NEET CHEMISTRY

Topic: Ionic Equilibrium

Q.1 Four solution of NH_4Cl are taken with concentrations 1M, 0.1 M, 0.01 M and 0.001 M. Their degree of hydrolysis are h_1, h_2, h_3 and h_4. What is the gradation of degree of hydrolysis ?

(1) $h_1 > h_2 > h_3 > h_4$ (2) $h_1 = h_2 = h_3 = h_4$

(3) $h_4 > h_3 > h_2 > h_1$ (4) None of these

Q.2 The solubility product of $BaCrO_4$ is 2.4×10^{-10} M^2. The maximum concentration of $Ba(NO_3)_2$ possible without precipitation in a 6×10^{-4} M K_2CrO_4 solution is-

(1) 4×10^{-7} M (2) 1.2×10^{10} M

(3) 6×10^{-4} M (4) 3×10^{-4} M

Q.3 Which of the following will occur if a 1.0 M solution of a weak acid is diluted to 0.01 M at constant temperature -

(1) Percentage ionization will increase

(2) $[H^+]$ will decrease to 0.01 M

(3) K_a will increase

(4) pH will decreases by 2 units

Q.4 Correct statement for HCN weak acid at 25ºC temperature -

(1) $\alpha = \frac{K_a}{[H^+]}$ (2) $\alpha = \frac{K_a \times [OH^-]}{K_w}$

(3) (1) and (2) both (4) $K_b = C\alpha^2$

Q.5 At 90ºC, pure water has $[H_3O^+] = 10^{-6.7}$ mol L^{-1} what is the value of K_W at 90ºC -

(1) 10^{-6} (2) 10^{-12}

(3) 10^{-67} (4) $10^{-13.4}$

Q.6 The common ion effect is shown by which of the following sets of solutions -

(1) $BaCl_2 + BaNO_3$ (2) NaCl + HCl

(3) $NH_4OH + NH_4Cl$ (4) None

Q.7 Basic strength of NH_4OH in presence of NH_4Cl

(1) Increases

(2) Remains unchanged

(3) Decreases

(4) Some times increases or sometimes decreases

Q.8 If it is known that H_2S is a weak acid and it is ionized into $2H^+$ and S^{-2}. Then in this solution HCl is added so, pH becomes less, then what will happen -

(1) Decrease in S^{-2} ion concentration

(2) Concentration of S^{-2} is not affected

(3) Increases in S^{-2} ion concentration

(4) It is not possible , to add HCl in solution

Q.9 Maximum efficiency of cationic hydrolysis will be shown by -

(1) $A\ell^{+3}$ (2) Ga^{+3} (3) $T\ell^{+1}$ (4) $T\ell^{+3}$

Q.10 $HCOO^- + H_2O \rightleftharpoons HCOOH + OH^-$ is related -

(1) $h = \sqrt{K_h}$ (2) $h = \sqrt{\frac{K_h}{C}}$

(3) $h = \sqrt{\frac{K_h}{V}}$ (4) $K_h = \sqrt{hc}$

Q.11 If pK_b for CN^- at 25º C is 4.7. The pH of 0.5 M aqueous NaCN solution is :

(1) 12 (2) 10 (3) 11.5 (4) 11

Q.12 The highest pH value is of -

(1) 0.1 M NaCl

(2) 0.1 M NH_4Cl

(3) 0.1 M CH_3COONa

(4) 0.1 M CH_3COONH_4

Q.13 A weak acid react with strong base ionization constant of weak acid is 10^{-4}. Find out equilibrium constant for this reaction -

(1) 10^{-10} (2) 10^{10} (3) 10^{-9} (4) 10^{9}

Q.14 K_a for cyano acetic acid is 3.5×10^{-3}. Then the degree of hydrolysis of 0.05 M, sodium cyano acetate solution will have the following value -

(1) 4.559×10^{-6} (2) 5.559×10^{-6}

(3) 6.559×10^{-6} (4) 7.559×10^{-6}

Q.15 In solubility of salt M_2X, QY_2 and PZ_2 equal , then the relation between their K_{sp} will be -

(1) $K_{sp}(M_2X) > K_{sp}(QY_2) > K_{sp}(PZ_2)$

(2) $K_{sp}(M_2X) = K_{sp}(QY_2) < K_{sp}(PZ_2)$

(3) $K_{sp}(M_2X) > K_{sp}(QY_2) = K_{sp}(PZ_2)$

(4) $K_{sp}(M_2X) = K_{sp}(QY_2) = K_{sp}(PZ_2)$

Q.16 The expression of solubility product of mercurous iodide is

(1) $[2\ Hg^{+}]^2 \times 2\ [I^{-}]^2$ (2) $[Hg^{++}] \times [2I^{-}]^2$

(3) $[\ Hg_2^{2+}] \times [I^{-}]^2$ (4) $[Hg^{2+}]^2 \times [I^{-}]^2$

Q.17 At 25ºC, required volume of water , to dissolve 1g $BaSO_4$ ($K_{sp} = 1.1. \times 10^{-10}$) will be -

(1) 820 L (2) 409.5L (3) 205 L (4) 430 L

Q.18 How many grams of CaC_2O_4 will dissolve in distilled water to make one litre saturated solution. K_{sp} of CaC_2O_4 is $2.5 \times 10^{-9}\ mol^2L^{-2}$ and its molecular weight is 128.

