

CHEMISTRY

NCERT - NCERT CHEMISTRY(TELUGU)

EQUILIBRIUM

Example

1. The following concentrations were obtained for the formation of NH_3 from N_2 and H_2 at equilibrium at $500K$.

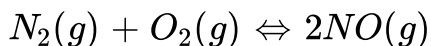
$[N_2] = 1.5 \times 10^{-2}M$. $[H_2] = 3.0 \times 10^{-2}M$ and

$[NH_3] = 1.2 \times 10^{-2}M$. Calculate equilibrium constant.



Watch Video Solution

2. At equilibrium , the concentrations of $N_2 = 3.0 \times 10^{-3}M$, $O_2 = 4.2 \times 10^{-3}M$ and $NO = 2.8 \times 10^{-3}M$ in a sealed vessel at $800K$. What will be K_c for the reaction



 [Watch Video Solution](#)

3. PCl_5 , PCl_3 and Cl_2 are at equilibrium at $500K$ and having concentration $1.59M$ PCl_3 , $1.59M$ Cl_2 and $1.41M$ PCl_5 . Calculate K_c for the reaction



 [Watch Video Solution](#)

4. The value of $K_c = 4.24$ at $800K$ for the reaction,

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

Calculate equilibrium concentrations of CO_2 , H_2 , CO and H_2O at $800K$, if only CO and H_2O are present initially at concentrations of $0.1M$ each.

 [Watch Video Solution](#)

5. For the equilibrium , $2NOCl(g) \rightleftharpoons 2NO(g) + Cl_2(g)$ the value of the equilibrium constant, K_c is 3.75×10^{-6} at $1069K$. Calculate the K_p for the reaction at this temperature ?

 [Watch Video Solution](#)

6. The value of K_p for the reaction, $CO_2(g) + C(s) \rightleftharpoons 2CO(g)$ is 3.0 at $1000K$. If initially $P_{CO_2} = 0.48$ bar and $P_{CO} = 0$ bar and pure graphite is present, calculate the equilibrium partial pressures of CO and CO_2 .

 [Watch Video Solution](#)

7. The value of K_c for the reaction $2A \rightleftharpoons B + C$ is 2×10^{-3} . At a given time, the composition of reaction mixture is $[A] = [B] = [C] = 3 \times 10^{-4} M$. In which direction the reaction will proceed ?

[Watch Video Solution](#)

8. 13.8g of N_2O_4 was placed in a 1L reaction vessel at 400K and allowed to attain equilibrium



The total pressure at equilibrium was found to be 9.15 bar .

Calculate K_c , K_p and partial pressure at equilibrium.

[Watch Video Solution](#)

9. 3.00 mol of PCl_5 kept in 1L closed reaction vessel was allowed to attain equilibrium at 380K. Calculate composition of the mixture at equilibrium $K_c = 1.80$

 [Watch Video Solution](#)

10. The value of ΔG^\oplus for the phosphorylation of glucose in glycolysis is 13.8kJ/mol . Find the value of K_c of 298K

 [Watch Video Solution](#)

11. Hydrolysis of sucrose gives, $\text{Sucrose} + H_2O \rightleftharpoons \text{Glucose} + \text{Fructose}$

Equilibrium constant K_c for the reaction is 2×10^{13} at 300K. Calculate ΔG^\oplus at 300K.

 [Watch Video Solution](#)

12. What will be the conjugate bases of the following Bronsted acids: HF , H_2SO_4 and HCO_3^- ?

 [Watch Video Solution](#)

13. Write the conjugate acids for the following Bronsted bases: NH_2^- , NH_3 and $HCOO^-$:

 [Watch Video Solution](#)

14. The species: H_2O , HCO_3^- , HSO_4^- and NH_3 can act both as Bronsted acids and bases. For each case give the corresponding conjugate acid and conjugate base.

 [Watch Video Solution](#)

15. Explain Lewis acid base theory with suitable example. Classify the following species into Lewis acids and Lewis bases and show how these act as Lewis acid/base.

a. OH^- b. F^- c. H^+ d. BCl_3

 [Watch Video Solution](#)

16. The concentration of hydrogen ion in a sample of soft drink is $3.8 \times 10^{-3} \text{ M}$. What is its pH ?

 [Watch Video Solution](#)

17. Calculate pH of a $1.0 \times 10^{-8} \text{ M}$ solution of HCl .

 [Watch Video Solution](#)

18. The ionization constant of HF is 3.2×10^{-4} . Calculate the degree of dissociation of HF in its $0.02M$ solution. Calculate the concentration of all species present (H_3O^+ , F^- and HF) in the solution and its pH .

