CHEMISTRY

31. Equilibrium constants K_1 and K_2 for the following equilibria

$NO(g)+\frac{1}{2}O_2 \rightleftharpoons NO_2(g)$ and

$2NO_2(g) \rightleftharpoons 2NO(g)+O_2(g)$ are related as

(1) $K_2=\frac{1}{K_1}$ (2) $K_2=K_1^2$

(3) $K_2=\frac{K_1}{2}$ (4) $K_2=\frac{1}{K_1^2}$

32. In which one of the following gaseous equilibria K_p is less than K_c

(1) $N_2O_4 \rightleftharpoons 2NO_2$

(2) $2HI \rightleftharpoons H_2+I_2$

(3) $2SO_2+O_2 \rightleftharpoons 2SO_3$

(4) $N_2+O_2 \rightleftharpoons 2NO$

33. For the reaction, $H_2(g)+I_2(g) \rightleftharpoons 2HI(g)$ at $721\,K$ the value of equilibrium constant (K_c) is 50. When the equilibrium concentration of both is $0.5\,M$, the value of K_p under the same conditions will be

(1) 0.002 (2)0.2

(3) 50.0 (4) $\frac{50}{RT}$

34. A chemical reaction is catalyzed by a catalyst *X*. Hence *X*

(1) Reduces enthalpy of the reaction

(2) Decreases rate constant of the reaction

(3) Increases activation energy of the reaction

(4) Does not affect equilibrium constant of reaction

35. A reversible reaction $H_2+Cl_2 \rightleftharpoons 2HCl$ is carries out in one litre flask. If the same reaction is carried out in two litre flask, the equilibrium constant will be

(1) Decreased (2)Doubled

(3) Halved (4)Same

36. Value of K_p in the reaction $MgCO_{3(s)} \rightleftharpoons MgO_{(s)}+CO_{2(g)}$ is

(1) $K_P=P_{CO_2}$

(2) $K_P=\frac{P_{MgO}}{P_{MgCO_3}}$

(3) $K_P=\frac{P_{CO_2}\times P_{MgO}}{P_{MgCO_3}}$

(4) $K_P=\frac{P_{MgCO_3}}{P_{CO_2}\times P_{MgO}}$

37. If equilibrium constant for reaction $2AB \rightleftharpoons A_2+B_2$, is 49, then the equilibrium constant for reaction $AB \rightleftharpoons \frac{1}{2}A_2+\frac{1}{2}B_2$, will be

(1) 7 (2)20

(3) 49 (4)21

38. In the manufacture of ammonia by Haber's process,

$N_{2(g)}+3H_2 \rightleftharpoons 2NH_{3(g)}+92.3kJ$,

which of the following conditions is unfavourable

(1) Increasing the temperature

(2) Increasing the pressure

(3) Reducing the temperature

(4) Removing ammonia as it is formed

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

(1)Pressure

(2)Catalyst

(3)Concentration of the reactants

(4) Temperature

40. Of the following which change will shift the reaction towards the product

$I_2(g) \rightleftharpoons 2I(g),\ \Delta H_r^0(298K)=+150\ kJ$

(1) Increase in concentration of I

(2) Decrease in concentration of I_2

(3) Increase in temperature

(4) Increase in total pressure