(1) 0.0064 g (2) 0.0128 g

(3) 0.0032 g (4) 0.0640 g

Q.19 If the solubility of AgCl (formula mass = 143) in water at 25ºC is 1.43×10^{-4} g/100 mL of solution then the value of K_{sp} will be -

(1) 1×10^{-5} (2) 2×10^{-5}

(3) 1×10^{-10} (4) 2×10^{-10}

Q.20 One litre of saturated solution of $CaCO_3$ is evaporated to dryness, when 7.0 g of residue is left. The solubility product for $CaCO_3$ is -

(1) 4.9×10^{-3} (2) 4.9×10^{-5}

(3) 4.9×10^{-9} (4) 4.9×10^{-7}

Q.21 Correct order of solubility product is -

(1) $CaCrO_4 > SrCrO_4 > BaCrO_4$

(2) $BaCrO_4 > SrCrO_4 > CaCrO_4$

(3) $CaCrO_4 > BaCrO_4 > SrCrO_4$

(4) $SrCrO_4 > BaCrO_4 > BaCrO_4$

Q.22 M_2SO_4 (M^+ is a monovalent metal ion) has a K_{sp} of 1.2×10^{-5} at 298 K. Its maximum concentration of M^+ ion that could be attained in a saturated solution of this solid at 298 K is -

(1) 3.46×10^{-3} M (2) 2.89×10^{-2} M

(3) 2.8×10^{-3} M (4) 7.0×10^{-3} M

Q.23 K_{sp} value is more for -

(1) CuS (2) NiS (3) PbS (4) CdS

Q.24 Solubility product of $Mg(OH)_2$ is 1×10^{-11}. At what pH, precipitation of $Mg(OH)_2$ will begin from 0.1 M Mg^{2+} solution -

(1) 9 (2) 5 (3) 3 (4) 7

Q.25 What will happen if the pH of the solution of 0.001 M $Mg(NO_3)_2$ solution is adjusted to pH = 9

($K_{sp}Mg(OH)_2 = 8.9 \times 10^{-12}$)

(1) ppt will take place

(2) ppt will not take place

(3) Solution will be saturated

(4) None of these

Q.26 A solution is a mixture of 0.06 M KCl and 0.06 M KI. $AgNO_3$ solution is being added drop by drop till AgCl starts precipitating (K_{sp} AgCl = 1×10^{-10} and K_{sp} AgI = 4×10^{-16}). The concentration of Iodide ion at this stage will be nearly equal to -

(1) 4.0×10^{-5} M (2) 2.4×10^{-7} M

(3) 2.0×10^{-8} M (4) 4×10^{-8} M

Q.27 To have more sulphide ion concentration H_2S should be passed though -

(1) 1 N HCl solution

(2) 0.01 M HCl solution

(3) A neutral solution such as water

(4) An ammonical solution

Q.28 When excess oxalic acid added to $CaCl_2$, CaC_2O_4 is precipitated and the solution still contains some unprecipitated Ca^{2+} for the reason -

(1) CaC_2O_4 is a soluble salt

(2) Oxalic acid does not ionize at all

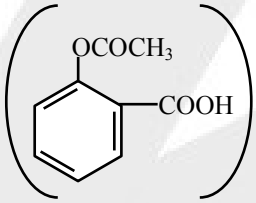
(3) When $H_2C_2O_4$ is added to $CaCl_2$, HCl is formed which is fully ionized and thus increases the H^+ ion concentration so suppresses the ionizations of $H_2C_2O_4$ and hence the solubility product of CaC_2O_4 is not exceeded -

(4) None of the above

Q.29 What is the molar concentration of chloride ion for the solution obtained by mixing 300 mL of 3.0 M NaCl and 200 mL of 4.0 M solution of $BaCl_2$ -

(1) 5.0 M (2) 1.8 M

(3) 1.6 M (4) None of these

Q.30 Acetyl salicylic acid 

(mol. wr = 180) called aspirin is a pain killer with $pK_a = 2$. If two tables each of 0.09 gm containing aspirin are dissolved in 100 mL solution . Its pH will be -

(1) 0.5 (2) 1.0 (3) 0.0 (4) 2.0

ANSWER KEY

Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ans.	3	1	1	3	4	3	3	1	1	2
Que.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.	3	3	2	4	4	3	2	1	3	1
Que.	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Ans.	1	2	2	1	2	2	4	3	1	4