CHEMISTRY

BOOKS - MBD CHEMISTRY (ODIA ENGLISH)

EQUILIBRIUM

QUESTION BANK

1. If K_e of the reaction, $2HI \rightarrow H_2 + I_2$ is 0.25, the equilibrium constant of the reaction $H_2 + I_2 \rightarrow$ 2HI would be :

A. 1

B. 2

C. 3

D. 4

Answer: D

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2. HI heated in a sealed tube at $440^{\circ} C$ till the equilibrium was reached. HI was found to be 22% decomposed. The equilibrium constant for dissociation is:

A. 0.282

B. 0.0796

C. 0.0199

D. 1.99

Answer: C

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3. For a reversible reaction the rate constant for the forward reaction is 2.38×10^{-4} and for the backward reaction is 8.15×10^{-5} The k_c of the reaction is:

A. 0.342

B. 2.92

C. 0.292

D. 3.42

Answer: B

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4. 2 $SO_3 \to 2SO_2 + O_2$ is at equilibrium. The SO_2 concentration is 0.6 M. Initial concentration of SO_3 is 1M. The equilibrium constant is:

A. 2.7

B. 1.36

C. 0.34

D. 0.675

Answer: D

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5. Which one favours the backward reaction in a comical equilibrium ?

A. Increasing the concentration of one of the reactants.

B. Removal of at least one of the products at regular interval.

C. Increasing the concentration of one or more of the products.

D. None of the above.

Answer: C

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6. The concentration of pure solid and liquid phase is not inculded in the expression of equilibrium constant because:

A. solid and liquid conc. are independent of their quarries.

B. solid and liquid react slowly.

C. solid and liquid at equilibrium don't interact with gaseous phase

D. the molecules of solid and liquid cannot migrate to the gaseous phase.

Answer: A

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7. 4 moles of A are mixed with 4 moles of B. When 2 moles of C are formed at equilibrium accordingly to the reaction $A+B \rightarrow C+D. K_c$ is:

A. 4

B. 1

C. sqrt4

D. sqrt2

Answer: B

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8. The unit of equilibrium constant K, $N_2 + 3H_2 \rightarrow 2NH_3$ will be:

A. $lit^2 mo \le^{-2}$

B. `mole^2 lit^(-2)

C. mole/lit

D. it has no unit

Answer: A

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9. When acetic acid and ethanol are mixed in equimolar proportions, equilibrium is attained when 2/3rd of the acid and alcohol are consumed. The value of K_c is:

A. 0.4

B. 4

C. 40

D. 4.0xx10^2

Answer: B

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10. If $N_2 + 3H_2 \Leftrightarrow 2NH_3$ has equilibrium constant K and $2N_2 + 6H_2 \Leftrightarrow 4NH_3$ has equilibrium constant k', then k' =

A. K^2

B. sqrtK

C. 1/sqrtK

D. 1/K^2

Answer: A

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11. Irreversible reaction is one which:

A. proceeds in one direction only

B. proceeds in both the direction

C. is an instantaneous reaction

D. is aslow reaction

Answer: A

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12. When rate of forward reaction is equal and opposite to the rate of backward reaction, the state is said to be:

A. reversible state

B. Equilibrium

C. Chemical equilibrium

D. None of the above

Answer: C

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13. Which of the following reaction will be favoured by low pressure ?

A. $H_2 + I_2 \leftrightarrow 2HI$

B. $N_2 + 3H_2 \leftrightarrow 2NH_3$

C. $PCL_5 \leftrightarrow PCL_3 + CL_2$

D. $N_2 + O_2 \leftrightarrow 2NO$

Answer: C

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14. Which of the following factor will be usefuk in manufacture of ammonia by Haber's process ?

A. High pressure

B. Low pressure

C. High temperature

D. Increase in the concentration of ammonia

Answer: A

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15. The reaction in which heat is absorbed is known as:

A. Exothermic

B. Endothermic

C. Reversible

D. None of the above

Answer: B

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16. The rate at which a substrance reacts is proportional to its active mass. This statement is :

A. Le-Chatelier's principle

B. Faraday's Law

C. Law of multiple proportion

D. Law of mass acction

Answer: D

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17. When chemical equilibrium is reached the :

A. reaction stops

B. rate of forward reaction is equal to the rate of backward reaction

C. rate of forward reaction is more than that of backward reaction

D. none of the above

Answer: B

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18. In a reversible reaction if there is no change in total number of molecules , the reaction will be favoured by

A. high pressure

B. low pressure

C. high temperature

D. higher concentration of a reactant

Answer: D

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19. Which of the following will be favoured by high pressure?

A. $PCL_5 \Leftrightarrow PCL_3 + CL_2$

B. $N_2 + O_2 \Leftrightarrow 2NO$

C. $N_2 + 3H_2 \Leftrightarrow 2NH_3$

D. $H_2 + I_2 \Leftrightarrow 2HI$

Answer: C

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20. Chemical equilibrium is:

A. stationary

B. dynamic

C. interness

D. state of rest

Answer: B

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21. For the reaction, $H_2 + I_2 \Leftrightarrow 2HI$the K_p and $K_c$are related as :

A. $K_p = K_c(RT)^2$

B. $K_p = K_c(RT)^0$

C. $K_p = K_c(RT)^{-2}$

D. K_p = K_c (RT)^-i

Answer: B

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22. In which of the following reactions K_p = K_c ?

A. $N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3(g)$

B. $2NOCI \Leftrightarrow 2NO(g) + CL_2(g)$

C. $I_2(g) + H_2(g) \Leftrightarrow 2HI(g)$

D. $H_2(g) + CL_2(g) \Leftrightarrow 2HCL(g)$

Answer: D

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23. The partial pressure of PCL_3, CL_2 and $PCL_5$are 0.1,0.2 and 0.008 atmosphere respectively for reaction , $PCL_5 \Leftrightarrow PCL_3 + CL_2. The value of$K_p` is :

A. 2.5

B. 5

C. 0.25

D. 25

Answer: A

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24. For which of the following reactions the value of K_p is greatier than K_c ?

A. $N_2 + O_2 \leftrightarrow 2NO$

B. $2SO_2 + O_2 \leftrightarrow 2SO_3$

C. $2SO_2 \leftrightarrow N_2O_4$

D. $PCL_5 \leftrightarrow PCL_3 + CL_2$

Answer: D

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25. For the reaction `PCL_5 hArr PCL_3+CL_2, the forward reaction at constant temperature is fovoured by :

A. introducing an inret gas at constant volume

B. introducing chlorine gas at constant volume

C. introdusing an inert gas at constant pressure

D. increasing the volume of the container

Answer: D

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26. According to law of mass action, the rate of reaction is directly proportional to:

A. volume of the container

B. equilibrium constant

C. nature of reactants

D. molar concemtration of reactants

Answer: D

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27. For a reversible reaction if the concentration of the reactants are doubled, the equilibrium constant will be :

A. halved

B. doubled

C. the same

D. one fourth

Answer: C

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28. In of the following case does the reaction go farthest to completion ?

A. $K = 10_2$

B. `K = 10^-2

C. K = 10

D. K=1

Answer: A

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29. In a reversible reaction two substances are in equilibrium. If the concentration of each is double the equilibrium is:

A. reduced to half of its original value

B. reduced to 1/4th of its original value

C. doubled

D. constant

Answer: D

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30. $N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3(g),$ /_\`H =-93.5 kj what will happen when helium gas is added to the vessel at constant valume:

A. more NH_3 is formed

B. less NH_3 is formed

C. no effect

D. none of these

Answer: C

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31. 1 mol of A and 0.5 mol of B were enclosed in a there litre vessel The following equilibrium was establised under suitable condition: $A + 2B \leftrightarrow C$ At equilibrium the amount of B was found to be 0.3 mol.The equilibrium constant K_c at the experimental temoerature will be :

A. 11.1

B. 1.11

C. 0.01

D. 2.5

Answer: A

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32. $\frac{K_p}{K_c}$ for the reaction: `CO(g)+1/2O_2(g) hArr CO_2(g) is :

A. 1

B. RT

C. 1/(sqrtRT)

D. RT^(1/2)

Answer: C

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33. The equilibrium constant, K_c for the reaction: $H_2 + I_2 \Leftrightarrow 2HI$ at 700 K is 49. what is the equilibrium constant for the reaction ? $HI \leftrightarrow \frac{1}{2}H_2 + \frac{1}{2}L_2$ at the same temperature

A. 49

B. 0.02

C. 1.43

D. 0.143

Answer: D

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34. An equilibrium mixture for the reaction $2H_2S(g) \Leftrightarrow 2H_2(g) + S_2(g)$ had 1 mole of hydrogen sulphide, 0.2 mole of H_2 and 0.8 mole of S_2 in 2 litre vessel. The value of K_c is:

A. 0.004

B. 0.08

C. 0.016

D. 0.16

Answer: C

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35. What is the equilibrium expression for the reaction:

$P_4(s) + 5O_2(g) \Leftrightarrow P_4O_{10}(s)$

A. $K = [O_2]^5$

B. $K_c = \dfrac{[P_4O_{10}]}{5[P_4][O_2]}$

C. $K_c = \dfrac{[P_4O_{10}]}{[P_4][O_2]^5}$

D. $K_c = \dfrac{1}{[O_2]^5}$

Answer: D

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36. The conjugate acid of NH_2 is

A. NH_3

B. `NH_2 OH

C. NH_4^+

D. N_2H_4

Answer: A

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37. Which of the following is not a lewis acid ?

A. BF_3

B. $AlCl_3$

C. BeCl_2

D. SnCl_2

Answer: A

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38. The strongest bronsted base is:

A. CIO^-

B. CIO_3^-

C. CIO_2

D. CIO_4^-

Answer: A

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39. An aqueous solution of acetic acid contains:

A. CH_3COOH and H^+

B. CH_3COO^-, H_3O^+ and CH_3COOH

C. CH_3COO^-, H_3O^+ andH^+

D. CH_3COOH, CH_3COO^- and H^+`

Answer: D

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40. Aqueous solution of copper sulphate changes blue litmus to red because:

A. Cu^{-2} is present

B. SO_4^{-2}

C. Hydrolysis take place

D. Reduction takes place

Answer: C

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41. An aqueous solution of salt is alkaline. This show that the salt is made from as:

A. strong acid and strong base

B. strong acid and week base

C. weak acid and week base

D. weak acid and strong base

Answer: D

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42. Which of the following statement is incorrect for a weak acid ?

A. It is partially dissociated.

B. Its dissociation constant is low.

C. Its K_2 is very low.

D. solution of its sodium salt in water is alkaline.

Answer: C

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43. Which of the following is not conjugate pair of acid base ?

A. HS and S^{-2}

B. H_3O^+ and OH^-

C. HONO and NO_2

D. C_6H_5COOH and $C_6H_5COO^-$

Answer: A

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44. According to bronstedconcept, the acids in the reaction : $NH_3 + H_2O = NH_4$+OH^- are:

A. NH_3 and NH_4^+

B. H_2O andOH^-

C. H_2 and NH_4^+

D. NH_3 and OH^-

Answer: B

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45. Ammonium hydroxide is a weaker base because it is :

A. unstable

B. covalent compound

C. only slightly ionises

D. none of these.

Answer: C

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46. Lewis acids are

A. electron acceptors

B. proton acceptors

C. electron donors

D. proton donors

Answer: A

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47. The pH of a soloution containing 0.4 gm NaOH per litre is :

A. 2

B. 12

C. 10

D. 11

Answer: B

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48. conjugate base of HCO_3^- ion is :

A. CO_2

B. $CO_3^2 -$

C. H_2CO_3

D. HCO_3^-

Answer: C

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49. Aqueous solution of $FeCl_3$ is :

A. acidic

B. basic

C. amphoteric

D. netural

Answer: A

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50. When 1.0 ml of dil H_2SO_4 is added to 100 ml of a buffer solution of pH :

A. becomes 7.0

B. is less than 7.0

C. is more than 7.0

D. docs not change

Answer: D

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51. What is the pH of 0.01 M NaOH assuming complete ionisation ?

A. 0.01

B. 2

C. 12

D. 14

Answer: C

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52. The pH of the solution is 3.0 if its pH is changed to 6.0 then the $[H^+]$ of the original solution has to be :

A. doubled

B. halved

C. increased 1000 times

D. decreased 1000 times

Answer: D

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53. The compound that is not a lewis acid is:

A. BF_3

B. $AlCl_3$

C. $BeCl_2$

D. $SnCl_4$

Answer: C

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54. The conjugate acid of NH_2 is

A. NH_3

B. NH_2OH

C. NH_4^+

D. N_2H_4

Answer: A

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55. An acidic buffer can be prepared by making solution of :

A. HCl and NaCl

B. NaOH and NaCl

C. HCOOH and HCOONa

D. NH_4Cl and NH_4OH

Answer: C

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56. A compound is precipitated when its:

A. ionic product exceeds the solubility product

B. ionic product is less than its solubility product

C. ionic product is equal to the solubility product

D. none of the above

Answer: A

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57. A basic buffer can be prepared by mixing

A. CH_3COONa and CH_3COOH

B. Na_2SO_4 and H_2SO_4

C. NaOH and NaCl

D. NH_4Cl and NH_4OH

Answer: D

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58. Which of the following solutions has the maximum pH value ?

A. solution of caustic soda

B. Pure water

C. Water saturated with CO_2 gas

D. Solution of sodium chloride

Answer: A

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59. Hydrolysis is regarded as an interaction between :

A. H^{+}, OH^-` ions

B. ions of acid with ions of base

C. ions of salt with ions of water

D. acid and base

Answer: C

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60. Which of the following solutions 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 + 45 ml of N/10 NaoH

C. 10 ml of M/10 HCL + 90 ml of M/10 NaoH

D. 75 ml of M/10 HCl + 25 ml of M/5 NaoH

Answer: D

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61. The decrease in the ionisation of H_2S in the presence of HCl is due to :

A. solubility product

B. Dilation

C. Common ion effect

D. saturation

Answer: C

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62. An aqueous solution of ammonia acetate is :

A. faintly acidic

B. faintly alkaline

C. fairly neutral

D. fairly acidic

Answer: C

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63. Ammonia gas dissolves in water to give NH_4OH In this reaction water act as :

A. a base

B. an acid

C. a salt

D. a conjugate base

Answer: B

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64. 4 gm of NaoH are added in 1 litre. The PH value of the solution will be :

A. 1

B. 0

C. 7

D. 13

Answer: D

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65. Which of the following is a lewis base ?

