CHEMISTRY

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Textbook Questions Answers Choose The Correct Answer

1. Concentration of the Ag^+ ions in a saturated solution of $Ag_2C_2O_4$ is $2.24 \times 10^{-4} mol L^{-1}$ solubility product of $Ag_2C_2O_4$ is :

A. $2.42 \times 10^{-8} mol^3 L^{-3}$
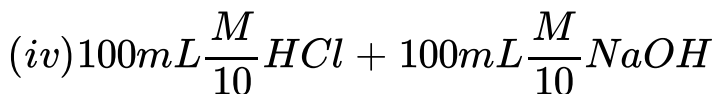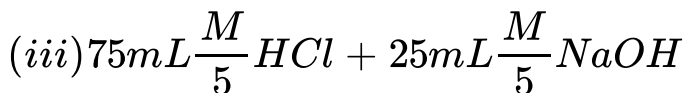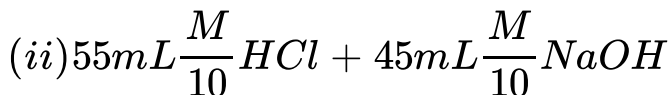
B. $2.66 \times 10^{-12} mol^3 L^{-3}$

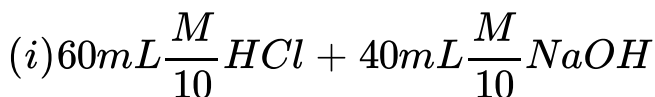C. $4.5 \times 10^{-11} mol^3 L^{-3}$

D. $5.619 \times 10^{-12} mol^3 L^{-3}$

Answer: D

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2. Following solutions were prepared by mixing different volumes of $NaOH$ of HCl different concentrations.

$(i) 60mL \dfrac{M}{10} HCl + 40mL \dfrac{M}{10} NaOH$

$(ii) 55mL \dfrac{M}{10} HCl + 45mL \dfrac{M}{10} NaOH$

$(iii) 75mL \dfrac{M}{5} HCl + 25mL \dfrac{M}{5} NaOH$

$(iv) 100mL \dfrac{M}{10} HCl + 100mL \dfrac{M}{10} NaOH$

pH of which one of them will be equal to 1 ?

A. (iv)

B. (i)

C. (ii)

D. (iii)

Answer: D

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3. The solubility of $BaSO_4$ in water is $2.42 \times 10^{-3} gL^{-1}$ at $298K$. The value of its solubility product (K_{sp}) will be :

(Given molar mass of $BaSO_4 = 233 gmol^{-1}$)

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

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

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

D. $1.08 \times 10^{-8} mol^2 L^{-2}$

Answer: C

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4. pH of a saturated solution of $Ca(OH)_2$ is 9. The solubility product (K_{sp}) of $Ca(OH)_2$:

A. 0.5×10^{-15}

B. 0.25×10^{-10}

C. 0.125×10^{-15}

D. 0.5×10^{-10}

Answer: A

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5. Conjugate base for bronsted acids H_2O and HF are :

A. OH^- and H_2FH^+ , respectively

B. H_2O^+ and F^- , respectively

C. OH^- and F^- , respectively

D. H_3O^+ and H_2F^+ , respectively

Answer: C

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6. Which will make basic buffer ?

A. $50mL$ of $0.1MNaOH + 25mL$ of $0.1MCH_3COOH$

B. $100mL$ of $0.1MCH_3COOH + 100mL$ of $0.1MNH_4OH$

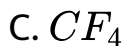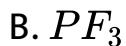C. $100mL$ of $0.1MHCl + 200mL$ of $0.1MNH_4OH$
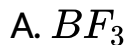
D. $100mL$ of $0.1MHCl + 100mL$ of $0.1MNaOH$

Answer: C

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7. Which of the following fluro compounds is most likely to behave as a Lewis base ?

