CHEMISTRY

BOOKS - UNIVERSAL BOOK DEPOT 1960 CHEMISTRY (HINGLISH)

IONIC EQUILIBRIUM

Ordinary Thinking (Electric conductors, Arrhenius theory and Ostawalds dilution law)

1. Acetic Acid is a weak electrolyte because:

A. Its molecular weight is high

B. It is covalent compound

C. It does not dissociate and much or its ionization is very less

D. It is highly unstable

Answer: C

Watch Video Solution

2. Which of the following is non-electrolyte ?

A. NaCl

B. $CaCl_2$

C. $C_{12}H_{22}O_{11}$

D. CH_3COOH

Answer: C

Watch Video Solution

3. Ionisation depends upon

A. Pressure

B. Volume

C. Dilution

D. None of these

Answer: C

Watch Video Solution

4. Degree of dissociation of 0.1 N CH_3COOH is (Dissociation constant $= 1 \times 10^{-5}$)

A. 10^{-5}

B. 10^{-4}

C. 10^{-3}

D. 10^{-2}

Answer: D

Watch Video Solution

5. For a 'C'M concentarted solution of a weak electrolyte $A_xB_y\alpha$ (degree of dissociation) is

A. $\alpha = \sqrt{K_{eq}/C(x+y)}$

B. $\alpha = \sqrt{K_{eq}C/(xy)}$

C. $\alpha = \left(K_{eq}/C^{x+y-1}X^xY^y\right)^{(1/(x+y))}$

D. $\alpha = (K_{eq}/Cxy)$

Answer: C

Watch Video Solution

6. A weak monobasic acid is 1% ionized in 0.1 M solution at 25°C.

The percentage of ionization in its 0.025 M solution is :

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

7. Theory of ionization was given by

A. Rutherford

B. Graham

C. Faraday

D. Arrhenius

Answer: D

Watch Video Solution

8. The colour of an electrolyte solution depends on

A. The nature of the anion

B. The nature of the cation

C. The nature of both the ions

D. The nature of the solvent

Answer: C

Watch Video Solution

9. Which of the following acids is stronger than benzoic acid $(K_a = 6.3 \times 10^{-5})$

A. $A(K_a = 1.67 \times 10^{-8})$

B. $B(pK_a = 6.0)$

C. $C(pK_a = 4.0)$

D. $D(K_a = 1.0 \times 10^{-5})$

Answer: C

Watch Video Solution

10. 0.2 M solution of formic acid is ionized 3.2%. Its ionization constant is

A. 9.6×10^{-3}

B. 2.1×10^{-4}

C. 1.25×10^{-6}

D. 4.8×10^{-5}

Answer: B

Watch Video Solution

11. The values of dissociation constants of some acids (at $25^{\circ} C$ are as follows. Indicate which is the strongest acid in water

A. 1.4×10^{-2}

B. 1.6×10^{-4}

C. 4.4×10^{-10}

D. 4.3×10^{-7}

Answer: A

Watch Video Solution

12. Which will not affect the degree of ionization

A. Temperature

B. Concentration

C. Type of solvent

D. Current

Answer: D

Watch Video Solution

13. An electrolyte

A. Gives complex ions in solution

B. Dissolves in water to give ions

C. Is ionized in the solid state

D. Generates ions on passing electric current

Answer: B

Watch Video Solution

14. Dissociation constant of a weak acid is decreased by

A. Addition of a strong acid

B. Addition of a salt of the above weak acid

C. Decreasing temperature

D. Dilution of the solution

Answer: C

Watch Video Solution

15. Ammonium hydroxide is a weak base because

A. It has low vapour pressure

B. It is only slightly ionized

C. It is not a hydroxide of any metal

D. It has low density

Answer: B

Watch Video Solution

16. In which of the following, dissociation of NH_4OH will be minimum?

A. NaOH

B. H_2O

C. NH_4Cl

D. NaCl

Answer: C

Watch Video Solution

17. The degree of dissociation of 0.1 M HCN solution is 0.01%. Its ionisation constant would be :

A. 10^{-3}

B. 10^{-5}

C. 10^{-7}

D. 10^{-9}

Answer: D

Watch Video Solution

18. Concentration of CN^{-} in 0.1 M HCN is (Given : $K_a = 4 \times 10^{-10}$)

A. $2.5 \times 10^{-6} M$

B. $4.5 \times 10^{-6} M$

C. $6.3 \times 10^{-6} M$

D. $9.2 \times 10^{-6} M$

Answer: C

Watch Video Solution

19. If α is the degree of ionization, C the concentration of a weak electrolyte and K_a the acid ionization constant , then the correct relationship between α and C is

A. $\alpha^2 = \sqrt{\frac{K_a}{C}}$

B. $\alpha^2 = \sqrt{\frac{C}{K_a}}$

C. $\alpha = \sqrt{\frac{K_a}{C}}$

D. $\alpha = \sqrt{\frac{C}{K_a}}$

Answer: C

Watch Video Solution

20. The pH of a 0.1 molar solution of the acid HQ is 3. The value of the ionisation constant, K_a of the acid is

A. 3×10^{-1}

B. 1×10^{-3}

C. 1×10^{-5}

D. 1×10^{-7}

Answer: C

Watch Video Solution

21. Which is generally true about ionic compounds

A. Have low boiling point

B. Have low melting point

C. Soluble in non polar solvents

D. Conduct electricity in the fused state

Answer: D

Watch Video Solution

22. Which one of the following is the correct quadratic form of the Ostwald's dilution law equation

A. $\alpha^2 C + \alpha K - K = 0$

B. $\alpha^2 C - \alpha K - K = 0$

C. $\alpha^2 C - \alpha K + K = 0$

D. $\alpha^2 C + \alpha K + K = 0$

Answer: A

Watch Video Solution

Watch Video Solution

23. An example of a strong electrolyte is

A. Urea

B. Ammonium hydroxide

C. Sugar

D. Sodium acetate

Answer: D

Watch Video Solution

24. A 0.010M solution of maleic acid, a monoprotic organic acid is 14% ionised. What is K_a for maleic acid ?

A. 2.3×10^{-3}

B. 2.3×10^{-4}

C. 2.0×10^{-4}

D. 2.0×10^{-6}

Answer: B

Watch Video Solution

25. The equilibrium that exists in aqueous solution , $CH_3COOH \Leftrightarrow CH_3COO^- + H^+$ if dil HCl is added at constant temperature then

A. Concentration of CH_3COO^- will increase

B. Concentration of CH_3COO^- will decrease

C. The equilibrium constant will increase

D. The equilibrium constant will decrease

Answer: D

Watch Video Solution

26. A monoprotic acid in $1.00M$ solution is 0.01% ionised. The dissociation constant of this acid is

A. 1×10^{-8}

B. 1×10^{-4}

C. 1×10^{-6}

D. 10^{-5}

Answer: A

Watch Video Solution

27. Accumulation of lactic acid $(HC_3H_5O_3)$, a monobasic acid in tissues leads to pain and a feeling of fatigue. In a 0.10 M aqueous solution, lactic acid is 3.7% dissociates. The value of dissociation constant Ka, for this acid will be

A. 1.4×10^{-5}

B. 1.4×10^{-4}

C. 3.7×10^{-4}

D. 2.8×10^{-4}

Answer: B

Watch Video Solution

28. The van't Hoff factor for $BaCl_2$ at 0.01 M concentration is 1.98. The percentage dissociation of $BaCl_2$ at this concentration is :

A. 49

B. 69

C. 89

D. 98

Answer: A

Watch Video Solution

29. An ionizing solvent has

A. Low value of dielectric constant

B. High value of dielectric constant

C. A dielectric constant equal to 1

D. Has a high melting point

Answer: B

Watch Video Solution

30. For a weak acid HA, Ostwald's dilution law is representented by the equation

A. $K_a = \dfrac{\alpha c}{1-\alpha^2}$

B. $K_a = \dfrac{\alpha^2 c}{1-\alpha}$

C. $K_a = \dfrac{K_a c}{1-c}$

D. $K_a = \dfrac{\alpha^2 c}{1-\alpha^2}$

Answer: B

Watch Video Solution

31. The addition of a polar solvent to a solenoid electrolyte results in

A. Polarization

B. Association

C. Ionization

D. Electron transfer

Answer: C

Watch Video Solution

32. For solution of weak electrolytic, the degree of ionization

A. Will be proportional to dilution

B. Will be proportional to concentration of electrolyte

C. Will be proportional to the square root of dilution

D. Will be reciprocal to the dilution

Answer: C

Watch Video Solution

33. The best conductor of electricity is a 1M solution of

A. Boric acid

B. Acetic acid

C. Sulphuric acid

D. Phosphoric acid

Answer: D

Watch Video Solution

Ordinary Thinking (Acids and Bases)

1. The degree of dissociation in a weak electrolyte increase

A. On increasing Dilution

B. On increasing pressure

C. On decreasing

D. None of these

Answer: A

Watch Video Solution

2. Which of the following is not a Lewis acid ?

A. PH_3

B. $FeCl_3$

C. SiF_4

D. C_2H_4

Answer: A

Watch Video Solution

3. Boron halides behave as Lewis acid because of their ___ nature.

A. Ionic nature

B. Acidic nature

C. Covalent nature

D. Electron deficient nature

Answer: D

Watch Video Solution

4. Which of the following is the strongest conjugate base ?

A. Cl^{-}

B. CH_3COO^{-}

C. SO_4^{-}

D. NO_2^{-}

Answer: B

Watch Video Solution

5. The most acidic compound in water is

A. $AlCl_3$

B. $BeCl_2$

C. $FeCl_2$

D. None of these

Answer: C

Watch Video Solution

6. Which of the following molecules acts as a Lewis acid?

A. $(CH_3)_3B$

B. $(CH_3)_2O$

C. $(CH_3)_3P$

D. $(CH_3)_3N$

Answer: A

Watch Video Solution

7. Which of the following is least likely to behave as Lewis acid?

A. OH^{-}

B. H_2O

C. NH_3

D. BF_3

Answer: D

Watch Video Solution

8. In which of the following arrangements the given sequence is not strict according to the property indicated against it?

A. $HF < HCl < HBr < HI$, increasing acidic strength

B. $H_2O < H_2S < H_2Se < H_2Te$, increasing pK_a values

C. $NH_3 < PH_3 < AsH_3 < SbH_3$: increasing acidic character

D. $CO_2 < SiO_2 < SnO_2 < PbO_2$, increasing oxidizing power

Answer: B

Watch Video Solution

9. Which of the following salts will give highest pH in water ?

A. Na_2CO_3

B. $CuSO_4$

C. KCl

D. $NaCl$

Answer: A

Watch Video Solution

10. NaOH is a atrong base because

A. It gives OH^- ion

B. it can be oxidized

C. It can be easily ionized

D. Both (a) and (c)

Answer: D

Watch Video Solution

11. The correct order of basic strength is

A. $H_2O < OH^- < CH_3OH < CH_3O^-$

B. $CH_3OH < H_2O < CH_3O^- < OH^-$

C. $H_2O < CH_3OH < OH^- < CH_3O^-$

D. $OH^- < H_2O < CH_3O^- < CH_3OH$

Answer: C

Watch Video Solution

12. Review the equilibrium and choose the correct statement

$HCIO_4 + H_2O \Leftrightarrow H_2O^+ CIO_4^-$

A. $HClO_4$ is the conjugate acid of H_2O

B. H_3O^+ is the conjugate base of H_2O

C. H_2O is the conjugate acid of H_3O^+

D. ClO_4^- is the conjugate base of $HClO_4$

Answer: D

Watch Video Solution

13. In the equilibrium

$$CH_3COOH + HF \Leftrightarrow CH_3COOH_2^{+} + F^{-}$$

A. F^{-} is the conjugate acid of CH_3COOH

B. F^{-} is the conjugate base of HF

C. CH_3COOH is the conjugate base of $CH_3COOH_2^{+}$

D. $CH_3COOH_2^{+}$ is the conjugate base of CH_3COOH

Answer: B

Watch Video Solution

14. Which of the following is a Lewis base

A. CH_4

B. C_2H_5OH

C. Acetone

D. Secondary amine

Answer: B::D

Watch Video Solution

15. $100ml$ of $0.2MH_2SO_4$ is added to $100ml$ of $0.2MNaOH$. The resulting solution will be

A. Acidic

B. Basic

C. Neutral

D. Slightly basic

Answer: A

Watch Video Solution

16. Which of the following is not a Bronsted acid

A. $CH_3NH_3^+$

B. CH_3COO^-

C. H_2O

D. HSO_4^-

Answer: B

Watch Video Solution

17. Dissociation of H_3PO_4 takes place in following steps

A. 1

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

18. The solution of strong acid and weak base NH_4Cl is

A. Acidic

B. Basic

C. Neutral

D. None of the above

Answer: A

Watch Video Solution

19. Neutralization of an acid with base invariably results in the production of

A. H_3O^+

B. OH^-

C. H_2O

D. H^+ and OH^-

Answer: C

Watch Video Solution

20. A salt X is dissolved in water having $pH = 7$. The resulting solution has a pH more than 7. The salt is made by neutralisation of

A. A strong acid and strong base

B. A strong acid and weak base

C. A weak acid and weak base

D. A weak acid and strong base

Answer: D

Watch Video Solution

21. Correct statement is

A. NH_4Cl gives alkaline solution in water

B. CH_3COONa gives acidic solution in water

C. CH_3COOH is a weak acid

D. NH_4OH is a strong base

Answer: C

Watch Video Solution

22. The aqueous solution of $CuSO_4$ is

A. Acidic

B. Basic

C. Neutral

D. Amphoteric

Answer: A

Watch Video Solution

23. According to Lewis concept, an acid is a substance which

A. Accepts protons

B. Donates protons

C. Accepts a lone pair of electrons

D. Donates a lone pair of electrons

Answer: C

Watch Video Solution

24. Which is a Lewis base ?

A. B_2H_6

B. $LiAIH_4$

C. AIH_4

D. NH_3

Answer: D

Watch Video Solution

25. A white substance was alkaline in solution. Which of the following substances could it be

A. Fe_2O_3

B. Na_2CO_3

C. NH_4Cl

D. $NaNO_3$

Answer: B

Watch Video Solution

26. Ammonia gas dissolves in water to form NH_4OH. In this reaction water acts as

A. An acid

B. A base

C. A salt

D. A conjugate base

Answer: A

Watch Video Solution

27. With reference to protonic acids, which of the following statements is correct

A. PH_3 is more basic than NH_3

B. PH_3 is less basic than NH_3

C. PH_3 is equally basic as NH_3

D. PH_3 is amphoteric while NH_3 is basic

Answer: B

Watch Video Solution

28. Which of the following is Lewis acid?

A. BF_3

B. Cl^-

C. H_2O

D. NH_3

Answer: A

Watch Video Solution

29. HClO is a weak acid. The concentration of H^{+} ions in 0.1 M solution of HClO $\left(K_a = 5 \times 10^{-8}\right)$ will be equal to

A. $7.07 \times 10^{-5}m$

B. $5 \times 10^{-9}m$

C. $5 \times 10^{-7}m$

D. $7 \times 10^{-4}m$

Answer: D

Watch Video Solution

Watch Video Solution

30. Which is the strongest Lewis acid?

A. SbH_3

B. AsH_3

C. PH_3

D. Bl_3

Answer: D

Watch Video Solution

31. In the equation $I_2 + I^- \rightarrow , I_3^-$ which is Lewis base

A. I_2

B. I^-

C. I_3^-

D. None of these

Answer: B

Watch Video Solution

32. Which one is Lewis acid

A. Cl^-

B. Ag^+

C. C_2H_5OH

D. S^{2-}

Answer: B

Watch Video Solution

33. According to Bronsted-Lowry concept, base is a substance which is

A. A proton donor

B. An electron pair acceptor

C. A proton acceptor

D. An electron pair donor

Answer: C

Watch Video Solution

34. The indicator used in the titration of iodine against sodium thiosulphate is

A. Starch

B. $K_3Fe(CN)_6$

C. K_2CrO_4

D. Potassium

Answer: A

Watch Video Solution

35. 100 mL of HCl + 35 mL of NaOH, colour of methyl orange in the solution will be

A. Red

B. Yellow

C. Can't be predicted

D. Methyl orange is not a suitable indicator

Answer: A

Watch Video Solution

36. According to Lewis concept which one of the following is not a base

A. OH^{-}

B. H_2O

C. Ag^{+}

D. NH_3

Answer: C

Watch Video Solution

37. Choose the correct option :

BF_3 is used as a catalyst in several industrial processes due to its

:

A. Strong reducing agent

B. Weak reducing agent

C. Strong Lewis acid nature

D. Weak Lewis acid character

Answer: C

Watch Video Solution

38. The acid that results when a base accepts a proton is called

A. Conjugate base of the acid

B. Conjugate protonated base

C. Lewis base

D. Conjugate acid of the base

Answer: D

Watch Video Solution

39. Accepting the definition that an acid is a proton donor, the acid in the following reaction

$NH_3 + H_2O \rightarrow NH_4^+ + OH^-$ is

A. NH_3

B. H^+

C. NH_4^+

D. H_2O

Answer: D

Watch Video Solution

40. The pK_a for acid A is greater than pK_a for acid B, the strong acid is :-

A. Acid B

B. Acid A

C. Both A and B

D. Neither A nor B

Answer: A

Watch Video Solution

41. The strongest acid is

A. H_3AsO_4

B. H_3AsO_3

C. H_3PO_3

D. H_3PO_4

Answer: D

Watch Video Solution

42. An aqueous solution of aluminium sulphate would show

A. A basic nature

B. An acidic nature

C. A neutral nature

D. Both acidic and basic nature

Answer: B

Watch Video Solution

43. Which halide of nitrogen is least basic

A. NBr_3

B. NI_3

C. NCl_3

D. NF_3

Answer: B

Watch Video Solution

44. Which of the following is a conjugated acid - base pair?

A. HCl, NaOH

B. NH_4Cl, NH_4OH

C. H_2SO_4, HSO_4^-

D. KCN, HCN

Answer: C

Watch Video Solution

45. The indicator used in the titration of sodium carbonate with sulphuric acid is

A. Phenolphthalein

B. Methyl organe

C. Potassium ferrocynide

D. Potassium ferricynide

Answer: B

Watch Video Solution

46. Which one is the weakest acid

A. HNO_3

B. $HClO_4$

C. H_2SO_4

D. HBr

Answer: A

Watch Video Solution

47. Strongest conjugate base is

A. Cl^{-}

B. Br^{-}

C. F^{-}

D. I^{-}

Answer: C

Watch Video Solution

48. An acid is a compound which furnishes (Bronsted-Lowery concept)

A. An electron

B. A proton

C. An electron and a proton

D. None of the above

Answer: B

Watch Video Solution

49. Which of the following is not a Lewis base

A. NH_3

B. PH_3

C. $(CH_3)_3N$

D. NH_3

Answer: D

Watch Video Solution

50. The salt that forms neutral solution in water is

A. NH_4Cl

B. NaCl

C. Na_2CO_3

D. K_3BO_3

Answer: B

Watch Video Solution

51. In the reaction $HCl + H_2O \rightarrow H_3^+O + Cl^-$

A. H_2O is the conjugate base of HCl acid

B. Cl^- is the conjugate base of HCl acid

C. Cl^- is the conjugate acid of H_2O acid

D. H_3O^+ is the conjugate base of HCl

Answer: B

Watch Video Solution

52. The conjugate acid of $S_2O_8^{-2}$

A. $H_2S_2O_8$

B. H_2SO_4

C. HSO_4^-

D. $HS_2O_8^-$

Answer: D

Watch Video Solution

53. In the reaction $BCl_3 + PH_3 \to Cl_3B \to PH_3$, Lewis base is

A. BCl_3

B. PH_3

C. $Cl_3B \to PH_3$

D. None of these

Answer: B

Watch Video Solution

54. In the reaction $SnCl_2 + 2Cl^- \to SnCl_4 + 2e^-$ the Lewis acid is

A. $SnCl_2$

B. Cl^-

C. $SnCl_4$

D. None of these

Answer: A

Watch Video Solution

55. The conjugate acid of HPO_3^{2-} is

A. H_3PO_4

B. H_3PO_3

C. $H_2PO_3^-$

D. PO_4^{3-}

Answer: C

Watch Video Solution

56. The conjugate acid of HPO_4^{2-} is

A. $H_2PO_4^-$

B. PO_4^{3-}

C. H_3PO_4

D. H_3PO_3

Answer: A

Watch Video Solution

57. Which of the following is the strongest Lewis acid

A. BI_3

B. BBr_3

C. BCl_3

D. BF_3

Answer: A

Watch Video Solution

58. The conjugate base of NH_2^- is

A. NH_3

B. NH^{2-}

C. NH_4^+

D. N_3^-

Answer: B

Watch Video Solution

59. Which of the anhydrous salts when come in contact with water turns blue

A. Ferrous sulphate

B. Copper sulphate

C. Znic sulphate

D. Cobalt sulphate

Answer: B

Watch Video Solution

60. An example of a Lewis acid is

A. NaCl

B. $MgCl_2$

C. $AlCl_3$

D. $SnCl_4$

Answer: C::D

Watch Video Solution

61. Orthoboric acid in aqueous medium is

A. Monobasic

B. Dibasic

C. Tribasic

D. All are correct

Answer: A

Watch Video Solution

62. When $100ml$ of $1MNaOH$ solution is mixed with $10ml$ of $10MH_2SO_4$, the resulting mixture will be

A. Acidic

B. Alkaline

C. Neutral

D. Strongly alkaline

Answer: A

Watch Video Solution

63. Cl^- is the conjugate base of

A. $HClO_4$

B. HCl

C. HOCl

D. $HClO_3$

Answer: B

Watch Video Solution

64. According to Bronsted principle, an aqueous solution of HNO_3 will contain

A. NO_2^-

B. NO_3^-

C. NO_2^+

D. NO^+

Answer: B

Watch Video Solution

65. Which of the following is strongest Lewis base?

A. CH_3^-

B. F^-

C. NH_2^-

D. OH^-

Answer: A

Watch Video Solution

66. Which of the following can give base OH^-

A. H_2O

B. H_3O^+

C. H_2

D. HCl

Answer: A

Watch Video Solution

67. The conjugate base of HBr is:

A. H_2Br^{+}

B. H^{+}

C. Br^{-}

D. Br^{-}

Answer: C

Watch Video Solution

68. According to Bronsted lowry, water is a/an

A. Base

B. Acid

C. Acid and base both

D. Salt

Answer: C

Watch Video Solution

69. Aqueous solution of $CuSO_4.5H_2O$ changes blue litmus paper to red due to

A. Presence of Cu^{++} ions

B. Presence of SO_4^{--} ions

C. Hydrolysis taking place

D. Reduction taking place

Answer: C

Watch Video Solution

70. An aqueous solution of ammonium carbonate is

A. Weakly acidic

B. Weakly basic

C. Strongly acidic

D. Neither acidic nor basic

Answer: B

Watch Video Solution

71. In the reaction $NH_3 + BF_3 \Leftrightarrow NH_3 \rightarrow BF_3, BF_3$ is

A. Lewis acid

B. Lewis base

C. Neither Lewis acid not Lewis base

D. Lewis acid and Lewis base both

Answer: A

Watch Video Solution

72. Molar heat of neutralization of NaOH with HCl in comparison to that of KOH with HNO_3 is

A. Less

B. More

C. Equal

D. Depends on pressure

Answer: C

Watch Video Solution

73. What name is given to the reaction between hydrogen ion and hydroxyl ion

A. Hydrogenenation

B. Hydroxylation

C. Hydrolysis

D. Neutralization

Answer: D

Watch Video Solution

74. pK_a value of the strongest acid among the following is

A. 3.0

B. 4.5

C. 1.0

D. 2.0

Answer: C

Watch Video Solution

75. In the following reaction $HC_2O_4^-(aq) + PO_4^{3-}(aq) \Leftrightarrow HPO_4^{-2}(aq) + C_2O_4^{2-}(aq)$, which are the two Bronsted bases?