A. $ALCl_3$

B. Ag

C. $Ag(OH)_3$

D. NH_3

Answer: D

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66. The PH of a solution obtained by mixing 50 ml of 0.4 M HCl and 50 ml of 0.2 M NaoH IS :

A. -log 2

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

C. 1

D. 2

Answer: C

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67. pH of `10^-8 M solution of HCl in water is:

A. 8

B. 6

C. Between 6 and 7

D. between 7 and 8

Answer: C

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68. Which of the following will have highest PH in water solution :

A. Nacl

B. Na_2CO_3

C. KCL

D. $CuSO_4$

Answer: B

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69. Which of the following species is amphoteric in nature ?

A. H_3O^{+}

B. Cl^{-}

C. HSO_4^{-}

D. CO_3^{2-}

Answer: C

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70. For a springly soluble salt $A_P B_q$ the relationship between its solubility product (L_s) and 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. $L_S = s^{pq}pq^{q+p}$

Answer: A

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71. When a salt of strong base and Weak acid is hydrolysed the resulting solution has :

A. PH=7

B. PH=0

C. PHlt 7

D. PHgt7

Answer: D

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72. 1 c.c. of 0.01 M HCl is added to 99.9 cc of NaCl solution . PH of resulting solution will be :

A. 7

B. 4

C. 2

D. 1

Answer: B

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73. Precipitation takes place when the producty of concentration of ions :

A. equals the solubility product

B. Exceeds the solubility product

C. is less than the solubility product

D. is negligible

Answer: B

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74. A sulphuric acid solutions has PH =2 its molarity is :

A. 1/100

B. 1/50

C. 1/2

D. 1/200

Answer: D

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75. The conjugate base of H_3PO_4 IS :

A. H_3PO_4

B. P_2O_5

C. PO_4

D. HPO_4^{2-}

Answer: D

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76. What is common ion effect ?

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77. Define 'active mass'.

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78. Define 'law of mass action'.

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79. Define solubility product.(K_sp).

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80. What is the approximate PH value of blood ?

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81. What is the PH OF 0.1 M HCl.

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82. write conjugate acid of NH_3.

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83. What is buffer solution ?

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84. Can PH value of any solution be less than zero ?

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85. What is acid buffer with some examples ?

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86. Explain basic buffer with some example ?

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87. What is relation between K_p and K_c?

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88. Give an example of buffer solution ?

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89. What is PH value of 0.1 N HCl?

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90. What is necessary to add dilute HCl before passing H_2S for precipitation group of II cations ?

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91. Calculate the PH of 0.001 M HCl.

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92. Acetic acid is less acidic in sodium acetate solution than in sodium chloride solution .

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93. Which catalyst is used in contact process for manufacture of H_2SO_4 ?

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94. What is the effect of pressure on the solubility of a solid ?

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95. What is the PH of 1M HCl ?

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96. An aqueous solution of ferric chloride is acidic. Explain.

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97. Discuss Lewis theory of acids and bases.

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98. what is conjugate base Of HSO_4^- ?

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99. What is the value of ionic product of water at $25^{\circ} C$?

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100. How K_w varies with temperature ?

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101. How does PH of a solution vary with H^+ ion concentration ?

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102. How does PH of a solution vary with temperature ?

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103. Define reaction quotient ?

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104. Which catalyst is used for synthesis of NH_3 by haber's process ?

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105. Find the solubility product If solubility of A_2B_3 is 10^{-4}.

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106. what is the value of PH + POH for any aqueous solution at $25^\circ C$.?

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107. Why $AlCl_3$ is lewis acid ?

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108. SO_2 is lewis acid ?

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109. Write some application of buffer ?

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110. Write two factors which influence the solubility of solid in a liquid .

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111. An equillibrium reaction between hydrogen and iodine to give hydrogen iodide at 670 K in a 5 litre flask contains 0.4 mole of hydrogen 0.4 mole of iodine and 2.4 mole of hydrogen iodide. Calculate the equillibrium constants.

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112. Calculate the value of equillibrium constant, $N_2O_4(g) \rightarrow 2NO_2(g)$, the concentration of $N_2O_4(g)$ and NO_2 at equilibrium are 4.8×10^{-2} and 1.2×10^{-2} mol/L respectively.

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113. State Le-chatelier's principle.

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114. What is equillibrium constant ? Explain

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115. Define law of mass action or state guldberg-Wagge's law.

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116. What is the effect of catalyst on equillibrium ?

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117. Write the expression that shows the dependence of equilibrium constant on temperatue.

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118. Two moles of NH_3 are introduced into one litre flask in which it dissociates at high temperature as $2NH_3(g) \Leftrightarrow N_2(g) + 3H_2(g)$ Find the value of K_C.

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119. 1 mole of N_2O_4 is heated in a flask with a volume of 10 dm^3. At equillibrium 1.708 mole of NO_2 and 0.146 mole of N_2O_4 were found at

$134^{\circ} c$ calculate the equillibrium constant .

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120. Write properties of chemical equillibrium.

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121. Write some characteristics of equillibrium constants .

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122. Derive relationship between K_C and K_P.

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123. At a certain temperature the dissociation constant of 0.25 M NH_4OH is `1.8 xx 10^-5 calculate its degree of ionisation at the same temperature.

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124. Calculate the PH of KOH solution 5.6 gm of which is dissolved in 10 litre solution .

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125. Calculate the PH Of 0.005 M H_2SO_4.

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126. Calculate the PH of 0.004 M KOH.

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127. Calculate the PH of a buffer solution which is formed by mixing 0.04 M sodium acetate and 0.08 acetic acid at 298 K. (Pk_a = 4.74)

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128. What is the pH of 0.01 M NaOH assuming complete ionisation ?

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129. Calculate PH Of 0.01 M acetic acid . $K_a = 1.8 \times 10^{-5}$ at 298 K.

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130. How much sodium acetate should be added to 1 litre of 0.1 M CH_3COOH to make a buffer of PH = 4.0 $(K_a = 3)$

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131. Discus Arhenius theory of acids and bases with examples .

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132. Discuss about PH of a solution.

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133. Write the application of PH.

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134. what is the effect of temperature on PH value ? Explain

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135. What is buffer solution ?

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136. How many types of buffer do u know ? explain with example.

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137. Discuss about the relationship between solubility(S) and solubility product(K_{sp}).

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138. What is common ion effect ?

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139. What is the PH of 0.001(N) HCl ?

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140. What is normal salt ? Give some example.

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141. Why sodium carbonate solution is alkaline ?

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142. Calculate the H^+ ion andOH^- ion conc of NaoH solution , 0.01 gm of which are dissolved in 250 cc solution .

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143. Calculate the PH of 0.01 M aqueous solution of NH_4CN. Given dissociation constants Of HCN is 6.2×10 −10 and of NH_3 is 1.6×10 −5

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144. Determine the degree of hydrolysis and PH of 0.02 M of sodium acetate. (Given $k_a = 1.8 \times 10^{-5}$,$K_w = 1 \times 10^{-14}$)

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145. Discuss Lowry -Bronsted theory of acids and bases .

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146. Discuss Lewis theory of acids and bases.

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147. What are the limitations of this theory ?

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148. Define solubility product.(K_{sp}).

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149. Write some application of common ion effect.

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150. What is the pH of 0.01 M NaOH assuming complete ionisation ?

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151. What is relation between K_p and K_c?

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152. If K_p< K_c and K_p=K_c then δn are ____ and ____ respectively.

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153. The value of equillibrium constants depends on ____ and ____.

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154. The value of $K_p$for the reaction $N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3$(g) is ___ than K_c.

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155. In reaction $H_2(g) + Cl_2(g) = 2HCl(g) relation between$K_p and K_c` is ____.

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156. The reaction $N_2 + 3H_2 \Leftrightarrow 2NH_3$ favoured at ____.

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157. The effect of concentration or pressure on the rate of a reversible reaction is given by ____.

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158. Henderson's equation for the POH of a basic buffer is ____.

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159. What is buffer solution ?

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160. The buffer action of acidic buffer is maximum when its pH is equal to:

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161. Acetic acid mixing with ____ gives buffer solution.

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162. what is conjugate base Of HSO_4^- ?

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163. A mixture of sodium acetate and acetic acid acts as a ____.

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164. PH of 0.01 M HCl solution is _____.

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165. The conjugate acid of HCO_3^- is ____.

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166. How does PH of a solution vary with temperature ?

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167. The conjugate base of `H_3O^+ is ____.

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168. solubility of calcium acetate ____ with increase in temperature.

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169. What is the PH OF 0.1 M HCl.

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170. PH of pure water is ____ at $22^\circ C$.

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171. 40% of a mixture of 0.2 mole of N_2 and 0.6 mole of H_2 react to give NH_3 according to the equation: $N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3$ (g) at constant temperature and pressure. Then what is the ratio of the final volume to the initial volume of gases ?

A. 4:5

B. 5:4

C. 7:10

D. 8:5

Answer: A

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172. At temperature T, a compound $AB_2(g)$ dissociates according to the reaction $2AB_2(g) \Leftrightarrow 2AB(g) + B_2(g)$ with a degree of dissociation x, Which is small compared with unity. Predict the expression for K_p in terms of x and the total pressure P.

A. $Px^3/2$

B. $Px^2/3$

C. $Px^3/3$

D. $Px^2/2$

Answer: A

Watch Video Solution

173. What is the amount of PCl_5 (in mole) need to be aded to one litre vessel at `250^Oc in order to obtain a concentration of 0.1 moles of Cl 2 ? K c for PCl 5 ⟺PCl 3 +Cl 2 is 0.0414 mol/litre

A. 0.3415

B. 0.0341

C. 3.415

D. 0.3415

Answer: A

Watch Video Solution

174. For $NH_4HS(s) \Leftrightarrow NH_3(g) + H_2S$, The observed pressure for reaction mixture in equillibrium is 1.12 atm at $160^O c$. Calculate the value of K_p for the reaction:

A. 3.136 atm^2

B. 0.3136 atm^2

C. 3.415 atm^2

D. 0.3415 atm^2

Answer: B

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175. In a reaction at equillibrium X mole of the reactant A decompose to give 1 mole each of C and D. if the fraction of A decomposed at equillibrium is independent of initial concentration of A then what will be the value pf X ?

A. 1

B. 3

C. 2

D. 4

Answer: C

Watch Video Solution

176. In a system : `A(s) hArr 2B(g) + 3C(g) If the concentration of C at equillibrium is increased by factor 2 then predict the equillibrium concentration of B in terms of original val,ue .

A. Two times of its original value

B. One half of its original value

C. $2\sqrt{2}$ times of its original value

D. $\frac{1}{2}\sqrt{2}$ times of its original value

Answer: D

Watch Video Solution

177. Eight mole of a gas AB_3 attain equillibrium in a closed container of volume 1 dm^3 as 2 $AB_3 \Leftrightarrow A_2(g) + 3B_2(g)$ if at equillibrium 2 mole of A_2 are present then calculate the equillibrium constant.

A. $72 mol^2 L^{-2}$

B. $36 mol^2 L^{-2}$

C. $3 mol^2 L^{-2}$

D. $27 mol^2 L^{-2}$

Answer: D

Watch Video Solution

178. In the reaction C(s) $+CO_2(g) \Leftrightarrow 2CO(g)$ the equilibrium pressure is 12 atm. If 50% OF CO_2 reacts. Calculate the K_P for the change:

A. 12 atm

B. 16 atm

C. 20 atm

D. 6 atm

Answer: B

Watch Video Solution

179. When 20 g of $CaCO_3$ were put into 10 litre flask and heated to $800^O c$ 35 % $CaCO_3$ remained unreacted at equillibrium . Predict k_p for decomposition of `CaCO_3 .

A. 1.145 atm

B. 0.145 atm

C. 2.145 atm

D. 3.145 atm

Answer: A

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180. Sulphides ions in alkaline solution react with solid sulphur to form polyvalent sulphide ions. The equillibrium constant for the formation of S_2^{2-} and S_3^{2-} from S and S^{2-} ions are 1.7 and 5.3 respectively.What is the equillibrium constant for the formation of S_3^{2-} from S_2^{2-} and S ?

A. 1.33

B. 3.11

C. 4.21

D. 1.63

Answer: B

Watch Video Solution

181. At equillibrium if K_p =1 then :

A. $\Delta G^o = 0$

B. $\Delta G^o > 1$

C. $\Delta G^o < 1$

D. None

Answer: A

Watch Video Solution

182. For N_2 + 3H_2 $\Leftrightarrow$ 2NH_3DeltaH` = -VE then :

A. $K_P = K_C$

B. K_p = K_CRT

C. $K_P = K_c(RT)^{-2}$

D. K_p = K_c (RT)^-1

Answer: C

Watch Video Solution

183. On applying pressure to the equilibrium, $ice \Leftrightarrow water$ which phenomenon will happen:

A. More ice will be formed

B. More water will be formed

C. Equiliberium will not be disturbed

D. Water will equilibrium

Answer: B

Watch Video Solution

184. For the equilibrium $2NO_2(g) \rightleftharpoons N_2O_4(g) + 14.6kcal$An increase of temperature will:

A. Favour the formation of N_2O_4

B. Favour the decomposotion of N_2O_4

C. Not affect the equilibrium

D. Stop the reaction

Answer: B

Watch Video Solution

185. Which equilibrium in gaseous phase would be unaffected by an increase in preassure:

A. $N_2O_4 \rightleftharpoons 2NO_2$

B. `N_2 + O_2 ⇌ 2NO

C. $N_2 + 3H_2 \rightleftharpoons 2NH_3$

D. CO + 1/2 $O_2 \rightleftharpoons CO_2$

Answer: B

Watch Video Solution

186. For the reaction, $H_2 + I_2 \Leftrightarrow 2HI$the K_p and $K_c$are related as :

A. $K_C = 2K_P$

B. $K_C > K_P$

C. $K_C = K_P$

D. $K_C < K_P$

Answer: C

Watch Video Solution

187. The vapour density of compeletly disssociated NH_4Cl would be :

A. Slightly less than half of that of ammonium chloride

B. Half of that of ammonium chloride

C. Double that of ammonium chloride

D. Determined by the amount of solid ammonium choride used in the experiment

Answer: B

Watch Video Solution

188. For the chemical reaction, $3X(g) + y(g) \rightarrow X_3Y(g)$: the amount of X_3Y at equilibrium is affected by:

A. Temperature and pressure

B. Temperature only

C. pressure only

D. Temperature,pressure and catalyst

Answer: A

Watch Video Solution

189. Which oxide of nitrogen is the most stable:

A. $2NO_2(g) \rightleftharpoons N_2(g) + 2O_2(g) K = 6.7 \times 10^{16} mollitre^{-1}$

B. `2NO(g) ⇌ N_2(g) + O_2(g) ,

K = 2.2 xx 10^(30) mol litre^(-1)