A. BF_3

B. PF_3

C. CF_4

D. SiF_4
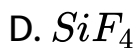
Answer: B

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8. Which oof these is not likely to act as Lewis base ?

A. BF_3

B. PF_3

C. CO

D. F^-
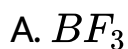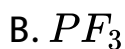
Answer: A

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9. What is the decreasing order of strength of bases ?

$OH^- > NH_2^- > H - C \equiv C^-$ and $CH_3 - CH_2^-$

A. $OH^- > NH_2^- > H - C \equiv C^-$ and

$CH_3 - CH_2^-$

B. $NH_2 > OH^- > CH_3 - CH_2^- > H - C \equiv C^-$

C. $CH_3 - CH_2^- > NH_2^- > H - C \equiv C^- > OH^-$

D.

$$OH^- > H - C \equiv C^- C^- > CH_3 - CH_2^- > NH_2^-$$
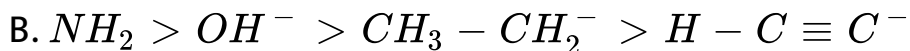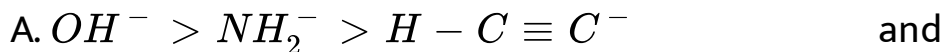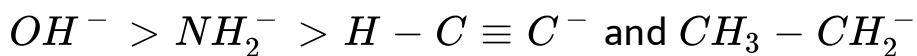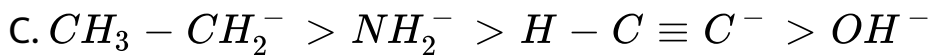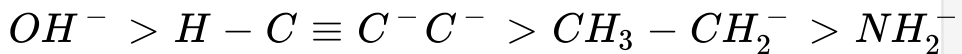
Answer: C

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10. The aqueous solutions of sodium formate, anilinium chloride and potassium cyanide are respectively :

A. acidic, acidic, basic

B. basic, acidic, basic

C. basic, neutral, basic
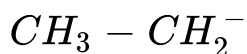
D. none of these

Answer: B

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11. The percentage of pyridine (C_5H_5N) that forms pyridinium ion (C_5H_5NH) in a$0.10M$ aqueous pyridine solution (K_b for $C_5H_5N = 1.7 \times 10^{-9}$) is

A. 0.006 %

B. 0.013 %

C. 0.77 %

D. 1.6 %

Answer: B

12. Equal volumes of three acid solutions of pH 1, 2 and 3 are mixed in a vessel. What will be the H^+ ion concentration in the mixture ?

    A. 3.7×10^{-2}

    B. 10^{-6}

    C. 0.111

    D. None of these

Answer: A

13. The solubility of $AgCl(s)$ with solubility product 1.6×10^{-11} in $0.1 M NaCl$ solution 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

14. If the solubility product of lead iodide is 3.2×10^{-8}, its solubility will be :

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

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

C. $1.6 \times 10^{-5} M$

D. $1.8 \times 10^{-5} M$

Answer: A

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15. Using Gibb's free energy change, $\Delta G^\circ = 57.34 kJmol^{-1}$, for the reaction,

$X_2Y(s) \Leftrightarrow 2X^+(aq) + Y^{2-}(aq)$, calculate the solubility product of X_2Y in water at $300K(R = 8.3JK^{-1}Mol^{-1})$:

A. 10^{-10}

B. 10^{-12}

C. 10^{-14}

D. cannot be calculated from the given data

Answer: A

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16. MY and NY_3 are insoluble salts and have the same K_{sp} values of 6.2×10^{-13} ar room temperature. Which

statement would be true with regard to MY and NY_3 ?

A. The salts MY and NY_3 are more soluble in $0.5MKY$ than in pure water

B. The addition of the salt of KY to the suspension of MY and NY_3 will have no effect on their solubility's.

C. The molar solubilities of MY and NY_3 in water are indentical.

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

Answer: D

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17. What is the pH of the resulting solution when equal volumes of $0.1MNaOH$ and $0.01MHCl$ are mixed ?