 [Watch Video Solution](#)

19. The pH of $0.1M$ monobasic acid is 4.50 . Calculate the concentration of species H^+ .

A^- and HA at equilibrium. Also, determine the value of K_a and pK_a of the monobasic acid.

 [Watch Video Solution](#)

20. Calculate the pH of $0.08M$ solution of hypochlorous acid, $HOCl$. The ionization constant of the acid is 2.5×10^{-5} . Determine the percent dissociation of $HOCl$.



Watch Video Solution

21. The pH of $0.004M$ hydrazine solution is 9.7 . Calculate its ionization constant K_b and pK_b .



Watch Video Solution

22. Calculate the pH of the solution in which $0.2M NH_4Cl$ and $0.1M NH_3$ are present. The pK_b of ammonia solution is 4.75 .



Watch Video Solution

23. Determine the degree of ionization and pH of $0.05M$ of ammonia solution. The ionization constant of ammonia can be taken from Table 7.7. Also, calculate the ionization constant of the conjugate acid of ammonia.



Watch Video Solution

24. Calculate the pH of $0.10M$ ammonia solution. Calculate the pH after $50.0mL$ of this solution is treated with $25.0mL$ of $0.10MHCl$. The dissociation constant of ammonia, $K_b = 1.77 \times 10^{-5}$.



Watch Video Solution

25. The pK_a of acetic acid and pK_b of ammonium hydroxide are 4.76 and 4.75 respectively. Calculate the pH of ammonium acetate solution.



Watch Video Solution

26. Calculate the solubility of A_2X_2 in pure water, assuming that neither kind of ion reacts with water. The solubility product of A_2X_3 , $K_{sp} = 1.1 \times 10^{-23}$.

 [Watch Video Solution](#)

27. The values of K_{sp} of two sparingly soluble salts $Ni(OH)_2$ and $AgCN$ are 2.0×10^{-15} and 6×10^{-17} respectively. Which salt is more soluble? Explain.

 [Watch Video Solution](#)

28. Calculate the molar solubility of $Ni(OH)_2$ in $0.10MNaOH$. The ionic product of $Ni(OH)_2$ is 2.0×10^{-15}

 [Watch Video Solution](#)

1. A liquid is in equilibrium with its vapour in a sealed container at a fixed temperature. The volume of the container is suddenly increased.

 [Watch Video Solution](#)

2. What is the initial effect of the change on vapour pressure ?

 [Watch Video Solution](#)

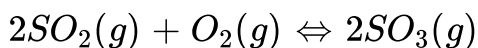
3. How do rates of evaporation and condensation change on vapour pressure ?

 [Watch Video Solution](#)

4. What happens when equilibrium is restored finally and what will be the final vapour pressure ?

 [Watch Video Solution](#)

5. State law of chemical equilibrium? What is K_c for the following equilibrium when the equilibrium concentration of each substance is $[SO_2] = 0.60M$, $[O_2] = 0.82M$ and $[SO_3] = 1.90M$



 [Watch Video Solution](#)

6. At a certain temperature and total pressure of $10^5 Pa$, iodine vapour contains 40 % by volume of I atoms

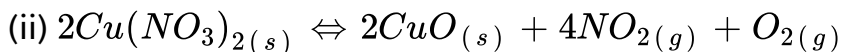
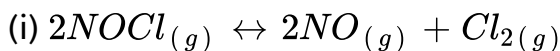


Calculate K_p for the equilibrium

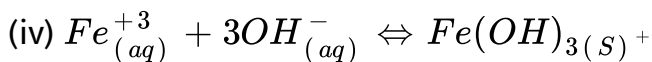
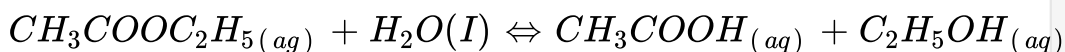


Watch Video Solution

7. Write expression for the equilibrium constant, K_c , for each of the following reactions:

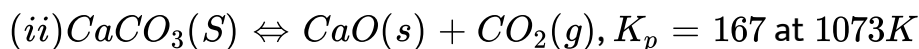
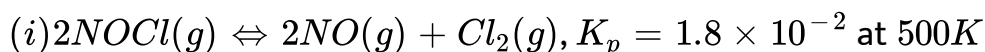


(iii)



Watch Video Solution

8. Find out the value of K_c for each of the following equilibria from the value of K_p :



 [Watch Video Solution](#)

9. For the following equilibrium, $K_c = 6.3 \times 10^{14}$ at $1000K$



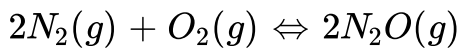
Both the forward and reverse reaction in the equilibrium are elementary bimolecular reactions. What is K_c , for the reverse reaction?

