CHEMISTRY

41. The formation of SO_3 takes place according to the following reaction, $2SO_2 + O_2 \rightleftharpoons 2SO_3$; $\Delta H = -45.2$ kcal
The formation of SO_3 is favoured by
(1) Increasing in temperature
(2) Removal of oxygen
(3) Increase of volume
(4) Increasing of pressure

42. For the following reaction in gaseous phase $CO + \frac{1}{2}O_2 \rightarrow CO_2$; $\frac{K_p}{K_c}$ is
(1) $(RT)^{1/2}$
(2) $(RT)^{-1/2}$
(3) (RT)
(4) $(RT)^{-1}$

43. For the equilibrium
$2NO_2(g) \rightleftharpoons N_2O_4(g)$ +14.6 kcal the increase in temperature would
(1) Favour the formation of N_2O_4
(2) Favour the decomposition of N_2O_4
(3) Not alter the equilibrium
(4) Stop the reaction

44. Consider the reaction $HCN_{(aq)} \rightleftharpoons H^+_{(aq)} + CN^-_{(aq)}$
.
At equilibrium, the addition of $CN^-_{(aq)}$ would
(1) Reduce $HCN_{(aq)}$ concentration
(2) Decrease the $H^+_{(aq)}$ ion concentration
(3) Increase the equilibrium constant
(4) Decrease the equilibrium constant

45. The equilibrium which remains uneffected by change in pressure of the reactants is
(1) $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$
(2) $2SO_{2(g)} + O_{2(g)} \rightleftharpoons 2SO_{3(g)}$
(3) $2O_{3(g)} \rightleftharpoons 3O_{2(g)}$
(4) $2NO_{2(g)} \rightleftharpoons N_2O_{4(g)}$

46. For the system $3A + 2B \rightleftharpoons C$, the expression for equilibrium constant is
(1) $\frac{[3A][2B]}{C}$
(2) $\frac{[C]}{[3A][2B]}$
(3) $\frac{[A]^3[B]^2}{[C]}$
(4) $\frac{[C]}{[A]^3[B]^2}$

47. 2 moles of PCl_5 were heated in a closed vessel of 2 litre capacity. At equilibrium, 40% of PCl_5 is dissociated into PCl_3 and Cl_2. The value of equilibrium constant is
(1) 0.266
(2) 0.53
(3) 2.66
(4) 5.3

48. In a chemical equilibrium $A + B \rightleftharpoons C + D$ when one mole each of the two reactants are mixed, 0.6 mole each of the products are formed. The equilibrium constant calculated is
(1) 1
(2) 0.36
(3) 2.25
(4) 4/9

49. A + B ⇌ C + D. If finally the concentration of A and B are both equal but at equilibrium concentration of D will be twice of that of A then what will be the equilibrium constant of reaction.
(1) 4 / 9
(2) 9 / 4
(3) 1 / 9
(4) 4

50. 2 mol of N_2 is mixed with 6 mol of H_2 in a closed vessel of one litre capacity. If 50% of N_2 is converted into NH_3 at equilibrium, the value of K_c for the reaction $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$ is
(1) 4 / 27
(2) 27 / 4
(3) 1 / 27
(4) 24

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