A. 2.0

B. 3

C. 7.0

D. 12.65

Answer: D

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18. The dissociation constant of a weak acid is 1×10^{-3}. In order to prepare a buffer solution with $pH = 4$, the

$\dfrac{[\text{Acid}]}{[\text{Salt}]}$ ratio should be

    A. $4:3$

    B. $3:4$

    C. $10:1$

    D. $1:10$

Answer: D

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19. The pH of $10^{-5}M\,KOH$ solution will be :

    A. 9

    B. 5

C. 19

D. None of these

Answer: A

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20. $H_2PO_4^-$ the conjugate base of :

A. PO_4^{3-}

B. P_2O_5

C. H_3PO_4

D. HPO_4^{2-}
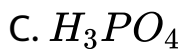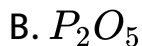
Answer: C

21. Which of the following can act as Lowery-Bronsted acid well as base?

 A. HCl

 B. SO_4^{2-}

 C. HPO_4^{2-}

 D. Br^-

Answer: C

22. The pH of an aqueous solution is Zero. The solution is :

    A. slightly acidic

    B. strongly acidic

    C. neutral

    D. basic

Answer: B

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23. The hydrogen ion concentration of a buffer solution consisting of a weak acid and its salts is given by :

A. $[H^+] = \dfrac{K_g[\text{acid}]}{[\text{salt}]}$

B. $[H^+] = K_a[\text{salt}]$

C. $[H^+] = K_a[\text{acid}]$

D. $[H^+] = \dfrac{K_g[\text{salt}]}{[\text{acid}]}$

Answer: A

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24. Which of the following relation is correct for degree of hydrolysis of ammonium acetate ?

A. $h = \sqrt{\dfrac{K_h}{C}}$

B. $h = \sqrt{\dfrac{K_a}{(K)_b}}$

C. $h = \sqrt{\dfrac{K_h}{K_a . K_b}}$

D. $h = \sqrt{\dfrac{K_a . K_b}{(K)_h}}$

Answer: C

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25. Dissociation constant of NH_4OH is 1.8×10^{-5} the hydrolysis constant of NH_4Cl would be :

A. 1.8×10^{-19}

B. 5.55×10^{-10}

C. 5.55×10^{-5}

D. 1.80×10^{-5}

Answer: B

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1. What are Lewis acids and bases ? Give two examples for

each

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2. Discuss the Lowery-Bronsted concept of acids and

bases.

3. Identifiy the conjugate acid base pair for the following reaction in aqueous solution :

$(i) HS^-(aq) + HF \Leftrightarrow F^-(aq) + H_2S(aq)$

$(ii) HPO_4^{2-} + SO_3^{2-} \Leftrightarrow PO_4^{3-} + HSO_3$

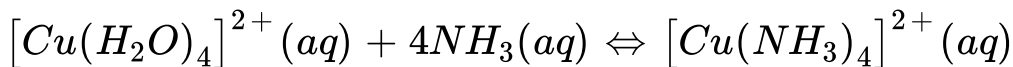$(iii) NH_4^+ + CO_3^{2-} \Leftrightarrow NH_3 + HCO_3^-$
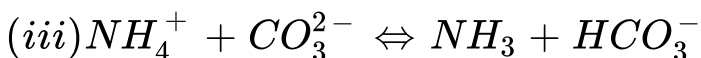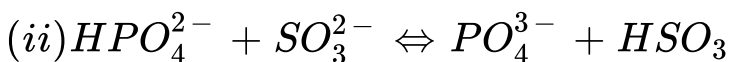
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4. Account for the acidic nature of $HCIO_4$ in terms of Bronsted-Lowry theory, identify its conjugate base.