 [Watch Video Solution](#)

10. Explain why pure liquids and solids can be ignored while writing the equilibrium constant expression?

 [Watch Video Solution](#)

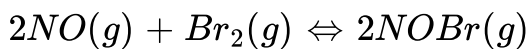
11. Reaction between N_2 and O_2 takes place as follows :



If a mixture of 0.482 mol N_2 and 0.933 mol of O_2 is placed in a 10L reaction vessel and allowed to form N_2O at a temperature for which $K_c = 2.0 \times 10^{-37}$. determine the composition of equilibrium mixture.

 [Watch Video Solution](#)

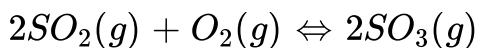
12. Nitric oxide reacts with Br_2 and gives nitrosyl bromide as per reaction given below :



When 0.087 mol of NO and 0.0437 mol of Br_2 are mixed in a closed container at constant temperature, 0.0518 mol of $NOBr$ is obtained at equilibrium. Calculate equilibrium amount of NO and Br_2 .

 [Watch Video Solution](#)

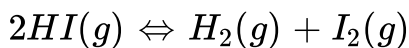
13. At 450K , $K_p = 2.0 \times 10^{10}$ /bar for the given reaction at equilibrium.



What is K_c at this temperature ?

 [Watch Video Solution](#)

14. A sample of $\text{HI}(g)$ is placed in flask at a pressure of 0.2atm . At equilibrium the partial pressure of $\text{HI}(g)$ is 0.04 atm . What is K_p for the given equilibrium ?



 [Watch Video Solution](#)

15. A mixture of 1.57 mol of N_2 , 1.92 mol of H_2 and 8.13 mol of NH_3 is introduced into a 20L reaction vessel at 500K. At this temperature, the equilibrium constant, K_c for the reaction $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ is 1.7×10^2 . Is the reaction mixture at equilibrium? If not, what is the direction of the net reaction?

 [Watch Video Solution](#)

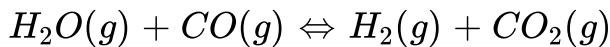
16. The equilibrium constant expression for a gas reaction is

$$K_c = \frac{[NH_3]^4 [O_2]^5}{[NO]^4 [H_2O]^6}$$

Write the balanced chemical equation corresponding to this expression.

 [Watch Video Solution](#)

17. One mole of H_2O and one mole of CO are taken in $10L$ vessel and heated to $725K$. At equilibrium 40% of water (by mass) reacts with CO according to the equation.



Calculate the equilibrium constant for the reaction.

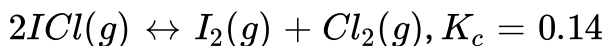
 [Watch Video Solution](#)

18. At $700K$ equilibrium constant for the reaction :

$H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ is 54.8 . If $0.5mol^{-1}$ of $HI(g)$ is present at equilibrium at $700K$. What are the concentration of $H_2(g)$ and $I_2(g)$ assuming that we initially started with $HI(g)$ and allowed it to reach equilibrium at $700K$?

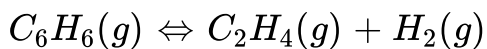
 [Watch Video Solution](#)

19. What is the equilibrium concentration of each of the substances in the equilibrium when the initial concentration of ICl was $0.78M$?



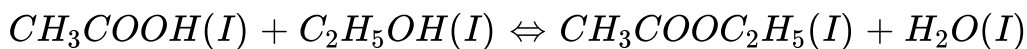
 [Watch Video Solution](#)

20. $K_p = 0.04$ atm at $899K$ for the equilibrium shown below. What is the equilibrium concentration of C_2H_6 when it is placed in a flask at 4.0 atm pressure and allowed to come to equilibrium ?



