CHEMISTRY

BOOKS - NEET PREVIOUS YEAR (YEARWISE + CHAPTERWISE)

IONIC EQUILIBRIUM

Others

1. Concentration of the Ag^{+} ions in a saturated solution of $Ag_2CO_2O_4$ is $2.2 \times 10^{-4} molL^{-1}$

Solubility product of $Ag_2C_2O_4$ is:

A. 2.42×10^{-8}

B. 2.66×10^{-12}

C. 4.5×10^{-11}

D. 5.3×10^{-12}

Answer: D

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2. 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 reaerged to MY and NY_3 ?

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

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

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

D. The molar solubilities of MU and NY_3 in water are identical.

Answer: A

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

A. $0.0060\ \%$

B. $0.013\ \%$

C. $0.77\ \%$

D. 1.6%

Answer: B

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4. The solubility product of $AgCl$ is 1.8×10^{-10} at $18^{\circ} C$. The solubility of $AgCl$ in $0.1M$ solution of sodium chloride would be

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

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

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

D. zero

Answer: B

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5. Which of the of the following fluoro - compouds is most likely to beahve as a Lewis base?

A. BF_3

B. PF_3

C. CF_4

D. SiF_4

Answer: D

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6. The K_{sp} of $Ag_2CrO_4, AgCl, AgBr$ and AgI are respectively, $1.1 \times 10^{-12}, 1.8 \times 10^{-10}, 5.0 \times 10^{-13}, 8.3 \times 10^{-17}$. 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. AgI

B. AgCl

C. AgBr

D. Ag_2CrO_4

Answer: D

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7. 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. 2.0

C. 7.0

D. 1.04

Answer: A

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8. 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

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

A. KCl

B. NaCl

C. Na_2CO_3

D. $CuSO_4$

Answer: C

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10. Which is the strongest acid in the following ?

A. H_2SO_4

B. $HClO_3$

C. $HClO_4$

D. H_2SO_3

Answer: C

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11. Which of these is least likely to act as Lewis base?

A. CO

B. F^-

C. BF_3

D. PF_3

Answer: C

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12. Which of the following is electron deficient ?

A. $(CH_3)_2$

B. $(SiH_3)_2$

C. $(BH_3)_2$

D. PH_3

Answer: C

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13. 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

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14. Equimolar solutions of the following substances were prepared separately. Which one of these will record the highest pH value?

A. $BaCl_2$

B. $AlCl_3$

C. LiCl

D. $BeCl_2$

Answer: A

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15. Buffer solutions have constant acidity and alkalinity because

A. these given unionised 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

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16. 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. 9.43

B. 11.72

C. 8.73

D. 9.08

Answer: A

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

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

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

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

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

Answer: D

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18. What is $[H^+]$ in mol/L of a solution that is $0.20M$ in CH_3COONa and $0.1M$ in CH_3COOH? K_a for CH_3COOH is 1.8×10^{-5}?

A. 3.5×10^{-4}

B. 1.1×10^{-5}

C. 1.8×10^{-5}

D. 9.0×10^{-6}

Answer: D

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19. In a buffer solution containing equal concentration of B^{-} and HB, the K_b for B^{-} is 10^{-10}. The pH of buffer solution is

A. 10

B. 7

C. 6

D. 4

Answer: D

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20. What is the $[OH^{-}]$ in the final solution prepared by mixing $20.0 mL$ of $0.050 M HCl$ with $30.0 mL$ of $0.10 M Ba(OH)_2$?

A. $0.10 M$

B. $0.40 M$

C. $0.0050M$

D. $0.12M$

Answer: A

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21. 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

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22. 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

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23. The values of K_{p_1} and K_{p_2} for the reactions

$X \Leftrightarrow Y + Z$ ....(i)

and $A \Leftrightarrow 2B$ ...(ii)

are in ratio of 9 : 1. If degree of dissociation of X and A be equal, then total presure at equilibrium (i) and (ii) are in the ratio.

A. $3:1$

B. $1:9$

C. $36:1$

D. $1:1$

Answer: C

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24. The dissociation equilibrium of a gas AB, can be represented as The degree of dissociation is x and is small compared to 1. The expression relating the degree of dissociation (x) with equilibrium constant K„ and total pressure p is

A. $(2K_p / p)$

B. $(2K_p / p)^{1/3}$

C. $(2K_p / p)^{1/2}$

D. (K_p / p)

Answer: B

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25. 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. $1.11 \times 10^{-4} M$

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

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

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

Answer: B

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26. 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

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

A. 7.00

B. 4.00

C. 9.00

D. 1.00

Answer: B

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

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

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

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

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

Answer: B

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29. Which of the following constitutes a buffer ?