A. $HC_2O_4^-$ and PO_4^{---}

B. HPO_4^{--} and $C_2O_4^{--}$

C. $HC_2O_4^{-}$ and HPO_4^{---}

D. $PO_4^{--{-3}}$ and $C_2O_4^{-2}$

Answer: D

Watch Video Solution

76. Which of the following statement is true

A. The conjugate base of a strong acid is a strong base

B. The conjugate base of a acid acid is a strong base

C. The conjugate base of a acid acid is a weak base

D. The base and its conjugate acid react to form a neutral solution

Answer: B

Watch Video Solution

77. Which of the following can act both as Bronsted acid and as Bronsted base?

A. Cl^{-}

B. HCO_3^{-}

C. H_3O^{+}

D. OH^{-}

Answer: B

Watch Video Solution

78. The species which acts as a Lewis acid but not as Bronsted acid is

A. NH_2^-

B. O^{2-}

C. BF_3

D. OH^-

Answer: C

Watch Video Solution

79. The aqueous solution of which one of the following is basic

A. HOCl

B. $NaHCO_4$

C. NH_4NO_3

D. $NaOCl$

Answer: D

Watch Video Solution

80. Among the following, the weakest base is

A. H^-

B. CH_3^-

C. CH_3O^-

D. Cl^-

Answer: D

Watch Video Solution

81. Which of the following behaves as both Lewis and Bronsted base

A. BF_3

B. Cl^{-}

C. CO

D. None of these

Answer: B

Watch Video Solution

82. The pH is less than 7, of the solution of

A. $FeCl_3$

B. NaCN

C. NaOH

D. NaCl

Answer: A

Watch Video Solution

83. Aqueous solution of weak acid and weak base is

A. Acidic

B. Basic

C. Neutral

D. Either acidic or basic

Answer: C

Watch Video Solution

84. The conjugate base of HSO_3^- is

A. H_2SO_3

B. SO_2

C. SO_3^{2-}

D. H_2S

Answer: C

Watch Video Solution

85. Which of the following can be classified as a Bronsted base ?

A. NO_3^-

B. H_3O^+

C. NH_4^+

D. CH_3COOH

Answer: A

Watch Video Solution

86. In the reaction $2H_2O \Leftrightarrow H_3O^+ + OH^-$, water is

A. A weak base

B. A weak acid

C. Both a weak acid and a weak base

D. Neither an acid nor a base

Answer: C

Watch Video Solution

87. The conjugate base of $H_2PO_4^-$ is :

A. HPO_4^{-2}

B. $H_2PO_4^-$

C. PO_4^{3-}

D. H_3O^+

Answer: A

Watch Video Solution

88. Which of the following is not used as a Lewis acid

A. $SnCl_4$

B. $FeCl_3$

C. KCl

D. BF_3

Answer: C

Watch Video Solution

89. An aqueous solution of ammonia consist of

A. H^+

B. OH^-

C. NH_4^+

D. NH_4^+ and OH^-

Answer: D

Watch Video Solution

90. Which of the following is not a Lewis acid

A. CO

B. $SiCl_4$

C. SO_3

D. Zn^{2+}

Answer: A

Watch Video Solution

91. An aqueous solution of sodium carbonate is alkaline because sodium carbonate is a salt of

A. Weak acid and weak base

B. Strong acid and weak base

C. weak acid and strong base

D. Strong acid and strong base

Answer: C

Watch Video Solution

92. In the given irreversible reaction, $H_2O + HCl \rightarrow H_3O^+ + Cl^-$ the species that acts as Bronsted base is

A. H_2O

B. HCl

C. H_3O^+

D. Cl^-

Answer: A

Watch Video Solution

93. which of the following dissolves in water to give a neutral solution

A. $(NH_4)_2SO_4$

B. $Ba(NO_3)_2$

C. $CrCl_3$

D. $CuSO_4$

Answer: B

Watch Video Solution

94. H^+ is a

A. Lewis acid

B. Lewis base

C. Bronsted-Lowry base

D. None of the above

Answer: A

Watch Video Solution

95. For two acids A and B, $pK_a = 1.2, pK_b = 2.8$ respectively in value , then which is true

A. A and B both are equally acidic

B. A is strongly than b

C. B is stronger than A

D. Neither A nor B is strong

Answer: B

Watch Video Solution

96. Lewis base is

A. CO_2

B. SO_3

C. SO_2

D. ROH

Answer: D

Watch Video Solution

97. The suitable for strong acid and weak base is

A. Methyl orange

B. Methyl red

C. Phenol red

D. Phenolphthalein

Answer: A::B

Watch Video Solution

98. Ammonium ion is

A. Neither an acid nor base

B. Both an acid and a base

C. A conjugate acid

D. A conjugate base

Answer: C

Watch Video Solution

99. Which is not electrophile ?

A. $AlCl_3$

B. BF_3

C. $(CH_3)_3C^+$

D. NH_3

Answer: D

Watch Video Solution

100. For an aqueous solution, the characteristic species of acid is

A. H^+ ion

B. H_3O^+ ion

C. H_2^+ ion

D. H_4O^+ ion

Answer: A::B

Watch Video Solution

101. The solvent which neither accepts proton nor donates proton is called

A. Amphoteric

B. Neutral

C. Aprotic

D. Amphiprotic

Answer: C

Watch Video Solution

102. Conjugate base of NH_3 is

A. $NH_4^{\oplus}$

B. $NH_2^{\oplus}$

C. $NH_2^{\oplus}$

D. N_2

Answer: C

Watch Video Solution

103. The aqueous solution of aluminium chloride is acidic due to the

A. Cation hydrolysis

B. Anion hydrolysis

C. Hydrolysis of both anion and cation

D. Dissociation

Answer: A

Watch Video Solution

104. which of the following salt does not get hydrolysed in water?

A. $KClO_4$

B. NH_4Cl

C. CH_3COONa

D. None of these

Answer: A

Watch Video Solution

105. The species among the following which can act as an acid and as a base is

A. HSO_4^-

B. SO_4^{2-}

C. H_3O^+

D. Cl^-

Answer: A

Watch Video Solution

Watch Video Solution

106. Which one of the following substances has the highest proton affinity ?

A. H_2O

B. H_2S

C. NH_3

D. PH_3

Answer: C

Watch Video Solution

107. The conjugate base of $H_2PO_4^-$ is :

A. H_3PO_4

B. P_2O_5

C. PO_4^{3-}

D. HPO_4^{2-}

Answer: D

Watch Video Solution

108. What is the conjugate base of OH^-?

A. O_2

B. H_2O

C. O^-

D. O^{2-}

Answer: D

Watch Video Solution

109. Four species are listed below:

(i) HCO_3^-

(ii) H_3O^+

(iii) HSO_4^-

(iv) HSO_3F

Which one of the following is the correct sequence of their acid strength?

A. $ii < iii < i < iv$

B. $i < iii < ii < iv$

C. $iii < i < iv < ii$

D. $iv < ii < iii < i$

Answer: B

Watch Video Solution

Watch Video Solution

110. The correct order of increasing basicity of the given conjugate bases $(R = CH_3)$ is

A. $RCO\overline{O} < HC \equiv \overline{C} < \overline{N}H_2 < \overline{R}$

B. $RCO\overline{O} < HC \equiv \overline{C} < \overline{R} < \overline{N}H_2$

C. $\overline{R} < HC \equiv \overline{C} < RCO\overline{O} < \overline{N}H_2$

D. $RCO\overline{O} < \overline{N}H_2 < HC \equiv \overline{C} < \overline{R}$

Answer: A

Watch Video Solution

111. Three reactions involving $H_2PO_4^-$ are given below

$I.\ H_3PO_4 + H_2O \rightarrow H_3O^+ + H_2PO_4^-$

$II.\ H_2PO_4^- + H_2O \rightarrow HPO_4^{2-} + H_3O^+$

$III.\ H_2PO_4^- + OH^- \rightarrow H_3PO_4 + O^{2+}$

In which of the above does $H_2PO_4^-$ act as an acid?

A. (i) only

B. (ii) only

C. (i) and (ii)

D. (iii) only

Answer: B

Watch Video Solution

112. Which one is not an acid salt?

A. NaH_2PO_2

B. NaH_2PO_3

C. NaH_2PO_4

D. None

Answer: A

Watch Video Solution

113. For the reaction in aqueous solution $Zn^{2+} + X^{-} \Leftrightarrow ZnX^{+}$, the K_{eq} is greatest when X is

A. F^{-}

B. NO_3^{-}

C. ClO_4^{-}

D. I^{-}

Answer: A

Watch Video Solution

114. Why are strong acids generally used as standard solutions in acid-base titrations ?

A. The pH at the equivalence point will always by 7

B. They can be used to titrate both strong and weak bases

C. Strong acids form more stable solutions than weak acids

D. The salts of strong acids do not hydrolysed

Answer: B

Watch Video Solution

115. Assign suitable reason for the following:

H_3PO_3 is diprotic

A. H_2PO_5

B. H_2S

C. $HClO_3$

D. H_3PO_3

Answer: D

Watch Video Solution

116. According to Bronsted Lowry concept, the correct order of strength of bases follows the order:

A. $CH_3COO^- > Cl^- < OH^-$

B. $CH_3COO^- > OH^- > Cl^-$

C. $OH^- > CH_3COO^- > Cl^-$

D. $OH^- > Cl^- > CH_3COO^-$

Answer: C

Watch Video Solution

117. Phenolphthalein does not act as an indicator for the titration between

A. NaOH and CH_3COOH

B. $H_2C_2O_4$ and $KMnO_4$

C. $Ba(OH)_2$ and HCl

D. KOH and H_2SO_4

Answer: B

Watch Video Solution

118. For a weak acid, the incorrect statement is

A. Its dissociation constant is low

B. Its pK_a is very low

C. it is partially dissociated

D. Solution of its sodium salt is expected to form ionic

Answer: B

Watch Video Solution

119. Which of the following salt is alkaline in water

A. CCl_4

B. O_2

C. NaBr

D. $CHBr_3$

Answer: C

Watch Video Solution

120. An organic dye, cosine used to detect end point of precipitation titration by adsorption is called

A. Absorption indicator

B. Adsorption indicator

C. Chemical indicator

D. None of these

Answer: B

Watch Video Solution

121. Which shows weak ionisation in water

A. H_2SO_4

B. NaCl

C. HNO_3

D. NH_3

Answer: D

Watch Video Solution

122. The shape of SO_4^{2-} ion is

A. SO_4^{2-}

B. HSO_4^{-}

C. $H_3SO_4^{+}$

D. None of these

Answer: B

Watch Video Solution

123. Which of the following is not a Lewis acid ?

A. PH_3

B. $AlCl_3$

C. HCl

D. $LiAlH_4$

Answer: A

Watch Video Solution

124. The conjugate base in the following reaction

$$H_2SO_4 + H_2O \to H_3O^+ + HSO_4^-$$

A. H_2O

B. HSO_4^-

C. H_3O^+

D. SO_2

Answer: B

Watch Video Solution

125. Which of the following base is weakest ?

A. $NH_4OH : K_b = 1.6 \times 10^{-6}$

B. $C_6H_5NH_2 : K_b = 3.8 \times 10^{-10}$

C. $C_2H_5NH_2 : K_b = 5.6 \times 10^{-4}$

D. $C_6H_7N : K_b = 6.3 \times 10^{-10}$

Answer: B

Watch Video Solution

126. Species acting both as Bronsted acid base is

A. HSO_4^-

B. Na_2CO_3

C. NH_3

D. OH^-

Answer: C

Watch Video Solution

127. According to hard and soft acid base principle, a hard acid

A. Has low charge density

B. Shows preference for soft bases

C. Shows preference for donor atoms of low electronegativity

D. Is not polarizable

Answer: B

Watch Video Solution

128. The pH indicators are

A. Salts of strong acid and strong bases

B. Salts of weak acids and weak bases

C. Either weak acids or weak bases

D. Either strong acids or strong bases

Answer: C

Watch Video Solution

129. The strongest base of the following species is

A. NH^{2-}

B. OH^{-}

C. O^{2-}

D. S^{2-}

Answer: A

Watch Video Solution

130. Water is a

A. Amphoteric acid

B. Aprotic acid

C. Protophobic solvent

D. None of these

Answer: D

Watch Video Solution

131. Amines behave as:

A. Aprotic acid

B. Neutral compound

C. Lewis acid

D. Lewis base

Answer: D

Watch Video Solution

132. The different colours of litmus in acidic, neutral and basic solutions are, respectively.

A. Red, orange and blue

B. Blue, violet and red

C. Red, colourless and blue

D. Red, violet and blue

Answer: D

Watch Video Solution

133. NH_4Cl is acidic, because

A. On hydrolysis NH_4Cl gives weak base NH_4OH and strong acid HCl

B. Nitrogen donates a pair of electron

C. It is a salt of weak acid and strong base

D. On hydrolysis NH_4Cl gives strong base ad weak acid

Answer: A

Watch Video Solution

134. $HSO_4^- + OH^- \rightarrow SO_4^{2-} + H_2O$ Which is correct about conjugate acid base pair

A. HSO_4^- is conjugate acid of base SO_4^{2-}

B. HSO_4^- is conjugate base of acid SO_4^{2-}

C. SO_4^{2-} is conjugate acid of base HSO_4^-

D. None of these

Answer: A

Watch Video Solution

135. The correct order of acidity for the following is

A. $HCN > ClCH_2COOH > HCOOH > CH_3COOH$

B. $HCN > HCOOH > ClCH_2COOH > CH_3COOH$

C. $ClCH_2COOH > HCOOH > CH_3COOH > HCN$

D. $ClCH_2COOH > HCN > HCOOH > CH_3COOH$

Answer: C

Watch Video Solution

136. The aqueous solution of $AlCl_3$ is acidic due to the hydrolysis of

A. Aluminium ion

B. Chloride ion

C. Both aluminium and chloride ion

D. None of these

Answer: A

Watch Video Solution

137. Would gaseous HCl be considered as an Arrhenius acid?

A. Yes

B. No

C. Not known

D. Gaseous HCl does not exist

Answer: B

Watch Video Solution

138. Which one of the following is called amphoteric solvent

A. Ammonium hydroxide

B. Chloroform

C. Benzene

D. Water

Answer: D

Watch Video Solution

139. pK_a of a weak acid is defined as

A. $\log_{10} K_a$

B. $\frac{1}{\log_{10} K_a}$

C. $\log_{10} \cdot \frac{1}{K_a}$

D. $-\log_{10} \cdot \frac{1}{K_a}$

Answer: C

Watch Video Solution

140. The compound HCl behaves as ....in the reaction,

$HCl + HF \rightarrow H_2^+ Cl + F^-$

A. Weak base

B. Weak acid

C. Strong base

D. Strong acid

Answer: A

Watch Video Solution

141. The acid having the highest pK_A value among the following is

A. HCOOH

B. CH_3COOH

C. $ClCH_2COOH$

D. FCH_2COOH

Answer: B

Watch Video Solution

142. Which of the following is not Lewis acid?

A. $AlCl_3.6H_2O$

B. NCl_3

C. $SnCl_4$

D. $FeCl_3$

Answer: B

Watch Video Solution

143. The aqueous solution of $FeCl_3$ is acidic due to

A. Hydrolysis

B. Acidic impurities

C. Dissociation

D. Ionisation

Answer: A

Watch Video Solution

144. Arrange NH_4^+, H_2O, H_3O^+, HF and OH^- in increasing order of acidic nature:

A. $H_3O^+ < NH_4^+ < HF < OH^- < H_2O$

B. $NH_4^+ < HF < H_3O^+ < H_2O < OH^-$

C. $OH^- < H_2O < NH_4^+ < HF < H_3O^+$

D. $H_3O^+ > HF > H_2O > NH_4^+ > OH^-$

Answer: C

Watch Video Solution

145. A solution of sodium bicarbonate in water turns

A. Phenolphthalein pink

B. Methyl orange yellow

C. Methyl orange red

D. Blue litmus red

Answer: C

Watch Video Solution

146. CH_3COOH is weaker acid than H_2SO_4. It is due to

A. More ionization

B. Less ionization

C. Covalent bond

D. Electrovalent bond

Answer: B

Watch Video Solution

147. Among the following the weakest base is

A. H^{-}

B. OH^{-}

C. Cl^{-}

D. HCO_3^{-}

Answer: C

Watch Video Solution

148. $10ml$ of $1MH_2SO_4$ will completely neutralise

A. 10 ml of 1M NaOH solution

B. 10 ml of 2M NaOH solution

C. 5 ml of 2 M KOH solution

D. 5 ml of 1 M Na_2CO_3 solution

Answer: B

Watch Video Solution

149. Which of the following species is an acid and also a conjugate base of another acid

A. HSO_4^-

B. H_2SO_4

C. OH^-

D. H_3O^+

Answer: A

Watch Video Solution

150. An aqueous solution of aluminium sulphate would show

A. An acidic reaction

B. A neutral reaction

C. A basic reaction

D. Both acidic and basic reaction

Answer: A

Watch Video Solution

151. Aqueous solution of aluminium sulphate would show

A. H^+ ions

B. H_2^+ ions

C. H_3O^+ ions

D. H_4O^+ ions

Answer: C

Watch Video Solution

152. Assertion (A): $BaCO_3$ is more soluble in HNO_3 than in water.

Reason (R): Carbonate is a weak base and reacts with $H^{\oplus}$ ions to form strong acid causing barium salt to dissociate.

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation is true but reason is false.

C. If the assertion and reason both are false.

D. If the assertion and reason both are false.

Answer: A

Watch Video Solution

153. Assertion: $CHCl_3$ is more acidic than CHF_3.

Reason: The conjugate base of $CHCl_3$ is more stable than CHF_3

.

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation is true but reason is false.

C. If the assertion and reason both are false.

D. If the assertion and reason both are false.

Answer: A

Watch Video Solution

154. Assertion : Ionic reactions are not instantaneous.

Reason : Oppositely charged ions exert strong forces.

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation is true but reason is false.

C. If the assertion and reason both are false.

D. If assertion is false but reason is true

Answer: D

Watch Video Solution

Ordinary Thinking (Common ion effect, Isohydric solutions, Solubility product, Ionic product of water and Salt hydrolysis)

1. The hydrogen ion concentration in weak acid of dissociation constant K_a and concentration c is nearly equal to

A. $\sqrt{K_a / c}$

B. c / K_a

C. $K_a c$

D. $\sqrt{K_a c}$

Answer: D

Watch Video Solution

2. Which of the following salts when dissolved in water with get hydrolysed?

A. NaCl

B. NH_4Cl

C. KCl

D. Na_2SO_4

Answer: B

Watch Video Solution

3. Which is the correct alternate for hydrolysis constant of NH_4CN?

A. $\sqrt{\frac{K_w}{K_a}}$

B. $\frac{K_w}{K_a \times K_b}$

C. $\sqrt{\frac{K_b}{c}}$

D. $\frac{K_a}{K_b}$

Answer: B

Watch Video Solution

4. In which of the following solvents will $AgBr$ has highest solubility?

A. 10^{-3} M NaBr

B. $10^{-3} MNH_4OH$

C. Pure water

D. 10^{-3} M HBr

Answer: B

Watch Video Solution

5. Which one of the following is most soluble ?

A. $CuS(K_{sp} = 8 \times 10^{-37})$

B. $MnS(K_{sp} = 7 \times 10^{-16})$

C. $Bi_2S_3(K_{sp} = 1 \times 10^{-70})$

D. $Ag_2S(K_{sp} = 6 \times 10^{-51})$

Answer: B

Watch Video Solution

6. The solubility of AgCl will be minimum in

A. 0.001 M $AgNO_3$

B. Pure water

C. 0.01 M $CaCl_2$

D. 0.01 M NaCl

Answer: B

Watch Video Solution

7. The ionic product of water at $25^{\circ} C$ is 10^{-14} its ionic product at $90^{\circ} C$ will be

A. 1×10^{-20}

B. 1×10^{-12}

C. 1×10^{-14}

D. 1×10^{-16}

Answer: B

Watch Video Solution

8. The solubility product of CuS, Ag_2S and HgS are $10^{-31}, 10^{-44}, 10^{-54}$ respectively. The solubilities of these sulphides are in the order

A. $Ag_2S > CuS > HgS$

B. $Ag_2S > HgS > CuS$

C. $HgS > Ag_2S > CuS$

D. $CuS > Ag_2S > HgS$

Answer: A

Watch Video Solution

9. The solubility of CaF_2 is $2 \times 10^{-4}\text{mole}/\text{litre}$. Its solubility product is

A. 2.0×10^{-4}

B. 4.0×10^{-3}

C. $4 \times 8.0 \times 10^{-12}$

D. 3.2×10^{-11}

Answer: c

Watch Video Solution

10. Solubility of MX_2 type electrolytes is $0.5 \times 10^{-4} mol / L$, then find out K_{sp} of electrolytes.

A. 5×10^{-13}

B. 25×10^{-10}

C. 1.25×10^{-13}

D. 5×10^{12}

Answer: A

Watch Video Solution

11. The solubility product of AgI at $25^{\circ}C$ is $1.0 \times 10^{-16} mol^2 L^{-2}$. The solubility of AgI in $10^{-4}N$ solution of KI at $25^{\circ}C$ is approximately (in $mol L^{-1}$)

A. 1.0×10^{-8}

B. 1.0×10^{-16}

C. 1.0×10^{-12}

D. 1.0×10^{-10}

Answer: C

Watch Video Solution

12. The solubility product of a sparingly soluble salt AX_2 is 3.2×10^{-11}. Its solubility (in mo/L) is

A. 2×10^{-4}

B. 4×10^{-4}

C. 5.6×10^{-6}

D. 3.1×10^{-4}

Answer: A

Watch Video Solution

13. A weak acid, HA, has a K_a of 1.00×10^{-5}. If 0.100 mol of the acid is dissolved in 1 L of water, the percentage of the acid dissociated at equilibrium is the closed to

A. $99.0\,\%$

B. 1.00%

C. 99.9%

D. 0.100%

Answer: B

Watch Video Solution

14. The ionization constant of ammonium hydroxide is 1.77×10^{-5} at $298K$. Hydrolysis constant of ammonium chloride is

A. 5.65×10^{-10}

B. 6.50×10^{-12}

C. 5.65×10^{-13}

D. 5.65×10^{-12}

Answer: A

Watch Video Solution

15. pH of saturated solution of $Ba(OH)_2$ is 12. The value of solubility product (K_{sp}) of $Ba(OH)_2$ is

A. 3.3×10^{-7}

B. 5.0×10^{-7}

C. 4.0×10^{-6}

D. 5.0×10^{-6}

Answer: B

Watch Video Solution

16. The K_{sp} of Ag_2CrO_4, $AgCl$, $AgBr$ and AgI are respectively, 1.1×10^{-12}, 1.8×10^{-10}, 5.0×10^{-13}, 8.3×10^{-17}. Which one of the following salts will precipitate last if $AgNO_3$ solution is added to the solution containing equal moles of NaCl,NaBr,NaI and Na_2CrO_4 ?

A. AgCl

B. AgBr

C. Ag_2CrO_4

D. AgI

Answer: C

Watch Video Solution

17. MY and NY_3 two nearly insoluble salts, have the same K_{sp} values of 6.2×10^{-13} at room temperature. Which statement would be true in rearged to MY and NY_3 ?

A. The molar solubilities of MY and NY_3 in water are identical

B. The molar solubility of MY in water is less than that of NY_3

C. The salts MY and NY_3 are more soluble in 0.5 M KY than in pure water

D. The addition of the salt of KY to solution of MY and NY_3 will have no effect on their solubilities

Answer: B

Watch Video Solution

18. The pH of a solution of AgCI(s) with solubility product 1.6×10^{-10} in 0.1 M Nacl solution would be :

A. Zero

B. $1.26 \times 10^{-5} M$

C. $1.6 \times 10^{-9} M$

D. $1.6 \times 10^{-11} M$

Answer: C

Watch Video Solution

19. The K_a value of $CaCO_3$ and CaC_2O_4 in water are 4.7×10^{-9} and 1.3×10^{-9}, respectively, at $25^{\circ} C$. If a miaxture of two is washed with H_2O, what is Ca^{2+} ion concentration in water?

