AgCl}(\text{s}) \rightleftharpoons \text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq})$
- (A) Addition of  $\text{NH}_3(\text{aq})$       (B) Addition of  $\text{AgNO}_3(\text{aq})$   
 (C) Addition of  $\text{NaCl}(\text{aq})$       (D) Addition of  $\text{AgCl}(\text{s})$
91. For the reaction,  
 $2\text{NO}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g}) + \text{O}_2(\text{g})$  ( $K_c = 1.8 \times 10^{-6}$  at  $184^\circ\text{C}$ ) ( $R = 0.00831 \text{ kJ} / (\text{mol K})$ )  
 When  $K_p$  and  $K_c$  is compared at  $184^\circ\text{C}$ , it is found that :
- (A) Whether  $K_p$  is greater than less than or equal to  $K_c$  depends upon the total gas pressure  
 (B)  $K_p = K_c$   
 (C)  $K_p$  is less than  $K_c$   
 (D)  $K_p$  is greater than  $K_c$
92. For the homogeneous reaction,  $4\text{NH}_3(\text{g}) + 5\text{O}_2(\text{g}) \rightleftharpoons 4\text{NO}(\text{g}) + 6\text{H}_2\text{O}(\text{g})$  the equilibrium constant  $K_c$  has the units : ▶
- (A)  $\text{conc}^{+10}$       (B)  $\text{conc}^{+1}$   
 (C)  $\text{conc}^{-1}$       (D) it is dimensionless



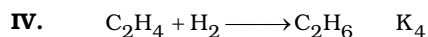
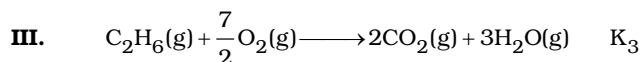
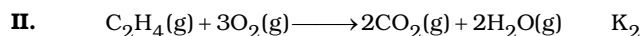
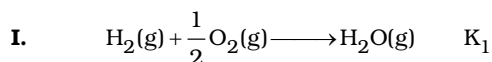
93. What is the value of  $K_c$  for the reaction



At 1473 K, when 1 mole of  $\text{I}_2(\text{g})$  introduced into an evacuated 1 litre flask such that only 5% of it gets dissociated ?

- (A) 0.0105      (B) 0.046      (C) 0.034      (D) 0.5

94. For the following three reactions I, II and III, equilibrium constants are given :



Which of the following relations is correct?

- (A)  $k_4 = k_1 k_2 k_3$       (B)  $k_4 = \frac{k_2 k_3}{k_1}$       (C)  $k_4 = \frac{k_1 k_2}{k_3}$       (D)  $k_4 = \frac{k_1^2 k_2}{k_3}$

95. 0.1 mole of  $\text{N}_2\text{O}_4(\text{g})$  was sealed in a tube under atmospheric conditions at  $25^\circ\text{C}$ . Calculate the number of mole of  $\text{NO}_2(\text{g})$  present, if the equilibrium  $\text{N}_2\text{O}_4(\text{g}) \rightleftharpoons 2\text{NO}_2(\text{g})$ , ( $K_p = 0.04$ ) is reached after some time.

- (A) 0.04      (B) 0.034      (C) 0.46      (D) 0.54