C. $2N_2O_5(g) \rightleftharpoons 2N_2(g) + 5O_2(g), K = 3.5 \times 10^{33} mol^{-5} litre^{-5}$

D. $2N_2O(g) \rightleftharpoons 2N_2(g) + O_2(g), K = 3.5 \times 10^{33} mollitre^{-1}$

Answer: A

Watch Video Solution

190. The equilibrium constant for equilibria $SO_2(g) + \frac{1}{2}O_2(g) \rightleftharpoons SO_3(g)$ and $2SO_3(g) \rightleftharpoons 2SO_2(g) + O_2(g)$ are K_1 and K_2 respectively Then:

A. $K_2 = K_1$

B. $K_2 = K_1^{2`}$

C. $K_2 = \frac{1}{K_1}$

D. $K_2 = \frac{1}{K_1^2}$

Answer: D

Watch Video Solution

191. For $PCl_5 \Leftrightarrow PCl_3 + Cl_2, \Delta H = 22$ kcal the dissociation of PCl_5 will be more on:

A. Increasing temperature

B. Decreasing pressure

C. Increasing pressure

D. Increasing the concentration of chlorine

Answer: A

Watch Video Solution

192. An increase in temprature on the reaction $N_2 + O_2 \rightleftharpoons 2NO, \Delta H$ = 43.2 kcal will :

A. Increase the yield of NO

B. Decrease the yield of NO

C. Not effect the yield of NO

D. Not help the reaction to proceed in forward direction

Answer: A

Watch Video Solution

193. The volume of the reaction vessel containing an equilibrium mixture in the reaction , $SO_2Cl_2(g) \Leftrightarrow SO_2(g) + Cl_2(g)$ is increased. When equilibrium is reestablished:

A. The amount SO_2(g) will decrease

B. The amount of SO_2Cl_2(g) will increase

C. The amount of Cl_2(g) will increase

D. The amount of Cl_2 (g) will remain unchanged

Answer: C

Watch Video Solution

194. The corrrect relationship between K_c and K_p is gaseous equilibrium is:

A. $K_C = K_P(RT)^{\Delta} n(b)$

B. $K_p = K_C(RT)^{\Delta} n$

C. $\frac{k_c}{RT}(K_P)^{\Delta} n$

D. (K_P)/(RT) = (K_C)^Deltan`

Answer: B

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195. In which equilibrium reaction the equilibrium whould shift to the right , if the total pressure is increased:

A. $N_2 + 3H_2 \rightleftharpoons 2NH_3$

B. $H_2 + I_2 \rightleftharpoons 2HI$

C. $H_2 + Cl_2 \rightleftharpoons 2HCl$

D. $N_2O_4 \rightleftharpoons 2NO_2$

Answer: A

Watch Video Solution

196. The chemical reaction in which the yield of the product cannot be increased by the application of high pressure is:

A. $PCl_3(g) + Cl_2(g) \rightleftharpoons PCl_5(g)$

B. $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$

C. `H_2(g) + 3Cl_2 (g) ⇌ 2HCl(g)

D. $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$

Answer: B

Watch Video Solution

197. For which reaction is $K_p = K_c$:

A. `2NOCl(g) ⇌ 2NO(g) + Cl_2(g)

B. $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

C. $H_2(g) + Cl_2(g) \rightleftharpoons 2HCl(g)$

D. $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$

Answer: C

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198. In a flask colourless N_2O_4 is in equilibrium with brown colourless NO_2. At equilibrium when the flask is heated at $100^O c$ the brown colour deepens and on cooling it becomes less coloured. The change in enthalpy $Da < aH$, for the system is:

A. Negative

B. Positive

C. Zero

D. Undefined

Answer: B

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199. For which system at equilibrium, at constant temperature, will the doubling of the volume cause a shift to the right:

A. $H_2(g) + Cl_2$(g) hArr 2HCl(g)

B. 2CO(g) +O_2(g) hArr 2CO_2(g)

C. $N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3$

D. $Pcl_5(g) \Leftrightarrow PCl_3(g) + Cl_2(g)$

Answer: D

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200. For which reaction K_p is less than `K_c:

A. $N_2O_4 \Leftrightarrow 2NO_2$

B. $2HI \Leftrightarrow H_2 + I_2$

C. $2SO_2 + O_2 \Leftrightarrow 2SO_3$

D. $N_2 + O_2 \leftrightarrow 2NO$

Answer: C

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201. When $NaCl_3$ is heated in a closed vessel, oxygen is liberated and $NaNO_2$ is left behind. At equilibrium:

A. Addition of $NaNO_2$ favours reverse reaction

B. Addition of $NaNO_2$ favours forward reaction

C. Increasing temperature favours forward reaction

D. Decreasing pressure favour reverse reaction

Answer: C

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202. Which is a reversible reaction:

A. $H_2 + I_2 \rightarrow 2HI$

B. $H_2SO_4 + Ba(OH)_2 \rightarrow BaSO_4 + 2H_2O$

C. $Nacl + AgNO_3 \rightarrow NaNO_3 + Agcl \downarrow$

D. $2KClO_3 \rightarrow 2KCl + 3O_2 \downarrow$

Answer: A

Watch Video Solution

203. In lime kiln,the reversible reaction, $CaCO_3(s) \Leftrightarrow CaO(s) + CO_2(g)$ proceeds to completion because:

A. of high temperature

B. CO_2 escapes out

C. Cao is removed

D. of low temperature

Answer: B

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204. In the reaction, $N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3(g)$ increase in H_2 concentration equilibrium:

A. Favours the dissociation of NH_3

B. Does not effect the reaction

C. Increases the equilibrium constant

D. Favours the formation of NH_3

Answer: D

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205. For the reaction, $CuSO_{4.5}H_2O(s) \Leftrightarrow CuSO_{4.3}H_2O(s) + 2H_2O(v)$.

Which one is correct representation ?

A. $K_p = \left(p^2_{H_{20}}\right.$

B. $K_c = [H_2O]^2$

C. $K_P = K_c(RT)^{-2}$

D. All of the above

Answer: D

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206. The equilibrium which remains uneffected by pressure change is :

A. $N_2(g) + O_2 \Leftrightarrow 2NO(g)$

B. $2O_3(g) \Leftrightarrow 3O_2$

C. 2O_3(g) hArr 3O_2`

D. $2NO_2 \Leftrightarrow N_2O_4$

Answer: A

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207. In an equilibrium reaction if $\Delta G^o = 0$ the equilibrium constant, K should be equal to:

A. Zero

B. 1

C. 2

D. 10

Answer: B

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208. Solubility of a subsatnce which dissolves with a decrease in volume and absorption of heat will be favoured by:

A. High P and High T

B. low P and low T

C. High P and low T

D. Low P and high T

Answer: A

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209. A chemical system is in equilibrium Addition of a catalyst would result in:

A. Increase in the rate of forward reaction

B. increase in the rate of reverse reaction

C. A new reaction path way to reaction

D. Increase the amount of heat evolved in the reaction

Answer: C

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210. In a vessel containing SO_3, SO_2 and O_2 at equilibrium,some helium gas is introduced os that the total pressure increases while temperature and volume remain constant. According to Le chatelier's principle the dissociation of SO_3 :

A. Increases

B. decreases

C. Reamains unaltered

D. Changes unpredictably

Answer: C

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211. Concentration of reaction and products at equilibrium for A + 2B $\Leftrightarrow$ C + D are, $[A] = 0.20$, $[B] = 0.10$, $[C] = 0.30$, $[D] = 0.50$. The value of equilibrium constant is:

A. 75

B. 150

C. 2.5

D. 750

Answer: A

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212. For a gaseous equilibrium, `A +2B hArr C + 3D the partial pressures of A, B, C and D are found to be 0.20, 0.10, 0.30 and 0.50 atm respectively. Predict the value of equilibrium constant.

A. 11.25

B. 18.75

C. 5

D. 3.75

Answer: B

Watch Video Solution

213. HI was heated in a sealed tube at $440^{O}c$ till the equiibrium was reached. HI was found to be 22% decomposed. Calculate the equilibrium constant for dissociation.

A. 0.282

B. 0.0796

C. 0.0199

D. 1.99

Answer: C

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214. The equilibrium constant for, $H_2(g) + CO_2(g) \Leftrightarrow H_2O(g) + CO(g)$ is 1.80 at $1000^{O}c$. If 1.0 mole of H_2 and 1.0 mole of CO_2 are placed in one litre flask. What will be the final equilibrium concentration of CO at $1000^{O}c$?

A. 0.573 M

B. 0.385 M

C. 5.73M

D. 0.295 M

Answer: A

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215. An equilibrium mixture for the reaction, $2H_2S(g) \Leftrightarrow 2H_2(g) + S_2(g)$ had 0.5 mole H_2S, 0.10 mole H_2 and 0.4 mole S_2 in one litre vessel. K_c for the reaction is :

A. 0.004 mol /lit

B. 0.016 mol/lit

C. 0.008 mol/lit

D. 0.160 mol/lit

Answer: B

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216. The equilibrium constant for the reaction , $3C_2H_2 \Leftrightarrow C_6H_6$ is 4.0 at T K. If the equilibrium concentration of C_2H_2 is 0.5 mole/litre the concentration of `C_6H_6.

A. 0.5 M

B. 1.5 M

C. 5×10^{-2}

D. 0.25 M

Answer: A

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217. For the reaction $C(s) + CO_2(g)$ hArr 2CO(g) the partial pressure of CO_2 and CO are 4 and 8 atm respectively K_p For the reaction is :

A. 16 atm

B. 2 atm

C. 5 atm

D. 4 atm

Answer: A

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218. If one third HI decomposes at a particular temperature: K_c for $2HI \Leftrightarrow H_2 + I_2$ is :

A. 1/16

B. 1/4

C. 1/6

D. 1/2

Answer: A

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219. For a reversible reaction the rate constant for the forward reaction is 2.38×10^{-4} and for the backward reaction is 8.15×10^{-5} The k_c of the reaction is:

A. 0.342

B. 2.92

C. 0.292

D. 3.42

Answer: B

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220. 28 g N_2 and 6 g H_2 were mixed .At equilibrium 17 g NH_3 was formed. The weight of N_2 and H_2 of equilibrium are respectively:

A. 11 g zero

B. 1g , 3 g

C. 14 g , 3g

D. 11g , 3g

Answer: C

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221. At $25^o c$ the equilibrium constant K_1 and K_2 of two reaction are : $2NH_3 \Leftrightarrow$ N_2+$3H_2$: $\frac{1}{2}N_2 + \frac{3}{2}H_2 \Leftrightarrow NH_3$ the relation between two equilibrium constant is :

A. $K_1 = K_2$

B. $K_2 = \frac{1}{K_1^2}$

C. $K_1 = \frac{1}{K_2^2}$

D. $K_1 = \frac{1}{K_2}$

Answer: C

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222. The function of an enzyme in a reaction of the type `A+B hArr C+D is to decreases:

A. Equilibrium constant

B. Rate of forward reaction

C. Rate of backward reaction

D. Activation energy

Answer: D

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223. The numerical value of K_p and K_c$f or the equilibrium$2NH_3 hArr N_2 + 3H_2` are related as :

A. $K_p = K_c \times (RT)^3$

B. $K_p = K_c \times (RT)^{-2}$

C. $K_p = K_c \times (RT)^2$

D. None of these

Answer: C

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224. The variation of equilibrium constant with temperature is called :

A. van't Hoff isotherm

B. Kirchoff's equation

C. van't Hoff isochore

D. None of these

Answer: C

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225. Which statement is correct about Henry's law ?

A. The amount of gas dissolved per unit volume of solvent is directly propotional to pressure of gas.

B. The amount of gas dissolved per unit volume of solvent is directly independent to pressure of gas.

C. The law is valid only when the gas dissolved neither dissociates nor associates in solvent

D. All of the above

Answer: D

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226. For the reaction $N_2 + 3H_2 \Leftrightarrow 2NH_3$ in a vessel after the addition of equal number of mole of N_2 and H_2 equilibrium state is formed.Which of the following is correct ?

A. $[H_2] = [N_2]$

B. $[H_2] < N_2]$

C. $[H_2] > N_2]$

D. $[H_2] > [NH_3]$

Answer: B

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227. For a reaction in gaseous state to reach an equilibrium state the reaction should be carried out in

A. An open vessel

B. Closed vessel

C. Glass vessel

D. Iron vessel

Answer: B

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228. Which reaction gives more products as a result of increase in pressure :

A. $H_2O + CO \Leftrightarrow H_2 + CO_2$

B. $H_2 + Br_2 \Leftrightarrow 2HBr$

C. $2SO_2 + O_2 \Leftrightarrow 2SO_3$

D. $2HI \Leftrightarrow H_2 + I_2$

Answer: C

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229. On addition of an inert gas at constant volume to the reaction : $N_2 + 3H_2 \Leftrightarrow 2NH_3$ at equilibrium:

A. The reaction halts

B. forward reaction is favoured

C. The reaction remains unaffected

D. Backward reaction is favoured

Answer: C

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230. The equilibrium constant for the reaction : $N_2(g) + O_2(g) \rightarrow 2NO(g)$ and $2NO(g) + O_2(g) \rightarrow 2NO_2$ are $K1$ and $K2$ respectively. Then the equilibrium constant for the equilibrium `NO 2 (g)⇌ 1/2 N 2 (g)+O 2 (g) ?

A. $\dfrac{K_1}{K_2}$

B. $\left[\frac{1}{K}1K2\right]\frac{1}{2}$

C. $K_1K_2^2$

D. $K_1^2K_2$

Answer: C

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231. In the reversible gaseous reaction , $A+2B\Leftrightarrow C+3D$ The partial pressure of A B C and D are 0.20 , 0.10 , 0.30 ,0.50 atm respectively at equilibrium. The numerical value of `K_p is :

A. 11.25

B. 18.75

C. 5

D. 3.75

Answer: B

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232. The formation of phosgene is represented as , CO+Cl_2 hArr $COCl_2$ The reaction is carried out in 500 ml flask. At equilibrium 0.3 mole of phosgene, 0.1 mole of CO and 0.1 mole of Cl_2 are present. What is the equilibrium constant of the reaction ?

A. 30

B. 15

C. 5

D. 3

Answer: B

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233. In the reaction, $A + B \Leftrightarrow 2C$, at equilibrium, the concentration of A and B is 0.20 mol $litre^{-1}$ each and that of C was found to be 0.60 mol

$litre^{-1}$. The equilibrium constant of the reaction ?