 [Watch Video Solution](#)

21. Ethyl acetate is formed by the reaction between ethanol and acetic acid and the equilibrium is represented as :



(i) Write the concentration ratio (reaction quotient). Q_c , for this reaction (note : water is not in excess and is not a solvent in this reaction)

(ii) At 293K , if one starts with 1.00 mol of acetic acid and 0.18 mol of ethanol, there is 0.171 mol of ethyl acetate in the final equilibrium mixture. Calculate the equilibrium constant.

(iii) Starting with 0.5 mol of ethanol and 1.0 mol of acetic acid and maintaining it at 293K , 0.214 mol of ethyl acetate is found after sometime. Has equilibrium been reached ?

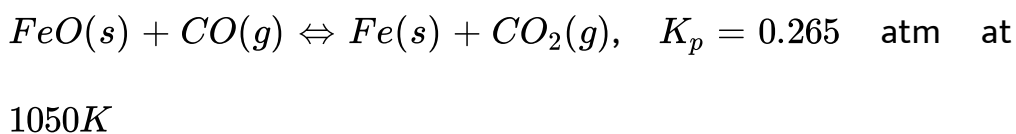


[Watch Video Solution](#)

22. How much PCl_5 must be added to a one litre vessel at $250^\circ C$ in order to obtain a concentration of 0.1 mole of Cl_2 at equilibrium. K_c for $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$ is 0.0414M

 [Watch Video Solution](#)

23. One of the reaction that takes place in producing steel from iron ore is the reduction of iron (II) oxide by carbon monoxide to give iron metal and CO_2 .



What are the equilibrium partial pressures of CO and CO_2 at $1050K$ if the initial partial pressures are : $P_{CO} = 1.4$ atm and $P_{CO_2} = 0.8$ atm?

 [Watch Video Solution](#)

24. Equilibrium constant, K_c for the reaction



At particular time, the analysis shows that composition of the reaction mixture is $3.0 \text{ mol L}^{-1} N_2$, $2.0 \text{ mol L}^{-1} H_2$ and $0.5 \text{ mol L}^{-1} NH_3$. Is the reaction at equilibrium? If not in which direction does the reaction tend to proceed to reach equilibrium?

 [Watch Video Solution](#)

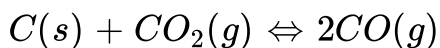
25. Bromine monochloride, $BrCl$ decomposes into bromine and chlorine and reaches the equilibrium:



for which $K_c = 32$ at $500K$. If initially pure $BrCl$ is present at a concentration of $3.3 \times 10^{-3} \text{ mol L}^{-1}$, what is its molar concentration in the mixture at equilibrium?

 [Watch Video Solution](#)

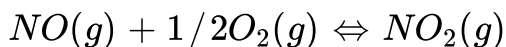
26. At $1127K$ and 1 atm pressure, a gaseous mixture of CO and CO_2 in equilibrium with solid carbon has 90.55% CO by mass



Calculate K_c for this reaction at the above temperature.

 [Watch Video Solution](#)

27. Calculate a) ΔG° and b) the equilibrium constant for the formation of NO_2 from NO and O_2 at $298K$



where

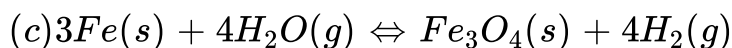
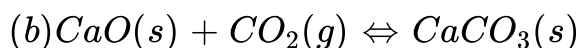
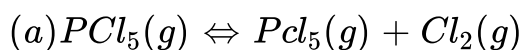
$$\Delta_f G^\oplus (NO_2) = 52.0kJ/mol$$

$$\Delta_f G^\oplus (NO) = 87.0kJ/mol$$

$$\Delta_f G^\oplus (O_2) = 0kJ/mol$$

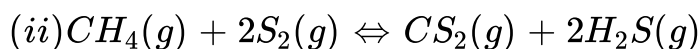
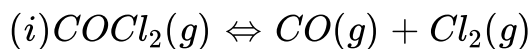
 [Watch Video Solution](#)

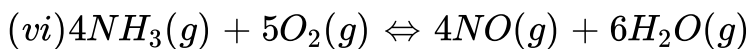
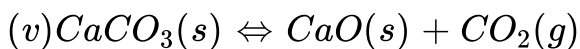
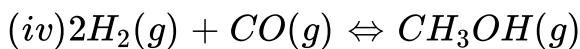
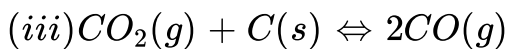
28. Does the number of moles of reaction products increase, decrease or remain the same when each of the following equilibria is subjected to a decrease in pressure by increasing the volume?