A. $5.831 \times 10^{-5} M$

B. $6.856 \times 10^{-5} M$

C. $3.606 \times 10^{-5} M$

D. $7.746 \times 10^{-5} M$

Answer: D

Watch Video Solution

20. Any precipitate is formed when

A. Solution becomes saturated

B. The value of ionic product is less that than the value of solubility product

C. The value of ionic product is equal than the value of solubility product

D. The value of ionic product is greater than the value of solubility product

Answer: D

Watch Video Solution

21. The solubility of $BaSO_4$ in water is $2.33 \times 10^{-3} g / litre$. Its solubility product will be (molecular weight of $BaSO_4 = 233$)

A. 1×10^{-5}

B. 1×10^{-10}

C. 1×10^{-15}

D. 1×10^{-20}

Answer: B

Watch Video Solution

Watch Video Solution

22. The solubility product of As_2O_3 is 10.8×10^{-9}. It is 50% dissociated in saturated solution. The solubility of salt is

A. 10^{-2}

B. 2×10^{-2}

C. 5×10^{-3}

D. 5.4×10^{-9}

Answer: B

Watch Video Solution

23. On adding 0.1 M solution each of Ag^{+}, Ba^{2+}, Ca^{2+} ions in a Na_2SO_4 solution, species first precipitated is $(K_{sp}BaSO_4 = 10^{-11}, K_{sp}CaSO_4 = 10^{-6}, K_{sp}Ag_2SO_4 = 10^{-5})$

A. Ag_2SO_4

B. $BaSO_4$

C. $CaSO_4$

D. All of these

Answer: B

Watch Video Solution

24. K_{sp} for sodium chloride is $36 mol^2 / \text{litre}^2$. The solubility of sodium chloride is

A. $\frac{1}{36}$

B. $\frac{1}{6}$

C. 6

D. 3600

Answer: C

Watch Video Solution

25. If the solubility of a sparingly soluble saltof the type BA_2 (Giving three ions on dissociation of a molecule) is 'x' moles per litre , then its solubility product is given by

A. x^2

B. $2x^3$

C. $4x^2$

D. $4x^3$

Answer: D

Watch Video Solution

26. If te solubility product of $BaSO_4$ is 1.5×10^{-9} in water, its solubility in moles per litre, is

A. 1.5×10^{-9}

B. 3.9×10^{-5}

C. 7.5×10^{-5}

D. 1.5×10^{-5}

Answer: B

Watch Video Solution

27. The solubility product of $AgCrO_4$ is 32×10^{-12}. What is the concentration of CrO_4^{2-} ions in that solution ?

A. $2 \times 10^{-4} M$

B. $16 \times 10^{-4} M$

C. $8 \times 10^{-4} M$

D. $8 \times 10^{-8} M$

Answer: A

Watch Video Solution

28. On adding ammonium chloride to a solution ammonium hydroxide

A. Dissociation of NH_4OH increases

B. Concentration of OH^{-} increases

C. Concentration of OH^{-} decreases

D. Concentration of NH_4^{+} and oH^{-} increases

Answer: C

Watch Video Solution

Watch Video Solution

29. The product of ionic concentration in a saturated solution of an electrolyte at a given temperature is constant an is known as

A. Ionic product

B. Solubility product

C. Ionization constant

D. Dissociation constant

Answer: B

Watch Video Solution

30. Solubility product of PbC_2 at 298K is 1.0×10^{-6} At this temperature solubility of $PbCI_2$ in moles per litre is

A. 6.3×10^{-3}

B. $(0.25 \times 10^{-6})^{1}/3$

C. 3.0×10^{-3}

D. 4.6×10^{-14}

Answer: A

Watch Video Solution

31. If the concentration of lead iodide in its saturated solution at $25^\circ C$ be 2×10^{-3} moles per litre, then the solubility product is

A. 4×10^{-6}

B. 8×10^{-12}

C. 6×10^{-9}

D. 32×10^{-9}

Answer: D

Watch Video Solution

32. Electrolytes when dissolved in water dissociate into their constituent ions. The degree of dissociation of an electrolyte increases with

A. Increasing concentration of the electrolyte

B. Decreasing concentration of the electrolyte

C. Decreasing temperature

D. Presence of a substance yielding a common ionsely proportional to the concentration of the electrolyte

Answer: B

Watch Video Solution

33. In which of the following salt hydrolysis takes place

A. KCl

B. $NaNO_3$

C. CH_3COOK

D. K_2SO_4

Answer: C

Watch Video Solution

34. Aqueous solution of sodium acetate is

A. Neutral

B. Weakly acidic

C. Strongly acidic

D. Alkaline

Answer: D

Watch Video Solution

35. Why pure NaCl is precipitated when HCl gas is passed in saturated solution of NaCl

A. Impurities dissolves in HCl

B. The value of $[Na^{+}]$ and $[Cl^{-}]$ becomes smaller than K_{sp} of NaCl

C. The value of $[Na^{+}]$ and $[Cl^{-}]$ becomes greater than K_{sp} of NaCl

D. HCl dissolves in the water

Answer: C

Watch Video Solution

36. The solubility of $PbCl_2$ at $25^\circ C$ is 6.3×10^{-3} mole/litre. Its solubility product at that temperature is

A. $(6.3 \times 10^{-3}) \times (6.3 \times 10^{-3})$

B. $(6.3 \times 10^{-3}) \times (12.6 \times 10^{-3})$

C. $(6.3 \times 10^{-3}) \times (12.6 \times 10^{-3})^2$

D. $(12.6 \times 10^{-3}) \times (12.6 \times 10^{-3})$

Answer: C

Watch Video Solution

37. The solubility product of a sparingly soluble salt AB at room temperature is 1.21×10^{-6}. Its molar solubility is

A. 1.21×10^{-6}

B. 1.21×10^{-3}

C. 1.1×10^{-4}

D. 1.1×10^{-3}

Answer: D

Watch Video Solution

38. The solubility product of $BaSO_4$ at $25^\circ C$ is 1.0×10^{-9}. What would be the concentration of H_2SO_4 necessary to precipitate $BaSO_4$ from a solution of 0.01 M Ba^{+2} ions

A. 10^{-9}

B. 10^{-8}

C. 10^{-7}

D. 10^{-6}

Answer: C

Watch Video Solution

39. If S and K_{sp} are respectively solubility and solubility product of a sparingly soluble binary electrolyte, then

A. $S = K_{sp}$

B. $S = K_{sp}^2$

C. $S = \sqrt{K_{sp}}$

D. $S = \frac{1}{2}K_{sp}$

Answer: C

Watch Video Solution

40. K_{sp} value of $Al(OH)_3$ and $Zn(OH)_2$ are 8.5×10^{-23} and 1.8×10^{-14} respectively. If NH_4OH is added in a solution of Al^{3+} and Zn^{2+}, which will precipitate earlier

A. $Al(OH)_3$

B. $Zn(OH)_2$

C. Both together

D. None

Answer: A

Watch Video Solution

41. Which one is strongest electrolyte in the following ?

A. NaCl

B. CH_3COOH

C. NH_4OH

D. $C_6H_{12}O_6$

Answer: A

Watch Video Solution

42. At infinite dilution, the percentage ionisation of both strong and weak electrolytes is

A. 1%

B. 20%

C. $50\ \%$

D. $100\ \%$

Answer: D

Watch Video Solution

43. If K_{sp} for $HgSO_4$ is 6.4×10^{-5}, then solubility of the salt is

A. 8×10^{-3}

B. 8×10^{-6}

C. 6.4×10^{-5}

D. 6.4×10^{-3}

Answer: A

Watch Video Solution

44. Solubility of BaF_2 in a solution of $Ba(NO_3)_2$, will be represented by the concentration term:

A. $[Ba^{++}]$

B. $[F^-]$

C. $\frac{1}{2}[F^-]$

D. $2[NO_3^-]$

Answer: C

Watch Video Solution

45. The solubility of Sb_2S_3 in water is 1.0×10^{-5} mol/letre at 298K. What will be its solubility product ?

A. 108×10^{-25}

B. 1.0×10^{-25}

C. 144×10^{-25}

D. 126×10^{-24}

Answer: A

Watch Video Solution

46. Pure sodium chloride is prepared by saturating a cold saturated solution of common salt in water with HCl gas. The principle used is

A. Le-Chatelier principle

B. Displacement law

C. Common ion effect

D. Fractional distillation

Answer: C

Watch Video Solution

47. In the reaction: $H_2S \Leftrightarrow 2H^+ + S^-$, when NH_4OH is added, then

A. S^{--} is precipitate

B. No reaction takes places

C. Concentration of S^{--} decreases

D. Concetration of S^- increases

Answer: D

Watch Video Solution

48. Solubility product of AgCl is 1×10^{-6} at 298 K. Its solubility in mole litre^{-1} would be

A. 1×10^{-6} mol/ litre

B. 1×10^{-3} mol/litre

C. 1×10^{-12} mol/litre

D. None of these

Answer: B

Watch Video Solution

49. A saturated solution of $Ag_2SO_4 is 2.5 \times 10^{-2} M$. The value of its solubility product is

A. 62.5×10^{-6}

B. 6.25×10^{-4}

C. 15.625×10^{-6}

D. 3.125×10^{-6}

Answer: A

Watch Video Solution

50. The solubility product of AgCl under standard conditions of temperature is given by

A. 1.6×10^{-5}

B. 1.5×10^{-8}

C. 3.2×10^{-10}

D. 1.5×10^{-10}

Answer: D

Watch Video Solution

51. For which of the following sparingly soluble salt the solubility (s) and solubility product (K_{sp}) are related by the expression $s = (K_{sp}/4)^{1/3}$

A. $BaSO_4$

B. $Ca_3(PO_4)_2$

C. Hg_2Cl_2

D. Ag_3PO_4

Answer: C

Watch Video Solution

52. At 25° C, the solubility product of Hg_2CI_2 in water is $3.2 \times 10^{-17} mol^3 dm^{-9}$ what is the solubility of Hg_2CI_2 in water at 25°C ?

A. $1.2 \times 10^{-12} M$

B. $3.0 \times 10^{-6} M$

C. $2 \times 10^{-6} M$

D. $1.2 \times 10^{-16} M$

Answer: C

Watch Video Solution

53. Which one of the following substances will be a mixed salt?

A. $NaHCO_3$

B. Ca(OCl)Cl

C. $K_2SO_4Al_2(SO_4)_3.24H_2O$

D. Mg(OH)Br

Answer: B

Watch Video Solution

54. What happens when CCl_4 is treated with $AgNO_3$

A. A white ppt. of AgCl will form

B. NO_2 will be evolved

C. CCl_4 will dissolved in $AgNO_3$

D. Nothing will happen

Answer: D

Watch Video Solution

55. Which one is a mixed salt

A. $NaHSO_4$

B. $NaKSO_4$

C. $K_4Fe(CN)_6$

D. $Mg(OH)Cl$

Answer: B

Watch Video Solution

56. A monoprotic acid in a 0.1 M solution ionizes to 0.001%. Its ionisation constant is

A. 1.0×10^{-3}

B. 1.0×10^{-6}

C. 1.0×10^{-8}

D. 1.0×10^{-11}

Answer: D

Watch Video Solution

57. Ionic product of water increases, if

A. Pressure is reduced

B. Temperature increases

C. OH^{-} is added

D. Temperature increases

Answer: D

Watch Video Solution

58. If the concentration of CrO_4^{2-} ions in a saturated solution of silver chromate is 2×10^{-4}, solubility product of silver chromate will be:

A. 4×10^{-8}

B. 8×10^{-12}

C. 12×10^{-12}

D. 32×10^{-12}

Answer: D

Watch Video Solution

59. Approximate relationship between dissociation constant of water (K) and ionic product of water (K_w) is

A. $K_w = K$

B. $K_w = 55.6 \times K$

C. $K_w = 18 \times K$

D. $K_w = 14 \times K$

Answer: B

Watch Video Solution

60. Solubility (s) of CaF_2 in terms of its solubility product is given as

A. $s = (K_{sp})^{1/3}$

B. $s = (K_{sp}/2)^{1/3}$

C. $s = (K_{sp}/4)^{1/3}$

D. $s = (K_{sp}/2)^{1/2}$

Answer: C

Watch Video Solution

61. If the solubility of Pr_2 is S g-mole per litre, its solubility product, considering it to be 80% ionized, is

A. $2.048S^2$

B. $20.48S^3$

C. $2.048S^3$

D. $2.048S^4$

Answer: C

Watch Video Solution

62. Which is a basic salt

A. PbS

B. $PbCO_3$

C. $PbSO_4$

D. $2PbCO_3 . Pb(OH)_2$

Answer: D

Watch Video Solution

63. According to the reaction $PbCl_2 = Pb^2 + 2Cl^-$, the solubility coefficient of $PbCl_2$ is

A. $[Pb^{2+}][Cl^-]^2$

B. $[Pb^{2+}][Cl^-]$

C. $[Pb^{2+}]^2[Cl^-]$

D. None of these

Answer: A

Watch Video Solution

64. Which will not be hydrolysed

A. Potassium nitrate

B. Potassium cyanide

C. Potassium succinate

D. Potassium carbonate

Answer: A

Watch Video Solution

65. Which of the following aqueous solution will have a pH less than `7.0 ?

A. KNO_3

B. NaOH

C. $FeCl_3$

D. NaCN

Answer: C

Watch Video Solution

66. On addition of a solution containing CrO_4^{2-} ions to the solution of Ba^{2+}, Sr^{2+}, and Ca^{2+} ions, the precipitate obtained first will be of

A. $CaCrO_4$

B. $SrCrO_4$

C. $BaCrO_4$

D. Mixture of (a), (b), (c)

Answer: C

Watch Video Solution

67. The solubility product of AgCl is 1.44×10^{-4} at $100^{\circ} C$. The solubility of silver chloride in boiling water may be

A. $0.72 \times 10^{-4} M$

B. $1.20 \times 10^{-2} M$

C. $0.72 \times 10^{-2} M$

D. $1.20 \times 10^{-4} M$

Answer: B

Watch Video Solution

68. The solubility of $PbCl_2$ is

A. $\sqrt{K_{sp}}$

B. $3\sqrt{K_{sp}}$

C. $3\sqrt{\frac{K_{sp}}{4}}$

D. $\sqrt{8K_{sp}}$

Answer: C

Watch Video Solution

69. Which of the following cannot be hydrolysed?

A. A salt of weak acid and strong base

B. A salt of strong acid and weak base

C. A salt of weak acid and weak base

D. A salt of strong acid and strong base

Answer: D

Watch Video Solution

70. The solubility of $CaCO_3$ in water is 3.05×10^{-4} moles/litre. Its solubility product will be

A. 3.05×10^{-4}

B. 10

C. 6.1×10^{-4}

D. 9.3×10^{-8}

Answer: D

Watch Video Solution

71. pH of water is 7. When a substance Y is dissolved in water, the pH becomes 13. The substance Y is a salt of

A. Strong acid and strong base

B. Weak acid and weak base

C. Strong acid and weak base

D. Weak acid and strong base

Answer: D

Watch Video Solution

72. At $20^{\circ}C$, the Ag^{+} ion concentration in a saturated solution Ag_2CrO_4 is $1.5x10^{-4}$ mol / litre. At $20^{\circ}C$, the solubility product of Ag_2CrO_4 would be

A. 3.3750×10^{-12}

B. 1.6875×10^{-10}

C. 1.6875×10^{-12}

D. 1.6875×10^{-11}

Answer: C

Watch Video Solution

73. Addition of which chemical will decrease the hydrogen ion concentration of an acetic acid solution

A. NH_4Cl

B. $Al_2(SO_4)$

C. $AgNO_3$

D. HCN

Answer: D

Watch Video Solution

74. What is minimum concentration of SO_4^{2-} required to precipitate $BaSO_4$ in solution containing 1×10^{-4} mole of Ba^{2+} ? (K_{sp} of $BaSO_4 = 4 \times 10^{-10}$)

A. $4 \times 10^{-10} M$

B. $2 \times 10^{-7} M$

C. $4 \times 10^{-6} M$

D. $2 \times 10^{-3} M$

Answer: C

Watch Video Solution

75. The concentration of KI and KCl in certain solution containing both is 0.001M each. If 20 mL of this solution is added to 20 ml of a saturated of AgI in water ? What will happen

A. AgCl will be precipitated

B. AgI will be precipitated

C. Both AgCl and AgI will be precipitated

D. There will be no precipitated

Answer: B

Watch Video Solution

76. The solubility of $Ca(OH)_2$ is 'S' moles lit^{-1}, the solubility product is

A. $4S^3$

B. $4S^2$

C. S^3

D. S^2

Answer: A

Watch Video Solution

77. Calculate the hydrolysis constant of the salt containing NO_2^-.

Given the K_a for $HNO_2 = 4.5 \times 10^{-10}$

A. 2.22×10^{-5}

B. 4.44×10^{-5}

C. 2.22×10^{-6}

D. 4.44×10^{-2}

Answer: A

Watch Video Solution

78. The addition of HCl will not suppress the ionisation of

A. Acetic acid

B. benzoic acid

C. H_2S

D. Sulphuric acid

Answer: D

Watch Video Solution

79. Solubility product is

A. The ionic product of an electrolyte in its saturated solution

B. The product of the solubilities of the ions of the electrolyte

C. The product of solubilities of the salts

D. The product of the concentration of the ions

Answer: A

Watch Video Solution

80. Which of the folowing represents hydrolysis ? .

A. $HCO_3^- + H_2O \Leftrightarrow CO_3^{2-} + H_3O^+$

B. $HCO_3^- + H_2O \Leftrightarrow H_2CO_3 + OH^-$

C. $H_3BO_3 + H_2O \Leftrightarrow H_2BO_3^- + H_3O^+$

D. $H_2PO_4^- + H_2O \Leftrightarrow HPO_4^{2-} + H_3O^+$

Answer: B

Watch Video Solution

81. Hydrolysis of the salt of a strong acid and weak base will

A. Increase with increase in temperature

B. Decrease with increase in temperature

C. Remains unaffected with change in temperature

D. Remains uneffected with change in concentration of the salt

Answer: A

Watch Video Solution

82. The solubility of AgCl in 0.2 M NaCl solution (K_{sp} for $AgCl = 1.20 \times 10^{-10}$) is

A. 0.2 M

B. $1.2 \times 10^{-10} M$

C. $0.2 \times 10^{-10} M$

D. $6.0 \times 10^{-10} M$

Answer: D

Watch Video Solution

83. Select correct sequence of solubility product values among the following

A. $CoS > CuS$

B. $NiS > PbS$

C. $Fe(OH)_3 > Fe(OH)_2$

D. $Ni(OH)_2 > Cr(OH)_3$

Answer: C

View Text Solution

84. The correct relation between hydrolysis constant (K_b) and degree of hydrolysis (α) for the following equilibrium is

A. $\alpha = \sqrt{\frac{K_w.\,C}{K_a}}$

B. $\alpha = \sqrt{\frac{K_w}{K_a.\,C}}$

C. $\alpha = \sqrt{\frac{K_a.\,C}{K_w}}$

D. $\alpha = \sqrt{\frac{K_a}{K_w.\,C}}$

Answer: B

Watch Video Solution

85. The correct representation for solubility product of SnS_2 is

A. $[Sn^{4+}][S^{2-}]^2$

B. $[Sn^{2+}][S^{2-}]^2$

C. $[Sn^{2+}][2S^{2-}]$

D. $[Sn^{4+}][2S^{2-}]^2$

Answer: A

Watch Video Solution

86. Solubility product of a salt AB is 1×10^{-8} in a solution in which concentration of A is $10^{-3}M$. The salt will precipitate when the concentration of B becomes more than

A. $10^{-4}M$

B. $10^{-7}M$

C. $10^{-6}M$

D. $10^{-5}M$

Answer: D

Watch Video Solution

87. How many grams of CaC_2O_4 (molecular weight = 128) on dissolving water will give a saturated solution $\left[K_{sp}(CaC_2O_4) = 2.5 \times 10^{-9} mol^2 I^{-2}\right]$

A. $0.0064g$

B. $0.1280g$

C. $0.0128g$

D. $1.2800g$

Answer: A

Watch Video Solution

88. The solubility product of $BaSO_4$ is 1.3×10^{-9}. The solubility of this salt in pure water will be

A. $1.69 \times 10^{-9} \text{mol litre}^{-1}$

B. $1.69 \times 10^{-18} \text{mol litre}^{-1}$

C. $3.6 \times 10^{-18} \text{mol litre}^{-1}$

D. $3.6 \times 10^{-5} \text{mol litre}^{-1}$

Answer: D

Watch Video Solution

89. Relation between hydrolysis constant and dissociation constant are given. Which is the correct formula for $MgCl_2$.

A. $K_h = \frac{K_w}{K_a}$

B. $K_h = \frac{K_w}{K_b}$

C. $K_h = \frac{K_w}{K_a \times K_b}$

D. $K_w = \frac{K_h}{K_b}$

Answer: B

Watch Video Solution

90. Solubility of $Al(OH)_3 = S, K_{sp}$ will be

A. $108S^3$

B. $27S^3$

C. $4S^2$

D. $27S^4$

Answer: D

Watch Video Solution

91. Which of salt will give basic solution on hydrolysis?

A. KCN

B. KCl

C. NH_4Cl

D. CH_3COONH_4

Answer: A

Watch Video Solution

92. The concentration of which ion is to be decreased, when NH_3 solution is added

A. OH^-

B. NH_4^+

C. H_3O^+

D. O_2^-

Answer: C

Watch Video Solution

93. If the solubility product K_{sp} of a sparingly soluble salt MX_2 at $25^{\circ}C$ is 1.0×10^{-11}, then the solubility of the salt in mole litre^{-1} at this temperature will be

A. 2.46×10^{14}

B. 1.36×10^{-4}

C. 2.60×10^{-7}

D. 1.20×10^{-10}

Answer: B

Watch Video Solution

94. Baking soda is

A. Basic salt

B. Acidic salt

C. Complex salt

D. Double salt

Answer: B

Watch Video Solution

95. At 298 K, the solubility of $PbCl_2$ is 2×10^{-2} mol/lit, then $K_{sp} =$

A. 1×10^{-7}

B. 3.2×10^{-7}

C. 1×10^{-5}

D. 3.2×10^{-5}

Answer: D

Watch Video Solution

96. The solubility product of silver chromate is 4×10^{-12}. The molar solubility of the salt is

A. 1×10^{-3} gm mol/litre

B. 1×10^{-5} gm mol/litre

C. 1×10^{-4} gm mol/litre

D. 1×10^{-2} gm mol/litre

Answer: C

Watch Video Solution

Watch Video Solution

97. Let the solubility of an aqueous solution of $Mg(OH)_2$ be x then its K_{sp} is

A. $4x^3$

B. $108x^5$

C. $27x^4$

D. 9x

Answer: A

Watch Video Solution

98. The solubility of a springly soluble salt AB_2 in water is $1.0 \times 10^{-5} molL^{-1}$. Its solubility product is:

A. 4×10^{-15}

B. 4×10^{-10}

C. 1×10^{-15}

D. 1×10^{-10}

Answer: A

Watch Video Solution

99. The solubility product of a salt having general formula MX_2 in water is 4×10^{-12}. The concentration of $M^{2+} ions$ in the aqueous solution of the salt is:

A. $2.0 \times 10^{-6} M$

B. $1.0 \times 10^{-4} M$

C. $1.6 \times 10^{-4} M$

D. $4.0 \times 10^{-10} M$

Answer: B

Watch Video Solution

100. Given the data at $25^{\circ} C$,

$Ag + I^{-} \rightarrow AgI + e^{-}, E^{\circ} = 0.152V,$

$A > oAg^{+} + e^{-}, E^{\circ} = -0.800V$ What is the value of log K-sp

For AgI ? $\left(\left(2.303 \frac{RT}{F} = 0.059V\right)\right)$

A. -8.12

B. $+8.612$

C. -37.83

D. -16.13

Answer: D

Watch Video Solution

101. In a saturated solution of the sparingly soluble strong electrolyte $AgIO_3$ (Molecular mass = 283) the equilibrium which sets in is

$AgIO_{3_s} \Leftrightarrow Ag^-_{(aq)} + IO^-_{3_{aq}}$

If the solubility product constant K_{sp} of $AgIO_3$ at a given temperature is 1.0×10^{-8}, what is the mass of $AgIO_3$ contained in 100 ml of its saturated solution

A. $28.3 \times 10^{-2} g$

B. $2.83 \times 10^{-3} g$

C. $1.0 \times 10^{-7} g$

D. $1.0 \times 10^{-4} g$

Answer: B

Watch Video Solution

102. The first and second dissociation constants of an acid H_2A are 1×10^{-5} and 5×10^{-10} respectively. The overall dissociation constant of the acid will be

A. 5.0×10^{-5}

B. 5.0×10^{15}

C. 5.0×10^{-15}

D. 0.0×10^{-5}

Answer: C

Watch Video Solution

103. Solid $Ba(NO_3)_2$ is gradually dissolven in 1.0×10^{-4} M Na_2CO_3 solution. At what concentration of Ba^{2+} will a precipitate begin to form?