A. 9

B. 4.8

C. 18

D. 2.4

Answer: A

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234. The equilibrium constants for the reaction, $Br_2 \Leftrightarrow 2Br$ at 500 K and 1×10^{-10} and $1 \times ^{-5}$ respectively. The reaction is:

A. Endothermic

B. Exothermic

C. Fast

D. Slow

Answer: A

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235. ΔG^o for the reaction $X + Y \Leftrightarrow Z$ IS -4.606 kcal. The equilibrium constant for the reaction at $227^O c$ is:

A. 100

B. 10

C. 2

D. 0.01

Answer: A

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236. The partial pressure of $CH_3OH(g)$, CO(g) and $H_2(g)$ in equilibrium mixture for the reaction, $CO(g) + 2H_2(g) \Leftrightarrow CH_3OH(g)$ are 2.0,1.0 and

0.1 atm respectively at $427^{O}c. The value of$ K_pf or $the decomposition of$

CH_3OH $\rightarrow CO$ and H_2` is :

A. 10^{2} atm

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

C. 50 atm^{2}

D. $5 \times 10(-3)\ atm^{2}$

Answer: D

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237. The equilibrium constant of a reaction is 20.0. At equilibrium, the rate constant of forward reaction is 10.0. The rate constant for backward reaction is:

A. 0.5

B. 2

C. 10

D. 200

Answer: A

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238. For the reaction a$C(s) + CO_2(g) \Leftrightarrow 2CO(g)$, the partial pressure of CO_2 and CO are 2.0 and 4.0 atm respectively at equilibrium. The K_p for reaction is:

A. 0.5

B. 4

C. 8

D. 32

Answer: C

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239. In the reaction,$PCl_5 \Leftrightarrow PCl_3 + Cl_2$, the amounts of PCl_5 PCl_3 and Cl_2 at equilibrium are 2 mole each and the total pressure is 3 atm. The equilibrium constant K_p is:

A. 1 atm

B. 2 atm

C. 3 atm

D. 6 atm

Answer: A

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240. If 340 g of mixture N_2 and H_2 in the correct raito gave a 20% yield of NH_3. The mass produced would be:

A. 16 g

B. 17 g

C. 20 g

D. 68g

Answer: D

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241. In a chemical equilibrium, the rate constants of the forward and backward reactions are respectively 3.2×10^{-4} and 1.2×10^{-5} , the equilibrium constant is :

A. 0.37

B. 26.7

C. 0.25

D. 3.7

Answer: B

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242. one mole of hydrogen iodide is heated in a closed container of 2 litre. At equilibrium half mole of hydrogen iodide has dissociated. What is the value of the equilibrium constant ?

A. 1

B. 5

C. 0.25

D. 0.75

Answer: C

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243. For the reaction $2NO_2(g) \Leftrightarrow 2NO(g) + O_2(g)$, $K_c = 1.8 \times 10^{-6}$ at $185^O c$. At $185^O c$, What is the value of K_c for $NO(g) + \frac{1}{2}O_2(g) \Leftrightarrow NO_2(g)$?

A. 0.9×10^{-6}

B. 7.5×10^2

C. `1.95xx10^(-3)

D. `1.95xx10^(3)

Answer: B

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244. 4 moles of A are mixed with 4 moles of B. When 2 moles of C are formed at equilibrium accordingly to the reaction $A + B \rightarrow C + D$. K_c is:

A. 4

B. 1

C. $\sqrt{2}$

D. $\sqrt{4}$

Answer: B

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245. 3.2 mole of hydrogen iodide were heated in a sealed bulb at $444^{O}c$ till the equilibriumn was reached . The degreee of dissociation of HI at this temperature was found to be 22% calculate the number of mole of hydrogen iodide present at equlibrium.

A. 2.496

B. 1.87

C. 2

D. 4

Answer: A

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246. For the reaction $H_2(g) + I_2(g) \Leftrightarrow 2HI(g)$ at 720 K the value of equlibrium constant is 50. When equilibrium concentration of H_2 and I_2

IS 0.5 M.`K_p under the same conditions will be :

A. 0.02

B. 0.2

C. 50

D. 50RT

Answer: C

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247. A quantity of PCl_5 was heated in a 10 litre vessel at $250^\circ C$ to show $PCL_5(g) \Leftrightarrow PCl_3 + Cl_2$ AT equilibrium the vessel contains 0.1 mole of PCl_5 0.20 mole of PCl_3 and 0.20 mole od cl_2 The equilibrium constant of the reaction is :

A. 0.02

B. 0.05

C. 0.04

D. 0.025

Answer: C

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248. If ΔG° for the reaction given below is 1.7KJ : The equilibrium constant of the reaction $2HI(g) \Leftrightarrow H_2(g) + I_2(g)at25$^@C` IS :

A. 24

B. 3.9

C. 2

D. 0.5

Answer: D

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249. At a given temperature the K_c for the reaction $PCL_5(g) \Leftrightarrow PCl_3 + Cl_2$ is 2.4×10^{-3} At the same temperature the K_c for the reaction $PCl_3 + Cl_2 \Leftrightarrow PCL_5(g)$ is :

A. $2.4XX10^{-3}$

B. -2.4×10^{-3}

C. 4.2×10^2

D. 4.8×10^{-2}

Answer: C

Watch Video Solution

250. For a reaction $2A + B \Leftrightarrow C$ where initial concentration of A=2M B=1M and C=0 the concentration of B at equilibrium is 0.5 M calculate the value of equilibrium constant for the reaction .

A. 0.5

B. 2

C. 1

D. 1.5

Answer: C

Watch Video Solution

251. $\frac{K_p}{K_c}$ for the reaction: `CO(g)+1/2O_2(g) hArr CO_2(g) is :

A. RT

B. 1/$\sqrt{R}T$

C. $\sqrt{R}T$

D. 1

Answer: B

Watch Video Solution

252. If the concentration of N_2 ,H_2 and NH_3 are 1,2,3, respectively , their concentration at equilibrium will be : $N_2 + 3H_2 \Leftrightarrow 2NH_3$.

A. (1-x) (2-3x) (2x)

B. (1-x/3) (2-x) (2x/3)

C. (1-x) (2-x) (3+x)

D. (1-x) (2-3x) (3+2x)

Answer: D

Watch Video Solution

253. For the equilibrium, $CaCO_3(s) \Leftrightarrow CaO(s) + CO_2$(g) which of the following expression is correct :

A. $K_p = [CaO]\frac{CO_2}{CaCO_3}$

B. $K_p = \frac{p(cao) + p(co_2)}{p_{caco_2}}$

C. $K_p = p(co_3)$

D. `K_p=(p_(cao)+p_(co_2))/p_(caco_3)

Answer: C

Watch Video Solution

254. For the reaction , $A \Leftrightarrow$ B : K_c =2 ,$B \Leftrightarrow$ C : K_c =4 , $C \Leftrightarrow$ D : K_c =6 K_c

for the reaction A hArr D is :

A. $(2 \div 4 \div 6)$

B. $\frac{2 \times 4}{6}$

C. $\frac{4 \times 6}{2}$

D. $2 \times 4 \times 6$

Answer: D

Watch Video Solution

255. For the reversible reaction $N_2(g) + 3H_2(g) = 2NH_3(g) at$500^@C

$the value of$K_p is

$1.44 \times 10^{-5} when \partial pressure measured \in atmosphere The c$ or $rospond \in$

K_c` with concentration is mole/lit. IS :

A. $\dfrac{1.44 \times 10^{-5}}{(0.082 \times 500)^{-2}}$

B. $\dfrac{1.44 \times 10^{-5}}{(8.314 \times 773)^{-2}}$

C. $\dfrac{1.44 \times 10^{-5}}{(0.082 \times 773)^{-2}}$

D. $\dfrac{1.44 \times 10^{-5}}{(0.082 \times 773)^{-2}}$

Answer: D

Watch Video Solution

256. 2 MOLE of PCl_5 were heated in a closed vessel of 2 litre capacity. AT equilibrium 40% Of PCl_5 dissociated into $PCl_3$and Cl_2.Find the value of equilibrium constant.

A. 0.267

B. 0.53

C. 2.63

D. 5.3

Answer: A

Watch Video Solution

257. If K_e of the reaction, $2HI \rightarrow H_2 + I_2$ is 0.25, the equilibrium constant of the reaction $H_2 + I_2 \rightarrow$ 2HI would be :

A. 1

B. 2

C. 3

D. 4

Answer: D

Watch Video Solution

258. One mole of ethyl alcohol was treated with one mole of acetic acid at `25^@C. 2/3 of the acid changes into ester at equilibrium Calculate the equilibrium constant for the reaction :

A. 1

B. 2

C. 3

D. 4

Answer: D

Watch Video Solution

259. If in the reaction $N_2O_4 \rightleftharpoons 2NO_2$,$\alpha$ is degree of dissociation of N_2O_4 Then the number of molecules at equiliberium will be :

A. 3

B. 1

C. $(1-\alpha)^2$

D. $(1+\alpha)$

Answer: D

Watch Video Solution

260. $K_c f$ or $A+B \rightleftharpoons C+Dis10at25$^o C

$. If aconta \in erconta \in s1, 2, 3, 4mo \leq perlitreof A, B, C,$ and $Drespect$

25^o C` , the reaction shall :

A. Proceed from right to left

B. Proceed from right to left

C. Be at equilibrium

D. None of these

Answer: A

Watch Video Solution

261. For a system in equilibrium, $\Delta G = 0$ under conditions of constant :

A. Temperature and pressure

B. temperature and volume

C. Energy and volume

D. Pressure and volume

Answer: A

Watch Video Solution

262. Dissolution of sugar being an endothermic reaction is favoured by :

A. Low T

B. High T

C. High P

D. Low P

Answer: B

Watch Video Solution

263. For the reaction `PCL_5 hArr PCL_3+CL_2, the forward reaction at constant temperature is fovoured by :

A. Introduction an inert gas at constant volume

B. Introduction chlorine gas at constant volume

C. Introduction an inert gas at constant pressure

D. None of these

Answer: C

Watch Video Solution

264. The reaction which proceed in the forward direction is :

A. $Fe_2O_3 + 6HCl = 2FeCl_3 + 3H_2O$

B. $SnCL_4 + Hg_2Cl_2 = SnCl_2 + 2HgCl_2$

C. $NH_3 + H_2O + NaCl = NH_4Cl + NaOH$

D. $2CuI + I_2 + 4K^+ = 2Cu^{2+}3KI$

Answer: A

Watch Video Solution

265. For reaction $PCl_3(g) + Cl_2(g) \rightleftharpoons PCl_5(g)$ the value of K_c at 250^oC is 26 mol^(-1) litre^(-1). The value of K_P at this temperature will be :

A. 0.61 atm^{-1}

B. 0,57 atm^{-1}

C. 0.83 atm^{-1}

D. 0.46 atm^{-1}

Answer: A

Watch Video Solution

266. For the gaseous phase reaction,

$2NO \rightleftharpoons N_2 + O_2, \Delta H^o = -43.5 Kcalmol^{-1}, Whichstatementisc$ or rc

N_2 (g) + O_2 (g) ⇌ 2NO(g):

A. K is independent of temperature

B. K increases as temperature decreases

C. K decreases as temperature decreases

D. K varies with addition of NO

Answer: C

Watch Video Solution

267. In which of the following cases, does the reaction go farthest to completion :

A. K = 10^3

B. K = 10^{-2}

C. K = 10

D. K = 1

Answer: A

Watch Video Solution

268. The solubility of CO_2 in water increases with :

A. Increases in temperature

B. Increases in pressure

C. Decreases in pressure

D. None of these

Answer: B

Watch Video Solution

269. If K_1 and K_2 are the respective equiliberium constant for the two reactions

$XeF_6(g) + H_2O(g) = XeOF_4(g) + 2HF(g)$

$XeO_4(g) + XeF_6(g) \rightleftharpoons XeOF_4(g) XeO_3F_2(g)$, The equiliberium constant for the reaction, $XeO_4(g) + 2HF(g) \rightleftharpoons XeO_3F_2 + H_2O(g)$ is :

A. K_1K_2

B. $\dfrac{K_1}{K_2^2}$

C. $\dfrac{K_2}{K_1}$

D. $\dfrac{K_1}{K_2}$

Answer: C

Watch Video Solution

270. A cylinder fitted with a movable piston contains liquid water in equiliberium with water vapour at $25^{o}C$. Which operation result in a decrease in the equiliberium vapour pressure ?

A. Moving the oiston downward a short distance

B. removing a small amount of vapour

C. Removing a small amount of the liquid water

D. Dissolving salt in the water

Answer: D

Watch Video Solution

271. The equiliberium constant for the reaction, 2X(g) + Y(g) ⇌ 2Z(g) is 2.25 litre mol^{-1} What would be the concentration of Y at equiliberium with 2.0 mole of X and 3.0 mole of Z in one litre vessel :

A. 1.0 M

B. 2.25 M

C. 2.0 M

D. 4.0 M

Answer: A

Watch Video Solution

272. At constant temperature in one litre vessel when the reaction $2SO_2(g) \rightleftharpoons 2SO_2(g) + O_2(g)$ is at equiliberium the SO_2 concentration is 6.0 M, initial concentration of SO_3 is 1 M. calculate the equiliberium constant.

A. 2.7

B. 1.36

C. 0.34

D. 0.675

Answer: D

Watch Video Solution

273. For a reaction

$2A + B \rightleftharpoons C + D, the \partial pressure of A, B, C$ and $D at equiliberium are 0.5$

k_p` for this reaction is :

A. 4.2

B. 2.4

C. 0.42

D. 0.24

Answer: A

Watch Video Solution

274. The decomposition of $N_2O_4 \rightarrow NO_2$ is carried out at 280 K in chloroform.When equiliberium has been established,0.2 mole of N_2O_4 and 2×10^{-3} mole of NO_2 are present in a 2 litre solution. THE equiliberium constant for the reaction, $N_2O_4 \rightleftharpoons 2NO_2$ is :

A. 1×10^{-2}

B. 1×10^{-3}

C. 1×10^{-5}

D. 2×10^{-5}

Answer: C

Watch Video Solution

275. In the equiliberium

$2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3$, the partial pressure of SO_2, O_2 AND SO_3 $are 0.662, 0.101$ and $0.331 atm respectively. W\hat{s}hod\underline{d}bethepartiaalpressure$

SO_2 and SO_3` are equal ?