A. HNO_2 and $NaNO_2$

B. NaOH and NaCl

C. HNO_3 and NH_4NO_3

D. HCl and KCl

Answer: A

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30. H_2S gas when passed through a solution of cations containing HCl precipitates the cations of second group in qualitative analysis but not those belonging to the fourth group. It is because

A. presence of HCl decreases the sulphide ion concentration

B. presence of HCl increases the sulphide ion concentration

C. solubility product of group II sulphides is more than that of group IV sulphides

D. sulphides of group IV cations are unstable in HCl

Answer: A

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31. 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. $pH_1 > pH_2 \approx pH_3 > pH_4$

B. $pH_1 < pH_2 < pH_3 < pH_4$

C. $pH_1 < pH_2 < pH_3 \approx pH_4$

D. $pH_1 > pH_2 > pH_3 > pH_4$

Answer: D

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32. 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

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33. The rapid change of pH near the stoichiometric point of an acid-base titration is the basic of indicator detection. pH of the solution is related to the ratio of the concentration of conjugate acid $(H \in)$ and base (In^{-}) forms of the indicator by the expression

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

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

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

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

Answer: D

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

A. 5.6×10^{-6}

B. 3.1×10^{-4}

C. 2×10^{-4}

D. 4×10^{-4}

Answer: C

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35. 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^{-10}

B. 1.0×10^{-8}

C. 1.0×10^{-16}

D. 1.0×10^{12}

Answer: D

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36. Solution of $0.1 N NH_4OH$ and $0.1 N NH_4Cl$ has $pH 9.25$, then find out K_b of NH_4OH.

A. 9.25

B. 4.75

C. 3.75

D. 8.25

Answer: B

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37. Which has the highest pH?

A. $CH_3CO^-OK^+$

B. Na_2CO_3

C. NH_4Cl

D. $NaNO_3$

Answer: B

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

A. 5×10^{-12}

B. 25×10^{-10}

C. 1×10^{-13}

D. 5×10^{-13}

Answer: D

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39. Solubility if M_2S type salt is 3.5×10^{-6}, then find out its solubility product

A. 1.7×10^{-6}

B. 1.7×10^{-16}

C. 1.7×10^{-18}

D. 1.7×10^{-12}

Answer: B

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40. Ionisation constant of CH_3COOH is 1.7×10^{-5} and concentration of $H^+ ions$ is 3.4×10^{-4}. Then, find out initial concentration of CH_3COOH molecules.

A. 3.4×10^{-4}

B. 3.4×10^{-3}

C. 6.8×10^{-4}

D. 6.8×10^{-3}

Answer: D

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41. Which one of the following is true for any diprotic acid, H_2X?

A. $K_{a_2} = K_{a_1}$

B. $K_{a_2} > K_{a_1}$

C. $K_{a_2} < K_{a_1}$

D. $K_{a_2} = \frac{1}{K_{a_1}}$

Answer: C

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42. Which of the following statements about pH and H^+ ion concentration is incorrect ?

A. Addition of one drop of concentrated HCl in NH_4OH solution decreases pH of the solution

B. A solution of the mixture of one equivalent of each of CH_3COOH and NaOH has a pH of 7.

C. pH of pure neutral water is not zero

D. A cold and concentrated H_2SO_4 has lower H^+ ion concentration than a dilute solution of H_2SO_4.

Answer: B

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43. The conjugate acid of $\overset{\Theta}{N}H_2$ is

A. N_2H_4

B. NH_4^+

C. NH_2OH

D. NH_3

Answer: D

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44. The solubility of a saturated solution of calcium fluoride is 2×10^{-4} mol/L. Its solubility product is

A. 12×10^{-2}

B. 14×10^{-4}

C. 22×10^{-11}

D. 32×10^{-12}

Answer: D

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45. The strongest conjugate base is

A. NO_3^-

B. Cl^-

C. SO_4^{2-}

D. CH_3COO^-

Answer: D

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

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

B. $1 \times 10^{-3} M$ and $3 \times 10^{-11} M$

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

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

Answer: C

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47. 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

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

A. CdS gt HgS gt CuS

B. HgS gt CdS gt CuS

C. CdS gt CuS gt HgS

D. CuS gt CdS gt HgS

Answer: D

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49. The hydride ion H^{-} is a stronger base than its hydroxide ion OH^{-}. Which of the following reactions will occurs if sodium hydride (NaH) is dissolved in water ?

A. $2H^{-}(aq) + H_2O(l) \rightarrow H_2O + H_2 + 2e^{-}$

B. $H^{-}(aq) + H_2O(l) \rightarrow OH^{-} + H_2$

C. $H^{-} + H_2O(l) \rightarrow$ No reaction

D. None of the above

Answer: B

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50. The pH value of blood does not change appreciably by a small addition of an acid or base, because the blood

A. is a body fluid

B. can be easily coagulated

C. contains iron as a part of the molecule

D. contains serum protein that acts as buffer

Answer: D

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51. The pH value of a 10 M solution of HCl is

A. less than 0

B. equal to 0

C. equal to 1

D. equal to 2

Answer: A

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52. Which of the following is most soluble?

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

B. $MnS(K_{sp} = 7x10^{-16})$

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

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

Answer: B

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53. In which of the following the solubility of AgCl will be minimum ?

A. $0.1MNaNO_3$

B. Water

C. $0.1 M NaCl$

D. $0.1 M NaBr$

Answer: C

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54. $0.1 M$ solution of which of the substances will behave basic?

A. Sodium borate

B. Cacium nitrate

C. NH_4Cl

D. Sodium sulphate

Answer: A

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55. Aqueous solution of acetic acid contains

A. CH_3COO^- and H^+

B. CH_3COO^-, H_3O^+

C. CH_3COO^-, H_3O^+ and H^+

D. CH_3COOH, CH_3COO^- and H^+

Answer: d

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

A. NaCl

B. $NaHCO_3$

C. Na_2CO_3

D. NH_4Cl

Answer: C

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