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5. When aqueous ammonia is added to $CuSO_4$ solution, the solution turns deep blue due to the formation of tetrammine copper (II) complex ,

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

, among H_2O and NH_3 Which is stronger Lewis base.

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6. The concentration of hydroxide ion in a water sample is found to be $2.5 \times 10^{-6}M$. Identify the nature of the solution.

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7. A lab assistant prepared a solution by adding a calculated quantity of HCl gas $25°C$ to get a solution with $[H_2O^+] = 4 \times 10^{-5}M$. Is the solution with $[H_2O^+] = 4 \times 10^{-5}M$. Is the solution neutral (or) acidic (or) basic.

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8. Calculate the pH of $0.04MHNO_3$ solution.

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9. Define solubility product.

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10. Define ionic product of water. Give its value at room temperature.

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11. Explain common ion effect with an example.

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12. Derive an expression for Ostwald's dilution law.

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13. Define pH.

14. Calculate the pH of $1.5 \times 10^{-3} M$ solution of $Ba(OH)_2$.

15. $50 ml$ of $0.05 M HNO_3$ is added to $50 ml$ of $0.025 m KOH$. Calculate the pH of the resultant solution.

16. The K_a value for HCN is 10^{-9} . What is the pH of 0.4$MHCN$ solution ?

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17. Calculate the extent of hydrolysis and the pH of $0.1M$ ammonium acetate Given that $K_a = K_b = 1.8 \times 10^{-5}$.

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18. Derive an expression for the hydrolysis constant and degree of hydrolysis of salt of strong acid and weak base.

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19. Solubility product of Ag_2CrO_4 is 1×10^{-12}. What is the solubility of Ag_2CrO_4 in $0.01 M AgNO_3$ solution ?

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20. Write the expression for the solubility product of $Ca_3(PO_4)_2$. Give the relationship between the solubility and solubility product of $Ca_3(PO_4)_2$.

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21. A saturated solution, prepared by dissolving $CaF_2(s)$ in water, has $\left[Ca^{2+}\right] = 3.3 \times 10^{-4} M$. What is the K_{sp} of CaF_2 ?

22. K_{sp} of $AgCl$ is 1.8×10^{-10}. Calculate molar solubility in $1M AgNO_3$.

23. A particular saturated solution of silver chromate Ag_2CrO_4 has $\left[Ag^+\right] = 5 \times 10^{-5}$ and $[CrO4]^{2-} = 4.4 \times 10^{-4}M$. What is the value of K_{sp} for Ag_2CrO_4 ?

24. Write the expression for the solubility product of Hg_2Cl_3.

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25. K_{sp} of Ag_2CrO_4 is 1.1×10^{-12}. What is solubility of Ag_2CrO_4 in $0.1M K_2CrO_4$.

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26. Will a precipitate be formed when $0.150L$ of $0.1M Pb(NO_3)_2$ and $0.100L$ of $0.2M NaCl$ are mixed ? $K_{sp}(PbCl_2) = 1.2 \times 10^{-5}$

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27. K_{sp} of $Al(OH)_3$ is $1 \times 10^{-15} M$. At what pH does $1.0 \times 10^{-3} Mal^{3+}$ precipitate on the addition of buffer of NH_4Cl and NH_4OH solution ?

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1. What is the conjugate base of OH ?

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2. C_2H_5ONa is .....of C_2H_5OH.
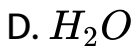
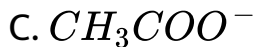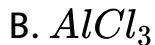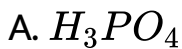   A. strong acid

    B. weak acid

    C. strong base

    D. weak base

Answer: C

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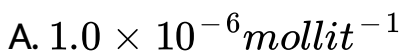**3.** Among the following, the one which can act as Bronsted acid as well as Bronsted base is :

A. H_3PO_4

B. $AlCl_3$

C. CH_3COO^-

D. H_2O

Answer: D

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4. At $25°C$, 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. $1.0 \times 10^{-6} mollit^{-1}$

B. $1.0 \times 10^{-7} mollit^{-1}$

C. $2.0 \times 10^{-6} mollit^{-1}$

D. $1.0 \times 10^{-5} mollit^{-1}$

Answer: B

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5. Which of the following is the correct statement?