(K_{sp} for $BaCO_3 = 5.1 \times 10^{-9}$)

A. $4.1 \times 10^{-5} M$

B. $5.1 \times 10^{-5} M$

C. $8.1 \times 10^{-8} M$

D. $8.1 \times 10^{-7} M$

Answer: B

Watch Video Solution

104. Solubility product of silver bromide is 5.0×10^{-13}. The quantity of potassium bromide (molar mass taken as $120 g mol^{-1}$)

to be added to $1L$ of $0.05M$ solution of silver nitrate to start the precipitation of $AgBr$ is

A. $5.0 \times 10^{-8} g$

B. $1.2 \times 10^{-10} g$

C. $1.2 \times 10^{-9} g$

D. $6.2 \times 10^{-5} g$

Answer: C

Watch Video Solution

105. At $25^\circ C$, the solubility product of $Mg(OH)_2$ is 1.0×10^{-11}. At which pH, will Mg^{2+} ions start precipitating in the form of $Mg(OH)_2$ from a solution of $0.001M Mg^{2+}$ ions ?

A. 8

B. 9

C. 10

D. 11

Answer: C

Watch Video Solution

106. Some salts although containing two different metallic elements give test for one of them in solution. Such salts are:

A. Double salts

B. Normal salts

C. Complex salt

D. Basic salts

Answer: C

Watch Video Solution

107. Mohr's salt is a

A. Normal salt

B. Acid salt

C. Basic salt

D. Double salt

Answer: D

Watch Video Solution

108. A white salt is readily soluble in water and gives a colourless solution with a pH of about 9. The salt would be

A. NH_4NO_3

B. CH_3COONa

C. CH_3COONH_4

D. $CaCO_3$

Answer: B

Watch Video Solution

109. The solubility product constant K_{sp} of $Mg(OH)_2$ is 9.0×10^{-12}. If a solution is 0.010 M with respect to Mg^{2+} ion, what is the maximum hydroxide ion concentration which could be present without causing the precipitation of $Mg(OH)_2$

A. $1.5 \times 10^{-7} M$

B. $3.0 \times 10^{-7} M$

C. $1.5 \times 10^{-5} M$

D. $3.0 \times 10^{-5} M$

Answer: D

Watch Video Solution

110. The solubility of silver chromate in $0.01 M K_2CrO_4$ is 2×10^{-8} mol/1. The solubility product of silver chromate will be

A. 8×10^{-24}

B. 16×10^{-24}

C. 1.6×10^{-18}

D. 16×10^{-18}

Answer: D

Watch Video Solution

111. If solubility of calcium hydroxide is $\sqrt{3}$, then its solubility product will be

A. 27

B. 3

C. 9

D. $12\sqrt{3}$

Answer: D

Watch Video Solution

112. $0.5M$ ammonium benzoate is hydrolysed to 0.25 precent, hence its hydrolysis constant is

A. 2.5×10^{-5}

B. 1.5×10^{-4}

C. 3.125×10^{-6}

D. 6.25×10^{-14}

Answer: C

Watch Video Solution

113. The solubility product of a sparingly soluble metal hydroxide $\left[M(OH)_2\right]$ is $5 \times 10^{-16} mol^3 dm^{-9}$ at 298 K. Find the pH of its saturated aqueous solution.

A. 5

B. 9

C. 11.5

D. 2.5

Answer: B

Watch Video Solution

114. The solublity product of iron (III) hydroxide is 1.6×10^{-39}. If X is the solublity of iron (III) hydroxide, then which one of the following expressions can be used to calculate X

A. $K_{sp} = X^4$

B. $K_{sp} = 9X^4$

C. $K_{sp} = 27X^3$

D. $K_{sp} = 27X^4$

Answer: D

Watch Video Solution

115. The solublity of AgCl is formed when equal volumes of the following are mixed. $[K_{sp}$ for $AgCl = 10^{-10}]$

A. $2.0 \times 10^{-5} M$

B. $1.0 \times 10^{-4} M$

C. $5.0 \times 10^{-9} M$

D. $2.2 \times 10^{-4} M$

Answer: C

View Text Solution

116. A precipitate of AgCl is formed when equal volumes of the following are mixed. $[K_{sp}$ for $AgCl = 10^{-10}]$

A. $10^{-4} MAgNO_3$ and $10^{-7} MHCl$

B. $10^{-5} MAgNO_3$ and $10^{-6} MHCl$

C. $10^{-5} MAgNO_3$ and $10^{-4} MHCl$

D. $10^{-6} MAgNO_3$ and $10^{-6} MHCl$

Answer: C

Watch Video Solution

117. $Fe(OH)_3$ can be separated from $Al(OH)_3$ by the addition of

A. NaCl solution

B. Dil. HCl solution

C. NaOH solution

D. NH_4Cl and NH_4OH

Answer: D

Watch Video Solution

118. Which is least soluble in water?

A. AgCl

B. AgF

C. AgI

D. Ag_2S

Answer: D

Watch Video Solution

119. The dissociation constant of water is $1 \times 10^{-14} mol^{-2} litre^{-2}$. What is the pH of 0.001 M KOH soluiton ?

A. 10^{-11}

B. 10^{-3}

C. 3

D. 11

Answer: D

Watch Video Solution

120. A solution of weak acid HA containing 0.01 moles of acid per litre of solutions has pH = 4. The percentage degree of ionisation of the acid and the ionisation constant of acid are respectively

A. 1% , 10^{-6}

B. 0.01% , 10^{-4}

C. 1% , 10^{-4}

D. 0.01% , 10^{-6}

Answer: A

Watch Video Solution

121. The units of ionic product of water (K_w) are

A. $Mol^{-1}L^{-1}$

B. $Mol^{-2}L^{-2}$

C. $Mol^{-2}L^{-1}$

D. Mol^2L^{-2}

Answer: D

Watch Video Solution

122. The solubility of AgI in NaI solutions is less than that in pure water because:

A. AgI fors complex with NaI

B. Of common ion effect

C. Solubility product of AgI is less than that of NaI

D. The temperature of the solution decreases

Answer: B

Watch Video Solution

123. Which of the following will occur if a 0.1 M solution of a weak acid is diluted to 0.01 M at constant temperature

A. $[H^+]$ will decrease to 0.01 M

B. pH will decrease

C. Percentage ionization will increase

D. K_a will increase

Answer: B::C

Watch Video Solution

124. The degree of hydrolysis in hydrolic equilibrium $A^- + H_2O \Leftrightarrow HA + OH^-$ at salt concentration of 0.001 M is $(K_1 = 1 \times 10^{-5})$

A. 1×10^{-3}

B. 1×10^{-4}

C. 5×10^{-4}

D. 1×10^{-6}

Answer: A

Watch Video Solution

125. A litre of solution is saturated with AgCl. To this solution if 1.0×10^{-4} mole of solid NaCl is added, what will be the $[Ag^{+}]$, assuming no volume change

A. More

B. Less

C. Equal

D. Zero

Answer: B

Watch Video Solution

126. Solubility of PbI_2 is $0.005M$. Then, the solubility product of PbI_2 is

A. 6.8×10^{-6}

B. 6.8×10^{6}

C. 2.2×10^{-9}

D. None of these

Answer: D

Watch Video Solution

127. Which is the correct representation for the solubility product constant of Ag_2CrO_4?

A. $\left[Ag^{+}\right]^{2}\left[CrO_4^{-2}\right]$

B. $\left[Ag^{+}\right]\left[CrO_4^{-2}\right]$

C. $\left[2Ag^{+}\right]\left[CrO_4^{-2}\right]$

D. $\left[2Ag^{+}\right]^{2}\left[CrO_4^{-2}\right]$

Answer: A

Watch Video Solution

128. Solubility product of a sulphide MS is 3×10^{-25} and that of another sulphide NS is 4×10^{-40}. In ammoniacal solution

A. Only NS gets precipitated

B. Only MS gets precipitated

C. No sulphide precipitates

D. Both sulphides precipitate

Answer: D

Watch Video Solution

129. On passing H_2S gas through a highly acidic solution containing Cd^{2+} ions, CdS is not precipitated because

A. Of common ion effect

B. The solubility of CdS is low

C. Cd^{2+} ions do not form complex with H_2S

D. The solubility product of CdS is low

Answer: A

Watch Video Solution

130. The following equilibrium exists in an aqueous solution of hydrogen sulphide $H_2S \Leftrightarrow H^+ + HS^-$

If dilute HCl is added to an aqueous solution of H_2S without any change in temperature

A. The equilibrium constant will change

B. The concentration of HS^- will increase

C. The concentration of undissociated H_2S will decrease

D. The concentration of HS^- will decrease

Answer: D

Watch Video Solution

131. Assertion : A ionic product is used for any types of electrolytes whereas solubility product is applicable only to sparingly soluble salts.

Reason : ionic product is defined at any stage of the reaction whereas solubility product is only applicable to the saturation stage

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If the assertion and reason both are false.

Answer: B

Watch Video Solution

132. Assertion: Addition of silver ions to a mixture of aqueous sodium chloride and sodium bromide solution will first precipitate $AgBr$ rather than $AgCl$.

Reason : K_{sp} of $AgCl < K_{sp}$ of $AgBr$.

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If the assertion and reason both are false.

Answer: C

Watch Video Solution

133. Assertion : Sb (III) is not precipitated as sulphide when in its alkaline solution H_2S is passed.

Reason : The concentration of S^{2-} ion in alkaline medium is inadequate for precipitation.

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If the assertion and reason both are false.

Answer: A

Watch Video Solution

134. Assertion : On mixing 500 ml of $10^{-6} MCa^{2+}$ ion and 500 ml of $30 \times 10^{-6} MF^{-}$ ion, the precipitate of CaF_2 will be obtained.

$K_{sp}(CaF_2 = 10^{-18})$

Reason : If K_{sp} is greater than ionic product, a precipitate will develop.

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If the assertion and reason both are false.

Answer: D

Watch Video Solution

135. Assertion: A solution of $FeCl_3$ in water produces brown precipitate on standing.

Reason: Hydrolysis of $FeCl_3$ takes place in water.

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If the assertion and reason both are false.

Answer: A

Watch Video Solution

136. Concentration of the Ag^{+} ions in a saturated solution of $Ag_2CO_2O_4$ is $2.2 \times 10^{-4} mol L^{-1}$ Solubility product of $Ag_2C_2O_4$ is:

A. 2.66×10^{-12}

B. 4.5×10^{-11}

C. 5.3×10^{-12}

D. 2.42×10^{-8}

Answer: C

Watch Video Solution

137. The solubility of $BaSO_4$ in water $2.42 \times 10^{-3} g L^{-1}$ at 298 K. The value of solubility product (K_{sp}) will be (Given molar mass of $BASO_4 = 233 g mol^{-1}$)

A. $1.08 \times 10^{-10} Mol^2 L^{-2}$

B. $1.08 \times 10^{-12} mol^2 L^{-2}$

C. $1.08 \times 10^{-14} mol^2 L^{-2}$

D. $1.08 \times 10^{14} mol^2 L^{-2}$

Answer: A

Watch Video Solution

Ordinary Thinking (Hydrogen ion concentration- pH scale and buffer solution)

1. A buffer solution has equal volume of 0.20 M NH_4OH and 0.02 MNH_4Cl: The pK_b of the base is 5. The pH is

A. 10

B. 9

C. 4

D. 7

Answer: A

Watch Video Solution

2. The pH of water at $25^\circ C$ is nearly

A. 2

B. 7

C. 10

D. 12

Answer: B

Watch Video Solution

3. The pH of 0.01 molar solution of HCl will be

A. 0.001

B. 3

C. 2

D. 6

Answer: C

Watch Video Solution

4. At $80^{\circ}C$ distilled water has $[H_3O^+]$ concentration equal $[OH^-]1\times10^{-6}\text{mole}/litre.$ The value of K_w at this temperature will be

A. 1×10^{-6}

B. 1×10^{-9}

C. 1×10^{-12}

D. 1×10^{-15}

Answer: C

Watch Video Solution

5. The pH of the blood does not appreacіably change by small addition of an acid or a base because blood

A. Contains serum protein which acts as buffer

B. Contains iron as a part of the molecule

C. Can be easily coagulated

D. It is body fluid

Answer: A

Watch Video Solution

6. A physician wishes to prepare a buffer solution at pH = 3.58 that efficiently resist changes in pH yet contains only small concentration of the buffering agents. Which one of the following weak acid together with its sodium salt would be best to use ?

A. m - chlorobenzoic acid $(pK_a = 3.98)$

B. p - chlorocinnamic acid $(pK_a = 4.41)$

C. 2, 5-dihydroxy benzoic acid $(pK_a = 2.97)$

D. Acetoacetic acid $(pK_a = 3.58)$

Answer: D

Watch Video Solution

7. To pH value of decinormal solution of NH_4OH which is 20% ionised is

A. 13.30

B. 14.70

C. 12.30

D. 12.95

Answer: C

Watch Video Solution

8. The aqueous solution of which of the following salt will have the lowest pH ?

A. NaClO

B. $NaClO_2$

C. $NaClO_3$

D. $NaClO_4$

Answer: D

Watch Video Solution

9. The rapid change of pH near the stoichiometric point of an acid-base titration is the basis of indicator detection. pH of the solution is related to ratio of the concentration of the conjugate acid (Hin) and base $[H^+] = 10^{-7} + 10^{-8} = 10^{-7}[1 + 0.1]$ forms of the indicator by the expression

A. $\log. \frac{[HIn]}{[In^-]} = pH - pK_{In}$

B. $\log. \frac{[In^-]}{[HIn]} = pH - pK_{In}$

C. $\log . \frac{[In^{-}]}{[HIn]} = pK_{In} - pH$

D. $\log . \frac{[HIn]}{[In^{-}]} = pK_{In} - pH$

Answer: B

Watch Video Solution

10. At $25^{\circ} C$, the dissociation constant of a base. BOH is 1.0×10^{-12}. The concentration of hydroxyl ions in 0.01M aqueous solution of the base would be

A. $2.0 \times 10^{-6} mol L^{-1}$

B. $1.0 \times 10^{-5} mol L^{-1}$

C. $1.0 \times 10^{-6} mol L^{-1}$

D. $1.0 \times 10^{-7} mol L^{-1}$

Answer: D

Watch Video Solution

11. What is the correct relationship between the pH of isomolar solutions of sodium oxide (pH_1), sodium sulphide (pH_2), sodium selenide (pH_3) , and sodium telluride (pH_4) ?

A. $pH_1 > pH_2 = pH_3 > pH_4$

B. $pH_1 < pH_2 < pH_3 < pH_4$

C. $pH_1 < pH_2 < pH_3 = pH_4$

D. $pH_1 > pH_2 > pH_3 > pH_4$

Answer: D

Watch Video Solution

12. The hydrogen ion concentration of a $10^{-8} MHCl$ aqueous soultion at $298K(K_w = 10^{-14})$ is

A. $9.525 \times 10^{-8} M$

B. $1.0 \times 10^{-8} M$

C. $1.0 \times 10^{-6} M$

D. $1.0525 \times 10^{-7} M$

Answer: D

Watch Video Solution

13. Which of the following pairs constitutes a buffer

A. NHO_3 and NH_4NO_3

B. HCl and KCl

C. NHO_2 and $NaNO_2$

D. NaOH and NaCl

Answer: A

Watch Video Solution

14. Calculate the pOH of solution at $25^{\circ} C$ that contains $1 \times 10^{-10} M$ of hydronium ions, i.e., H_3O^+

A. 7.000

B. 4.000

C. 9.000

D. 1.000

Answer: B

Watch Video Solution

Watch Video Solution

15. Equal volumes of three acid solutions of $pH 3, 4$ and 5 are mixed in a vessel. What will be the H^{+} ion concentration in the mixture?

A. $3.7 \times 10^{-3} M$

B. $1.11 \times 10^{-3} M$

C. $1.11 \times 10^{-4} M$

D. $3.7 \times 10^{-4} M$

Answer: D

Watch Video Solution

16. Equimolar solutions of the following were prepared in water separately. Which one of the solutions will record the highest pH

?

A. $MgCl_2$

B. $CaCl_2$

C. $SrCl_2$

D. $BaCl_2$

Answer: D

Watch Video Solution

17. What is the $\left[OH^{-}\right]$ in the final solution prepared by mixing $20.0mL$ of $0.050MHCl$ with $30.0mL$ of $0.10MBa(OH)_2$?

A. 0.10 M

B. 0.40 M

C. 0.0050 M

D. 0.12 M

Answer: A

Watch Video Solution

18. A buffer solution is prepared in which the concentration of NH_3 is $0.30M$ and the concentration of NH_4^+ is $0.20M$. If the equilibrium constant, K_b for NH_3 equals 1.8×10^{-5}, what is the pH of this solution? ($\log 2.7 = 0.43$)

A. 8.73

B. 9.08

C. 9.43

D. 11.72

Answer: C

Watch Video Solution

19. Buffer solutions have constant acidity and alkalinity because

A. These give unionized acid or base on reaction with added acid or alkali

B. Acids and alkalies in these solutions are shielded from attack by other ions

C. They have large excess of H^{+} or OH^{-} ions

D. They have fixed value of pH

Answer: A

Watch Video Solution

20. Which one of the following pairs of solution is not an acidic buffer?

A. $HClO_4$ and $NaClO_4$

B. CH_3COOH and CH_3COONa

C. H_2CO_3 and Na_2CO_3

D. H_3PO_4 and Na_3PO_4

Answer: A

Watch Video Solution

21. What is the pH of the resulting solution when equal volumes of $0.1 M NaOH$ and $0.01 M HCl$ are mixed?

A. 12.65

B. 2

C. 7

D. 1.04

Answer: A

Watch Video Solution

22. The percentage of pyridine (C_5H_5N) that forms pyridinium ion $(C_5H_5N^+H)$ in a 0.10 M aqueous pyridine solution (K_b for $C_5H_5N = 1.7 \times 10^{-9}$) is

A. $1.6\,\%$

B. $0.0060\,\%$

C. $0.013\,\%$

D. $0.77\,\%$

Answer: C

Watch Video Solution

23. Which is a buffer solution?

A. $CH_3COOH + CH_3COONa$

B. $CH_3COOH + CH_3COONH_4$

C. $CH_3COOH + NH_4Cl$

D. $NaOH + NaCl$

Answer: A

Watch Video Solution

24. One weak acid (like CH_3COOH) and its strong base together with salt (like CH_3COONa) is a buffer solution. In which pair this type of characteristic is found.

A. HCl and NaCl

B. NaOH and $NaNO_3$

C. KOH and KCl

D. NH_4OH and NH_4Cl

Answer: D

Watch Video Solution

25. The pH of solution having $\left[OH^{-}\right] = 10^{-7}$ is

A. 7

B. 14

C. Zero

D. -7

Answer: A

Watch Video Solution

26. pH value of a solution , whose hydronium ion concentration is a $6.2 \times 10^{-9} mol / l$ is

A. 6.21

B. 7.21

C. 7.75

D. 8.21

Answer: D

Watch Video Solution

27. When $10ml$ of $0.1M$ acetic acid $(pK_a = 5.0)$ is titrated against $10ml$ of $0.1M$ ammonia solution $(pK_b = 5.0)$, the equivalence point occurs at pH

A. 5.0

B. 6.0

C. 7.0

D. 9.0

Answer: C

Watch Video Solution

28. 40 ml of 0.1 M ammonia is mixed with 20 ml of $0.1MHCI$.

What is the pH of the mixture ? (pK_b of ammonia solution is 4.74.)

A. 4.74

B. 2.26

C. 9.26

D. 5

Answer: C

Watch Video Solution

29. What is the pH value of $1MH_2SO_4$

A. 0

B. -0.213

C. -2

D. -0.3010

Answer: D

Watch Video Solution

30. A solution which is resistant to change of pH upon the addition of an acid or a base is known as

A. A colloid

B. A crystalloid

C. A buffer

D. An indicator

Answer: C

Watch Video Solution

Watch Video Solution

31. If 0.4 gm NaOH is present in 1 litre solution, then its pH will be

A. 2

B. 10

C. 11

D. 12

Answer: D

Watch Video Solution

32. The most important buffer in the blood consist of :

A. HCl and $Cl^{\oplus}$

B. H_2CO_3 and $HCO_3^{\ominus}$

C. H_2CO_3 and $Cl^{\ominus}$

D. HCl and $HCO_3^{\ominus}$

Answer: B

Watch Video Solution

33. The pH of an aqueous solution containing $[H^+] = 3 \times 10^{-3} M$ is

A. 2.471

B. 2.523

C. 3

D. -3

Answer: B

Watch Video Solution

34. The pH of an acetic acid $+$ sodium acetate buffer is given by $pH = pK_a + \log. \frac{[\text{Salt}]}{[\text{Acid}]}$ where K_a of acetic acid $= 1.8 \times 10^{-5}$

If [Salt] = [Acid] $= 0.1$ M, then the pH of the solution would be about

A. 7

B. 4.7

C. 5.3

D. 1.4

Answer: B

35. Which of the following is a buffer

A. $NAOH + CH_3COONa$

B. $NaOH + Na_2SO_2$

C. $K_2SO_4 + H_2SO_4$

D. $NH_4OH + CH_3COONH_4$

Answer: D

Watch Video Solution

36. The pH of 0.0001 N solution of KOH will be

A. 4

B. 6

C. 10

D. 12

Answer: C

Watch Video Solution

37. A sample of $Na_2CO_3. H_2O$ weighing 0.62 g is added to 10 ml of $0.1NH_2SO_4$ solution . The resulting solution will be

A. Acidic

B. Neutral

C. Basic

D. None of these

Answer: C

Watch Video Solution

38. On adding sold potassium cyanide to water

A. pH will increase

B. pH will decrease

C. pH will not change

D. Electrical conducting will not change

Answer: A

Watch Video Solution

39. $NaOH_{(aq)}$, $HCl_{(aq)}$ and $NaCl_{(aq)}$ concentration of each is 10^{-3} M. Their pH will be respectively

A. 10, 6, 2

B. 11, 3, 7

C. 10, 2, 6

D. 3, 4, 7

Answer: B

Watch Video Solution

40. Given pH of a solution A is 3 and it is mixed with another solution B having pH 2. If both mixed then resultant pH of the solution will be

A. 3.2

B. 1.9

C. 3.4

D. 3.5

Answer: B

Watch Video Solution

41. Consider the following solutions of equal concentrations

$$A = NH_4Cl \qquad B = CH_3COONa$$
$$C = NH_4OH \qquad D = CH_3COOH$$

A buffer solution can be obtained by mixing equal volumes of

A. C and D

B. A and B

C. A and C

D. C and D

Answer: C

Watch Video Solution

42. By adding 20 ml of 0.1 N HCl to 20 ml 0.1 N KOH, the pH of the obtained solution will be

A. 0

B. 7

C. 2

D. 9

Answer: B

Watch Video Solution

43. Which of the following salt is acidic

A. $(NH_4)_2SO_4$

B. $NaHSO_3$

C. Na_2SO_3

D. Na_2S

Answer: B

Watch Video Solution

44. Which is incorrect for buffer solution

A. It contains weak acid and its conjugate base

B. It contains weak weak base and its conjugate acid

C. In this there is very less change is pH value when very less amount of acid and base is mixed

D. None of the above

Answer: D

Watch Video Solution

45. When a buffer solution of sodium acetate and acetic acid is diluted with water

A. Acetate ion concentration increases

B. H^{+} ion concentration increases

C. OH^{-} ion concentration increases

D. H^{+} ion concentration remain unaltered

Answer: D

Watch Video Solution

46. The pH of a buffer solution containing 25 ml of $1MCH_3COONa$ and 25 ml of $1MCH_3COOH$ will be

appreciably affected by 5 ml of

A. $1 M CH_3COOH$

B. $5 M CH_3COOH$

C. $5 M HCl$

D. $1 M NH_4OH$

Answer: B

View Text Solution

47. The pH of the solution containing 10 ml of 0.1 N NaOH and 10 ml of 0.05 NH_2SO_4 would be

A. 0

B. 1

C. > 7

D. 7

Answer: C

Watch Video Solution

48. The pH of H_2O is

A. 7

B. >7

C. <7

D. 0

Answer: A

Watch Video Solution

49. In a solution of pH = 5, more acid is added in order to reduce the pH = 2. The increase in hydrogen ions concentration is