A. 0.4 atm

B. 1.0 atm

C. 0.8 atm

D. 0.25 atm

Answer: A

Watch Video Solution

276. For reaction $PCl_3(g) + Cl_2(g) \rightleftharpoons PCl_5(g)$ the value of K_c at 250^oC is 26 mol^(-1) litre^(-1). The value of K_P at this temperature will be :

A. 0.605

B. 0.57

C. 0.83

D. 0.46

Answer: A

Watch Video Solution

277. At equiliberium , the amount of HI in a 3 litre vessel was 12.8 g. Its equiliberium concentraction is :

A. 4.267 M

B. 0.033 M

C. 0.1 M

D. 0.2 M

Answer: B

Watch Video Solution

278. One mole of nitrogen is mixed with 3 mole of hydrogen in a closed 3 litre vessel $20\ \%$ of nitrogen is converted into NH_3 .Then what is the K_C

for $\frac{1}{2}(N_2) + \frac{3}{2}(H_2) \rightleftharpoons NH_3$

A. 0.36 litre mol^{-1}

B. 0.46 litre mol^{-1}

C. 0.5 litre mol^{-1}

D. 0.2 litre mol^{-1}

Answer: A

Watch Video Solution

279. 1.1 mole of A are mixed with 2.2 mole of Band the mixture is then kept In one litre flask till the equiliberium is attained A + 2B ⇌ 2C + D. At the equiliberium, 0.2 mole of C are formed. The equiliberium constant of the rection is :

A. 0.001

B. 0.002

C. 0.003

D. 0.004

Answer: A

Watch Video Solution

280. For the reaction $A + B \rightleftharpoons C + D$ the initial cocentration pf A and B are equal but the equiliberium concentration of C is twice that of equiliberium concentration of A. Find the value of the equiliberium constant .

A. 4

B. 9

C. 1/4

D. 1/9

Answer: A

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281. The degree of dissociation of$PCl_5(\alpha)$ obeying the equiliberium, $PCl_5 \rightleftharpoons PCl_3 + Cl_2$ is approximately realted to the pressure at equilibrium by :

A. alpha prop P`

B. $\alpha \propto \dfrac{1}{\sqrt{P}}$

C. $\alpha \propto \dfrac{1}{P^2}$

D. $\alpha \propto \dfrac{1}{P^4}$

Answer: B

Watch Video Solution

282. If K_1 and K_2 are equiliberium constant for reactions (I) and (II) respectively for ,

$N_2 + O_2 \rightleftharpoons 2NO$ ....(i)

$\frac{1}{2}N_2 + \frac{1}{2}O_2 \rightleftharpoons NO$ ....(ii)

then :

A. $K_2 = K_1$

B. $K_2 = \sqrt{K_1}$

C. $K_1 = 2K_2$

D. $K_1 = \left(\frac{1}{2}\right)K_2$

Answer: B

Watch Video Solution

283. The most favourable conditon of temperature and pressure for the oxidation of $SO_2 \int oSO_3$ are :

A. Low remperature and high pressure

B. low temperature and low pressure

C. High temperature and high pressure

D. High temperature andlow pressure

Answer: A

Watch Video Solution

284. When KOH is dissolved in water, Heat is evolved. If the temperature is raised, the solubility of KOH:

A. Increases

B. Decreases

C. Remains the same

D. Cannot be predicted

Answer: B

Watch Video Solution

285. Solubility of a gas in liquid increaes on :

A. Addition of a catalyst

B. Increasiing the pressure

C. Decreasing the pressure

D. Increasing the temperature

Answer: B

Watch Video Solution

286. A reversible chemical reaction having two reactant is in equiliberium. If the concentrations of the reactants are doubled then the equiliberium constant will :

A. Also be doubled

B. Be halved

C. Become one fourth

D. Remains the same

Answer: D

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287. Reaction favoured by low pressure is :

A. $H_2 + I_2 \rightleftharpoons 2HI$

B. $PCl_5 \rightleftharpoons PCl_3 + Cl_2$

C. $N_2 + 3H_2 \rightleftharpoons 2NH_3$

D. $N_2 + O_2 \rightleftharpoons 2NO$

Answer: B

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288. van't Hoff' equation giving the effect of temperature on chemical equiliberium is represented a :

A. $\frac{d\ln F}{dT} = \frac{\Delta H}{RT^2}$

B. $\frac{d\ln K_P}{dT} = \frac{\Delta HT^2}{R}$

C. $\frac{d\ln K_P}{dT} = \frac{\Delta H}{RT^2}$

D. $\frac{d\ln K_P}{dT} = \frac{RT^2}{\Delta H}$

Answer: C

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289. The unit of equilibrium constant for the reaction , $H_2 + I_2 \Leftrightarrow 2HI$ IS :

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290. the equiliberium constant K for the reaction $2HI(g) \rightleftharpoons H_2(g) + I_2(g)$ at room temperature 300 K is 2.85 and at 698 K is1.84×10^{-2} . Hence the reason that HI existsas a stable compound at room temperature is because :

A. It decomposes so slowly that equilibrium is not readily achived

B. The HI bond has a large covalent contribution

C. The heat of reavtionat room temperature is $-5.31 kcal$

D. It is uncatalytic reaction

Answer: C

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291. The equilibrium constant foa a reaction is 1×10^{20} at 300 K.Find the standard free energy vhange for this reaction.

A. `-115 kJ

B. `+115 kJ

C. `+16 kJ

D. `-166 kJ

Answer: A

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292. A(g) + B(g) $\rightleftharpoons$ AB(g) is areversible reaction. At equilibrium 0.4 mole of AB is formed whn each A and B are tsken on emole. How much of A change into AB ?

A. $20\ \%$

B. $40\ \%$

C. $60\ \%$

D. $4\ \%$

Answer: B

Watch Video Solution

293. 8 mole of a gas AB_3 are introduced into a 1.0 dm^3 vessel. It dissociates as, $2AB_3(g) \rightleftharpoons A_2(g) + 3B_2(g)$ At equilibrium, 2 mole of A_2 are found ot be present. What is the equilibrium constant of rection ?

A. 2

B. 3

C. 27

D. 36

Answer: C

Watch Video Solution

294. At a certain temperature , $2HI \rightleftharpoons H_2 + I_2 on 50$ % HI is dissolved at equilibrium .What the value of equilibrium constant ?

A. 1

B. 3

C. 0.5

D. 0.25

Answer: D

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295. Equilibrium concentration of HI, I_2 and H_2 are 0.7, 0.1 and 0.1 M respectively.The equilibrium constant for the reaction,

$I_2 + H_2 \rightleftharpoons 2HI$ is :

A. 0.36

B. 36

C. 49

D. 0.49

Answer: C

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296. An equilibrium mixture of the reaction $2NO(g) + O_2(g) \Leftrightarrow 2NO_2(g)$ contains 0.120 mole of NO_2 , 0.080 mole of 0.640 mole of O_2 in a 4 litre flask at a constant temperature . The value K_c for the reaction at this temperature is :

A. 14

B. 24

C. 7

D. 8

Answer: A

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297. The equilibrium concentration of X , Y and YX_2 are 4,2,2 respectively for the equilibrium $2X + Y \Leftrightarrow YX_2$ The equilibrium constant K_c is :

A. 0.0625

B. 0,625

C. 0.0628

D. None of these

Answer: D

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298. The reaction $A + 2B \Leftrightarrow 2C + D$ was situated using an initial concentration of B which was 1.5 times that of A But the equilibrium concentration of A and C were found to be equal . Then what is the K_c for the equilibrium?

A. 4

B. 8

C. 6

D. 0.632

Answer: A

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299. The vapour density of undecomposed N_2O_4 is 46. When heated vapour density decreases to 24.5 due to its dissociation to NO_2 WHAT is the percent dissociation of N_2O_4 at the final stage ?

A. 88

B. 60

C. 40

D. 70

Answer: A

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300. For a system

$A + 2B \Leftrightarrow 2C the equilibrium concentration are [A] = 0.06, [B] = 0.12$ an

K_c` for the reaction is :

A. 54

B. 415

C. 4×10^{-5}

D. 125

Answer: A

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301. An aqueous solution of hydrogen sulphide shows the equilibrium, $H_2S \rightleftharpoons H^+ + HS^-$ if dilute hydrochloric acid is added to an aqueous solution of hydrogen sulphide without any change in temperature:

A. The equilibrium constant will change

B. The concentration HS^- will increase

C. The concentration of undissociated hydrogen sulphide will decrease

D. The concentration of HS^- will decrease.

Answer: D

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302. Consider the reversible reaction, $HCN(aq.) \rightleftharpoons H^{+} + CN^{-(aq.)} Atequilibriumtheadditionof$CN^-(aq.) would:

A. Reduce HCN(aq.) concentration

B. Decrease the H^{+}(aq.) ion concentration

C. Increase the equilibrium constant

D. Decrease the equilibrium constant

Answer: B

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303. Which can be explained as applications of Le Chatelier 's principle :

A. Transport of oxygen by haemoglobin in blood

B. Removal of CO_2 from tissues by blood

C. Tooth decay due to use of sweet substances

D. All of these

Answer: D

Watch Video Solution

304. The following equilibrium exist in aqueous solution, $CH_3COOH \rightleftharpoons$ CH_3COO^- + H^+` If dilute HCl is added without a change in temperature then :

A. Concentration of `CH_3COO^- will decrease

B. Concentration of `CH_3COO^- will increase

C. The equilibrium constant will increase

D. The equilibrium constant will decrease

Answer: A

Watch Video Solution

305. The equilibrium constant for the reactions are :

$H_3PO_4 \xrightarrow{K} H^+ + H_2PO_4^- : K_1$

$H_2PO_4 \xrightarrow{K} H^+ + HPO_4^{2-} : K_2$

$HPO_4^{2-} \xrightarrow{K} H^+ + PO_4^{3-} : K_3$ The equilibrium constant for

$H_3PO_4 \to 3H^+ + PO_4^{3-}$ will be :

A. K_1/K_2 K_3

B. $K_1 \times K_2 \times K_3$

C. K_2/K_1 K_3

D. K_1/K_2/K_3

Answer: B

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306. If 1 mole of I_2 is introduced into 1.o litre flask at 1000 K, at equilibrium (K_c = 10^-6) which one is correct ?

A. [I_2(g)]gt $\left[I^{-(g)}\right]$

B. [I_2(g)]lt $\left[I^{-(g)}\right]$

C. [I_2(g)]= $\left[I^{-(g)}\right]$

D. [I_2(g)]gt1/2 $\left[I^{-(g)}\right]$

Answer: A

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307. If ammonia is added to pure water the concentration of a chemical species already present will decrease.The species is :

A. O^{2-}

B. OH^{-}

C. H_3O^{+}

D. H_2O

Answer: C

Watch Video Solution

308. If the system $CaF_2(s) \Leftrightarrow Ca^{2+} + 2F^{- \in} crea \sin g the concentration of$Ca^(2+) ions 4 times will cause the equilibrium concentration of F^- ions to change to :

A. 1/4 of the initial value

B. 1/2 of the initial value

C. 2 times of the initial value

D. None of these

Answer: B

Watch Video Solution

309. When CO_2 dissolves in water the following equilibrium is established, $CO_2 + 2H_2O \Leftrightarrow H_3O^+ HCO_3^-$ for which the equilibrium

constant is 3.8×10^{-7} and PH =6.0 The ratio of $\frac{HCO_3}{CO_2^-}$ IS :

A. 3.8×10^{-18}

B. 3.8

C. 0.38

D. 13.8

Answer: C

Watch Video Solution

310. For the reaction: $\left[Ag(CN)_2\right]^{-} \Leftrightarrow Ag^{+} + 2CN^{-}$ the equilibrium constant K_c at $25^{\circ} C$ is $4.0 \times 10^{-19} thenthesilverionconcentration \in asolutionwhichwas \text{ or } ig$ ∈

AgNO_3`

A. 7.5×10^{18}

B. 7.5×10^{-18}

C. 7.5×10^{19}

D. 7.5×10^{-19}

Answer: B

Watch Video Solution

311. Calculate the concentration of hydroxyl ion in a solution left after mixing 100 ml of 0.1 M $Mgcl_2$ and 100 ml of 0.2 M NaOH [K_sp of $Mg(OH_2)$=1.2×10^{-11})]

A. 2.8×10^{-3}

B. 2.8×10^{-2}

C. 2.8×10^{-4}

D. 2.8×10^{-5}

Answer: C

Watch Video Solution

312. Find the PH of saturated solution of $Mg(OH)_2$ [K_p of Mg(OH_2)=`8.9xx 10^(-12)]

A. 10.4168

B. 9.4168

C. 11.4168

D. 7

Answer: A

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313. What is PH at which an acid indicator with $K_a = 1 \times 10^{-5}$ changes colour when the indicator concentration is 1×10^{-3} M ?

A. 4

B. 5

C. 6

D. 3

Answer: B

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314. An acid type indicator Hin differ in colour from its conjugate base (In^-) The human eye is sensitive to the colour of differences only when the ratio [In^-]/[HIn] is greater than 10 or smaller than 0.1. What should be the minimum change in the PH of the solution to observe a complete colour change$\left(K_a = 1 \times 10^{-5}\right)$?

A. 4

B. 2

C. 6

D. 1

Answer: B

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315. Soda water has a PH value :

A. Less than 7

B. More than 7

C. 7

D. Greater than 7

Answer: A

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316. The ionic product of water ____ with the increase in temperature

A. Increases

B. Decreases

C. Remains constant

D. None of the above

Answer: A

Watch Video Solution

317. The PH of a solution is defined by the equation:

A. $pH = -\log[H_3O^+]$

B. $pH = \frac{\log 1}{H_{30}^+}$

C. $[H^+] = 10^{-pH}$

D. All of these

Answer: D

Watch Video Solution

318. If 1 M $CH_3COOHNa$ is added to 1M CH_3COOH:

A. pH of the solution increases

B. pH decreases

C. pH does not change

D. None of these

Answer: A

Watch Video Solution

319. The pH of mixture of , $CH_3COONA + CH_3COOH$ after adding water shows _____ value:

A. Increased

B. Decreased

C. Constant

D. All of the above

Answer: C

Watch Video Solution

320. The unit of ionic product of water (K_w) is :

A. $mol^{-1}litre^{-1}$

B. $mol^{-1}litre^{-2}$

C. $mol^{-2}litre^{-2}$

D. mol^2litre^{-2}

Answer: D

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321. Isoelctric point is defined as the pH at which :

A. An amino acid becomes acidic

B. An amino acid becomes basic

C. Zwitter ion has positive charge

D. Zwitter ion has zero charge

Answer: D

Watch Video Solution

322. The addition of HCl does not suppresses the ionisation of :

A. Acetic acid

B. Benzoic acid

C. H_2S

D. H_2SO_4

Answer: D

Watch Video Solution

323. Water acts as an acid in presence of :

A. NH_3

B. H_2SO_4

C. C_6H_6

D. HCl

Answer: A

Watch Video Solution

324. The dissociation constants of a weak acid and a weak base constituting the salt are same. The pH of a solution of salt is :

A. 7

B. More than 7

C. Less than 7

D. Zero

Answer: A

Watch Video Solution

325. Which one is bronstad acid but not a bronstad base?

A. H_2O

B. NH_3

C. H_2S

D. HCO_3^-

Answer: C

Watch Video Solution

326. The pH of blood is maintained by CO_2 and H_2CO_3 in the body and chemical constituents of blood.The phenomenon is called:

A. Collidal

B. Buffer solution

C. Acidity

D. Salt balance

Answer: B

Watch Video Solution

327. Fear or excitement generally cause one to breathe rapidly and it results in the decreases of concentration of CO_2 in blood. In what way it will change pH of blood :

A. pH will increase

B. pH will decrease

C. No change

D. pH will be 7

Answer: C

Watch Video Solution

328. On adding solid pottasium cyanide to water :

A. pH will increase

B. pH will decrease

C. pH will not change

D. Electrical conductance will not change

Answer: A

Watch Video Solution

329. The hydrogen ion concentration in a solution of weak acid of dissociation constant K_a and concentration C is nearly equal to :

A. $\sqrt{\frac{k_c}{C}}$

B. $\frac{C}{K_a}$

C. K_aC

D. $\sqrt{K_a C}$

Answer: D

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330. A 50 ml solution of 0.1M acetic acid is titrated against a 0.1 M sodium hydroxide.The best indicator will be :

A. Phenophthalein

B. Methyl orange

C. A self indicator

D. Methyl red

Answer: A

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331. Which is a mixed salt ?