A. HCO_3 is the conjugate base of CO_3^{2-}

B. NH_2 is the conjugate acid of NH_3

C. H_2SO_4 is the conjugate acid of HSO_4
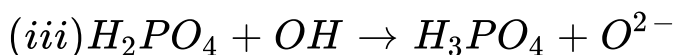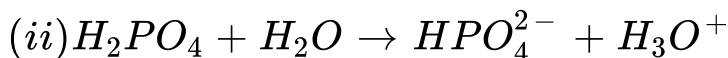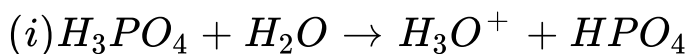
D. NH_3 is the conjugate base of NH_2

Answer: C

6. Three reactions involving H_2PO_4 are given below :

$(i) H_3PO_4 + H_2O \rightarrow H_3O^+ + HPO_4$

$(ii) H_2PO_4 + H_2O \rightarrow HPO_4^{2-} + H_3O^+$

$(iii) H_2PO_4 + OH \rightarrow H_3PO_4 + O^{2-}$

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

A. (iii) only

B. (i) only

C. (ii) only

D. (i) and (ii)

Answer: C

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7. Which one of the following will decrease the pH of $50ml$ of $0.01M$ hydrochloric acid ?

    A. Addition of $50ml$ of $0.01MHCl$

    B. Addition of $50ml$ of $0.002MHCl$

    C. Addition of $150ml$ of $0.002MHCl$

    D. Addition of $5ml$ of $1MHCl$

Answer: D

8. If pK_b for fluoride ion at $25°C$, is 10.83, the ionisation constant of hydrofluoric acid 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

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9. The pH of a solution obtained by mixing $100ml$ of a solution of $pH = 3$ with $400ml$ of a solution of $pH = 4$ is

:

A. $3 - \log 2.8$

B. $7 - \log 2.8$

C. $4 - \log 2.8$

D. $5 - \log 2.8$

Answer: C

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10. The pH of $0.1M$ aqueous solution of a weak acid, HA is 3. What is its degree of dissociation ?

A. 1%

B. 10 %

C. 50 %

D. 25 %

Answer: A

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11. The pK_a of acetic acid is 4.74. The concentration of acetic acid is $0.01M$. The pH of acetic acid

A. 3.37

B. 4.37

C. 4.74

D. 0.474

Answer: A

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12. How many times $1M CH_3COOH$ solution should be diluted so that pH of the solution is doubled ?

    A. 20 times

    B. 200 times

    C. 5.55×10^2 times

    D. 5.55×10^4 times

Answer: D

13. $40ml$ of $0.1M$ ammonia is mixed with $20ml\,0.1M\,HCl$.

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

A. 4.74

B. 2.26

C. 9.26

D. 5.00

Answer: C

14. The pH of a solution formed on mixing $20ml$ of $0.05MH_2SO_4$ with $5ml$ of $0.45MNaOH$ at $298K$ is :

A. 6

B. 2

C. 12

D. 7

Answer: C

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15. Which of the following salts will have the highest pH in water?