Watch Video Solution

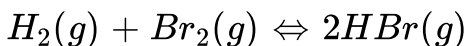
29. Which of the following reactions will get affected by increasing the pressure? Also, mention whether change will cause the reaction to go into forward or backward direction.





 [Watch Video Solution](#)

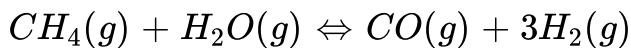
30. The equilibrium constant for the following reaction is 1.6×10^5 at $1024k$



Find the equilibrium pressure of all gases if 10.0 bar of HBr is introduced into a sealed container at $1024K$.

 [Watch Video Solution](#)

31. Dihydrogen gas is obtained from natural gas by partial oxidation with steam as per the following endothermic reaction.

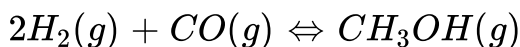


- a. Write an expression for K_p for the above reaction.
- b. How will the values of K_p and composition of equilibrium mixture be affected by
- (i) increasing the pressure (ii) increasing the temperature (iii) using a catalyst?

 [Watch Video Solution](#)

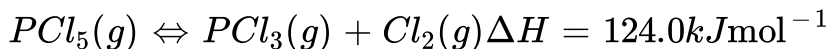
32. Describe the effect of:

- a. addition of H_2
- b. addition of CH_3OH
- c. removal of CO
- d. removal of CH_3OH on the equilibrium of the reaction.



 [Watch Video Solution](#)

33. At 473K, equilibrium constant K_C for the decomposition of phosphorus pentachloride, PCl_5 is 8.3×10^{-3} . If the decomposition is depicted as:

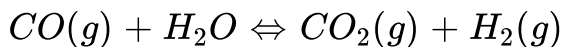


- Write an expression of K_c for the reaction.
- What is the value of K_c for the reverse reaction at the same temperature?
- What would be effect on K_c if
 - more PCl_5 is added
 - pressure is increased
 - the temperature is increased.

 [Watch Video Solution](#)

34. Dihydrogen gas used in Haber's process is produced by reacting methane from natural gas with high temperature steam. The first stage of two stage reaction involves the formation of

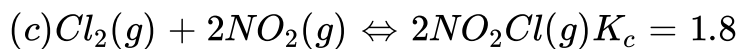
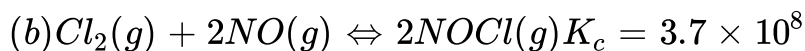
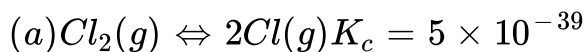
CO and H_2 . In second stage, CO formed in first stage is reacted with more steam in water gas shift reaction.



If a reaction vessel at $400^\circ C$ is charged with an equimolar mixture of CO and steam such that $p_{CO} = p_{H_2O} = 4.0$ bar, what will be the partial pressure of H_2 at equilibrium? $K_p = 10.1$ at $400^\circ C$

 [Watch Video Solution](#)

35. Predict which of the following reaction will have appreciable concentration of reactants and products :



 [Watch Video Solution](#)

36. The value of K_c for the reaction $3O_2(g) \rightleftharpoons 2O_3(g)$ is 2.0×10^{-50} at $25^\circ C$. If the equilibrium concentration of O_2 in air at $25^\circ C$ is 1.6×10^{-2} , what is the concentration of O_3 ?

 [Watch Video Solution](#)

37. The reaction , $CO(g) + 3H_2(g) \rightleftharpoons CH_4(g) + H_2O(g)$ is at equilibrium at $1300K$ in a $1L$ flask. It also contain 0.30 mol of CO , 0.10 mol of H_2 and 0.02 mol of H_2O and an unknown amount of CH_4 in the flask. Determine the concentration of CH_4 in the mixture. The equilibrium constant. K_c for the reaction at the given temperature is 3.90 .

 [Watch Video Solution](#)

38. What is meant by the conjugate acid-base pair ? Find the conjugate acid/base for the following species :

HNO_2 , CN^- , $HClO_4$, F^- , OH^- , CO_3^{2-} , and S^{2-} .