A. $NaHCO_3$

B. Ca(OCL)CL

C. $K_2SO_4Al_2(SO_4)_{324}H_2O$

D. $MgBr_2$

Answer: B

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332. The aqueous solution of disodium hydrogen phosphate is :

A. Acidic

B. Neutral

C. Basic

D. None of these

Answer: C

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333. The aqueous solution of aluminium chloride is acidic due to :

A. Cation hydrolysis

B. Anion hydrolysis

C. Hydrolysis of both anion and cation

D. Dissociation

Answer: A

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334. Which gives a neutral solution in water?

A. $(NH_4)_2SO_4$

B. $Ba(NO_3)_2$

C. $Crcl_3$

D. $CuSO_4$

Answer: B

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335. Reaction of an acid with a base usually results in the production of

A. H_3O^+

B. H_2O

C. H^+ and OH^- ions

D. OH^-

Answer: B

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336. The precipitation is noticed when an aqueous solution of :

A. $NaNO_2$

B. $Ba(NO_3)_2$

C. $ZNSO_4$

D. $HgNO_3$

Answer: D

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337. Conjugate base of hydrazoic acid :

A. HN_3^-

B. N_3^-

C. N^{3-}

D. N_2^-

Answer: B

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338. Which one of the strongest base ?

A. $OH^{\,-}$

B. $RO^{\,-}$

C. $NH_2^{\,-}$

D. $R^{\,-}$

Answer: D

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339. Which one of the strongest acid ?

A. $ClO_3(OH)$

B. $ClO_2(OH)$

C. $SO(OH)_2$

D. $HCOO^-$

Answer: A

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340. Arrange H_2SO_4 (I) , H_3PO_4 (II) $HClO_4$ (III) in decreasing order of acidic nature:

A. IgtIIIgtII

B. IgtIIgtIII

C. IIIgtIIgtI

D. IIIgtIgtII

Answer: D

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341. Which anion is weakest base ?

A. $C_2H_5O^-$

B. NO_3^-

C. F^-

D. CH_3COO^-

Answer: B

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342. The weakest base among the following is :

A. H^-

B. CH_3^-

C. CH_3O^-

D. CL^-

Answer: D

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343. Which one is the strongest base?

A. AsH_3

B. NH_3

C. PH_3

D. SbH_3

Answer: B

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344. Weakest base among the following is :

A. NaOH

B. $Ca(OH)_2$

C. $Zn(OH)_2$

D. KOH

Answer: C

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345. The strongest base is :

A. Cl^-

B. CH_3COO^-

C. SO_4^{2-}

D. NO_2^-

Answer: B

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346. The conjugate base of OH^- ion is :

A. H_2O

B. `O^(2-)

C. H_3O^+

D. O^-

Answer: B

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347. Aqueous solution of which salt has the lowest pH :

A. NaoH

B. NH_4CL

C. Na_2CO_3

D. Nacl

Answer: B

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348. The strongest acid among the following is :

A. $ClO_3(OH)$

B. $ClO_2(OH)$

C. $SO(OH)_2$

D. $SO_2(OH)_2$

Answer: A

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349. The correct representation for solubility product of SnS_2 is :

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

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

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

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

Answer: A

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350. The hydrolysis of sodium carbonate involves the reaction betweem:

A. Na^+ and water

B. Na^+ and OH^-

C. CO_3^{2-} and water

D. CO_3^{2-} and H^+

Answer: C

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351. Given $HF + H_2O \xrightarrow{K_a} H_3O^+ + F^-$

$F^{-+}H_2O\overset{K_b}{H}F + OH^-$

Which relation is correct?

A. $K_b = K_w$

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

C. $K_a \times k_b = K_w$

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

Answer: C

Watch Video Solution

352. Which hydrolysis in water :

A. Nacl

B. NH_4CL

C. KCL

D. Na_2SO_4

Answer: B

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353. The pH of 0.1 M solution of the following salts increases in the order:

A. NaclltNH_4clltNaCNltHCL

B. HCllt`NH_4clltNacllt NaCN

C. NaCNltNH_4ClltNaclltHCl

D. HClltNaclltNaCNltNH_4Cl

Answer: B

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354. A solution of $CuSO_4$ in water will :

A. Turn red litmus blue

B. Turns blue litmus red

C. Show no effect on litmus

D. Decolourise litmus

Answer: B

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355. If s and S are respectively solubility and solubility product of a sparingaly soluble binary electrolyte then:

A. s=S

B. s=S^{12}

C. s=$s^{\frac{1}{2}}$

D. s=1/2S

Answer: C

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356. Which statement is /are correct?

A. All bronstad bases are also Lewis bases

B. All bronstad acids are not Lewis acid

C. All cations are acids and all anions are base

D. All of the above

Answer: D

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357. If the solubility of a sparingly soluble salt of the type BA_2 (giving three ions on dissociation of a molecule) is x mole per litre, Then its solubility product is given by :

A. x^2

B. $2x^2$

C. $4x^2$

D. $4x^3$

Answer: D

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358. The bronstad acid which gives the weakest conjugate base is :

A. HF

B. H_2S

C. H_2O

D. HCl

Answer: D

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359. The correct statement for the equilibrium is , $HClO_4 + H_2O \Leftrightarrow H_3O^+ + ClO_4^-$:

A. $HClO_4$ is the conjugate acid of H_2O

B. H_2O is the conjugate acid of H_3O^+

C. H_3O^+ is the conjugate base of H_2O

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

Answer: D

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360. The common ion effect is shown by which of the following:

A. $Bacl_2 + BaNO_3$

B. Nacl+ HCl

C. $NH_4OH + NH_4Cl$

D. None of these

Answer: C

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361. A white substance having alkaline nature in solution:

A. Fe_2O_3

B. Na_2CO_3

C. NH_4Cl

D. $NaNO_3$

Answer: B

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362. The correct relation for hydrolysis constant of NH_4CN is :

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

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

C. $\frac{\sqrt{K_H}}{C}$

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

Answer: B

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363. For weak acid strong base titration the indicator used is :

A. Pottasium dichromate

B. Methyl orange

C. Litmus

D. Phenolphthalein

Answer: D

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364. Phenolphthalein is not a good indicator for titrating:

A. NaOH against oxalic acid

B. Ferrous sulphate against $KMnO_4$

C. NaoH against HCl

D. NaoH against H_2SO_4

Answer: B

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365. The compound that does not act as lewis acid :

A. $AlCl_3$

B. BF_3

C. NH_3

D. $Fecl_2$

Answer: C

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366. The conjugate acid of NH_2^- IS :

A. NH_3

B. NH_2OH

C. NH_4^+

D. N_2H_2

Answer: A

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367. Which is lewis acid ?

A. Cl

B. NH_3

C. H_2O

D. BF_3

Answer: D

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368. Aprotic solvent is :

A. $\mathbb{C}l_4$

B. C_6H_6

C. SO_2

D. All of these

Answer: D

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369. For which salt the pH OF its solution does not change the dilution:

A. NH_4Cl

B. CH_3COONH_4

C. CH_3COONa

D. None of these

Answer: B

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370. Hcl does not behave as acid in :

A. NH_3

B. C_6H_6

C. H_2O

D. None of these

Answer: B

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371. In the reaction $Alcl_3 + Cl \rightarrow [Alcl_4]^-$, $AlCl_3$ acts as :

A. Salt

B. Lewis base

C. Lewis acid

D. Bronstad acid

Answer: C

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372. Which one is hard base ?

A. Ag^+

B. `Cr^(3+)

C. I_2

D. F^{-}

Answer: D

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373. Which does not act as bronsted acid ?

A. NH_4^+

B. CH_3COO^-

C. HCO_3^-

D. HSO_3^-

Answer: B

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374. Which species would be least likely to act as Lewis base ?

A. PCl_3

B. CN^-

C. SCl_2

D. i^+

Answer: D

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

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

B. One mole of NH_4OH and on mole of NaoH

C. one mole of `NH_4Cl and one mole of HCl

D. One mole of $HC_2H_3O_2$ and 0.5 mole of NaoH

Answer: D

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376. The OH^- ion concentration of a weak base is :

A. C $.K_b$

B. sqrt(C . K_b)

C. sqrt(K_b/C)

D. sqrt(K_b)

Answer: B

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377. Addition of NH_4Cl to NH_4OH results in :

A. Increases in OH^- concentration

B. Decreases in OH^- concentration

C. No change in OH^- concentration

D. None of these

Answer: B

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378. The relation for calculating ph of a weak base is :

A. pH = $PK_w - \frac{1}{2}pK_b + \frac{1}{2}\log C$

B. pH = $PK_w - \frac{1}{2}pK_b - \frac{1}{2}\log C$

C. pH = $PK_w - \frac{1}{2}pK_b + \frac{1}{2}\log C$

D. None of these

Answer: A

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379. Which aqueous solution will have Ph less than 7?

A. KNO_3

B. NaoH

C. NaCN

D. $Fecl_3$

Answer: D

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380. Which statement/relationship is correct?

A. Use hydrolysis salt of strong base and weak acid gives a solution with phlt7

B. pH= $-\frac{\log 1}{H+}$

C. only at $25^{\circ}C$ the ph of water is 7

D. The value of PK_w at $25^\circ C$ is 7

Answer: C

Watch Video Solution

381. Ionic product of water increass if :

A. Pressure is reduced

B. H^+ ion is added

C. OH^- ion is added

D. Temperature is increased

Answer: D

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382. A buffer solution helps in maintaining the :

A. Alkanity of solution

B. Acidic nature of solution

C. pH of medium

D. None of these

Answer: C

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383. $[H^+]$ in aqueous ammonium sulphate solution is :

A. More than 10^{-7}

B. Less than 10^{-7}

C. 10^{-7}

D. 10^{-4}

Answer: A

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384. The correct statement about buffer solution:

A. It contains a weak acid and its conjugate base.

B. it contains a weak base and its conjugate acid

C. it shows little change in ph on adding small amount of an acid or base

D. All of the above

Answer: D

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385. Phenolphthalein does not act as indicator for the titration between :

A. KOH and H_2SO_4

B. $Ba(OH)_2$ and HCl

C. NaoH and acetic acid

D. Oxalic acid and $KMnO_4$

Answer: D

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386. The pink colour of phenolphthalein in alkaline medium is due to :

A. Negative ion

B. Positive ion

C. OH^{-} ION

D. neutral ion

Answer: A

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387. Phenolphthalein shows ____ in acid medium:

A. Red colour

B. yellow colour

C. Pink colour

D. No colour

Answer: D

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

A. Pottasium ferrocyanide

B. Pottasium ferricyanide

C. Methyl orange

D. Phenolphthalein

Answer: C

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389. The indicator use in the titrating oxalic acid with caustic soda solution is :

A. Methyl orange

B. Methyl red

C. Fluorescein

D. Phenolphthalein

Answer: D

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390. Methyl orange gives red colour in :

A. Sodium carbonate solution

B. Sodium chloride solution

C. Hydrochloric acid solution

D. Pottasium hydroxide solution

Answer: C

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391. The range of ph in which methyl orange works as indicator:

A. 3-4

B. 10-12

C. 8-10

D. 6-8

Answer: A

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392. Which can act as buffer?

A. $NH_4Cl + NH_4OH$

B. $CH_3COOH + CH_3COONa$

C. 40 ml of 0.1 M NaCN + 20 ml of 0.1 M HCl

D. All of these

Answer: D

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393. Which statement is /are correct?

A. All arhenius acids are bronstad acids

B. All arhenius bases are bronstad bases

C. H^{+} ion in solution exist as $H_9PO_4^{+}$

D. All of the above

Answer: D

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394. Which indicator works in ph range 8-9.8?

A. Phenophthalein

B. Methyl orange

C. Methyl red

D. Litmus

Answer: A

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395. Which of the following is not a lewis acid ?

A. BF_3

B. $Alcl_3$

C. $Becl_2$

D. $SnCL_4$

Answer: C

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396. The strongest bronsted base is:

A. CLO^-

B. ClO_2^-

C. ClO_3^-

D. ClO_4^-

Answer: A

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397. The weakest Lewis base is :

A. H^{-}

B. OH^{-}

C. Cl^{-}

D. HCO_3^{-}

Answer: C

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398. Glycine is :

A. Arhenius acid

B. Lewis base

C. Simplest amino acid

D. All of the above

Answer: D

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399. Strongest conjugate base among the following is :

A. NO_3^-

B. Cl^-

C. SO_4^{2-}

D. CH_3COO^-

Answer: D

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400. The strongest base among the following is :

A. CH_3^-

B. F^-

C. NH_2^-

D. OH^-

Answer: A

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401. Hydrolysis of oxide ion in water produces

A. H^+

B. OH^-

C. O_2

D. H_2O

Answer: B

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402. H_3BO_3 IS _____ acid ?

A. Monobasic

B. diabasic

C. Tribasic

D. NONE

Answer: A

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403. The conjugate base of H_3BO_3 is :

A. $B(OH)_4^-$

B. $H_2BO_3^-$

C. HBO_3^(2-)

D. none

Answer: A

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404. The aqueous solution of an acid is characterised by the presence of :

A. OH^{-} ions

B. H_3O^{+} ions

C. H^{+} ions

D. H_4O^{+} ions

Answer: B

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405. The solubility of A_2X_3 is y mol `dm^(-3) its solubility product is

A. $6y^4$

B. $64y^4$

C. $36y^5$

D. $108y^5$

Answer: D

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406. Although CO is neutral but it shows acidic nature on reaction at high P and T with

A. $Ca(OH)_2$

B. NaoH

C. $Mg(OH)_2$

D. LiOH

Answer: B

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407. Which oxide is neutral ?

A. N_2O

B. NO

C. Co

D. ALL

Answer: D

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408. Which is not a lewis acid ?

