Le-Chaterlier principle and It's application

41. In $N_2 + 3H_2 \rightleftharpoons 2NH_3$ reversible reaction, increase in pressure will favour

(a) Reaction in forward direction

(b) Reaction in reverse direction

(c) Will not exert any effect

(d) In backward and forward direction equally

42. In the reaction $N_2 + 3H_2 \rightarrow 2NH_3$, the product increases on

(a) Increasing temperature

(b) Increasing pressure

(c) Increasing temperature and pressure both

(d) Decreasing temperature and pressure both

(e) None of these

43. In which of the following system, doubling the volume of the container cause a shift to the right

(a) $H_2(g) + Cl_2(g) = 2HCl(g)$

(b) $2CO(g) + O_2(g) = 2CO_2(g)$

(c) $N_2(g) + 3H_2(g) = 2NH_3(g)$

(d) $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$

44. Which of the following information can be obtained on the basis of Le-chatelier's principle

(a) Entropy change in a reaction

(b) Dissociation constant of a weak acid

(c) Equilibrium constant of a chemical reaction

(d) Shift in equilibrium position on changing value of a constant

45. The equilibrium $2SO_{2(g)} + O_{2(g)} \rightleftharpoons 2SO_{3(g)}$ shifts forward, if

(a) A catalyst is used

(b) An adsorbent is used to remove SO_3 as soon as it is formed

(c) Low pressure

(d) Small amounts of reactants are used

46. The equilibrium $SO_2Cl_{2(g)} \rightleftharpoons SO_{2(g)} + Cl_{2(g)}$ is attained at 25°C in a closed container and an inert gas helium is introduced which of the following statement is correct

(a) More chlorine is formed

(b) Concentration of SO_2 is reduced

(c) More SO_2Cl_2 is formed

(d) Concentration of SO_2Cl_2, SO_2 and Cl_2 does not change

47. Which of the following equilibria will shift to right side on increasing the temperature

(a) $CO_{(g)} + H_2O_{(g)} \rightleftharpoons CO_{2(g)} + H_{2(g)}$

(b) $2SO_{2(g)} + O_{2(g)} \rightleftharpoons 2SO_{3(g)}$

(c) $H_2O_{(g)} \rightleftharpoons H_{2(g)} + \frac{1}{2}(O_2)_{(g)}$

(d) $4HCl_{(g)} + O_{2(g)} \rightleftharpoons 2H_2O_{(g)} + 2Cl_{2(g)}$

48. Sodium sulphate dissolves in water with evolution of heat. Consider a saturated solution of sodium sulphate. If the temperature is raised, then according to Le-Chatelier principle

(a) More solid will dissolve

(b) Some solid will precipitate out from the solution

(c) The solution will become supersaturated

(d) Solution concentration will remain unchanged

49. Consider the equilibrium $N_2(g) + 3H_2(g) \rightleftharpoons \mathbf{2NH_3(g)}$; ΔH = – 93.6 *KJ*. The maximum yield of ammonia is obtained by

(a) Decrease of temp. and increase of pressure

(b) Increase of temp. and decrease of pressure

(c) Decrease of both the temp. and pressure

(d) Increase of both the temp. and pressure

50. In the equilibrium $AB \rightleftharpoons A + B$; if the equilibrium concentration of A is doubled, the equilibrium concentration of *B* would become:

(a) Twice (b) Half

(c) 1/4th (d) 1/8th

51. Le-Chatelier's principle is applicable only to a

(a) System in equilibrium

(b) Irreversible reaction

(c) Homogeneous reaction

(d) Heterogeneous reaction

52. In a vessel containing SO_3, SO_2 and O_2 at equilibrium, some helium gas is introduced so that the total pressure increases while temperature and volume remain constant. According to Le–Chatelier principle the dissociation of SO_3

(a) Increases

(b) Decreases

(c) Remains unaltered

(d) Changes unpredictably

53. $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)} \Delta H = +q$ *cal*, then formation of *HI*:

(a) Is favoured by lowering the temperature

(b) Is favoured by increasing the pressure

(c) Is unaffected by change in pressure

(d) Is unaffected by change in temperature

54. In which of the following equilibrium systems is the rate of the backward reaction favoured by increase of pressure
(a) $PCl_5 \rightleftharpoons PCl_3 + Cl_2$
(b) $2SO_2 + O_2 \rightleftharpoons 2SO_3$
(c) $N_2 + 3H_2 \rightleftharpoons 2NH_3$
(d) $N_2 + O_2 \rightleftharpoons 2NO$

55. Which of the following equilibrium is not shifted by increase in the pressure
(a) $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$
(b) $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$
(c) $2CO_{(g)} + O_{2(g)} \rightleftharpoons 2CO_{2(g)}$
(d) $2C_{(S)} + O_{2(g)} \rightleftharpoons 2CO_{(g)}$

56. According to Le–Chatelier's principal adding heat to a solid and liquid in equilibrium with endothermic nature will cause the
(a) Temperature to rise
(b) Temperature to fall
(c) Amount of solid to decrease
(d) Amount of liquid to decrease

57. On addition of an inert gas at constant volume to the reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3$at equilibrium
(a) The reaction remains unaffected
(b) Forward reaction is favoured
(c) The reaction halts
(d) Backward reaction is favoured

58. Le-Chatelier principle is not applicable to
(a) $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$
(b) $Fe_{(S)} + S_{(S)} \rightleftharpoons FeS_{(S)}$
(c) $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$
(d) $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$

59. For the reaction: $A + B + Q \rightleftharpoons C + D$, if the temperature is increased, then concentration of the products will
(a) Increase
(b) Decrease
(c) Remain same
(d) Become Zero

60. $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$
In this reaction when pressure increases, the reaction direction
(a) Does not change (b) Forward
(c) Backward (d) Decrease