 [Watch Video Solution](#)

39. Which of the followings are Lewis acids? H_2O , BF_3 , H^+ , and NH_4^+

 [Watch Video Solution](#)

40. What will be the conjugate bases of the following Bronsted acids: HF , H_2SO_4 and HCO_3^- ?

 [Watch Video Solution](#)

41. Write the conjugate acids for the following Bronsted bases:

NH_2^- , NH_3 and $HCOO^-$:

 [Watch Video Solution](#)

42. The species: H_2O , HCO_3^- , HSO_4^- and NH_3 can act both as Bronsted acids and bases. For each case give the corresponding conjugate acid and conjugate base.

 [Watch Video Solution](#)

43. Explain Lewis acid base theory with suitable example. Classify the following species into Lewis acids and Lewis bases and show how these act as Lewis acid/base.

a. OH^- b. F^- c. H^+ d. BCl_3

 [Watch Video Solution](#)

44. The concentration of hydrogen ion in a sample of soft drink is $3.8 \times 10^{-3} M$. What is its pH ?

 [Watch Video Solution](#)

45. The pH of a sample of vinegar is 3.76. Calculate the concentration of hydrogen ion in it.

 [Watch Video Solution](#)

46. The ionization constants of HF , $HCOOH$ and HCN at 298 K are 6.8×10^{-4} , 1.8×10^{-4} and 4.7×10^{-9} respectively. Calculate the ionization constants of the corresponding conjugate base.

 [Watch Video Solution](#)

47. The ionization constant of phenol is 1.0×10^{-10} . What is the concentration of phenolate ion in $0.05M$ solution of phenol? What will be its degree of ionization if the solution is also $0.01M$ in sodium phenolate ?

 [Watch Video Solution](#)

48. The first ionization constant of H_2S is 9.1×10^{-8} . Calculate the concentration of HS^- ion in its $0.1M$ solution. How will this concentration be affected if the solution is $0.1M$ in HCl also ? If the second dissociation constant of H_2S is 1.2×10^{-13} , calculate the concentration of S^{2-} under both conditions.

 [Watch Video Solution](#)

49. The ionization constant of acetic acid is 1.74×10^{-5} . Calculate the degree of dissociation of acetic acid in its $0.05M$ solution. Calculate the concentration of acetate ion in the solution and its pH .

 [Watch Video Solution](#)

50. It has been found that the pH of a $0.01M$ solution of an organic acid is 4.15. Calculate the concentration of the anion, the ionization constant of the acid and its pK_a .

 [Watch Video Solution](#)

51. Assuming complete dissociation, calculate the pH of the following solutions :

(a) $0.003M HCl$

(b) $0.005M NaOH$

(c) $0.002M HBr$

(d) $0.002M KOH$



Watch Video Solution

52. Calculate the pH of the following solution :

(a) $2g$ of $TlOH$ dissolved in water to give 2 litre of solution.

(b) $0.3g$ of $Ca(OH)_2$ dissolved in water to give $500mL$ of solution.

(c) $0.3g$ of $NaOH$ dissolved in water to give $200mL$ of solution.

(d) $1mL$ of $13.6M HCl$ is diluted with water to give 1 litre of solution.



Watch Video Solution

53. The degree of ionization of a $0.1M$ bromoacetic acid solution is 0.132 . Calculate the pH of the solution and the pK_a of

bromoacetic acid.

 [Watch Video Solution](#)

54. The pH of $0.005M$ codeine ($C_{18}H_{21}NO_3$) solution is 9.95.

Calculate its ionization constant and pK_b .

 [Watch Video Solution](#)

55. What is the pH of $0.001M$ aniline solution ? The ionization constant of aniline can be taken from Table 7.7. Calculate the degree of ionization of aniline in the solution. Also calculate the ionization constant of the conjugate acid of aniline.

 [Watch Video Solution](#)

56. Calculate the degree of ionization of $0.05M$ acetic acid if its pK_a value is 4.74. How is the degree of dissociation affected when its solution also contains

(a) $0.01M$ (b) $0.1M$ in HCl ?

 [Watch Video Solution](#)

57. The ionization constant of dimethylamine is 5.4×10^{-4} . Calculate its degree of ionization in its $0.02M$ solution. What percentage of dimethylamine is ionized if the solution is also $0.1M$ in $NaOH$?