A. $Zncl_2$

B. BF_3

C. Ag^+

D. H_2O

Answer: D

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409. Which is not a lewis base ?

A. OH^-

B. Ag^+

C. NH_3

D. H^-

Answer: B

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410. Which is not a lewis acid ?

A. $\mathbb{C}l_4$

B. $SNCl_2$

C. $AlCl_3$

D. BF_3

Answer: A

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411. Which is acid anhydride?

A. BaO

B. Na_2O

C. CO_2

D. CO

Answer: C

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412. The oxyacid of SO_2 is :

A. H_2SO_3

B. H_2SO_4

C. $H_2S_2O_8$

D. None

Answer: A

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413. The conjugate acid of H^- ion is :

A. H_3O^+

B. H_2

C. OH^-

D. H_2O

Answer: B

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414. The increasing order of acid strength $HClO_4$,$HClO_3$, $HClO_2$ HClO is

A. HClO lt $HClO_2$lt $HClO_3$ lt $HClO_4$

B. $HClO_4$lt$HClO_3$lt$HClO_2$ltHClO

C. $HClO_4$lt$HClO_2$lt$HClO_3$ltHClO

D. None of these

Answer: A

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415. Which metal sulphide has maximum solubility in water?

A. $CdS(K_sp = 36 \times 10^{-30})$

B. FeS(K_sp=11xx10^-20)

C. $HgS(K_sp = 32 \times 10^{-54})$

D. $ZnS(K_sp = 11 \times 10^{-22})$

Answer: B

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416. The solubility of $PbCL_2$ is given by,

A. $\sqrt{K}_{sp}$

B. [K_sp]^(1/3)

C. $\left[\frac{(K_sp)}{4}\right]^{\frac{1}{3}}$

D. $[8K_{sp}]^{\frac{1}{2}}$

Answer: C

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417. The metallic sulphide not precipitated if H_2S gas is passed through HCl containing aqueous solution is:

A. CoS

B. Bi_2S_3

C. HgS

D. CuS

Answer: D

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418. The solubility of AgI in NaI is lower than that in pure water, because:

A. AgI forms complex with NaI

B. Effect of common ion increases ionic concentration of I^{-}

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

D. The tempreature of the solution decreases

Answer: B

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419. Which of the following is most solubule in water?

A. $MnS(Ksp = 8 \times 10^{-37})$

B. $Zns(K_sp = 7 \times 10^{-16})$

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

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

Answer: B

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420. The polyprotic acid is:

A. HCL

B. $HCLO_4$

C. H_3PO_4

D. HNO_3

Answer: C

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421. The salt that does not hydrolyse:

A. $SnCl_2$

B. $FeCl_3$

C. $SnCl_4$

D. $CaCl_2$

Answer: D

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422. Which is not a Lewis acid?

A. $MgCl^2$

B. $SnCl_2$

C. $\mathbb{C}l_4$

D. RMgX

Answer: C

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423. The conjugate acid of CO_3^{2-}

A. H_2O

B. H_2CO_3

C. OH^-

D. HCO_3^-

Answer: D

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424. The conjugate base of H_2SO_4 in the following reaction is: $H_2SO_4 + H_2O \leftrightarrow H_3O^+ + HSO_3^{-4}$

A. H_2O

B. HSO_4^-

C. H_3O^+

D. SO_4^{-2}

Answer: B

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425. Ostwald's dilution law is applicable in the case of the solution of:

A. CH_3COOH

B. NaCl

C. NaOH

D. H_2SO_4

Answer: A

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426. The decreasing order of strengthh of following bases is :

A. $Cl^{-3}, CH_3COO^-, NH_2^-$

B. CH_3COO^-, NH_2^-, Cl^-

C. CH_3COO^-, Cl^-, NH_2^-

D. NH_2^-, CH_3COO^-, Cl^-

Answer: D

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427. The pH of 10 M HCl aqueous solution is:

A. Less than zero

B. One

C. Two

D. Zero

Answer: D

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428. In a buffer solution consisting of a weak acid its salt, the ratio of concentration of salt to acid is increased tenfold, then the pH of the solution will:

A. Increase by one

B. Increase tenfold

C. Decrease by one

D. Decrease tenfold

Answer: A

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429. The Ph of a 0.005 M aqueous solution of sulphuric acid is approximately:

A. 0.005

B. 2

C. 1

D. 0.01

Answer: B

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430. The ph of a `10^(-10) HCl solution is approximately:

A. 10

B. 7

C. 1

D. 14

Answer: B

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431. If the dissociation constant of an acid HA is `1 xx 10^(-5) the Ph of a 0.1 M solution of the acid HA will be approximately:

A. 3

B. 5

C. 1

D. 6

Answer: A

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432. The ph of a solution is 5.0 to this solution sufficient acid is added to decreases the ph to 2.0 The increase in hydrogen ion concentration is :

A. 1000 times

B. 5/2 times

C. 100 times

D. 5 times

Answer: A

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433. When the ph of a solution is 2 the hydrogen ion concentration is :

A. 1.0×10^{-14} M

B. 1.0×10^{-2} M

C. 1.0×10^{-7} M

D. 1.0×10^{-12} M

Answer: B

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434. The Ph of (1/1000) N KOH solution is :

A. 10^{-11}

B. 3

C. 2

D. 11

Answer: D

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435. The ph of 1% ionised 0.1 M solution of a weak monotrooic acid :

A. 1

B. 2

C. 3

D. 11

Answer: C

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436. A monotropic acid in 1.00 M solution is 0.01% ionised. What is the dissociation constant of the acid ?

A. 1.0×10^{-4}

B. 1.0×10^{-6}

C. 1.0×10^{-8}

D. 10^{-5}

Answer: C

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437. 50 ml of 2 N acetic acid mixed with 10 ml of 1N sodium acetate solution will have an approximate ph of (K_a=10^(-5))

A. 4

B. 5

C. 6

D. 7

Answer: A

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438. How many times a solution of pH =2 has higher acidic nature than the solution of pH=6 ?

A. 1000

B. 12

C. 400

D. 4

Answer: A

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439. A monotropic acid in 1.00 M solution is 0.01% ionised. What is the dissociation constant of the acid ?

A. 1.0×10^{-3}

B. 1.0×10^{3}

C. 1.0×10^{-8}

D. 1.0×10^{-10}

Answer: D

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440. one litre of water contains $10^{-7} mo \leq$ H^+` ions what is degree of ionisation of water ?

A. $1.8 \times 10^{-7}\%$

B. $1.8 \times 10^{-9}\%$

C. $3.6 \times 10^{-7}\%$

D. $3.6 \times 10^{-9}\%$

Answer: A

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441. The hydrogen ion concentration of 0.001 N NaOH solution is:

A. 1.0×10^{-2} M

B. 1.0×10^{-11} M

C. 1.0×10^{-14} M

D. 1.0×10^{-12} M

Answer: B

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442. Hclo is a weak acid. What is the concentration of H^{+} ions in 0.1 solution of Hclo '(K_a = 5 xx 10^-8)`?

A. 7.07×10^{-5} M

B. 5×10^{-7} M

C. 5×10^{-7} M

D. 7×10^{-4} M

Answer: A

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443. The pH of simple sodium acetate and acetic acid buffer is given by, pH=pK_a + log [Salt]/[Acid] K_a of acetic acid = 1.8 $\times$ 10^-5. If [Salt] = [Acid] =0.1 M, the pH of the solution would be about:

A. 7

B. 4.7

C. 5.3

D. 1.4

Answer: B

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444. Find the pH of a 0.01 M solution of acetic acid having degree of dissociation 12.5%.

A. 4.509

B. 3.723

C. 2.903

D. 5.623

Answer: C

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445. For weak acid strong base titration the indicator used 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

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446. The pk_a of acetylsalicylic 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 9. Aspirin wil be

A. unionized in the small intestine and in the stomach

B. Completely ionized in the small intestine and in the stomach

C. Ionized in the stomach and almost unionized in the small intestine

D. ionized in the small intestine and almost unionized in the stomach

Answer: D

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447. The alkali not suitable for volumettric determination of HCl, using phenolphthalein as an indicator is:

A. NaOH

B. $Ba(OH)_2$

C. KOH

D. NH_4OH

Answer: D

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448. The hydrolysis of the salt of weak acid and strong base is known as:

A. Anionic hydrolysis

B. Cationic hydrolysis

C. Neutral hydrolysis

D. Acid hydrolysis

Answer: A

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449. The hydrolysis of the salt of strong acid and weak base is called:

A. increases with concentration

B. decreases with concentration

C. Amphoteric hydrolysis

D. None of these

Answer: B

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450. Degree of hydrolysis of a salt of weak acid and a seak base:

A. increases with concentration

B. decreases with concentration

C. Independent of concentration

D. None of these

Answer: C

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451. The hydrolysis constant of a salt of weak acid and weak base is inversely propertional to:

A. Dissociation constant of weak acid

B. Dissociation constant of weak base

C. Ionic product of water

D. Dissociation constant of both weak acid and weak base

Answer: D

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452. Ostwald dilution law is expressed as:

A. $K_a = \frac{C \cdot \alpha^2}{1 - \alpha}$

B. $K_a = \frac{C \cdot \alpha}{1 - \alpha}$

C. $K_a = \frac{1 - \alpha}{C \cdot \alpha^2}$

D. $K_a = \frac{C(1 - \alpha)}{\alpha^2}$

Answer: A

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453. Phenolphthalein is a:

A. Weak acid

B. Weak base

C. strong acid

D. Strong base

Answer: A

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454. Which on ehas maximum solubility in liquid Ccl_4:

A. Cl_2

B. I_2

C. NaCl

D. Br_2

Answer: B

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455. The pH of gastric juice is normally:

A. Greater than 1.5 and less than 1.2

B. less than 1.5

C. greater than 1 and less than 3

D. Less than 1 and greater than zero

Answer: C

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456. Blood is:

A. Strong acidic

B. Strongly basic

C. Neutral

D. Slightly basic

Answer: D

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457. To a mixture of acetic acid and sodium acetate a further amount of sodium acetate is added. The pH of the mixture:

A. Increases

B. Decreases

C. Remains unchanged

D. Not predictable

Answer: A

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458. pH for the solution of salt undergoing anionic hydrolysis (say CH_3COONa) is given by:

A. pH= $\frac{1}{2}[PK_w + PK_a + \log C]$

B. pH= $\frac{1}{2}[PK_w + PK_a - \log C]$

C. pH= $\frac{1}{2}[PK_w + PK_b + \log C]$

D. None of these

Answer: A

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

A. $\left[Ba^{2+}\right]$

B. $[F^{-}]$

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

D. $2[NO_3^{-}]$

Answer: C

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460. The blood buffers are most often involed in stabilizing the pH in presence of metabolically produced:

A. Acids

B. bases

C. salts

D. None of these

Answer: A

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461. Acidosis is diagnosed when blood pH:

A. falls below 7.35

B. Rises above 7.45

C. BOTH (A) AND (B)

D. None of the above

Answer: A

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462. The solution of AgCl is unsaturated if:

A. $[Ag^+][Cl^-] < K_sp$

B. $[Ag^+][Cl^-] < K_sp$

C. $[Ag^+][Cl^-] = K_sp$

D. none of these

Answer: A

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463. Select the correct order for the strength of bases given below:

A. $C_2H_5^{\rightarrow}NH_2^{\rightarrow}C_2H_3^{\rightarrow}OH^{\rightarrow}C_2H^-$

B. $OH^{\rightarrow}NH_2^{\rightarrow}C_2H_3^{\rightarrow}C_2H_5^{\rightarrow}C_2H^-$

C. $C_2H^{\rightarrow}C_2H_3^{\rightarrow}C_2H_5^{\rightarrow}NH_2^{\rightarrow}OH^-$

D. $C_2H_5^{\rightarrow}C_2H_3^{\rightarrow}NH_2^{\rightarrow}C_2H^{\rightarrow}OH^-$

Answer: D

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464. In the precipitation of iron group in qualitative analysis, NH_4Cl is added before the addition of NH_4OH:

A. To prevent the interference of phosphate

B. To decrease NH_4^+ ions concentration

C. To increase OH^- ions concentration

D. To prevent the precipitation of subsequent groups

Answer: D

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465. What is the pH of 0.01 M NaOH assuming complete ionisation ?

A. 2

B. 14

C. 12

D. 0.01

Answer: C

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466. The pH of the solution obtained by mixing 10 mL of 10^{-1} N HCl and 10 mL of 10^{-1} N NaOH is:

A. 8

B. 2

C. 7

D. None

Answer: C

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467. At $90^{\circ}C$ pure water has $\left[H_3O^{+}\right]$ = 10^{-6} mol/ litre. The value of K_w at $90^{\circ}C$ is:

A. 10^{-6}

B. 10^{-12}

C. 10^{-14}

D. 10^{-8}

Answer: B

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468. 0.4 g of NaOH present in one litre solution shows the pH:

A. 12

B. 2

C. 6

D. 10

Answer: A

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469. pH of `10^-8 M solution of HCl in water is:

A. 8

B. -8

C. Between 7 and 8

D. Between 6 and 7

Answer: D

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470. The hydrogen ion concentration in a given solution is `6 xx 10^-4. Its pH will be:

A. 6

B. 4

C. 3.22

D. 2

Answer: C

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471. A certain buffer solution contains equal concentration of X^- and HX. The K_b for X^- is 10^{-10}. What is the pH of the buffer?

A. 4

B. 7

C. 10

D. 14

Answer: A

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472. 10^{-6} M HCl is diluted to 100 times. Find its pH value.

A. 6

B. 8

C. 6.95

D. 9.5

Answer: C

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473. An aqueous solution contains a substance which yields 4×10^{-3} mol $liter^{-1}$ ion of H_3O^+. If log 2 = 0.3010 the pH of the solution is:

A. 1.5

B. 2.398

C. 3

D. 3.4

Answer: B

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474. If the hydrogen ion concentration of a given solution is `5.5 xx 10^-3 M. Find the pH of the solution.

A. 2.26

B. 3.4

C. 3.75

D. 4.76

Answer: A

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475. What is the pH of a 1 M CH_3COONa solution? K_2 of acetic acid = 1.8×10^{-5} and K_w = 10^{-14} mol^2 `litre^-2:

A. 2.4

B. 3.6

C. 4.8

D. 9.4

Answer: D

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476. A 0.01 M ammonia solution is 5% ionized. The concentration of `OH^- ion is:

A. 0.005 M

B. 0.0001 M

C. 0.0005 M

D. 0.05 M

Answer: C

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477. 0.04 g of pure NaOH is dissolved in 10 litof distilled water. The pH of the solution is:

A. 9

B. 10

C. 11

D. 12

Answer: B

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478. The pH of the solution produced when an aqueous solution of strong acid pH 5 is mixed with equal volume of an aqueous solution of strong acid of pH 3 is:

A. 3.3

B. 3.5

C. 4.5

D. 4

Answer: A

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479. 100 mL of 1 N NH_4OH `(K_b = 5 xx 10^-5) is neutralised to equivalence point by 1 NHCl. Calculate the pH of solution at equivalence point.