A. 100 times

B. 1000 times

C. 3 times

D. 5 times

Answer: B

Watch Video Solution

50. Which is not a buffer solution

A. $NH_4Cl + NH_4OH$

B. $CH_3COOH + CH_3COONa$

C. CH_3COONa

D. Borax + Boric acid

Answer: C

Watch Video Solution

51. The concentration of NaOH solution is 10^{-8}M . Find out the (OH^{-}) concentration

A. 10^{-8}

B. Greater than 10^{-6}

C. 10^{-6}

D. Lies between 10^{-6} and 10^{-7}

Answer: A

Watch Video Solution

52. The pH vaue of 0.1 M NaOH solution is (when there is a given reaction $\left[H^{+}\right]\left[OH^{-}\right]=10^{-14}$

A. 13

B. 12

C. 11

D. 2

Answer: A

Watch Video Solution

53. Which oxychloride has maximum pH?

A. NaClO

B. $NaClO_3$

C. $NaClO_3$

D. $NaClO_4$

Answer: A

Watch Video Solution

54. pH of $HCl(10^{-12}M)$ is

A. 12

B. -12

C. ≈ 7

D. 14

Answer: C

Watch Video Solution

55. Which one is buffer solution

A. $\left[PO_4^-\right]\left[HPO_4^-\right]$

B. $\left[PO_3^{3-}\right]\left[\left[H_2PO_4^-\right]\right.$

C. $\left[HPO_4^-\right]\left[H_2PO_4^-\right]$

D. All of these

Answer: B

View Text Solution

56. When an acid or alkali is mixed with buffer solution, then pH of buffer solution

A. Not changes

B. Can Increase or Decrease

C. Increases

D. Decreases

Answer: A

Watch Video Solution

57. pH of a solution can be expressed as

A. $-\log_e(H^+)$

B. $-\log_{10}(H^+)$

C. $\log_e(H^+)$

D. $\log_{10}(H^+)$

Answer: B

Watch Video Solution

58. The ionization constant of a certain weak acid is 10^{-4}. What should be the [salt] to [acid] ratio if we have to prepare a buffer with $pH = 5$ using this acid and one of the salts

A. $1:10$

B. $10:1$

C. $5:4$

D. $4:5$

Answer: B

Watch Video Solution

59. The pH of a buffer solution containing 0.2 mole per litre CH_3COONa and 1.5 mole per litre CH_3COOH is (K_a for acetic acid is 1.8×10^{-5})

A. 4.87

B. 5.8

C. 2.4

D. 9.2

Answer: A

Watch Video Solution

60. The pH of 0.05 M Ba$(OH)_2$ solution is

A. 12

B. 13

C. 1

D. 12.96

Answer: B

Watch Video Solution

61. The hydrogen ion concentration of $0.001 M NaOH$ solution is

A. 1×10^{-2} mole/litre

B. 1×10^{-11} mole/litre

C. 1×10^{-14} mole/litre

D. 1×10^{-12} mole/litre

Answer: B

Watch Video Solution

62. If pH of A, B,C and D are 9.5, 2.5, 3.5 and 5.5 respectively, then strongest acid is

A. A

B. C

C. D

D. B

Answer: D

Watch Video Solution

63. A base dissolved in water yields a solution with a hydroxide ion concentration of $0.05 mol litre^{-1}$. The solution is

A. Basic

B. Acid

C. Neutral

D. Both (a) and (b)

Answer: A

Watch Video Solution

64. At $25^\circ C$ the pH value of a solution is 6. The solution is

A. Basic

B. Acidic

C. Neutral

D. Both (b) and (c)

Answer: B

Watch Video Solution

65. A solution has $pH = 5$, it is diluted 100 times, then it will become

A. Neutral

B. Basic

C. Unaffected

D. More acidic

Answer: A

Watch Video Solution

66. 40 mg of pure sodium hydroxide is dissolved in 10 L of distilled water. The pH of the solution is

A. 9.0

B. 10

C. 11

D. 12

Answer: B

Watch Video Solution

67. which one of the following electrolytes would dissolve in water to give a 0.1 M solution with pH about 9

A. CH_3COOH

B. CH_3COONa

C. NH_4Cl

D. KOH

Answer: B

View Text Solution

68. The number of H^+ ions present in 250 ml of lemon juice of pH=3 is

A. 1.506×10^{22}

B. 1.506×10^{23}

C. 1.506×10^{20}

D. 3.012×10^{21}

Answer: C

Watch Video Solution

69. A mono basic weak acid solution has a molarity of 0.005 and pH of 5. What is its percentage ionisation in this solutino ?gt

A. 2.0

B. 0.2

C. 0.5

D. 0.25

Answer: B

Watch Video Solution

70. The pH of normal rain water is

A. 6.5

B. 7.5

C. 5.6

D. 3.5

Answer: A

Watch Video Solution

71. Which of the following will decrease the pH of a 50 ml solution of $0.01 MHCI$?

A. Addition of 5 ml of 1 M HCL

B. Addition of 50 ml of 0.01 M HCl

C. Addition of 50 mL of 0.002 M HCl

D. Addition of Mg

Answer: A

Watch Video Solution

Watch Video Solution

72. The pK_a of a weak acid, HA, is 4.80. The pK_b of a weak base, BOH, is 4.78. The pH of an aqueous solution of the corresponding salt, BA, will be:

A. 4.79

B. 7.01

C. 9.22

D. 9.58

Answer: B

Watch Video Solution

73. The pH of a solution obtained by mixing 50 mL of 1N HCl and 30 mL of 1N NaOH is $[\log 2.5 = 0.3979]$

A. 3.979

B. 0.6021

C. 12.042

D. 1.2042

Answer: B

Watch Video Solution

74. If pK_a of acetic acid and pK_b of ammonium hydroxide are 4.76 each. Find the pH of ammonium acetate.

A. 7

B. Less than 7

C. More than 7

D. Zero

Answer: A

Watch Video Solution

75. The aqueous solution whose pH =0 is-

A. Alkaline

B. Acidic

C. Neutral

D. Amphoteric

Answer: B

Watch Video Solution

76. The pH of $\frac{N}{100}$ HCl would be approximately

A. 1

B. 1.5

C. 2

D. 2.5

Answer: C

Watch Video Solution

77. A compound whose aqueous solution will have the highest pH

A. NaCl

B. Na_2CO_3

C. NH_4Cl

D. $NaHCO_3$

Answer: B

Watch Video Solution

78. By adding a strong acid to the buffer solution, the pH of the buffer solution

A. Remains constant

B. Increases

C. Decreases

D. Becomes zero

Answer: A

Watch Video Solution

79. A buffer solution contains 0.1 M of acetic acid and 0.1 M of sodium acetate. What will be its pH, it pK_a of acetic acid is 4.75

A. 4.00

B. 4.75

C. 5.00

D. 5.25

Answer: B

Watch Video Solution

80. Pure water is kep in a vessel and it remains exposed to atmospheric CO_2 which is absorbed, then its pH will be

A. Greater than 7

B. Less than 7

C. 7

D. Depends on ionic product of water

Answer: B

Watch Video Solution

81. The K_{sp} of $Mg(OH)_2$ is 1×10^{-12}. $0.01 M Mg(OH)_2$ will precipitate at the limiting pH

A. 3

B. 9

C. 5

D. 8

Answer: B

Watch Video Solution

82. The concentration of hydrogen ion $[H^+]$ in 0.01 M HCl is

A. 10^{12}

B. 10^{-2}

C. 10^{-1}

D. 10^{-12}

Answer: B

Watch Video Solution

83. The pH of the aqueous solution containing 0.49 gm of H_2SO_4 in one litre is

A. 2

B. 1

C. 1.7

D. 0.3

Answer: A

Watch Video Solution

84. The pH of a solution increased from 3 to 6. Its $\left[H^{\oplus}\right]$ will be

A. Reduced to half

B. Doubled

C. Reduced by 1000 times

D. increased by 1000 times

Answer: C

Watch Video Solution

85. Which of the following solution cannot act as buffer?

A. $NaH_2PO_4 + H_3PO_4$

B. $CH_3COOH + CH_3COONa$

C. $HCl + NH_4Cl$

D. $H_3PO_4 + Na_2HPO_4$

Answer: C

Watch Video Solution

86. pH of a buffer solution decreases by 0.02 units when 0.12g of acetic acid is added to 250 mL of a buffer solution of acetic acid and potassium acetate at $27^{\circ} C$. The buffer capacity of the solution is

A. 0.1

B. 10

C. 1

D. 0.4

Answer: D

View Text Solution

87. 20 ml of 0.1 M acetic acid is mixed with 50 ml of potassium acetate. K_a of acetic acid $= 1.8 \times 10^{-5}$ at $27^{\circ} C$. Calculate concentration of potassium acetate if pH of the mixture is 4.8

A. 0.1 M

B. 0.04 M

C. 0.4 M

D. 0.02 M

Answer: B

Watch Video Solution

88. If the hydrogen ion concentration of a given solution is $5.5 \times 10^{-3} \text{ mol litre}^{-1}$, the pH of the solution will be

A. 2.26

B. 3.4

C. 3.75

D. 2.76

Answer: A

Watch Video Solution

89. The solution of sodium carbonate has pH

A. Greater than 7

B. Less than 7

C. Equal to 7

D. Equal to zero

Answer: A

Watch Video Solution

90. The pH of a solution obtained by mixing equal volumes of $\frac{N}{10} NaOH$ and $\frac{N}{20} HCl$

A. 13.4

B. 12.4

C. 7.6

D. 1.6

Answer: D

Watch Video Solution

91. The pH of the solution produced by mixing equal volume of $2.0 \times 10^{-3} MHClO_4$ and $1.0 \times 10^{-2} MKClO_4$ is

A. 2.7

B. 2.3

C. 3

D. 1

Answer: A

Watch Video Solution

92. How many moles of $Ca(OH)_2$ must be dissolved to produce 250 mL of an aqueous solution of pH 10.65, assuming completer dissociation ?

A. 5.6×10^{-5}

B. 6.5×10^{-5}

C. 4.5×10^{-5}

D. 5.4×10^{-5}

Answer: A

Watch Video Solution

93. If H^+ ion concentration of a solution is increased by 10 times its pH will be

A. Increase by one

B. Remains unchanged

C. Decrease by one

D. Increase by 10

Answer: C

Watch Video Solution

94. Buffer solution is prepared by mixing

A. Strong acid + its salt of strong base

B. Weak acid + its salt of weak base

C. Strong acid + its salt of weak base

D. Weak acid + its salt of strong base

Answer: D

Watch Video Solution

95. If pOH of a solution is 6.0, then its pH will be

A. 6

B. 10

C. 8

D. 14

Answer: C

Watch Video Solution

96. If the pH of a solution is 4.0 a $25^{\circ} C$, its pOH would be $(K_w = 10^{-14})$

A. 4.0

B. 6.0

C. 8.0

D. 10.0

Answer: D

Watch Video Solution

97. The pH value of 0.1 M HCl is approximately 1. What will be the approximately pH value of 0.05 MH_2SO_4

A. 0.05

B. 0.5

C. 1

D. 2

Answer: C

Watch Video Solution

98. The $\left[OH^{-}\right]$ of an aqueous solution is 1×10^{-5} . The pH of the solution is :

A. 5

B. 9

C. 4.5

D. 11

Answer: B

Watch Video Solution

99. The pH of a 0.02 M solution of hydrochloric acid is

A. 2.0

B. 1.7

C. 0.3

D. 2.2

Answer: B

Watch Video Solution

100. The pOH of beer is 10.0. The hydrogen ion concentration will be

A. 10^{-2}

B. 10^{-10}

C. 10^{-8}

D. 10^{-4}

Answer: D

Watch Video Solution

101. The pH of a 0.001 M NaOH solution will be

A. 3

B. 2

C. 11

D. 12

Answer: C

Watch Video Solution

102. The sum of pH and pOH in aqueous solution is equal to

A. 7

B. pk_w

C. Zero

D. 1

Answer: B

Watch Video Solution

103. The dissociation constant of water is $1 \times 10^{-14} mol^{-2} litre^{-2}$. What is the pH of 0.001 M KOH soluiton ?

A. 10^{-11}

B. 3

C. 14

D. 11

Answer: D

Watch Video Solution

104. pH values of HCl and NaOH solutions each of strength $\frac{N}{100}$ will be respectively

A. 2 and 3

B. 2 and 12

C. 12 and 2

D. 2 and 10

Answer: B

Watch Video Solution

105. Amongst the following solutions, the buffer solution is

Or

A basic buffer is made by mixing the solution

A. $NH_4Cl + NH_4OH$ solution

B. $NH_4Cl + NaOH$ solution

C. $NH_4OH + HCl$ solution

D. $NaOH + HCl$ solution

Answer: a

Watch Video Solution

106. 50 ml water is added to a 50 ml solution of $Ba(OH)_2$ of strength 0.01 M. The pH value of the resulting solution will be

A. 8

B. 10

C. 12

D. 6

Answer: C

Watch Video Solution

107. The pH of $10^{-7}M$ NaOH is

A. 7.01

B. Between 7 and 8

C. Between 9 and 10

D. Greater than 10

Answer: B

Watch Video Solution

108. A solution of $MgCl_2$ in water has pH

A. < 7

B. > 7

C. 7

D. 14.2

Answer: A

Watch Video Solution

109. pH of a solution of $10ml. 1N$ sodium acetate and $50ml2N$ acetic acid $\left(K_a = 1.8 \times 10^{-5}\right)$ is approximately

A. 4

B. 5

C. 6

D. 7

Answer: A

Watch Video Solution

110. If the pH value is 4.5 for a solution then what is the value of H^{+} concentration?

A. 3.162×10^{-5} mol/L

B. 31.62×10^{-5} mol/L

C. 0.3162×10^{-5} mol/L

D. 3.162×10^{-8} mol/L

Answer: A

Watch Video Solution

111. pH of a solution having 0.00001 gm ions of ions of hydrogen per litre is

A. 5

B. 4

C. 10^{-5}

D. 10^{-4}

Answer: A

Watch Video Solution

112. Whether a negative value of pH is possible

A. Yes

B. No

C. Some times

D. None of these

Answer: B

Watch Video Solution

113. The pH of the solution is 4. The hydrogen ion concentration of the solution in mol/litre is

A. 9.5

B. 10^{-4}

C. 10^{4}

D. 10^{-2}

Answer: B

Watch Video Solution

Watch Video Solution

114. The aqueous solution of sodium acetate with minimum pH is

A. $0.01M$

B. $0.001M$

C. $0.0001M$

D. $0.1M$

Answer: C

Watch Video Solution

115. The concentration of hydrogen ion in water is

A. 8

B. 1×10^{-7}

C. 7

D. 43472

Answer: B

Watch Video Solution

116. The pH of normal KOH is

A. 1

B. 0

C. 14

D. 7

Answer: C

Watch Video Solution

117. The pH of z solution at $25^0 C$ is 2. If its pH is to be changed to 4, conc. of H^+ of the original has to be

A. Doubled

B. Halved

C. Increased hundred times

D. Decreased hundred times

Answer: D

Watch Video Solution

118. For preparing a buffer solution of $pH6$ by mixing sodium acetate and acetic, the ratio of the concentration of salt and acid should be $(K_a = 10^{-5})$

A. $1:10$

B. $10:1$

C. $100:1$

D. $1:100$

Answer: B

Watch Video Solution

119. If the pH of a solution is 2, its normality will be

A. 2N

B. $\frac{1}{2}N$

C. 0.01 N

D. None of these

Answer: C

Watch Video Solution

120. Which buffer solution out of the following will have $pH > 7$?

A. $CH_3COOH + CH_3COONa$

B. $HCOOH + HCOOK$

C. CH_3COONH_4

D. $NH_4OH + NH_4Cl$

Answer: D

Watch Video Solution

121. Which one of the following is the buffer solution of strong acidic nature ?

A. $HCOOH + HCOO^{-}$

B. $CH_3COOH + CH_3COO^{-}$

C. $H_2C_2O_4 + C_2O_4^{2-}$

D. $H_3BO_3 + BO_3^{3-}$

Answer: A

Watch Video Solution

122. Upto what pH must a solution containing a precipitate of $Cr(OH)_3$ be adjusted so that all of precipitate dissolves

A. Upto 4.4

B. Upto 4.1

C. Upto 4.2

D. Upto 4.0

Answer: D

View Text Solution

123. The pK_a of a weak acid is 4.8 . What should be the ratio of [Acid]/[Salt] of a buffer if $pH = 5.8$ is required

A. 10

B. 0.1

C. 1

D. 2

Answer: B

Watch Video Solution

124. 100 mL of 0.01 M solution of NaOH is diluted to 1 litre. The pH of resultant solution will be

A. 12

B. 11

C. 2

D. 3

Answer: B

Watch Video Solution

125. Calculate pOH of 0.001 MNH_4OH. When it is 1% dissociated in the solution

A. 5

B. 2.96

C. 9.04

D. 11.04

Answer: A

Watch Video Solution

126. pH of water is 7.0 at $25^\circ C$. If water is heated to $80^\circ C$

A. pH will increase

B. pH will decrease

C. pH remains 7.0

D. H^{+} ion concentration will increase but OH^{-} ion concentration will decrease

Answer: B

Watch Video Solution

127. The following reaction is known to occur in the body $CO_2 + H_2O \Leftrightarrow H_2CO_3 \Leftrightarrow H^{+} + HCO_3^{-}$. If CO_2 escapes from the system

A. pH will decrease

B. Hydrogen ion concentration will decrease

C. H_2CO_3 concentration will be unaltered

D. The forward reaction will be promoted

Answer: B

Watch Video Solution

128. When 100 ml of M/10 NaOH solution and 50 ml of M/5 HCl solution are mixed, the pH of resulting solution would be

A. 0

B. 7

C. Less than 7

D. More than 7

Answer: B

Watch Video Solution

129. Aqueous solution of HCl has pH = 4 . Its molarity would be

A. 4 M

B. 0.4 M

C. 0.0001 M

D. 10 M

Answer: C

Watch Video Solution

130. The condition for minimum change in pH for a buffer solution is

A. Isoelectronic species are added

B. Conjugate acid or base is added

C. $pH = pK_a$

D. None of these

Answer: C

Watch Video Solution

131. Henderson's equation is $pH = pK_a + \log. \frac{[\text{salt}]}{[\text{acid}]}$. If the acid gets half neutralized the value of pH will be : $[pK_a = 4.30]$

A. 4.3

B. 2.15

C. 8.6

D. 7

Answer: A

Watch Video Solution

132. An alcoholic drink substance pH = 4.7 then OH ion concentration of this solution is $\left(K_w = 10^{-14} mol^2 / l^2\right)$

A. 3×10^{-10}

B. 5×10^{-10}

C. 1×10^{-10}

D. 5×10^{-8}

Answer: B

Watch Video Solution

133. pH of human blood is 7.4. Then H^{+} concentration will be

A. 4×10^{-8}

B. 2×10^{-8}

C. 4×10^{-4}

D. 2×10^{-4}

Answer: A

Watch Video Solution

134. The pH of a 0.1M NH_3 solution $\left(K_b = 1.8 \times 10^{-5}\right)$ is

A. 11.13

B. 12.5

C. 13.42

D. 11.55

Answer: A

Watch Video Solution

135. Components of buffer solution are 0.1 M HCN and 0.2 M NaCN. What is the pH of the solution

A. 9.61

B. 6.15

C. 2

D. 4.2

Answer: A

Watch Video Solution

136. The pH of a $0.005 M H_2SO_4$ solution is

A. 3

B. 4

C. 2

D. 5

Answer: C

Watch Video Solution

137. $1MNaCl$ and $1MHCl$ are present in an aqueous solution. The solution is

A. Not a buffer solution with $pH < 7$

B. Not a buffer solution with $pH > 7$

C. A buffer solution with $pH < 7$

D. A buffer solution with $pH > 7$

Answer: A

Watch Video Solution

138. Which one of the following statements is not true

A. The conjugate base of $H_2PO_4^-$ is HPO_4^{2-}

B. $pH + pOH = 14$ for all aqueous solutions

C. The pH of 1×10^{-8} M HCl is 8

D. 96, 500 coulombs of electricity when passed througha $CuSO_4$ solution deposits 1 gram equivalent of copper at the cathode

Answer: C

Watch Video Solution

139. When rain is accompanied by a thunderstorm, the collected rain water will have a pH value

A. Slightly lower than that of rain water without thunderstorm

B. Slightly higher than that when the thunderstorm is not there

C. Uninfluenced by occurrence of thunderstorm

D. Which depends on the amount of dust in air

Answer: A

Watch Video Solution

140. Hydrogen ion concentration in mol/L in a solution of $pH = 5.4$ will be:

A. 3.98×10^{8}

B. 3.88×10^{6}

C. 3.68×10^{-6}

D. 3.98×10^{-6}

Answer: D

Watch Video Solution

141. The pK_a of a weak acid (HA) is 4.5. The pOH of an aqueous buffered solution of HA in which 50% of the acid is ionized is:

A. 4.5

B. 2.5

C. 9.5

D. 7.0

Answer: C

Watch Video Solution

142. What is the pH value of $\frac{N}{100}$ KOH solution

A. 10^{-11}

B. 3

C. 2

D. 11

Answer: D

Watch Video Solution

143. Given a 0.1 M solution of each of the following. Which solution has the lowest pH

A. $NaHSO_4$

B. NH_4Cl

C. HCl

D. NH_3

Answer: C

Watch Video Solution

144. A weak monoprotic acid of 0.1 M, ionizes to 1% in solution. What will be the pH of solution

A. 1

B. 2

C. 3

D. 11

Answer: C

Watch Video Solution

145. How many millilitree of 6.0 M hydrochloric acid should be used to prepare 150 ml of 0.30 M HCl solution ?

A. 3.0

B. 7.5

C. 9.3

D. 30

Answer: B

Watch Video Solution

146. 0.02 M monobasic acid dissociates 2% hence, pH of the solution is

A. 0.3979

B. 1.3979

C. 1.699

D. 3.3979

Answer: D

Watch Video Solution

147. pH of a solution is 9.5. The solution is

A. Neutral

B. Acidic

C. Basic

D. Amphoteric

Answer: C

Watch Video Solution

148. Which on reaction with water will have pH less than 7

A. BaO

B. CaO

C. Na_2O

D. P_2O_5

Answer: D

Watch Video Solution

149. Which of the following would decrease the pH of 25 cm^2 of a 0.01 M solution of HCl?

A. The addition of $25cm^3$ 0.005 M hydrochloric acid

B. The addition of $25cm^3$ of 0.02 M hydrochloric acid

C. The addition of magnesium metal

D. None of these

Answer: B

Watch Video Solution

150. The pH of 0.05 M solution of dibasic acid is

A. $+1$

B. -1

C. $+2$

D. -2

Answer: A

Watch Video Solution

151. pH of blood is maintained constant by mechanisms of

A. Common ion effect

B. Buffer

C. Solubility

D. All of these

Answer: B

Watch Video Solution

152. The pH of millimolar HCl is

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

153. The pH of the solution: 5ml of $\frac{M}{5}$, HCl + 10 ml of $\frac{M}{10}$ NaOH is

A. 5

B. 3

C. 7

D. 8

Answer: C

Watch Video Solution

154. HA is a weak acid. The pH of 0.1 M HA solution is 2. What is the degree of dissociation (α) of HA ?

A. 0.5

B. 0.2

C. 0.1

D. 0.301

Answer: C

Watch Video Solution

155. pH of 0.0002 M formic acid $\left[K_a = 2 \times 10^{-4}\right]$ approximatly is

