



Arjuna NEET (2024)

Chemical equilibrium

DPP-03

- For the reaction,
 $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}(\text{s}) \rightleftharpoons \text{CuSO}_4 \cdot 3\text{H}_2\text{O}(\text{s}) + 2\text{H}_2\text{O}(\text{g})$
Which one is correct representation?
(1) $K_p = (P_{\text{H}_2\text{O}})^2$ (2) $K_c = [\text{H}_2\text{O}]^2$
(3) $K_p = K_c (RT)^2$ (4) All of these
- For the reaction, $\text{H}_{2(\text{g})} + \text{I}_{2(\text{g})} \rightleftharpoons 2\text{HI}_{(\text{g})}$:
(1) $K_c = 2K_p$ (2) $K_c > K_p$
(3) $K_c = K_p$ (4) $K_c < K_p$
- For the reaction, $\text{C}_{(\text{s})} + \text{CO}_{2(\text{g})} \rightleftharpoons 2\text{CO}_{(\text{g})}$, the partial pressures of CO_2 and CO are 4 and 8 atm respectively, K_p for the reaction is:
(1) 16 atm (2) 2 atm
(3) 5 atm (4) 4 atm
- In which of the following reaction, the value of K_p will be equal to K_c
(1) $\text{H}_2 + \text{I}_2 \rightleftharpoons 2\text{HI}$
(2) $\text{PCl}_5 \rightleftharpoons \text{PCl}_2 + \text{Cl}_2$
(3) $2\text{NH}_3 \rightleftharpoons \text{N}_2 + 3\text{H}_2$
(4) $2\text{SO}_2 + \text{O}_2 \rightleftharpoons 2\text{SO}_3$
- For $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3 + \text{heat}$
(1) $K_p = K_c(RT)$
(2) $K_c = K_p(RT)$
(3) $K_p = K_c(RT)^{-2}$
(4) $K_p = K_c(RT)^{-1}$
- The oxidation of SO_2 by O_2 to SO_3 is an exothermic reaction. The yield of SO_3 will be maximum if:
(1) Temperature is increased and pressure is kept constant
(2) Temperature is reduced and pressure is increased
(3) Both temperature and pressure are increased
(4) Both temperature and pressure are reduced
- For the given equilibrium reaction
 $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
The addition of more $\text{CaCO}_3(\text{s})$ causes:
(1) The decrease in the concentration of $\text{CO}_2(\text{g})$
(2) The increase in the concentration of $\text{CO}_2(\text{g})$
(3) No change in the concentration of $\text{CO}_2(\text{g})$
(4) Increase in the concentration of $\text{CaO}(\text{s})$
- Which of the following will shift the reaction
 $\text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g}) \rightleftharpoons \text{PCl}_5(\text{g})$, $\Delta H = (+)$ ve to the left hand side?
(1) Addition of PCl_5
(2) Increase in pressure
(3) Increase in temperature
(4) Catalyst
- The equilibrium,
 $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$, shifts in forward direction if:
(1) Catalyst is added
(2) Large amount of product is used
(3) Small amount of reactants are consumed
(4) An adsorbent is used to remove SO_3 as soon as it is formed
- Which of the following reactions will be favoured by high pressure?
(1) $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$
(2) $\text{PCl}(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$
(3) $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$
(4) $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g})$
- K_c for $\text{A} + \text{B} \rightleftharpoons \text{C} + \text{D}$ is 10 at 25°C . If a container contains 1, 2, 3, 4 mol per litre of A, B, C and D respectively at 25°C , the reaction shall:
(1) Proceed from left to right
(2) Proceed from right to left
(3) Be at equilibrium
(4) None of these



12. K_c for $A + B \rightleftharpoons 3C$ is 20 at 25°C . If a 2 litre vessel contains 1, 2 and 4 mole of A, B and C respectively, the reaction at 25°C shall:
- (1) Proceed from left to right
 - (2) Proceed from right to left
 - (3) Be at equilibrium
 - (4) Not occur
13. The reaction quotient (Q) for the reaction $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$ is given by $Q = \frac{[\text{NH}_3]^2}{[\text{N}_2][\text{H}_2]^3}$. The reaction will proceed from right to left if:
- (1) $Q = 0$
 - (2) $Q = K_c$
 - (3) $Q < K_c$
 - (4) $Q > K_c$
14. The equilibrium constant for the reaction $\text{A}_2 \rightleftharpoons 2\text{A}$ at 500 K and 700 K are 1×10^{-10} and 1×10^{-5} respectively. The given reaction is:
- (1) Exothermic
 - (2) Irreversible
 - (3) Endothermic
 - (4) None of these
15. The correct relationship between free energy change in a reaction and the corresponding equilibrium constant K is:
- (1) $-\Delta G^\circ = RT \ln K$
 - (2) $\Delta G = RT \ln K$
 - (3) $-\Delta G = RT \ln K$
 - (4) $\Delta G^\circ = RT \ln K$
16. The value of ΔG° for a reaction in aqueous phase having $K_C = 1$, would be:
- (1) $-RT$
 - (2) -1
 - (3) 0
 - (4) $+RT$
17. Some inert gas is added at constant volume to the following reaction at equilibrium, $\text{NH}_4\text{HS}(\text{s}) \rightleftharpoons \text{NH}_3(\text{g}) + \text{H}_2\text{S}(\text{g})$. Predict the effect of adding the inert gas:
- (1) The equilibrium shifts in the forward direction
 - (2) The equilibrium shifts in the backward direction
 - (3) The equilibrium remains unaffected
 - (4) The value of K_p is increased
18. The yield of product in the reaction, $\text{A}_2(\text{g}) + 2\text{B}(\text{g}) \rightleftharpoons \text{C}(\text{g}) + Q \text{ kJ}$ would be high at:
- (1) High temperature and high pressure
 - (2) High temperature and low pressure
 - (3) Low temperature and high pressure
 - (4) Low temperature and low pressure
19. For the reaction $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$ $K_C = 66.9$ at 350°C and $K_C = 50.0$ at 448°C . The reaction has:
- (1) $\Delta H = +ve$
 - (2) $\Delta H = -ve$
 - (3) $\Delta H = \text{zero}$
 - (4) ΔH sign can not be determine
20. The effect of increasing the pressure on the equilibrium $2\text{A} + 3\text{B} \rightleftharpoons 3\text{A} + 2\text{B}$ is:
- (1) Forward reaction is favoured
 - (2) Backward reaction is favoured
 - (3) No effect
 - (4) None of the above



Note: Kindly find the Video Solution of DPPs Questions in the DPPs Section.

Answer Key

1. (4)
2. (3)
3. (1)
4. (1)
5. (3)
6. (2)
7. (3)
8. (1)
9. (4)
10. (3)

11. (1)
12. (1)
13. (4)
14. (3)
15. (1)
16. (3)
17. (3)
18. (3)
19. (2)
20. (3)



PW Web/App - <https://smart.link/7wwosivoicgd4>

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