A. KCl

B. $NaCl$

C. Na_2CO_3

D. $CuSO_4$

Answer: C

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16. The H_3O^+ ion concentration of a solution of $pH 6.58$ is :

A. antilog (-6.58)

B. antilog (6.58)

C. antilog (-5.58)

D. antilog (5.58)

Answer: A

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17. $30CC$ of $\dfrac{M}{4}HCl$, $20CC$ of $\dfrac{M}{2}HNO_3$, and $40CC$ of $\dfrac{M}{4}NaOH$ solutions are mixed and the volume is made upto $1dm^3$. The pH of the resulting solution is :
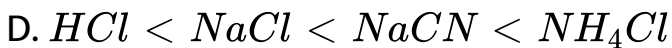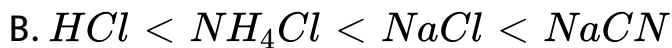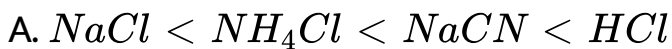
A. 2

B. 1

C. 3

D. 8

Answer: A

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18. The pH of $0.1M$ solutions 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

19. A weak acid HX has the dissociation constant 1×10^{-5}. It forms NaX on reaction with alkali. The degree of hydrolysis of $0.1M$ solution of NaX is

    A. 0.0001%

    B. 0.01%
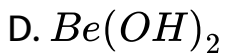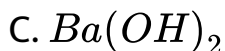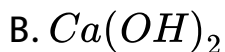
    C. 0.1%

    D. 0.15%
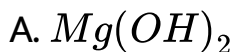
Answer: B

20. Among the following hydroxides, the one which has the lowest value of K_s (solubility product) at ordinary temperature is :

A. $Mg(OH)_2$

B. $Ca(OH)_2$
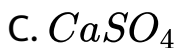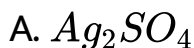
C. $Ba(OH)_2$

D. $Be(OH)_2$

Answer: D

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21. On adding $0.1M$ solution each of Ag^+, Ba^{2+}, Ca^{2+} ions in a Na_2SO_4 solution, the species first precipitated is $\left(K_s(CaSO_4) = 10^{-6}, \quad K_s(BaSO_4) = 10^{-11}, \right.$ $K_s(Ag_2SO_4) = 10^{-5}$:

A. Ag_2SO_4

B. $BaSO_4$

C. $CaSO_4$

D. All of these

Answer: B

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22. The K_s of Ag_2CrO_4, $AgCl$, $AgBr$, and AgI are respectively 1.1×10^{-12}, 1.8×10^{-6}, 5.0×10^{-13} and 8.3×10^{-17}. Which of the following salts will precipitate last of $AgNO_3$ solution containing equal moles of $NaCl$, $NaBr$, NaI and Na_2CrO_4 ?

A. $AgBr$

B. Ag_2CrO_4

C. AgI

D. $AgCl$

Answer: B

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23. The K_s of Ag_2CrO_4 is 1.1×10^{-12} at $298K$. The solubility in mol per litre of Ag_2CrO_4 in $0.1M. \, AgNO_3$ solution is

    A. 1.1×10^{-11}

    B. 1.1×10^{-10}

    C. 1.1×10^{-12}

    D. 1.1×10^{-9}

Answer: B

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24. Using Gibb's free energy change, $\Delta G^\circ = +63.3 kJ$, for the following reaction:

$Ag_2CO_3(s) \Leftrightarrow 2Ag^+(aq) + CO_3^{2-}(aq)$ the K_s for

Ag_2CO_3 in water at $25^\circ C$ is $(R = 8.314 JK^{-1}mol^{-1})$

    A. 3.2×10^{-26}

    B. 8.0×10^{-12}

    C. 2.9×10^{-3}

    D. 7.9×10^{-2}

Answer: B

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25. 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 the solution?