A. 1.35

B. 0.5

C. 3.7

D. 1.85

Answer: C

Watch Video Solution

156. Highest pH (14) is shown by

A. $0.1MH_2SO_4$

B. $0.1MNaOH$

C. 1N NaOH

D. 1N HCl

Answer: C

Watch Video Solution

157. An aqueous solution of sodium carbonate has a pH greater than 7 because

A. It contains more carbonate ion than H_2O molecules

B. Contains more hydroxide ions than carbonate ions

C. Na^+ ions react with water

D. Carbonate ions react with H_2O

Answer: B

Watch Video Solution

158. K_a of H_2O_2 is of the order of

A. 10^{-12}

B. 10^{-14}

C. 10^{-16}

D. 10^{-10}

Answer: A

Watch Video Solution

159. The pH at the equivalence point of a titration may differ from 7.0 because of

A. The self ionisation of water

B. Hydrolysis of the salt formed

C. The indicator used

D. The concentration of the standard solution

Answer: B

Watch Video Solution

160. The pH of a solution obtained by mixing 50 ml of 0.4 M HCl with 50 ml of 0.2 M NaOH is

A. $-\log 2$

B. $-\log 2 \times 10^{-1}$

C. 7.0

D. 2.0

Answer: C

Watch Video Solution

161. In a mixture of weak acid and its salt, the ratio of concentration of acid to salt is increased ten-fold. The pH of the solution

A. Decreases by one

B. Increases by one-tenth

C. Increases by one

D. Increases ten-fold

Answer: A

Watch Video Solution

162. How much sodium acetate should be added to a 0.1 M solution of CH_3COOH to give a solution of pH = 5.5 (pK_a of $CH_3COOH = 4.5$)

A. 0.1 M

B. 0.2 M

C. $1.0M$

D. $10.0M$

Answer: C

Watch Video Solution

163. The pH of a solution obtaine by mixing $50mL$ of $0.4NHCl$ and $50mL$ of $0.2NNaOH$ is

A. $-\log 2$

B. $-\log 0.2$

C. 1.0

D. 2.0

Answer: C

Watch Video Solution

164. Assuming complete ionisation, the pH of 0.1 M HCl is 1. The molarity of H_2SO_4 with the same pH is

A. 0.2

B. 0.1

C. 2.0

D. 0.05

Answer: D

Watch Video Solution

165. The dissociation constant of an acid is 1×10^{-5}. The pH of its $0.1M$ solution will be approximately

A. Five

B. Four

C. Three

D. One

Answer: C

Watch Video Solution

166. By adding $20ml0.1NHCl$ to $20ml0.001NKOH$, the pH of the obtained solution will be

A. 2

B. 1.3

C. 0

D. 7

Answer: B

Watch Video Solution

167. A' is an aqueous acid , 'B' is an aqueous base. If they are diluted separately , then

A. pH of A increases and pH of B decreases

B. pH of A inceases and pH of B decreases till pH in each case is 7

C. pH of A and B increase

D. pH of A and B decrease

Answer: A

Watch Video Solution

168. Select the pK_a value of the strongest acid from the following

A. 1.0

B. 3.0

C. 2.0

D. 4.5

Answer: A

Watch Video Solution

169. In a mixing of acetic acid and sodium acetate the ratio of concentration of the salts to the acid is increased ten times . Then the pH of the solution

A. Increase by one

B. Decreases by one

C. Decrease ten fold

D. Increase ten fold

Answer: A

Watch Video Solution

170. 20mL of 0.5 M HCl and 35 mL of 0.1 N NaOH are mixed. The resulting solution will

A. Be neutral

B. Be basic

C. Turn phenolphthalein solution pink

D. Turn methyl orange red

Answer: D

Watch Video Solution

171. 30 cc of $\frac{M}{3}$ HCl, 20cc of $\frac{M}{2}$ HNO_3 and 40 cc of $\frac{M}{4} NaOH$ solutions are mixed and the volume was made upto $1 dm^3$. The pH of the resulting solution is :

A. 2

B. 1

C. 3

D. 8

Answer: A

Watch Video Solution

172. $10^{-6} M NaOH$ is diluted by 100 times. The pH of diluted base is

A. Between 5 and 6

B. Between 6 and 7

C. Between 10 and 11

D. Between 7 and 8

Answer: D

Watch Video Solution

173. 0.023 g of sodium metal is reacted with 100cm^3 of water. The pH of the resulting solution is

A. 10

B. 11

C. 9

D. 12

Answer: D

Watch Video Solution

174. A buffer solution contains 0.1 mole of sodium acetate dissolved in $1000 cm^3$ of 0.1 M acetic acid. To the above buffer solution, 0.1 mole of sodium acetate is further added and dissolved. The pH of the resulting buffer is :

A. $pK_a - \log_2$

B. pK_a

C. $pK_a + 2$

D. $pK_a + \log 2$

Answer: D

Watch Video Solution

175. pH value of which of the following is not equal to one

A. $0.1 M HNO_3$

B. 0.05 M H_2SO_4

C. $0.1 M CH_3COOH$

D. $50 cm^3$ of $0.4 M HCl + 50 cm^3$ of .2 NaOH

Answer: C

Watch Video Solution

176. On adding which of the following the pH of 20 ml of 0.1 NaOH will not alter

A. 1 mL of 1N HCl

B. 20 mL of distilled water

C. 1 mL of 0.1 N NaOH

D. 500 mL of HCl of pH = 1

Answer: D

View Text Solution

177. Solubility product of Mg(OH)2 at ordinary temperature is 1.96×10^{-11}, pH of a saturated solution of $Mg(OH)_2$ will be :

A. 10.5

B. 8.47

C. 6.94

D. 3.47

Answer: A

Watch Video Solution

Watch Video Solution

178. 0.1 M HCl and $0.1 M H_2SO_4$, each of volume 2 ml are mixed and the volume is made up to 6 ml by adding 2ml of 0.01 N NaCl solution. The pH of the resulting mixture is

A. 1.17

B. 1.0

C. 0.3

D. log 2 - log 3

Answer: B

Watch Video Solution

179. A 100 mL 0.1m solution of ammonium nitrate is diluted by adding 100 ml of water. The pH of the resulting solution will be (

pK_a of acetic acid is nearly equal of NH_4OH)

A. 4.9

B. 5.0

C. 7.0

D. 10.0

Answer: C

Watch Video Solution

180. At $25^{\circ}C$, pH of a $10^{-8}M$ aqueous KOH solution will be

A. 6.0

B. 7.01

C. 8.02

D. 9.02

Answer: B

Watch Video Solution

181. 1×10^{-3} mole of HCl is added to a buffer solution made up of 0.01 M acetic acid and 0.01 M sodium acetate. The final pH of the buffer will be (given, pK_a of acetic acid is 4.75 at 25° C)

A. 4.60

B. 4.66

C. 4.75

D. 4.8

Answer: B

Watch Video Solution

182. Which of the following has the highest pH

A. 0.1 M NaOH

B. 0.01 M NaOH

C. 0.1 M HCl

D. $0.1MCH_3COOH$

Answer: A

Watch Video Solution

183. A buffer solution is prepared by mixing equal concentration of acid (ionisation constant K_a) and a salt. The pH of buffer is

A. $pK_a + 7$

B. $14 - pK_a$

C. pK_a

D. $pK_a + 1$

Answer: C

Watch Video Solution

184. A strong acid is titrated with weak base. At equivalence point, pH will be :

A. 7

B. > 7

C. < 7

D. ≈ 7

Answer: C

Watch Video Solution

185. The pH of 10^{-2} M $Ca(OH)_2$ is

A. 12

B. 12.3

C. 11.3

D. 2

Answer: B

Watch Video Solution

186. pH of $10^{-8} MHNO_3$ is (nearly)

A. 7

B. 6.96

C. 7.2

D. 6

Answer: B

Watch Video Solution

187. A solution has $[H_3O^+]$ as 10^{-4}. This solution is

A. Neutral

B. Basic

C. Acidic

D. Amphoteric

Answer: C

Watch Video Solution

188. Determine the pH of the solution that results from the addition of 20.00 mL of 0.01 M Ca $(OH)_2$ to 30.00 mL of 0.01 M HCl

A. 11.3

B. 10.53

C. 2.70

D. 8.35

Answer: A

Watch Video Solution

189. What will be hydrogen ion concentration in moles litre^{-1} of a solution, whose pH is 4.58

A. 2.63×10^{-5}

B. 3.0×10^{-5}

C. 4.68

D. None of these

Answer: A

Watch Video Solution

190. As the temperature increases, the pH of a KOH solution

A. Will decreases

B. Will increases

C. Remains constant

D. Depends upon concentration of KOH solution

Answer: A

Watch Video Solution

191. A certain buffer solution sontains equal concentration of X^{-} and HX. The K_a for HX is 10^{-8}. The of the buffer is

A. 3

B. 8

C. 11

D. 14

Answer: B

Watch Video Solution

Watch Video Solution

192. A buffer solution with $pH = 9$ is to be prepared by mixing NH_4Cl in 1.8 mole of NH_4OH. What will be the number of moles of salt that should be added to one litre $\left(K_b = 10^{-5}\right)$

A. 3.4

B. 2.6

C. 1.5

D. 1.8

Answer: D

Watch Video Solution

193. 100 ml of 0.04 N HCl aqueous solution is mixed with 100 ml of 0.02 N NaOH solution. The pH of the resulting solution is

A. 1.0

B. 1.7

C. 2.0

D. 2.3

Answer: C

Watch Video Solution

194. Equivalent weight of an acid

A. Depends on the reaction involved

B. Depends upon the number of oxygen atoms present

C. Is always same

D. None of the above

Answer: A

Watch Video Solution

195. pH scale was introduced by :

A. Arrhenius

B. Sorensen

C. Lewis

D. Lowry

Answer: B

Watch Video Solution

196. A solution of weak acids is diluted by adding an equal volume of water. Which of the following will not change

A. Strength of the acid

B. The value of $\left[H_3O^+\right]$

C. pH of the solution

D. The degree of dissociation of acid

Answer: B

View Text Solution

197. Which of the following solutions can act as buffer

A. 0.1 molar aq. NaCl

B. 0.1 molar aq. $CH_3COOH + 0.1$ molar NaOH

C. 0.1 molar aq. Ammonium acetate

D. None of the above

Answer: C

Watch Video Solution

198. What is the pH for a neutral solutions at the normal temperature of the human body

A. 7.2

B. 14.0

C. 6.8

D. 6.0

Answer: C

Watch Video Solution

Watch Video Solution

199. Which solutions has the highest pH value

A. 1M KOH

B. $1MH_2SO_4$

C. Chlorine water

D. Water containing carbon dioxide

Answer: A

Watch Video Solution

200. If the pH of a solution of an alkali metal hydroxide is 13.6, the concentration of hydroxide is

A. Between 0.1 M and 1M

B. More than 1 M

C. Less than 0.001 M

D. Between 0.01 M and 1 M

Answer: A

Watch Video Solution

201. The pH of a 0.01 M solutions of acetic acid having degree of dissociation 12.5% is

A. 5.623

B. 2.903

C. 3.723

D. 4.509

Answer: B

Watch Video Solution

202. Which may be added to one litre of water to act as a buffer

A. One mole of $HC_2H_3O_2$ and 0.5 mole of NaOH

B. One mole of NH_4Cl and one mole of HCl

C. One mole of NH_4OH and one mole of NaOH

D. One mole of $HC_2H_3O_2$ and one mole of HCl

Answer: A

Watch Video Solution

203. A solutio of sodium borate has a pH of approximately

A. < 7

B. > 7

C. $= 7$

D. Between 4 to 5

Answer: B

Watch Video Solution

204. The dissociation constant of HCN is 5×10^{-10}. The pH of the solution prepared by mixing 1.5 mole of HCN and 0.15 moles of KCN in water and making up the total volume to $0.5dm^3$ is

A. 7.302

B. 9.302

C. 8.302

D. 10.302

Answer: C

Watch Video Solution

205. The hydrogen ion concentration of 0.1 N solution of CH_3COOH, which is 30% dissociated, is

A. 0.03

B. 3.0

C. 0.3

D. 30.0

Answer: A

Watch Video Solution

206. At $100^\circ C$ the K_w of water is 55 times its value at $25^\circ C$.

What will be the pH of neutral solution ?

(log 55=1.74)

A. 7.00

B. 7.87

C. 5.13

D. 6.13

Answer: D

Watch Video Solution

207. The concentration of hydronium (H_3O^+) ion in water is

A. Zero

B. 1×10^{-7} gm ion /litre

C. 1×10^{-14} gm ion/litre

D. 1×10^{-7} gm ion/litre

Answer: D

Watch Video Solution

208. The pH of a solution is the negative logarithm to the base 10 of its hydrogen ion concentration in

A. Moles per litre

B. Millimoles per litre

C. Micromoles per litre

D. Nanomoles per litre

Answer: A

Watch Video Solution

209. What will be the pH of a solution formed by mixing $40ml$ of $0.10MHCl$ with $10ml$ of $0.45MNaOH$?

A. 12

B. 10

C. 8

D. 6

Answer: A

Watch Video Solution

210. pH of NaCl solution is

A. 7

B. Zero

C. > 7

D. < 7

Answer: A

Watch Video Solution

211. In a solution of acid H^{+} concentration is $10^{-10}M$. The pH of this solution will be

A. 8

B. 6

C. Between 6 and 7

D. Between 3 and 6

Answer: C

Watch Video Solution

212. The pH of blood is

A. 5.2

B. 6.3

C. 7.4

D. 8.5

Answer: C

Watch Video Solution

213. A solution of sodium chloride in contact with atmosphere has a pH of about

A. 3.5

B. 5

C. 7

D. 1.4

Answer: C

Watch Video Solution

214. The gatric juice in our stomach contains enough HCI to make the hydrogen ion concentration about $0.01mol^{-1}$. The pH of gastric juice is

A. 0.01

B. 1

C. 2

D. 14

Answer: C

Watch Video Solution

215. The one which has the highest value of pH is

A. Distilled water

B. NH_3 solution in water

C. NH_3

D. Water saturated with Cl_2

Answer: B

Watch Video Solution

216. In its 0.2 M solution, acid ionies to an extent of 60%. Its hydrogen ion concentration is

A. 0.6 M

B. 0.2 M

C. 0.12 M

D. None of these

Answer: C

Watch Video Solution

217. the addition of solid sodium carbonate to pure water causes

A. An increase in hydronium ion concentration

B. An increase in alkalinity

C. No change in acidity

D. A decrease in hydroxide ion concentration

Answer: B

Watch Video Solution

218. The pH value of $1.0 \times 10^{-8} MHCl$ solution is less than 8 because

A. HCl is completely ionised at this concentration

B. the ionization of water is negligible

C. The ionization of water cannot be assumed to be negligible in comparison with this low concentration of HCl

D. The pH cannot be calculated at such a low concentraion of HCl

Answer: C

Watch Video Solution

219. To obtain a buffer wich should be suitable for maintaining a pH of about 4-5, we need to have in solution, a mixture of

A. A strong base + its salt with a weak acid

B. A weak base + its salt with a strong acid

C. A strong acid + its salt with a weak base

D. A weak acid + its salt with a strong base

Answer: D

Watch Video Solution

220. Which solution contains maximum number of H^{+} ion

A. 0.1 M HCl

B. $0.1MNH_4Cl$

C. $0.1MNaHCO_3$

D. $0.1MCH_3COOH$

Answer: A

Watch Video Solution

221. Which of the following does not make any change in pH when added to 10 mL dilute HCl

A. 5 ml pure water

B. 20 ml pure water

C. 10 ml HCl

D. Same 20 ml dilute HCl

Answer: D

Watch Video Solution

222. The pH of 0.1 M acetic acid is 3, the dissociation constant of acid will be

A. 1.0×10^{-4}

B. 1.0×10^{-5}

C. 1.0×10^{-3}

D. 1.0×10^{-8}

Answer: B

Watch Video Solution

223. Assertion : pH of hydrochloric acid solution is less than that of acetic acid solution of the same concentration .

Reason : In equimolar solutions, the number of titrable protons present in hydrochloric acid is less than that present in acetic acid.

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If the assertion and reason both are false.

Answer: C

Watch Video Solution

224. Assertion: The pK_a of acetic acid is lower than that of phenol.

Reason : Phenoxide ion is more resonance sabilised.

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If the assertion and reason both are false.

Answer: A

Watch Video Solution

225. Assertion : NaCl is precipitated when HCl gas is passed in a saturated solution of NaCl.

Reason : HCl is strong acid.

A. If both assertion and reason are true and reason is the correct explanation of the assertion

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If the assertion and reason both are false.

Answer: B

Watch Video Solution

Critical thinking (Objective question)

1. For a weak acid HA with dissociation constant 10^{-9}, POH of its 0.1 M solutions is

A. 9

B. 3

C. 11

D. 10

Answer: D

View Text Solution

2. Total number of moles for the reaction $2Hl \rightarrow H_2 + I_2$. If α is degree of dissociation is , if intial mole of HI = 1.

A. 2

B. $2 - \alpha$

C. 1

D. $1 - \alpha$

Answer: A

Watch Video Solution

Watch Video Solution

3. The concentration of $\left[H^{+}\right]$ and concentration of $\left[OH^{-}\right]$ of a 0.1 aqueous solution of 2% ionised weak acid is [Ionic product of water $= 1 \times 10^{-14}$]

A. $2 \times 10^{-3} M$ and $5 \times 10^{-12} M$

B. 1×10^{3} and $3 \times 10^{-11} M$

C. $0.02 \times 10^{-3} M$ and $5 \times 10^{-11} M$

D. $3 \times 10^{-2} M$ and $4 \times 10^{-13} M$

Answer: A

Watch Video Solution

4. A base dissolved in water yields a solution with a hydroxide ion concentration of $0.05 mol litre^{-1}$. The solution is

A. Basic

B. Acid

C. Neutral

D. Either (b) or (c)

Answer: A

Watch Video Solution

5. Solubility of $AgCl$ at $20^{\circ}C$ is $1.435 \times 10^{-3} g per litre$. The solubility product of $AgCl$ is

A. 1×10^{-5}

B. 1×10^{-10}

C. 1.435×10^{-5}

D. 108×10^{-3}

Answer: B

Watch Video Solution

6. Which one of the following compounds is not a protoric acid?

A. $SO_2(OH)_2$

B. $B(OH)_3$

C. $PO(OH)_3$

D. $SO(OH)_2$

Answer: B

Watch Video Solution

7. If pH of a saturated solution of $Ba(OH)_2$ is 12, the value of its $K_{(SP)}$ is

A. $5.00 \times 10^{-7} M^{-3}$

B. $4.00 \times 10^{-6} M^3$

C. $4.00 \times 10^{-7} M^3$

D. $5.00 \times 10^{-6} M^3$

Answer: A

Watch Video Solution

8. In qualitative analysis, the metals of group I can be separated from other ions by precipitating them as chloride salts. A solution initially contains Ag^+ and Pb^+ at a concentration of 0.10M. Aqueous HCl is added to this solution until be Cl^- concentration is 0.10M. What will be concentration of Ag^{+} and Pb^{2+} be at equilibrium ?

$(K_{sp}$ for AgCl $= 1.8 \times 10^{-10}$

K_{sp} for $PbCl_2 = 1.7 \times 10^{-5})$

A. $\left[Ag^{+}\right] = 1.8 \times 10^{-9}M, \left[Pb^{2+}\right] = 1.7 \times 10^{-3}M$

B. $\left[Ag^{+}\right] = 1.8 \times 10^{-11}M, \left[Pb^{2+}\right] = 1.7 \times 10^{-4}M$

C. $\left[Ag^{+}\right] = 1.8 \times 10^{-7}M, \left[Pb^{2+}\right] = 1.7 \times 10^{-6}M$

D. $\left[Ag^{+}\right] = 1.8 \times 10^{-11}M, \left[Pb^{2+}\right] = 1.7 \times 10^{-5}M$

Answer: A

Watch Video Solution

9. Acidity of diprotic acids in aqueous solutions increases in the order

A. $H_2Te < H_2S < H_2Se$

B. $H_2Se < H_2Te < H_2S$

C. $H_2S < H_2Se < H_2Te$

D. $H_2Se < H_2S < H_2Te$

Answer: C

Watch Video Solution

10. Which equilibrium can be described as an acid- base reaction using the Lewis acid-base definition but not using the Bronsted-Lowry definition

A. $2NH_3 + H_2SO_4 \Leftrightarrow 2NH_4^+ + SO_4^{2-}$

B. $NH_3 + CH_3COOH \Leftrightarrow NH_4^+ + CH_3COO^-$

C. $H_2O + CH_3COOH \Leftrightarrow H_3O^+ + CH_3COO^-$

D. $\left[Cu(H_2O)_4\right]^{2+} + 4NH_3 \Leftrightarrow \left[Cu(NH_3)_4\right]^{2-} + 4H_2O$

Answer: D

Watch Video Solution

11. Given

$$HF + H_2O \xrightarrow{K_a} H_3O^+ + F^-$$
$$F^- + H_2O \xrightarrow{K_b} HF + OH^-$$

Which of the following reaction is correct

A. $K_b = K_w$

B. $K_b = \dfrac{1}{K_w}$

C. $K_a \times K_b = K_w$

D. $\dfrac{K_a}{K_b} = K_w$

Answer: C

View Text Solution

12. The solubility of $CuBr$ is 2×10^{-4} at $25^{\circ} C$. The K_{sp} value for $CuBr$ is

A. $4 \times 10^{-8} mol^2 l^{-2}$

B. $4 \times 10^{-11} mol^2 L^{-1}$

C. $4 \times 10^{-4} mol^2 l^{-2}$

D. $4 \times 10^{-15} mol^2 l^{-2}$

Answer: A

Watch Video Solution

13. The pH of a solution at $25^{\circ} C$ containing $0.10 M$ sodium acetate and $0.03 M$ acetic acid is (pK_a for $CH_3COOH = 4.57$)

A. 4.09

B. 5.09

C. 6.1

D. 7.09

Answer: B

Watch Video Solution

14. Which one of the following is not a buffer solution ?

A. $0.8MH_2S + 0.8MKHS$

B. $2MC_6H_5NH_2 + 2MC_6H_5\overset{+}{N}H_3Br$

C. $3MH_2CO_3 + 3MKHCO_3$

D. $0.05MKClO_4 + 0.05MHClO_4$

Answer: D

Watch Video Solution

15. What is the pH of 0.01 M glycine solution? For glycine $K_{a_1} = 4.5 \times 10^{-3}$ and $Ka_2 = 1.7 \times 10^{-10}$ at 298 K

A. 3.0

B. 10.0

C. 6.1

D. 7.2

Answer: C

Watch Video Solution

16. $\Delta H_f(H_2O) = X$, Heat of neutralisation of CH_3COOH and NaOH will be

A. Less than 2X

B. Less tha X

C. X

D. Between X and 2X

Answer: B

Watch Video Solution

17. K_{sp} of an electrolyte AB is 1×10^{-10}. $[A^+] = 10^{-5}m$, which concentration of B^- will not give precipitate of AB

