Le-Chaterlier principle and It's application

21. Raising the temperature of an equilibrium system

    (a) Favours the exothermic reaction only

    (b) Favours the endothermic reaction only

    (c) Favours both the exothermic and endothermic reactions

    (d) Favours neither the exothermic nor endothermic reactions

22. Reaction in which yield of product will increase with increase in pressure is

    (a) $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$

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

    (c) $H_2O_{(g)} + C_{(s)} \rightleftharpoons CO_{(g)} + H_{2(g)}$

    (d) $CO_{(g)} + 3H_{2(g)} \rightleftharpoons CH_{4(g)} + H_2O_{(g)}$

23. In reaction $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}; \Delta H = -93.6kJ$, the yield of ammonia does not increase when

    (a) Pressure is increased

    (b) Temperature is lowered

    (c) Pressure is lowered

    (d) Volume of the reaction vessel is decreased

24. The equilibrium which remains uneffected by change in pressure of the reactants is

    (a) $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$

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

    (c) $2O_{3(g)} \rightleftharpoons 3O_{2(g)}$

    (d) $2NO_{2(g)} \rightleftharpoons N_2O_{4(g)}$

25. The endothermic reaction $(M + N \rightleftharpoons P)$ is allowed to attain an equilibrium at 25°. Formation of P can be increased by

    (a) Raising temperature

    (b) Lowering temperature

    (c) Keeping temperature constant

    (d) Decreasing the concentration of M and N

26. According to Le-chatelier's principle, an increase in the temperature of the following reaction will

    $N_2 + O_2 \rightleftharpoons 2NO - 43,200 kcal$

    (a) Increase the yield of NO

    (b) Decrease the yield of NO

    (c) Not effect the yield of NO

    (d) Not help the reaction to proceed in forward direction

27. In the manufacture of NH_3 by Haber's process, the condition which would give maximum yield is

    $N_2 + 3H_2 \rightleftharpoons 2NH_3 + Qkcal$

(a) High temperature, high pressure and high concentrations of the reactants

(b) High temperature, low pressure and low concentrations of the reactants

(c) Low temperature and high pressure

(d) Low temperature, low pressure and low concentration of H_2

28. Suppose the reaction $PCl_{5(s)} \rightleftharpoons PCl_{3(s)} + Cl_{2(g)}$ is in a closed vessel at equilibrium stage. What is the effect on equilibrium concentration of $Cl_{2(g)}$ by adding PCl_5 at constant temperature

(a) Decreases

(b) Increases

(c) Unaffected

(d) Cannot be described without the value of K_p

29. In which of the following equilibrium reactions, the equilibrium would shift to the right, if total pressure is increased

(a) $N_2 + 3H_2 \rightleftharpoons 2NH_3$

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

(c) $H_2 + Cl_2 \rightleftharpoons 2HCl$

(d) $N_2O_4 \rightleftharpoons 2NO$

30. In which of the following gaseous equilibrium an increase in pressure will increase the yield of the products

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

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

(c) $H_2 + Br_2 \rightleftharpoons 2HBr$

(d) $H_2O + CO \rightleftharpoons H_2 + CO_2$

31. In the reaction $A(g) + B(g) \rightleftharpoons C(g)$, the backward reaction is favoured by

(a) Decrease of pressure

(b) Increase of pressure

(c) Either of the two

(d) None of the two

32. The formation of NO_2 in the reaction $2NO + O_2 \rightleftharpoons 2NO_2 +$ heat is favoured by

(a) Low pressure

(b) High pressure

(c) Low temperature

(d) Reduction in the mass of

33. For the reaction $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$, the forward reaction at constant temperature is favoured by

(a) Introducing an inert gas at constant volume

(b) Introducing chlorine gas at constant volume

(c) Introducing an inert gas at constant pressure

(d) Decreasing the volume of the container

34. Which of the following conditions is favourable for the production of ammonia by Haber's process
   (a) High concentration of reactants
   (b) Low temperature and high pressure
   (c) Continuous removal of ammonia
   (d) All of these

35. According to Le-chatelier's principle, which of the following factors influence a chemical system
   (a) Concentration only
   (b) Pressure only
   (c) Temperature only
   (d) Concentration, pressure and temperature

36. If pressure increases then its effect on given equilibrium $C(s) + H_2O(g) \rightleftharpoons CO(g) + H_2(g)$ it is satisfied in
   (a) Forward direction
   (b) Backward direction
   (c) No effect
   (d) None of these

37. The exothermic formation of ClF_3 is represented by the equation
   $$Cl_{2(g)} + 3F_{2(g)} \rightleftharpoons 2ClF_{3(g)} \; ; \; \Delta H = -329kJ$$

Which of the following will increase the quantity of ClF_3 in an equilibrium mixture of Cl_2, F_2 and ClF_3
   (a) Increasing the temperature
   (b) Removing Cl_2
   (c) Increasing the volume of the container
   (d) Adding F_2

38. What would happen to a reversible reaction at equilibrium when an inert gas is added while the pressure remains unchanged
   (a) More of the product will be formed
   (b) Less of the product will be formed
   (c) More of the reactants will be formed
   (d) It remains unaffected

39. Formation of SO_3 takes place according to the reaction $2SO_2 + O_2 \rightleftharpoons 2SO_3; \Delta H = -45.2kcal$

Which of the following factors favours the formation of SO_3
   (a) Increase in temperature
   (b) Increase in pressure
   (c) Removal of oxygen
   (d) Increase in volume

40. 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