A. 8.73

B. 9.08

C. 9.43

D. 11.72

Answer: C

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26. What is the $[H^+]$ in mol/L of a solution that is $0.20M$ in CH_3COONa and $0.10M$ in CH_3COOH ? K_b for $CH_3COOH = 1.8 \times 10^{-5}$

A. 9.0×10^6

B. 3.5×10^{-6}

C. 1.1×10^{-5}

D. 1.8×10^{-5}

Answer: A

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27. In what volume ratio of NH_4Cl and NH_4OH solution (each $1M$) should be mixed to get a buffer solution of pH , 9.80 (pK_b for NH_4OH is 4.74):

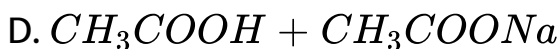   A. $1:2.5$

    B. $2.5:1$

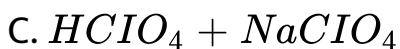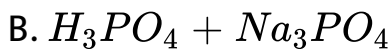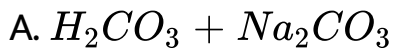   C. $1:3.5$

    D. $3.5:1$

Answer: C

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28. Which one of the following pairs of solutions is not an acidic buffer ?
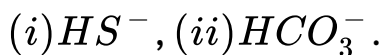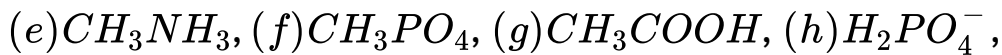
A. $H_2CO_3 + Na_2CO_3$

B. $H_3PO_4 + Na_3PO_4$
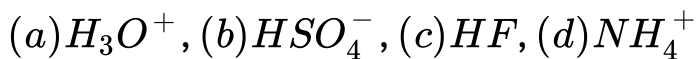
C. $HCIO_4 + NaCIO_4$

D. $CH_3COOH + CH_3COONa$

Answer: C

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Other Important Question Answer Answer The Following Questions

1. State the formula and the name of the conjugate base of each of the following acids.

$(a) H_3O^+$, $(b) HSO_4^-$, $(c) HF$, $(d) NH_4^+$

$(e) CH_3NH_3$, $(f) CH_3PO_4$, $(g) CH_3COOH$, $(h) H_2PO_4^-$,

$(i) HS^-$, $(ii) HCO_3^-$.

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2. State the formula and name of the conjugate acid of each of the following :

$(a) OH^-$, $(b) CH_3COOH$, $(c) HPO_4^{-2}$, $(d) CO_3^{-2}$,

$(e) NH_3$, $(f) CH_3NH_2$, $(g) HS^-$, $(h) CH_3COO^-$,

$(i) H_2PO_4^-$, $(ii) Cl^-$
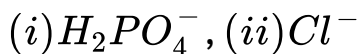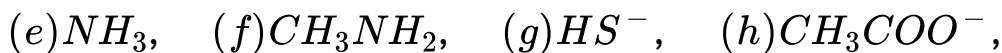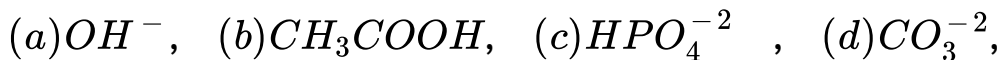
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3. Which of the following behave both as Bronsted acids as well as Brosnsted bases ?

$NH_3, HSO_4^- \cdot H_2SO_4, HCO_3^-, H_3PO_4, HS^-, H_2O.$

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4. Classify Lewis acids and bases from the following :

$H_3O^+, CH_3NH_2, BF_3, OH^-, Cu^{2+}, S^{2-}, CH_3COO^-$
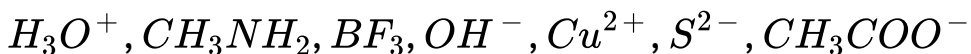
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5. Classify the following species into Lewis acids and Lewis bases and show how these act as Lewis acid/base.

$(a) OH^-, (b) F^-, (c) H^+, (d) BCl_3.$
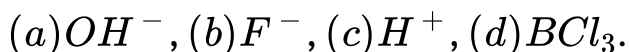
6. Explain how the $[H^+]$ concentration or $[OH^-]$ concentration, decide a solution as acidic, neutral or alkaline .