A. 5×10^{-6}

B. 1×10^{-5}

C. 2×10^{-5}

D. 5×10^{-5}

Answer: A

Watch Video Solution

18. If solubility product of $HgSO_4$ is 6.4×10^{-5}, then its solubility is

A. 8×10^{-3} mole/litre

B. 6.4×10^{-5} mole/litre

C. 6.4×10^{-3} mole/litre

D. 2.8×10^{-6} mole/litre

Answer: A

Watch Video Solution

19. One litre of water contains 10^{-7} mole H^{+} ions. Degree of ionisation of water is:

A. 1.8×10^{-7} %

B. 0.8×10^{-9} %

C. 3.6×10^{-7} %

D. 3.6×10^{-9} %

Answer: A

Watch Video Solution

20. If the solubility product of lead iodide (PbI_2) is 3.2×10^{-8}, then its solubility in moles/litre will be

A. 2×10^{-3}

B. 4×10^{-4}

C. 1.6×10^{-5}

D. 1.8×10^{-5}

Answer: A

Watch Video Solution

21. At 298 K, 0.1 M solution of acetic acid is 1.34% ionised . What is the ionisation constant (K_a) for the acid ?

A. 1.82×10^{-5}

B. 18.2×10^{-5}

C. 0.182×10^{-5}

D. None of these

Answer: A

Watch Video Solution

22. Which of the following is Lewis acid

A. S

B. $:CH_2$

C. $(CH_3)_3B$

D. All of these

Answer: D

View Text Solution

23. The solubility product of As_2S_3 is 2.8×10^{-72}. What is the solubility of As_2S_3

A. 1.09×10^{-15} mole/litre

B. 1.72×10^{-15} mole/litre

C. 2.3×10^{-16} mole/litre

D. 1.65×10^{-36} mole/litre

Answer: A

Watch Video Solution

24. The solubility product (K_{sp}) of the following compounds are given at $25^\circ C$

Compound	K_{sp}
AgCl	1.1×10^{-10}
Agl	1.0×10^{-16}
$PbCrO_4$	4.0×10^{-14}
Ag_2CO_3	8.0×10^{-12}

The most soluble and least soluble compound are respectively

A. AgCl and $PbCrO_4$

B. Agl and Ag_2CO_3

C. AgCl and Ag_2CO_3

D. Ag_2CO_3 and Agl

Answer: D

Watch Video Solution

25. Which is nucleophile

A. BF_3

B. NH_3

C. $BeCl_2$

D. H_2O

Answer: B

Watch Video Solution

26. What is the pH of a $1 M CH_3COOH$ a solution K_a of acetic acid $= 1.8 \times 10^{-5}$?

$K = 10^{-14} mol^2 litre^{-2}$

A. 9.4

B. 4.8

C. 3.6

D. 2.4

Answer: A

Watch Video Solution

27. If a neutral solution has $pK_w = 13.36$ at $50^\circ C$, then pH of the solution is

A. 7.0

B. 7.13

C. 6.0

D. 6.63

Answer: D

Watch Video Solution

28. The Bronsted acids in the reversible reaction are

$HCO_3^-(aq.) + OH^-(aq.)CO_3^{2-}(aq.) + H_2O$

A. OH^- and CO_3^{2-}

B. OH^- and H_2O

C. HCO_3^- and H_2O

D. HCO_3^- and CO_3^{2-}

Answer: C

Watch Video Solution

29. If the solubility product of $AgBrO_3$, and $AgSO_4$ are 5.5×10^{-5} and 2×10^{-5} respectively, the relationship between the solubility of these salts can be correctly represented as

A. $S_{AgBrO_3} > S_{Ag_2SO_4}$

B. $S_{AgBrO_3} < S_{Ag_2SO_4}$

C. $S_{AgBrO_3} = S_{Ag_2SO_4}$

D. $S_{AgBrO_3} \approx S_{Ag_2SO_4}$

Answer: B

Watch Video Solution

30. Which of the following is the strongest acid

A. $SO(OH)_2$

B. $SO_2(OH)_2$

C. $CIO_3(OH)$

D. $PO(OH)_3$

Answer: C

Watch Video Solution

31. The degree of hydrolysis of a salt of weak acid and weak base in its 0.1 M solution is 0.2 M, the precentage hydrolysis of the salt should be

A. 50%

B. 35%

C. 75%

D. 100%

Answer: A

View Text Solution

32. In the equilibrium $A^{-} + H_2O \Leftrightarrow HA + OH^{-} \left(K_a = 1.0 \times 10^{-5}\right)$. The degree of hydrolysis of $0.001M$ solution of the salt is

A. 10^{-3}

B. 10^{-4}

C. 10^{-5}

D. 10^{-6}

Answer: A

Watch Video Solution

33. The K_{SP} of AgI is 1.5×10^{-16}. On mixing equal volumes of the following solutions, precipitation will occur only with

A. $10^{-7} MAg^{+}$ and $10^{-19} MI^{-}$

B. $10^{-8} M Ag^{+}$ and $10^{-8} M I^{-1}$

C. $10^{-16} M Ag^{+}$ and $10^{-16} M I^{-1}$

D. $10^{-9} M Ag^{+}$ and $10^{-9} M I^{-1}$

Answer: B

View Text Solution

34. The charge balance equation of species in 0.100 M acetic solution is given by

A. $[H^{+}] = [OH^{-}]$

B. $[H^{+}] = [CH_3COO^{-}]$

C. $[H^{+}] = [OH^{-}] + [CH_3COO^{-}]$

D. $2[H^{+}] = [OH^{-}] + [CH_3COO^{-}]$

Answer: D

Watch Video Solution

35. The pH of a solution prepared by mixing 2.0 mL of HCI solution of pH 3.0 and 3.0 mL of NaOH of pH 10.0 is

A. 2.5

B. 3.5

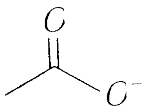
C. 5.5

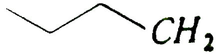
D. 6.5

Answer: B

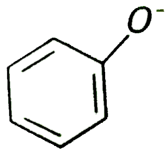
Watch Video Solution

36. Order of the base strength of the compounds

(i) 

(ii) 

(iii) NH_2^-

(iv) 

A. $iv > iii > i > ii$

B. $iii > ii > iv > i$

C. $ii > iii > iv > i$

D. $ii > iii > i > iv$

Answer: B

View Text Solution

37. The relative basic character of the following is

A. $CIO^- < CIO_2^- < CIO_3^- < CIO_4^-$

B. $CIO_4^- < CIO_3^- < CIO_2^- < CIO^-$

C. $CIO_3^- < CIO_4^- < CIO_2^- < CIO^-$

D. $CIO_2^- < CIO^- < CIO_3^- < CIO_4^-$

Answer: B

Watch Video Solution

38. For a diprotic acid, which of the following is true for 1^{st} and 2^{nd} ionization constants (K_{a_1} and K_{a_2})

A. $K_{a_1} = K_{a_2}$

B. $K_{a_1} > K_{a_2}$

C. $K_{a_2} > K_{a_1}$

D. $K_{a_2} \geq K_{a_1}$

Answer: B

Watch Video Solution

39. At $30^{\circ} C$ the solubility of $Ag_2CO_3(K_{SP} = 8 \times 10^{-12})$ would be gretest in one litre of:

A. $0.05 M Na_2CO_3$

B. $0.05 M AgNO_3$

C. Pure water

D. $0.05 M NH_3$

Answer: C

Watch Video Solution

40. The dissocication constant of a weak acid is 1.0×10^{-5}, the equilibrium constant for the reaction with strong base is

A. 1.0×10^{-5}

B. 1.0×10^{-9}

C. 1.0×10^{9}

D. 1.0×10^{14}

Answer: C

Watch Video Solution

41. What is $\left[H^{+}\right]$ in a solution that is 0.01 M in HCn and 0.02 M in NaCN ?

$\left(K_a$ for HCN $6.2 \times 10^{-10}\right)$

A. 3.1×10^{10}

B. 6.2×10^{5}

C. 6.2×10^{-10}

D. 3.1×10^{-10}

Answer: D

Watch Video Solution

42. The pH of a soft drink is 3.82. Its hydrogen ion concentration will be

A. 1.96×10^{-2} mol/l

B. 1.96×10^{-3} mol/l

C. 1.5×10^{-4} mol/l

D. 1.96×10^{-1} mol/l

Answer: C

Watch Video Solution

43. If the solubility products of AgCl and AgBr are 1.2×10^{-10} and 3.5×10^{-13} respectively, then the relation between the solubilities (denoted by the symbol'S') of these

A. S of AgBr is less than that of AgCl

B. S of AgBr is greater than that of AgCl

C. S of AgBr is equal to that of AgCl

D. S of AgBr is 10^{6} times greater than that of AgCl

Answer: A

Watch Video Solution

44. pH of a solution produced when an aqueous soution of $pH = 6$ is mixed with an equal volume of an aqueous solution of $pH = 3$ is about :

A. 3.3

B. 4.3

C. 4.0

D. 4.5

Answer: A

Watch Video Solution

45. In which of the reactions, the enthalpy is the least

A. $CH_3COOH + NaOH \Rightarrow CH_3COONa + H_2O$

B. $HCl + NH_4OH \Rightarrow NH_4Cl + H_2O$

C. $HCl + NaOH \Rightarrow NaCl + H_2O$

D. $HCN + NH_4OH \rightarrow NH_4CN + H_2O$

Answer: C

View Text Solution

46. On increasing the temperature, the pKw

A. Increase

B. Decrease

C. Remains constant

D. May increase or decrease

Answer: B

Watch Video Solution

47. Determine the hydrogen ion concentration in 1.0 M solution of HCN , if its dissociation constant is 4.0×10^{-10}.

A. 4×10^{-14} mole/litre

B. 2×10^{-5} mole/litre

C. 2.5×10^{-5} mole/litre

D. None of these

Answer: B

Watch Video Solution

48. Which one is a Lewis acid

A. CIF_3

B. H_2O

C. NH_3

D. None of these

Answer: A

View Text Solution

49. An aqueous solution of ammonium acetate is

A. Faintly acidic

B. Faintly basic

C. Fairly acidic

D. Almost neutral

Answer: D

Watch Video Solution

50. Increasing order of acidic character would be

A. $CH_3COOH < H_2SO_4 < H_2CO_3$

B. $CH_3COOH < H_2CO_3 < H_2SO_4$

C. $H_2CO_3 < CH_3COOH < H_2SO_4$

D. $H_2SO_4 < H_2CO_3 < CH_3COOH$

Answer: C

View Text Solution

51. Electrophiles are

A. Lewis acids

B. Lewis base

C. Bronsted acid

D. Bronsted base

Answer: A

View Text Solution

52. The dissociation constant of two acids HA_1 and HA_2 are 3.14×10^{-4} and 1.96×10^{-5} respectively. The relative strength of the acids will be approximately

A. $1:4$

B. $4:1$

C. $1:16$

D. $16:1$

Answer: B

Watch Video Solution

53. The molar solubility (in mol L^{-1}) of a sparingly soluble salt MX_4 is $'s'$. The corresponding solubility product K_{sp}, $'s'$ is given in terms of K_{sp} by the relation

A. $s = (256K_{sp})^{1/5}$

B. $s = (128K_{sp})^{1/4}$

C. $s = (K_{sp}/128)^{1/4}$

D. $s = \left(\frac{K_{sp}}{256}\right)^{1/5}$

Answer: D

Watch Video Solution

54. In an aqueous solution the ionisation constants for carbonic acid are $K_1 = 4.2 \times 10^{-7}$ and $K_2 = 4.8 \times 10^{-11}$. Select the

correct statement for a saturated 0.034 M solution of the carbonic acid.

A. The concentration of H^{+} is double that of CO_3^{2-}

B. The concentration of CO_3^{2-} is 0.034 M

C. The concentration of CO_3^{2-} is greater than that of HCO_3^{-}

D. The concentration of H^{+} and HCO_3^{-} are approximately equal

Answer: D

Watch Video Solution

55. A 0.1 N solution of an acid at room temperature has a degree of ionisation 0.1. The concentration of OH^{-} would be

A. $10^{-12}M$

B. $10^{-11}M$

C. $10^{-9}M$

D. $10^{-2}M$

Answer: A

Watch Video Solution

56. If 50 ml of 0.2 M KOH is added to 40 ml of 0.5 M HCOOH, the pH of the resulting solution is $\left(K_a = 1.8 \times 10^{-4}\right)$

A. 3.4

B. 7.5

C. 5.6

D. 3.75

Answer: A

View Text Solution

57. The correct order of decreasing acidic nature of $H_2O, ROH, HC \equiv CH$ and $NH_3)$ is

A. $CH \equiv CH > H_2OROH > NH_3$

B. $H_2O > ROH > CH \equiv CH > NH_3$

C. $ROH > NH_3 > CH \equiv CH > H_2O$

D. $H_2O > ROH > NH_3 > CH \equiv CH$

Answer: B

Watch Video Solution

58. pK_a values of two acids. A and B are 4 and 5. The strengths of these two acids are related as

A. Acid A is 10 times stronger than acids B

B. Strength of acid A : strength of acid B = 4:5

C. The strengths of the two acids can not be compared

D. Acid B is 10 times stronger than acid A

Answer: A

Watch Video Solution

59. If for a binary weak electrolyte the solubility product is 4×10^{-10} at 298K.Calculate its solubility is mol dm^{-3} at the same temperature

A. 4×10^{-5}

B. 2×10^{-5}

C. 8×10^{-10}

D. 16×10^{-20}

Answer: B

Watch Video Solution

60. Hydrogen ion concentration of an aqueous solution is $1 \times 10^{-4} M$. The solution is diluted with equal volume of water. Hydroxyl ion concentration of the resultant solution in terms of mol dm^{-3} is

A. 1×10^{-8}

B. 1×10^{-6}

C. 2×10^{-10}

D. 0.5×10^{-10}

Answer: C

Watch Video Solution

61. Heat of neutralisation of weak acid and strong base is less than the heat of neutralisation of strong acid and strong base due to

A. Energy has to be spent for the total dissociation of weak acid

B. Salt of weak acid and strong base is not stable

C. Incomplete dissociation of weak acid

D. Incomplete neutralisation of weak acid

Answer: A

Watch Video Solution

62. 1 dm3 solution containing 10^{-5} moles each of Cl^{-} ions and CrO_4^{2-} ions is treated with 10^{-4} moles of silver nitrate. Which one of the following observation is made? $[K_{sp}Ag_2CrO_4 = 4 \times 10^{-12}]$, $[K_{sp}AgCl = 1 \times 10^{-10}]$

A. Precipitation does not occur

B. Silver chromate gets precipitated first

C. Silver chloride gets precipitated first

D. Both silver chromate and silver chloride start precipitation simultaneously

Answer: C

Watch Video Solution

63. A weak acid of dissociation constant 10^{-5} is being titrated with aqueous NaOH solution . The pH at the point of one third of neutralization of the acid will be

A. $5 + \log 2 - \log 3$

B. 5 - log 2

C. 5 - log 3

D. 5 - log 6

Answer: B

Watch Video Solution

64. K_{sp} for $Cr(OH)_3$ is 2.7×10^{-31}. What is its solubility in moles/litre

A. 1×10^{-8}

B. 8×10^{-8}

C. 1.1×10^{-8}

D. 0.18×10^{-8}

Answer: A

Watch Video Solution

65. In the given reaction, the oxide of sodium is ....

$$\begin{bmatrix} 4Na + O_2 \rightarrow 2Na_2O \\ Na_2O + H_2O \rightarrow 2NaOH \end{bmatrix}$$

A. Acidic

B. Basic

C. Amphoteric

D. Neutral

Answer: B

Watch Video Solution

66. pK_a of CH_3COOH is 4.74 . The pH of 0.01 M CH_3COONa IS

A. 8.37

B. 4.37

C. 4.74

D. 0.474

Answer: A

Watch Video Solution

67. NH_4HF_2 ionises in aqueous medium as

A. $NH_4HF^+F^-$

B. $NH_4^+HF_2^-$

C. $NH_3HF^-H^+$

D. $NH_4F_2^-H^+$

Answer: B

View Text Solution

68. Calculate the hydrolysis constant of the salt containing NO_2^-.

Given the K_a for $HNO_2 = 4.5 \times 10^{-10}$

A. 2.22×10^{-5}

B. 2.02×10^{5}

C. 4.33×10^{-4}

D. 3.03×10^{-5}

Answer: A

Watch Video Solution

69. Arrange the acids (I) $H_2SO_3(II)H_3PO_3(III)HClO_3$ in the decreasing order of acidity

A. $I > III > II$

B. $I > II > III$

C. $II > III > I$

D. $III > I > II$

Answer: D

Watch Video Solution

70. Calculate the amount of $(NH_4)SO_4$ in grams which must be added to 500 ml of 0.200 M NH_3 to yield a solution with pH = 9.35 (K_b for $NH_3 = 1.78 \times 10^{-5}$)

A. 10.56 gm

B. 15 gm

C. 12.74 gm

D. 16.25 gm

Answer: A

View Text Solution

71. The correct order of increasing $[H_3O^+]$ in the following aqueous solution is :

A.

$0.01 M H_2S < 0.01 M H_2SO_4 < 0.01 M NaCl < 0.01 M NaNO_2$

B.

$0.01 M NaCl < 0.01 M NaNO_2 < 0.01 M H_2S < 0.01 M H_2SO_4$

C.

$0.01 M NaNO_2 < 0.01 M NaCl < 0.01 M H_2S < 0.01 M H_2SO_4$

D.

$0.01 M H_2S < 0.01 M NaNO_2 < 0.01 M NaCl < 0.01 M H_2SO_4$

Answer: C

Watch Video Solution

72. Self-ionisation of liquid ammonia occurs as, $2NH_3 \rightarrow NH_4^+ + NH_2^-, K = 10^{-10}$. In this solvent, an acid might be

A. NH_4^+

B. NH_3

C. Any species that will form NH_4^+

D. All of these

Answer: A

View Text Solution

73. The number of moles of hydroxide (OH^-) ion in 0.3 litre of 0.005 M solution of $Ba(OH)_2$ is

A. 0.005

B. 0.003

C. 0.0015

D. 0.0075

Answer: B

Watch Video Solution

74. The ionization constant of a phenol is higher than that of ethanol because

A. Phenoxide ion is bulkier than ehtoxide

B. Phenoxide ion is stronger base than ethoxide

C. Phenoxide ion is stabilised through delocalisation

D. Phenoxide ion is less stable than ethoxide

Answer: C

Watch Video Solution

75. The pH of 0.1 M solution of a weak acid (HA) is 4.50. It is neutralised with certain ammount of $NaOH$ solution to decrease the acid content to half of initial value. Calculate the pH of the resulting solution.

A. 4.50

B. 8.00

C. 7.00

D. 10.00

Answer: B

Watch Video Solution

76. A weak acid is 0.1% ionised in 0.1 M solution. Its pH is

A. 2

B. 3

C. 4

D. 1

Answer: C

Watch Video Solution

77. Autoprotolysis constant of NH_3 is

A. $\left[NH_4^+\right][NH_3]$

B. $\left[NH_2^-\right][NH_3]$

C. $[NH_4^+][NH_2^-]$

D. $\dfrac{[NH_4^+]}{[NH_2^-]}$

Answer: C

View Text Solution

78. The sulphide ion concentration $[S^{2-}]$ in saturated H_2S solution is 1×10^{-22}. Which of the following sulphides should be quantitatively precipitated by H_2S in the presence of dil. HCl

Sulphide	Solubility Product
(I)	1.4×10^{-16}
(II)	1.2×10^{-22}
(III)	8.2×10^{-46}
(IV)	5.0×10^{-34}

A. I, II

B. III, IV

C. II, III, IV

D. Only I

Answer: B

View Text Solution

JS Jee Section (Only one choice correct answer)

1. Which of the following is the weakest base?

A. NaOH

B. $Ca(OH)_2$

C. NH_4OH

D. KOH

Answer: C

Watch Video Solution

2. Molten sodium chloride conducts electricity due to the presence of

A. Free electrons

B. Free ions

C. Free molecules

D. Atoms of sodium and chlorine

Answer: B

Watch Video Solution

3. The pH of a 10^{-8} molar solution of HCl in water is

A. 8

B. -8

C. Between 7 and 8

D. Between 6 and 7

Answer: D

Watch Video Solution

4. Of the given anions, the strongest Bronsted base is

A. ClO^{-}

B. ClO_2^{-}

C. ClO_3^{-}

D. ClO_4^-

Answer: A

Watch Video Solution

5. At $90^\circ C$, pure water has $\left[H_3O^{\oplus}\right] = 10^{-6}M$. What is the value of K_w at $90^\circ C$

A. 10^{-6}

B. 10^{-12}

C. 10^{-14}

D. 10^{-8}

Answer: B

Watch Video Solution

6. The precipitate of $CaF_2(K_{sp} = 1.7 \times 10^{-10})$ is obtained when equal volumes of the following are mixed

A. $10^{-4}MCa^{2+} + 10^{-4}MF^{-}$

B. $10^{-2}MCa^{2+} + 10^{-3}MF^{-}$

C. $10^{-5}MCa^{2+} + 10^{-3}MF^{-}$

D. $10^{-3}MCa^{2+} + 10^{-5}MF^{-}$

Answer: B

Watch Video Solution

7. A certain weak acid has a dissocation constant of 1.0×10^{-4}. The equilibrium constant for its reaction with a strong base is

A. 1.0×10^{-4}

B. 1.0×10^{-10}

C. 1.0×10^{10}

D. 1.0×10^{14}

Answer: C

Watch Video Solution

8. A certain buffer solution contains equal concentration of X^{-} and HX. The K_b for X^{-} is 10^{-10}. The pH of the buffer is:

A. 4

B. 7

C. 10

D. 14

Answer: A

Watch Video Solution

9. The best indicator for detection of end point in titration of a weak acid and a strong base is

A. Methyl orange (3 to 4)

B. Methyl red (5 to 6)

C. Bromothymol blue (6 to 7.5)

D. Phenolphthalein (8 to 9.6)

Answer: D

Watch Video Solution

10. The compound that is not a Lewis acids is

A. BF_3

B. $AlCl_3$

C. $BeCl_2$

D. $SnCl_4$

Answer: D

Watch Video Solution

11. 0.1 mole of $CH_3CH\left(K_b = 5 \times 10^{-4}\right)$ is mixed with 0.08 mole of HCl and diluted to one litre. What will be the H^+ concentration in the solution

A. $8 \times 10^{-2} M$

B. $8 \times 10^{-11} M$

C. $1.6 \times 10^{-11} M$

D. $8 \times 10^{-5} M$

Answer: B

Watch Video Solution

12. The pK_a of acteylsalicylic acid (aspirin) is 3.5. The pH of gastric juice in human stomach is about $2 - 3$ and the pH in the small intestine is about 8. Aspirin will be:

A. Unionised in the small intestine and the stomach

B. Completely ionised in the small intestine and in the stomach

C. Ionised in the stomach and almost unionised in the small intestine

D. Ionised in the small intestine and almost unionised in the stomach

Answer: D

Watch Video Solution

13. The conjugate acid of NH_2^- is :

A. NH_3

B. NH_4^+

C. NH_2OH

D. N_2H_4

Answer: A

Watch Video Solution

14. The compound whose $0.1M$ solution is basic is

A. Ammonium acetate

B. Ammonium chloride

C. Ammonium sulphate

D. Sodium acetate

Answer: D

Watch Video Solution

15. The compound insoluble in acetic acid is

A. Calcium oxide

B. Calcium carbonate

C. Calcium oxalate

D. Calcium hydroxide

Answer: C

View Text Solution

16. When equal volumes of the following solutions are mixed, precipitation of $AgCI(K_{sp} = 1.8 \times 10^{-10})$ will occur only wity

A. $10^{-4}M(Ag^{+})$ and $10^{-4}M(Cl^{-})$

B. $10^{-5}M(Ag^{+})$ and $10^{-5}M(Cl^{-})$

C. $10^{-6}M(Ag^{+})$ and $10^{-6}M(Cl^{-})$

D. $10^{-10}M(ag^{+})$ and $10^{-10}M(Cl^{-})$

Answer: A

Watch Video Solution

17. Which one of the following is the strongest acid ?

A. $ClO_3(OH)$

B. $ClO_2(OH)$

C. $SO(OH)_2$

D. $SO_2(OH)_2$

Answer: A

Watch Video Solution

18. Solubility product of $BaCl_2$ is 4×10^{-9}. Its solubility in moles//litre would be

A. 1×10^{-3}

B. 1×10^{-9}

C. 4×10^{-27}

D. 1×10^{-27}

Answer: A

Watch Video Solution

19. The hydroxide of alkaline earth metal, which has the lowest value of solubility product (K_{sp}) at normal temperature $(25^{\circ} C)$ is :

A. $Mg(OH)_2$

B. $Ca(OH)_2$

C. $Ba(OH)_2$

D. $Be(OH)_2$

Answer: D

Watch Video Solution

20. The following equilibrium is established when hydrogen chloride is dissolved in acetic acid

$HCl(aq) + CH_3COOH(aq) \Leftrightarrow Cl^-(aq) + CH_3COOH_2^+(aq)$

The set that characterises the conjugate acid-base pairs is :

A. (HCl, CH_3COOH) and $(CH_2COOH_2^+, Cl^-)$

B. $(HCl, CH_3COOH_2^+)$ and (CH_3COOH, Cl^-)

C. $\left(CH_3COOH_2^+, HCl\right)$ and $\left(Cl^-, CH_3COOH\right)$

D. $\left(HCl, Cl^-\right)$ and $\left(CH_3COOH_2^+, CH_2COOH\right)$

Answer: D

Watch Video Solution

21. Which of the following solutions will have pH close to 1.0

A. 100 ml of (M/10) HCl + 100 ml of (M/10) NaOH

B. 55 ml of (M/10) HCl + 45ml of (M/10) NaOH

C. 10 ml of (M/10) HCl + 90 ml of (M/10) NaOH

D. 75 ml of (M/5) HCl + 25 ml of (M/15) NaOH

Answer: D

Watch Video Solution

22. The cyanide ion CN and N_2 are isoelectronic, but in contrast to CN^{-}, N_2 is chemically inert, because of

A. Low bond energy

B. Absence of bond polarity

C. Unsymmetrical electron distribution

D. Presence of more number of electrons in bonding orbitals

Answer: B

Watch Video Solution

23. The dissoctiation of water of $25^{\circ}C$ is $1.9 \times 10^{-7}\%$ and the density of water is $1g/cm^3$ the ionisation constant of water is

A. 1.0×10^{-14}

B. 2.0×10^{-16}

C. 1.0×10^{-16}

D. 1.0×10^{-8}

Answer: B

Watch Video Solution

24. Which one of the following salt is most acidic in water?

A. $NiCl_2$

B. $BeCl_2$

C. $FeCl_3$

D. $AlCl_3$

Answer: D

Watch Video Solution

25. Which of the following solutions has $pH = 12$?

A. 0.01 M KOH

B. 1 N KOH ml

C. 1 NaOH ml

D. 1 N $Ca(OH)_2 ml$

Answer: A

Watch Video Solution

26. In a solution of acetic acid, sodium acetate is added, then its pH value

A. Decreases

B. Increases

C. Remains unchanged

D. (a) and (b) both are correct

Answer: B

View Text Solution

27. The following acids have been arranged in the order of decreasing acid strength. Identify the correct order

ClOH(I), BrOH (II), IOH (III)

A. $I > II > III$

B. $II > I > III$

C. $III > II > I$

D. $I > III > II$

Answer: A

View Text Solution

28. If pK_b for fluoride ion at $25^\circ C$ is 10.83, the ionisation constant of hydrofluoric acid in water at this temperature is

A. 1.74×10^{-5}

B. 3.52×10^{-3}

C. 6.75×10^{-4}

D. 5.38×10^{-2}

Answer: C

Watch Video Solution

29. the solubility of A_2B_3 is y mol dm^{-3}. Its solubility product is

A. $6y^4$

B. $64y^4$

C. $36y^5$

D. $108y^5$

Answer: D

Watch Video Solution

30. Read the following statement and explanation and answer as per the options given below:

Assertion : HNO_3 is a stronger acid than HNO_2

Reason : In HNO_3 there are two nitrogen-to-oxygen bonds whereas in HNO_2 there is only one.

