


Date Planned : __ / __ / __	Daily Tutorial Sheet-4	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-1	Exact Duration : _____

46. For the reaction $\text{N}_2\text{O}_4(\text{g}) \rightleftharpoons 2\text{NO}_2(\text{g})$ the relation connecting the degree of dissociation (α) of $\text{N}_2\text{O}_4(\text{g})$ with the equilibrium constant K_p is : 

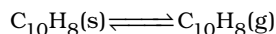
(A) $\alpha = \frac{K_p / p}{4 + K_p / p}$

(B) $\alpha = \frac{K_p}{4 + K_p}$

(C) $\alpha = \left(\frac{K_p / p}{4 + K_p / p} \right)^{1/2}$

(D) $\alpha = \left(\frac{K_p}{4 + K_p} \right)^{1/2}$

47. Naphthalene, a white solid used to make mothballs, has a vapour pressure of 0.10 mmHg at 27°C. Hence, K_p and K_c for the equilibrium are



(A) 0.10, 0.10

(B) 0.10, 4.1×10^{-3}

(C) 1.32×10^{-4} , 5.36×10^{-6}

(D) 5.36×10^{-6} , 1.32×10^{-4}

48. For $\text{PCl}_5(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$, initial concentration of each reactant and product is 1 M. If $K_{eq} = 0.41$ then :

(A) More PCl_3 will form

(B) More Cl_2 will form

(C) More PCl_5 will form

(D) No change

49. 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 mol L^{-1} for decomposition of PCl_5 is :

(A) 2.33

(B) 2.66

(C) 5.32

(D) 4.66

50. A liquid is in equilibrium with its vapour at its boiling point. On the average, the molecules in two phases have equal :

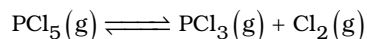
(A) Inter-molecular forces

(B) Potential energy 

(C) Kinetic energy

(D) Total energy

51. Phosphorus pentachloride dissociates as follows, in a closed reaction vessel,




If total pressure at equilibrium of the reaction mixture is p and degree of dissociation of PCl_5 is x , the partial pressure of PCl_3 will be :

(A) $\left(\frac{x}{x+1} \right) p$

(B) $\left(\frac{2x}{1+x} \right) p$

(C) $\left(\frac{x}{x-1} \right) p$

(D) $\left(\frac{x}{1-x} \right) p$ 

52. The chemical equilibrium of a reversible reaction is not influenced by :

(A) Pressure

(B) Catalyst

(C) Concentration of the reactants

(D) Temperature

53. Which of the following is not a characteristic property of chemical equilibrium?
- (A) Rate of forward reaction is equal to rate of backward reaction at equilibrium
- (B) After reaching the chemical equilibrium, the concentrations of reactants and products remain unchanged with time
- (C) For $A(g) \rightleftharpoons B(g)$, K_c is 10^{-2} . If this reaction is carried out in the presence of catalyst, the value of K_c decreases
- (D) After reaching the equilibrium, both forward and backward reactions continue to take place
54. The equilibrium reaction that is not influenced by volume change at constant temperature is :
- (A) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ (B) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$
- (C) $N_2O_4(g) \rightleftharpoons 2NO_2(g)$ (D) $2NO(g) + O_2(g) \rightleftharpoons 2NO_2(g)$
55. The change in pressure will not affect the equilibrium constant for :
- (A) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ (B) $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$
- (C) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ (D) All of these
56. For a reaction if $K_p > K_c$, the forward reaction is favoured by :
- (A) Low pressure (B) High pressure
- (C) High temperature (D) Low temperature
57. $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$
- In the reaction given above, the addition of small amount of an inert gas at constant pressure will shift the equilibrium towards which side?
- (A) LHS (Left hand side) (B) RHS (Right hand side)
- (C) Neither side (D) Either side
58. When hydrogen molecules decomposed into its atoms, which conditions gives maximum yield of H atom ?
- (A) High temperature and low pressure (B) Low temperature and high pressure
- (C) High temperature and high pressure (D) Low temperature and low pressure
59. According to Le-Chatelier's principle, the increase of temperature in the following reaction
- $$CO_2(g) + 2H_2O(g) \longrightarrow CH_4(g) + 2O_2(g)$$
- will cause it shift to the right. This reaction is, therefore :
- (A) Exothermic (B) Unimolecular (C) Endothermic (D) Spontaneous
60. For the chemical reaction $3X(g) + Y(g) \rightleftharpoons X_3Y(g)$, the amount of X_3Y at equilibrium is affected by:
- (A) Temperature and pressure (B) Temperature only
- (C) Pressure only (D) Temperature, pressure and catalyst