7. Calculate the hydrogen and hydroxyl ion concentration in $(i)0.01MHNO_3, (ii)0.001MKOH$ solution at $298K$.

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

$(i)0.003MHCl$, $(ii)0.005MNaOH$,

$(iii)0.002MHBr$, $(iv)0.002MKOH$

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9. Calculate the pH of the resulting mixtures $10ml$ of $0.02MCa(OH)_2 + 25ml$ of $0.1MHCl$

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10. The concentration of H^+ ions in $0.1M$ solution of a weak acid is 1.0×10^{-5} molL^(-1)`. Calculate the

dissociation constant of the acid.

11. Find whether the resulting solution is acidic, netural or

basic when

(i) a strong acid is mixed with a strong base

(ii) a strong acid is mixed with a weak base

(iii) a weak acid is mixed with a strong base

(iv) a weak acid is mixed with a weak base.

12. State Ostwald's dilution law.

13. Explain the term 'common ion effect' with an example.

14. What are buffer solution ? Give example

15. Give the characteristics of a buffer solution.

16. Give examples for acidic and basic buffers.

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17. Explain buffer action with a suitable example.

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18. Explain the terms 'buffer capacity" and 'buffer index".

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19. Derive Henderson equation for the determination of pH of an acid-buffer.

20. Write Henderson's equation for a basic buffer.

21. Suppose it is required to make a buffer solution of $pH = 4$. Using acetic acid and sodium acetate. How much of sodium acetate to be added to 1 litre of $N/10$ acetic acid ? Dissociation constant of acetic acid is 1.8×10^{-5}.

22. Calculate the pH of a buffer solution containing 0.15 moles of NH_4OH and 0.25 moles of NH_4Cl . (K_b for $NH_4OH = 1.8 \times 10^{-5}$)

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23. Calculate the pH of $0.1M$ ammonia solution . Calculate the pH after $50ml$ of this solution is treated with $25ml$ of $0.1MHCl$. The dissociation constant of ammonia, $K_b = 1.77 \times 10^{-5}$.

> ▶ View Text Solution

24. Define hydrolysis

> ▶ **View Text Solution**

25. Define the term degree of hydrolysis.

> ▶ **View Text Solution**

26. Define the term hydrolysis constant (K_b), with an example.

> ▶ **View Text Solution**

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

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

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29. Calculate the degree of hydrolysis and pH of a $0.1M$ sodium acetate solution. Hydrolysis constant of sodium

acetate is 5.6×10^{-10}.

30. Calculate the pH of an aqueous solution of $1.0M$ ammonium formate assuming complete dissociation . pK_a for formic acid is 3.8 and pK_b of ammonia $= 4.8$.

31. $A0.02M$ solution of pyridinium hydrochloride has $pH = 3.44$. Calculate the ionisation constant of pyridine.

32. Define solubility product.

33. Give expression for the solubility product of the following : $(i) BaSO_4, (ii) H_2S, (iii) Sb_2S_3, (iv) AII_3.$

34. Mention the criteria of precipitation of an electrolyte.

35. How will you decide whether a solution is saturated or unsaturated, from the ionic product values ?

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36. Obtain a relationship between solubility and solubility product of the following : $(i) AgCl$, $(ii) Ag_2CO_3$, $(iii) CaF_2$, $(iv) Cr(OH)_3$.

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37. Equal volumes of $0.002M$ solution of sodium iodate and cupric chlorate are mixed together. Will it lead to the

precipitation of copper iodate? K_s for cupric iodate $= 7.4 \times 10^{-8}$.

38. What is the minimum volume of water required to dissolve $1gm$ of calcium sulphate at $298K$. The K_s for calcium sulphate is 9.1×10^{-6}.

39. The solubility product of $BaSO_4$ is 1.5×10^{-9}. Find its solubility (i) in pure water and (ii) in $0.1MBaCl_2$ solution.

40. Calculate the pH at which $Mg(OH)_2$ begins to precipitate from a solution containing $0.10 Mg^{2+}$ ions.