A. If both assertion and reason are correct, and reason is the correct explanation of the assertion

B. If both assertion and reason are correct, but reason is not the correct explanation of the assertion.

C. If assertion is correct but reason is false.

D. If assertion is incorrect but reason is correct.

Answer: C

View Text Solution

31. If the K_a value in the hydrolysis reaction, $B^{+} + H_2O \rightarrow BOH + H^{+}$ is 1.0×10^{-6},then the hydrolysis constant of the salt would be :

A. 1.0×10^{-6}

B. 1.0×10^{-7}

C. 1.0×10^{-8}

D. 1.0×10^{-9}

Answer: C

Watch Video Solution

32. The pH of 0.1 M solution of the following salts increases in the order

A. $NaCl > NH_4Cl < NaCN < HCl$

B. $HCl < NH_4Cl < NaCl < NaCN$

C. $NaCN < NH_4Cl < NaCl < HCl$

D. $HCl < NaCl < NaCN < NH_4Cl$

Answer: B

Watch Video Solution

33. The solubility product of $Mg(OH)_2$ is 1.2×10^{-11}. The solubility of this compound in gram per $100 cm^3$ of solution is

A. 1.4×10^{-4}

B. 8.16×10^{-4}

C. 0.816

D. 1.4

Answer: B

View Text Solution

34. Which of the following is the strongest base

A. $C_2H_5^-$

B. $C_2H_5COO^-$

C. $C_2H_5O^-$

D. OH^-

Answer: A

View Text Solution

35. The set with correct order of acidity is :

A. $HClO < HClO_2 < HClO_3 < HClO_4$

B. $HClO_4 < HClO_3 < HClO_2 < HClO$

C. $HClO < HClO_4 < HClO_3 < HClO_2$

D. $HClO_4 < HClO_2 < HClO_3 < HClO$

Answer: A

Watch Video Solution

36. For a sparingly soluble salt A_pB_q, the relationship of its solubility product (L_s) with its solubility (S) is

A. $L_S = S^{p+q}.\, p^p.\, q^q$

B. $L_S = S^{p+q}.\, p^q.\, q^p$

C. $L_S = S^{pq}.\, p^p.\, q^q$

D. $L_s = S^{pq}.\, (pq)^{p+q}$

Answer: A

Watch Video Solution

37. The correct order of acidic strength is

A. $CaO < CuO < H_2O < CO_2$

B. $H_2O < CuO < CaO < CO_2$

C. $CaO < H_2O < CuO < CO_2$

D. $H_2O < CO_2 < CaO < CuO$

Answer: A

View Text Solution

38. H_3BO_3 is :

A. Monobasic and weak Lewis acid

B. Monobasic and weak Bronsted acid

C. Monobasic and strong Lewis

D. Tribasic and weak Bronsted acid

Answer: A

Watch Video Solution

39. A solution which is $10^{-3}M$ each in Mn^{2+}, Fe^{2+}, Zn^{2+}, and Hg^{2+} it treated with $10^{-16}M$ sulphide ion. If the K_{sp} of $MnS, FeS, ZnS$and HgS are $10^{-15}, 10^{-23}, 10^{-20}$,and 10^{-54}, respectively, which one will precipitate first?

A. FeS

B. MgS

C. HgS

D. ZnS

Answer: C

Watch Video Solution

40. A weak acid HX has the dissociation constant $1 \times 10^{-5}M$. It forms a salt NaX on reaction with alkali. The percentage hydrolysis of $0.1M$ solution of NaX is

A. 1.0E-6

B. 0.0001

C. 0.01

D. 0.0015

Answer: c

Watch Video Solution

41. A $0.004M$ solution of Na_2SO_4 is isotonic with 0.010 M solution of glucose at same temperature . The apparent percentage dissociation of $NaSO_4$ is :

A. 0.25

B. 0.5

C. 75

D. 0.85

Answer: C

Watch Video Solution

42. 0.1 mole of $CH_3CH\left(K_b = 5 \times 10^{-4}\right)$ is mixed with 0.08 mole of HCl and diluted to one litre. What will be the H^+ concentration in the solution

A. $8 \times 10^{-2} M$

B. $8 \times 10^{-11} M$

C. $1.6 \times 10^{-11} M$

D. $8 \times 10^{-5} M$

Answer: B

Watch Video Solution

43. The species present in solution when CO_2 is dissolved in water

A. $CO_2, H_2CO_3, HCO_3^-, CO_3^{2-}$

B. H_2CO_3, CO_3^{2-}

C. CO_3^{2-}, HCO_3

D. CO_2, H_2CO_3

Answer: A

Watch Video Solution

44. Solubility product constant (K_{sp}) of salts of types MX, MX_2 and M_3X at temperature 'T' are $4.0 \times 10^{-8}, 3.2 \times 10^{-14}$ and 2.7×10^{-15}, respectively. Solubilities $\left(\text{mol. Dm}^{-3}\right.$ of the salts at temperature 'T' are in the order

A. $MX_1 > MX_2 > M_3X$

B. $M_3X > MX_2 > MX_1$

C. $MX_2 > M_3X > MX_1$

D. $MX_1 > M_3X > MX_2$

Answer: D

Watch Video Solution

Watch Video Solution

45. 2.5 ml of $\frac{2}{5}M$ weak monoacidic base ($K_b = 1 \times 10^{-12}$ at $25^\circ C$) is titrated with $\frac{2}{15}$ M HCl in water at $25^\circ C$. The concentration of h^+ at equivalence point is ($K_w = 1 \times 10^{-14}$ at $25^\circ C$)

A. $3.7 \times 10^{-13} M$

B. $3.2 \times 10^{-7} M$

C. $3.2 \times 10^{-2} M$

D. $2.7 \times 10^{-2} M$

Answer: C

View Text Solution

46. Passing H_2S gas into a mixture of Mn^{2+}, Ni^{2+}, Cu^{2+} and Hg^{2+} ions in an acidified aqueous solution precipitates

A. CuS and HgS

B. MnS and CuS

C. MnS and NiS

D. NiS and HgS

Answer: A

Watch Video Solution

47. How many litres of water must be added to $1L$ of an aqueous solution of HCl with a pH of 1 to create an aqueous solution with pH of 2?

A. 0.1 L

B. 0.9 L

C. $2.0L$

D. $9.0L$

Answer: D

Watch Video Solution

48. pK_a of a weak acid (HA) and pB_b of a weak base (BOH) are 3.2 and 3.4 respectively. The pH of their salt (AB) solution is

A. 6.9

B. 7.0

C. 1.0

D. 7.2

Answer: A

Watch Video Solution

JS Jee Section (More than one choice correct answer)

1. Which of the following will show common ion effect and form a buffer solution?

A. CH_3COONH_4 and CH_3COOH

B. $NH_4Cl + NH_4OH$

C. $H_2SO_4 + Na_2SO_4$

D. $NaCl + NaOH$

Answer: A::B

Watch Video Solution

2. The decreasing order of strength of the bases, $OH^-, NH_2^-, H-C\equiv C^-$ and $CH_3-CH_2^-$:

A. $CH_3-CH_2^- > NH_2^- > H-C^- > OH^-$

B. $H-C\equiv C^- > CH_3-CH_2^- > NH_2^- > OH^-$

C. $OH^- > NH_2^- > H-C\equiv C^- > CH_3-CH_3^-$

D. $NH_2^- > H-C\equiv C^- > OH^- > CH_3-CH_2^-$

Answer: A

Watch Video Solution

3. Which of the following statement(s) is (are) correct?

A. The pH of $1.0\times10^{-8}M$ solution of HCl is 8

B. The conjugate base of $H_2PO_4^-$ is HPO_4^{2-}

C. Autoprotolysis constant of water increases with temperature

D. When a solution of a weak monoprotic acid is titrated against a strong base, at half-neutralisation point $pH = (1/2)pK_a$

Answer: B::C

Watch Video Solution

4. Assuming complete dissociation, which of the following aqueous solutions will have the same pH value

A. 100 ml of 0.01 M HCl

B. 100 ml of 0.01 M H_2SO_4

C. 50 ml of 0.01 M HCl

D. Mixture of 50 ml of 0.02 M H_2SO_4 and 50 ml of 0.02 M NaOH

Answer: A::D

View Text Solution

5. A buffer solution can be prepared from a mixture of

A. Sodium acetate and acetic acid in water

B. Sodium acetate and hydrochloric acid in water

C. Ammonia and ammonium chloride in water

D. Ammonium and sodium hydroxide in water

Answer: A::C

Watch Video Solution

6. Which of the following can not function as a buffer solution under any condition ?

A. NaCl and NaOH

B. NaOH and NH_4OH

C. CH_3COONH_4 and HCl

D. Borax and boric acid

Answer: A::B::C

Watch Video Solution

7. Aqueous solutions of HNO_3, KOH, CH_3COOH,and CH_3COONa of identical concentrations are provided. The pair

(s) of solution which form a buffer upon mixing is// are

A. HNO_3 and CH_3COOH

B. KOH and CH_3COONa

C. HNO_3 and CH_3COONa

D. CH_3COOH and CH_3COONa

Answer: C::D

Watch Video Solution

8. The equilibrium: $2Cu^1 \Leftrightarrow Cu^0 + Cu^u$ in aqueous medium at $25^\circ C$ shifts towards the left in the presence of

A. NO_3

B. Cl^-

C. SCN^-

D. CN^{-}

Answer: B::C::D

Watch Video Solution

9. The initial rate of hydrolysis of methyl acetate (1M) by a weak acid $(HA, 1M)$ is $1/100th$ of that of a strong acid $(HX, 1M)$, at $25^{\circ}C$. The $K_a(HA)$ is

A. 1×10^{-4}

B. 1×10^{-5}

C. 1×10^{-6}

D. 1×10^{-3}

Answer: A

Watch Video Solution

10. The K_{sp} of Ag_2CrO_4 is 1.1×10^{-12} at $298K$. The solubility (in mol/L) of Ag_2CrO_4 in a $0.1 M AgNO_3$ solution is

A. 1.1×10^{-11}

B. 1.1×10^{-10}

C. 1.1×10^{-12}

D. 1.1×10^{-9}

Answer: B

Watch Video Solution

11. Choose the correct statement

A. pH of acidic buffer solutions decrease if more salt is added

B. pH of acidic buffer solution increases is more salt is added

C. pH of basic buffer decreases if more salt is added

D. pH of basic buffer increases if more salt is added.

Answer: B::C

View Text Solution

12. K_w of H_2O at 373 K is 1×10^{-12} Identify which of the following is/are correct?

A. pK_w of H_2O is 12

B. pH of H_2O is 6

C. H_2O is neutral

D. H_2O is acidic

Answer: A::B::C

Watch Video Solution

13. For two different acids with same concentration:

A. The relative strength is expressed as $\frac{\alpha_1}{\alpha_2}$

B. Relative strength is expressed as $\frac{K_{a_1}}{K_{a_2}}$

C. Relative strength is expressed as $\sqrt{\frac{K_{a_1}}{K_{a_2}}}$

D. $\frac{pH_1}{pH_2}$

Answer: A::C

Watch Video Solution

14. Which of the following statement (s) is/are correct

A. pOH of an acidic buffer decreases if less salt is added

B. pOH of a basic buffer decreases if less salt is added

C. At the saturation point the ionic product is equal to solubility product

D. The term solubility product is only for sparingly soluble salt

Answer: A::B::C

View Text Solution

15. The percentage ionization of a weak base is given by

A. $\left(\sqrt{\frac{K_a}{c}}\right) \times 100$

B. $\left(\frac{1}{1 + 10^{pK_b - pOH}}\right) \times 100$

C. $\left(\sqrt{\frac{K_b}{c}}\right) \times 100$

D. $\left(\sqrt{\frac{K_w}{c \times K_a \text{of conjugate acid}}}\right)100$

Answer: C::D

View Text Solution

16. Which of the following solution (s) is/are correct

A. In contains weak acid and its conjugate base

B. In contains weak base and its conjugate acid.

C. It shows change in pH on adding small amount of acid or base

D. All of these

Answer: A::B

View Text Solution

17. There is a salt of weak acid and weak base the K_a of the acid is greater than the K_b of the base hence

A. Degree of hydrolysis is independent of the concentration of the salt solution

B. Anionic hydrolysis will be greater than cationic hydrolysis

C. Cationic hydrolysis is greater than anionic hydrolysis

D. $h = \sqrt{\frac{K_w}{K_a K_b}}$

Answer: A::C::D

View Text Solution

JS Jee Section (Reasoning type question)

1. Statement 1 : H_2SO_4, HCl and HNO_3 are all equally strong in water but not equally strong in acetic acid.

Statement 2 : H_2O gives H^+ as well as OH^- ions, but CH_3COOH gives only H^+ and no OH^- ions.

A. Statement 1 is true, statement 2 is true , statement 2 is correct explanation for statement 1

B. Statement 1 is true, statement 2 is true , statement 2 is not a correct explanation for statement 1

C. Statement 1 is true, statement 2 is false

D. Statement 1 is false, statement 2 is true

Answer: B

View Text Solution

2. Statement: A micture of the solution of a weak acid and its conjugates base acts as a good buffer.

Explanation: The ratio of the conjugates base acid in the mixture does not change substantially when small amount of acids or alkalines are added to the buffer.

A. Statement 1 is true, statement 2 is true , statement 2 is correct explanation for statement 2

B. Statement 1 is true, statement 2 is true , statement 2 is not a correct explanation for statement 2

C. Statement 1 is true, statement 2 is false

D. Statement 1 is false, statement 2 is true

Answer: B

Watch Video Solution

3. Assertion (A): pK_a of a weak acid become equal of the pH of the solution at the mid-point of titration.

Reason (R) : The molar concentration of the proton donor an proton acceptor beomes equal at the mid-point.

A. Statement 1 is true, statement 2 is true , statement 2 is correct explanation for statement 3

B. Statement 1 is true, statement 2 is true , statement 2 is not a correct explanation for statement 3

C. Statement 1 is true, statement 2 is false

D. Statement 1 is false, statement 2 is true

Answer: A

Watch Video Solution

JS Jee Section (Comprehension Type Questions)

1. The Ph of basic buffer mixtures is given by : $Ph = Pk_a +$ log $\frac{[\text{Base}]}{[\text{Salt}]}$ whereas Ph of acidic buffer mixtures is given by : Ph = $pK_a + \log \frac{[\text{Salt}]}{[\text{Acid}]}$. Addition of little acid or base although shows no appreciable change in Ph for all practical purposes, but sicne the ratio $\frac{[\text{Base}]}{[\text{Salt}]}$ or $\frac{[\text{Salt}]}{[\text{Acid}]}$ changes, a slight decrease or increase in pH results.

The ratio of pH of solution (I) containing 1 mole to pH of solution (II) containing 1 mole of CH_3COONa and 1 mole of acetic in one litre is :

A. $1:2$

B. $2:1$

C. $1:3$

D. $3:1$

Answer: A

Watch Video Solution

2. The pH of basic buffer mixtures is given by : $pH = pK_a + \log\left(\frac{[\text{Base}]}{[\text{Salt}]}\right)$, whereas pH of acidic buffer mixtures is given by: $pH = pK_a + \log\left(\frac{[\text{Salt}]}{[\text{Acid}]}\right)$. Addition of little acid or base although shows no appreciable change for all practical purpose, but since the ratio $\frac{[\text{Base}]}{[\text{Salt}]}$ or $\frac{[\text{Salt}]}{[\text{Acid}]}$ change, a slight decrease or increase in pH results in.

The volume of $0.2 M NaOH$ needed to prepare a buffer of $pH 4.74$ with 50 mL of $0.2M$ acetic acid is: $(pK_a of CH_3COO^- = 9.26)$

A. 50 mL

B. 25 mL

C. 20 mL

D. 10 mL

Answer: B

Watch Video Solution

3. The pH of basic buffer mixtures is given by : $pH = pK_a + \log\left(\frac{[\text{Base}]}{[\text{Salt}]}\right)$, whereas pH of acidic buffer mixtures is given by: $pH = pK_a + \log\left(\frac{[\text{Salt}]}{[\text{Acid}]}\right)$. Addition of little acid or base although shows no appreciable change for all practical purpose, but since the ratio $\frac{[\text{Base}]}{[\text{Salt}]}$ or $\frac{[\text{Salt}]}{[\text{Acid}]}$ change, a slight decrease or increase in pH results in.

The amount of $(NH_4)_2SO_4$ to be added to 500 mL of $0.01 M NH_4OH$ solution $(pK_a f \text{ or } NH_4^+ is 9.26)$ prepare a buffer of $pH 8.26$ is:

A. 0.05 mole

B. 0.025 mole

C. 0.10 mole

D. 0.005 mole

Answer: B

Watch Video Solution

4. The pH of basic buffer mixtures is given by : $pH = pK_a + \log\left(\frac{[\text{Base}]}{[\text{Salt}]}\right)$, whereas pH of acidic buffer mixtures is given by: $pH = pK_a + \log\left(\frac{[\text{Salt}]}{[\text{Acid}]}\right)$. Addition of little acid or base although shows no appreciable change for all practical purpose, but since the ratio $\frac{[\text{Base}]}{[\text{Salt}]}$ or $\frac{[\text{Salt}]}{[\text{Acid}]}$ change, a slight decrease or increase in pH results in.

A solution containing 0.2 mole of dichloroacetic acid

$\left(K_a = 5 \times 10^{-2}\right)$ and 0.1 mole sodium dichloroacetate in one litre solution has $\left[H^{+}\right]$:

A. 0.05 M

B. 0.025 M

C. 0.10 M

D. 0.005 M

Answer: A

Watch Video Solution

JS Jee Section (Integer type questions)

1. The dissociation constant of a substituted benzoic acid at $25^{\circ} C$ is 1.0×10^{-4}. The pH of $0.01M$ solution of its sodium salt is

Watch Video Solution

2. Amongst the following, the total number of compounds whose aqueous solution turns red litmus paper blue is:

KCN	K_2SO_4	$(NH_4)_2C_2O_4$	$NaCI$
$ZN(NO_3)_2$	$FeCI_3$	K_2CO_3	NH_4NO_3
$LiCN$			

Watch Video Solution

3. The total number of diprotic acids among the following is

$H_3PO_4, H_2SO_4, H_3PO_3$

$H_2CO_3, H_2S_2O_7, H_3BO_3$

$H_3PO_2, H_2CrO_4, H_2SO_3$

Watch Video Solution

4. In 1L saturated solution of $AgCI\left[K_{sp}(AgCI) = 1.6 \times 10^{-10}\right], 0.1mol$ of $CuCI\left[K_{sp}(CuCI) = 1.0 \times 10^{-6}\right]$ is added. The resultant concentration of Ag^{+} in the solution is 1.6×10^{-x}. The value of "x" is.

Watch Video Solution

5. K_a for butyric acid is 2.0×10^{-5}. Calculate pH and hydroxyl ion concentration in $0.2M$ aqueous solution of sodium butyate.

Watch Video Solution

6. $0.16gN_2H_4$ is dissoolved in H_2O and total volume is made upto $500mL$. Calculate the percentage of N_2H_4 that has reacted with H_2O in this solution. K_b for $N_2H_4 = 4.0 \times 10^{-6}M$.

Watch Video Solution

7. A certain buffer solution contains equal concentration of X^- and HX. The K_b for X^- is 10^{-10}. The pH of the buffer is:

Watch Video Solution

8. Calculate the per cent error in the hydronium-ion concentration made by neglecting the ionisation of water in a 1×10^{-6} M NaOH solution.

Watch Video Solution

JS Jee Section (Matrix Match Type Questions)

1. When a salt reacts with water to form acidic or basic solution , the process is called hydrolysis . The pH of salt solution can be calculated using the following relations :

$pH = \frac{1}{2}[pK_w + pK_a + \log c]$ (for salt of weak acid and strong base .)

$pH = \frac{1}{2}[pK_w - pK_b - \log c]$ (for salt of weak base and strong acid) .

$pH = \frac{1}{2}[pK_w + pK_a - pK_b]$ (for weak acid and weak base).

where 'c' represents the concentration of salt .

When a weak acid or a weak base not completely neutralized by strong base or strong acid

respectively , then formation of buffer takes place . The pH of buffer solution can be calculated using the following relation :

$$pH = pK_a + \log.\ \frac{[\text{Salt}]}{[\text{Acid}]},\ pOH = pK_b + \log.\ \frac{[\text{Salt}]}{[\text{Base}]}$$

Answer the following questions using the following data :

$$pK_a = 4.7447, pK_b = 4.7447, pK_w = 14$$

When 100 mL of 0.1 M NH_4OH is added to 50 mL of $0.1M$ HCl solution , the pH is

Watch Video Solution

JS Jee Section (JEE Advanced (Numeric answer type question))

1. The solubility of a salt of weak acid (AB) at pH 3 is $Y \times 10^{-3} \text{ mol } L^{-1}$. The value of Y is ____. (Given that the value of solubility product of AB $(K_{sp}) = 2 \times 10^{-10}$ and the value of ionization constant of HB $(K_a) = 1 \times 10^{-8}$)

Watch Video Solution