 [Watch Video Solution](#)

58. Calculate the hydrogen ion concentration in the following biological fluids whose pH are given below :

(a) Human muscle-fluid, 6.83 (b) Human stomach fluid, 1.2

(c) Human blood 7.38 (d) Human saliva 6.4

 [Watch Video Solution](#)

59. The pH of milk, black, coffee, tomato juice, lemon juice and egg white are 6.8, 5.0, 4.2, 2.2 and 7.8 respectively. Calculate corresponding hydrogen ion concentration in each.

 [Watch Video Solution](#)

60. If $0.561g$ of KOH is dissolved in water to give $200mL$ of solution at $298K$. Calculate the concentrations of potassium, hydrogen and hydroxyl ions. What is its pH ?

 [Watch Video Solution](#)

61. The solubility of $Sr(OH)_2$ at $298K$ is $19.23g/L$ of solution.

Calculate the concentrations of strontium and hydroxyl ions acid the pH of the solution.

 [Watch Video Solution](#)

62. The ionization constant of propanoic acid is 1.32×10^{-5} .

Calculate the degree of ionization of the acid in its $0.05M$ solution and also its pH . What will be its degree of ionization if the solution is $0.01M$ in HCl also ?

 [Watch Video Solution](#)

63. The pH of $0.1M$ solution of cyantic acid ($HCNO$) is 2.34

.Calculate the ionization constant of the acid and its degree of ionization in the solution.

 [Watch Video Solution](#)

64. The ionization constant of nitrous acid is 4.5×10^{-4} . Calculate the pH of $0.04M$ sodium nitrite solution and also its degree of hydrolysis.

 [Watch Video Solution](#)

65. A $0.02M$ solution of pyridinium hydrochloride has $pH = 3.44$. Calculate the ionization constant of pyridine.

 [Watch Video Solution](#)

66. Predict if the solutions of the following salts are neutral, acidic or basic: $NaCl$, KBr , $NaCN$, NH_4NO_3 , $NaNO_2$ and KF

 [Watch Video Solution](#)

67. The ionization constant of chloroacetic acid is 1.65×10^{-3} .

What will be the pH of $0.1M$ acid and its $0.1M$ sodium salt solution ?

 [Watch Video Solution](#)

68. Ionic product of water at $310K$ is 2.7×10^{-14} . What is the pH of neutral water at this temperature ?

 [Watch Video Solution](#)

69. Calculate the pH of the resultant mixture :

$10mL$ of $0.2M Ca(OH)_2$ + $25mL$ of $0.1M HCl$

(b) $10mL$ of $0.01M H_2SO_4$ + $10mL$ of $0.01M Ca(OH)_2$

(c) $10mL$ of $0.1M H_2SO_4$ + $10mL$ of $0.1M KOH$



Watch Video Solution

70. Determine the solubilities of silver chromate, barium chromate, ferric hydroxide, lead chloride and mercurous iodide at $298K$ from their solubility product constants given in Table 7.9. Determine also the molarities of individual ions.



Watch Video Solution

71. The solubility product constant of Ag_2CrO_4 and $AgBr$ are 1.1×10^{-12} and 5.0×10^{-13} respectively. Calculate the ratio of the molarities of their saturated solutions.



Watch Video Solution

72. Equal volumes of $0.002M$ solutions of sodium iodate and cupric chlorate are mixed together. Will it lead to precipitation of copper iodate? (For cupric iodate $K_{sp} = 7.4 \times 10^{-8}$).

 [Watch Video Solution](#)

73. The ionization constant of benzoic acid is 6.46×10^{-5} and K_{sp} for silver benzoate is 2.5×10^{-13} . How many times is silver benzoate more soluble in a buffer of pH 3.19 compared to its solubility in pure water?

 [Watch Video Solution](#)

74. What is the maximum concentration of equimolar solutions of ferrous sulphate and sodium sulphide so that when mixed in

equal volumes, there is no precipitation of iron sulphide ? (For iron sulphide, $K_{sp} = 6.3 \times 10^{-18}$).

 [Watch Video Solution](#)

75. What is the minimum volume of water required to dissolve 1g of calcium sulphate at 298K ? (For calcium sulphate, K_{sp} is 9.1×10^{-6}).

 [Watch Video Solution](#)

76. The concentration of sulphide ion in 0.1M HCl solution saturated with hydrogen sulphide is $1.0 \times 10^{-19} M$. If 10mL of this is added to 5mL of 0.04M solution of the following : $FeSO_4$, $MnCl_2$, $ZnCl_2$ and $CdCl_2$. in which of these solutions precipitation will take place ?

 [Watch Video Solution](#)

watch video solution