A. 2

B. 2.5

C. 3

D. 5

Answer: D

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480. A certain weak acid has a dissociation constant `1.0 xx 10^-4. What is the equilibrium constant for its reaction with a strong base?

A. 1×10^{-4}

B. 1×10^{-10}

C. 1×10^{10}

D. 1×10^{-14}

Answer: C

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481. If K_a for a weak acid is 10^{-5}. pK_b value of its conjugate base is:

A. 5

B. 6

C. 7

D. 9

Answer: D

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482. The buffer action of acidic buffer is maximum when its pH is equal to:

A. 5

B. 7

C. 10

D. $Pk_a = 1$

Answer: D

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483. The pH of a solution is 2. Its pH is to be changed to 4. Then the H^+ concentration of original solution has to be:

A. Halved

B. doubled

C. increase by 100 times

D. decrease by 100 times

Answer: D

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484. A buffer mixture of acetic acid and potassium acetate has pH= 5.24. The ratio of $[CH_3COO^-]/[CH_3COOH]$ in this buffer is, $(pK_a = 4.740)$:

A. 3:1

B. 1:3

C. 1:1

D. 1:2

Answer: A

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485. The $[H_3O^+]$ in the rain water of pH = 4.35 is:

A. 4.5×10^{-5} M

B. 6.5×10^{-5}M

C. 9.5×10^{-5}M

D. 12.5×10^{-5}M

Answer: A

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486. What is the pH of a 0.02 M ammonia solution which is 5% ionised?

A. 2

B. 5

C. 7

D. 11

Answer: D

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487. The hydrogen ion concentration of a solution is 3×10^{-6} g ion/litre. Find its pH value

A. 5.523

B. 6.523

C. 6.477

D. 6.3

Answer: A

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488. Find the `[OH^-] in 100 mL of 0.015 M HCl (aq.) solution.

A. 5×10^{-12} M

B. 3×10^{-10} M

C. 6.7×10^{-13} M

D. 2×10^{-9} M

Answer: C

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489. A certain buffer solution contains equal concentration of X^{-} and HX. The K_a for HX is 10^{-8}. What is the pH of the buffer solution?

A. 3

B. 8

C. 11

D. 14

Answer: B

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490. The pH of a 10^{-10} M NaOH solution is nearest to:

A. 10

B. 7

C. 4

D. -10

Answer: B

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491. The H^+ ion concentration in 0.001 M acetic acid is 1.34×10^{-4} g ion/litre. What is the H^{+} ion concentration of 0.164 g of CH_3COONa is added to a litre of 0.001 M CH 3 COOH will be ?

A. 9×10^{-6}

B. 18×10^{-6}

C. 4.5×10^{-6}

D. 5×10^{-6}

Answer: A

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492. K_a for HCN is 5×10^{-10} at $25^{\circ} C$. For maintaining a constant pH of 9. Find the volume of 5 M KCN solution required to be added to 10 mL of 2 M HCN solution.

A. 4 ml

B. 7.95 ml

C. 2 ml

D. 9.3 ml

Answer: C

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493. An aqueous solution of 0.1 M NH_4Cl will have a pH closer to:

A. 9.1

B. 8.1

C. 7.1

D. 5.1

Answer: D

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494. Find the number of mole of hydroxide (OH^{-}) ion in 0.3 litre of 0.005 M solution of $Ba(OH)_2$.

A. 0.0075

B. 0.0015

C. 0.003

D. 0.005

Answer: C

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495. How many grams of NaOH must be present in one litre of the solution of give it a pH = 12?

A. 0.20 g/lit

B. 0.4 g/lit

C. 4 g/lit

D. 0,10 g/lit

Answer: B

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496. The pH of pure water at $50^\circ C$ is ....$(pK_w$ = 13.26 at $50^\circ C)$:

A. 6

B. 6.63

C. 7

D. 7.13

Answer: B

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497. The pH of a solution formed by mixing 40 mL of 0.10 M HCl and 10 mL of 0.45 M NaOH is:

A. 5

B. 8

C. 12

D. 10

Answer: C

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498. The pH of a soft drink is 3.82. Its H^+ ion concentration will be:

A. 1.96×10^{-2} mol/lit

B. 1.96×10^{-3} mol/lit

C. 1.5×10^{-4} mol/lit

D. 1.96×10^{-1} mol/lit

Answer: C

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499. The solubility of $Al(OH)_3$ is 's' mol per litre, the solubility product of $Al(OH)$ 3 is :

A. s^3

B. $27s^4$

C. s^2

D. $4s^2$

Answer: B

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500. The equivalent conductance of $0.1N$ acetic acid is $5cm^2$ $ohm^{-1}geq^{-1}$ and at infinite dilution is $390cm^2ohm^{-1}geq^{-1}$. Calculate the degree of dissociation of acetic acid.

A. 0.0013

B. 0.013

C. 0.13

D. 0.5

Answer: B

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501. The dissociation constant of HCN is 1.3×10^{-9}. The value of hydrolysis constant of KCN will be:

A. 1.3×10^{-19}

B. 10^{-14}

C. 7.7×10^{-5}

D. 0.77×10^{-5}

Answer: D

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502. If the solubility of lithium sodium hexafluro-aluminate, $Li_3Na_3(AlF_6)_2$ is 'a' mol/litre, its solubility product is equal to:

A. a^2

B. $12a^2$

C. $18a^3$

D. $2916a^8$

Answer: D

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503. The solubility of AgCl in water at $10^\circ C$ is 6.2×10^{-6} mol/litre. The K_sp of AgCl is:

A. $\frac{\left[6.2 \times 10^{-6}\right]^{1}}{2}$

B. 6.2×10^{-6} ^ 2

C. $(6.2)^2 \times 10^{-6}$

D. $\left[6.2 \times 10^{-6}\right]^2$

Answer: D

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504. K_sp of AgCl at $18^\circ C$ is 1.8×10^{-10}. $IfAg^+ofsolutionis4$ xx 10^-3 $mo\frac{l}{l}itre.The$Cl^-$t\hat{\mu}stexceedbef$ or eAgCl is precipitated would be:

A. 4.5×10^{-8} mol/lit

B. 7.2×10^{-13} mol/lit

C. 4×10^{-3} mol/lit

D. 4.5×10^{-7} mol/lit

Answer: A

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505. When equal volumes of the following solutions are mixed, precipitation of AgCl $(K_sp = 1.8 \times 10^{-10})$ wil occur only with

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

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506. Solubbility product of $PbCl_2$ at 298 K is $1.0 \times 10^{-6}. Atthistemperatureso \text{lub} ilityof$PbCL_2` in mol per litre is :

A. $(1.0 \times 10^{-6})^{\frac{1}{2}}$

B. $\left(1.0 \times 10^{-6}\right)^{\frac{1}{3}}$

C. $\left(0.25 \times 10^{-6}\right)^{\frac{1}{3}}$

D. $\left(0.25 \times 10^{-6}\right)^{\frac{1}{2}}$

Answer: C

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507. Solubility product of $Ba(OH)_2$ is 4×10^{-9} its solubbility in water is

A. 1×10^{-3} M

B. 1×10^{-9} M

C. 4×10^{-27} M

D. 1×10^{-27} M

Answer: A

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508. The precipitate of $CaF_2(K_s = 1.7 \times 10^{-10})$ is obtained when equal volmes of the following are mixed:

A. 10^{-4} M $Ca^{2+} + 10^{-4} MF^{-}$

B. 10^{-2} M $Ca^{2+} + 10^{-3} MF^{-}$

C. 10^{-5} M $Ca^{2+} + 10^{-3} MF^{-}$

D. 10^{-3} M $Ca^{2+} + 10^{-5} MF^{-}$

Answer: B

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509. The solubility of $PbCl_2$ at $25^{o} C$ is $6.3 \times 10^{-3} mo\frac{l}{l} itre$. The solubility product of $PbCl_2$ at $25^{o} C$ 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

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510. A saturated solution of Ag_2SO_4 is 2.5×10^{-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

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511. The pK_a of an indicator is 4. Its working range lies in beetween pH:

A. 1-5

B. 3-5

C. 5-8

D. 8-12

Answer: B

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512. A saturated solution of $Mg(OH)_2$ in water at $25^{o}C$ contains 0.11 g $Mg(OH)_2$ per litre of solution. The solubility product of $Mg(OH)_2$ is :

A. $(0.11)^2$

B. $(0.11)^3$

C. $4 \times (0.11)^3$

D. $4 \times \frac{(0.11)^3}{(58)^3}$

Answer: D

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513. Which is least soluble in H_2O.

A. $ZnCO_3$

B. $HgCL_2$

C. $PbBr_2$

D. AgI

Answer: B

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514. The solubility porduct of $CaSO_4$ is 6.4×10^{-5}. The solubbility of $CaSO_4$ is:

A. 8×10^{-3}M

B. 8×10^{-6}M

C. 8×10^{-10}M

D. 1.6×10^{-3}M

Answer: A

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515. What is the solubility of $Mg(OH)_2$ in mole per litre if $K_p = 1.0 \times 10^{-11}$?

A. $2. .46 \times 10^{-14}$

B. 1.36×10^{-4}

C. 2.60×10^{-7}

D. 1.2×10^{-10}

Answer: B

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516. If the solubility of $Ca(OH)_2$ is $\sqrt{3}$, the solubility product of $Ca(OH)_2$ is :

A. 3

B. 27

C. $\sqrt{3}$

D. $12\sqrt{3}$

Answer: D

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517. The solubility product, K_f of a sparingly soluble salt MX at 25^oC is 2.5×10^{-9}. The solubility of the salt in mol `litre^-1 at this temperature is :

A. 1.0×10^{-14}

B. 5.0×10^{-8}

C. 1.25×10^{-9}

D. 5.0×10^{-5}

Answer: D

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518. What is the solubilty product of CaF_2, if its satuated solution contains 0.017 g of CaF_2 per litre ?

A. 1.44×10^{-4}

B. 4.14×10^{-11}

C. 4.14×10^{-18}

D. 41.4×10^{-24}

Answer: B

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519. $K_sp = 1.2 \times 10^{-5}$ of M_2SO_4 (M^+ is monovalent metal ion) at 298 K find the maximum concentration of M^+ ions that could be attaiined in a saturated solution of this solid at 298 K.

A. 3.46×10^{-3} M

B. 7×10^{-3} M

C. 2.88×10^{-2} M

D. 14.4 xx 10^(-3) M

Answer: C

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520. To 100 mL of 0.1 M $AgNO_3$ solution solid K_2S_4 is added. Find the concentration of $K_2SO_4 t\hat{s} howsthe \prec i\pi tation$. (K_sp for Ag_2SO_4 = 6.4 xx 10^-5 M)`

A. 0.1 M

B. 6.4×10^{-3} M

C. 6.4×10^{-7} M

D. 6.4×10^{-5} M

Answer: B

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521. If the solubility of $Pb3(PO_4)_2$ is mol per litre, then the solubility product of $Pb_3(PO_4)_2$ will be :

A. $6s^2$

B. $6s^5$

C. s^5

D. $108s^5$

Answer: D

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522. How many grams of CaC_2O_4 saturation will dissolve in one litre of saturated solution ? $(K_sp$ of CaC_2O_4 is$2.5 \times 10-9mol^{-2}$ and its molecular weight is 128).

A. 0.0064g

B. 0.0128g

C. 0.0032 g

D. 0.0640 g

Answer: A

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523. The K_sp of $PbCO_3$ and $MgCO_3$ are 1.5×10^{-15} and 1×10^{-15} repectively at 298 K. What is the concentration of Pb^2+ ions in saturated solution containing $MgCO_3$ and $PbCO_3$?

A. 1.5×10^{-4} M

B. 3×10^{-8} M

C. 2×10^{-8} M

D. 2.5×10^{-8} M

Answer: B

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524. K_s for the acid HA is 1×10^{-6}. The value of K fo the reaction

$A + H_3O^+ \rightleftharpoons HA + H_2O$ is:

A. 1×10^{-6}

B. 1×10^{12}

C. 1×10^{-12}

D. 1×10^{6}

Answer: D

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525. The ph of a solution is 5.0 to this solution sufficient acid is added to decreases the ph to 2.0 The increase in hydrogen ion concentration is :

A. Increases 1000 times

B. Decreases 1000 times

C. Increases 100 times

D. Decreases 100 times

Answer: A

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526. Decinormal solution of CH_3COOH ionised to an extent of 1.3%. pH of the solution is, $(\log 1.3 = 0.11)$

A. 2.89

B. 1.945

C. 3.4

D. 4.98

Answer: A

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527. If 50 mL of 0.2 M KOH is added to 40 mL of 0.5 M HCOOH. Find the resulting solution. $\left(K_c = 1.8 \times 10^{-4}\right)$:

A. 3.75

B. 5.6

C. 7.5

D. 3.4

Answer: A

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528. In 100 mL of an aqueous HCl of pH 1.0, 900 mL of distilled water is added, the pH of the resultant becomes:

A. 1

B. 2

C. 4

D. 7

Answer: B

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529. If $\left[OH^{-}\right]$ is 1×10^{-8} ion/litre.Is pH is:

A. 6

B. 7

C. 5

D. 8

Answer: A

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530. The weight of HCl present in one litre of solution, if pH of the solution is one :

A. 3.65 g

B. 36.5 g

C. 0.365 g

D. 0.0365 g

Answer: A

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531. Solution prepared by dissolving equal number of mole of HOCl $\left(K_s = 3.2 \times 10^{-8}\right)$ and NaOCl is a buffer of pH :

A. 8

B. 3.2

C. 7.5

D. 4.8

Answer: C

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532. The pK_c of equimolecular sodium acetate and acetic acid mixtuare is 4.74. If pH is :

A. 1.4

B. 4.74

C. 9.2

D. 7

Answer: B

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533. The ionic product of warter at $60^\circ C$ is 9.61×10^{-14}. The pH of water at `60^@C is :

A. 6.51

B. 6.7

C. 9.61

D. 7

Answer: A

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534. What is the pH of boiling water (373 K)? $(K_w$ at 373 K = `10^-12):

A. 12

B. 8

C. 6

D. 2

Answer: C

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535. The solubility of $PbCl_2$ in water is 0.01 M at $25^\circ C$ it maximum concentration in 0.1M NaCl will be :

A. 2×10^{-3} M

B. 1×10^{-4} M

C. 1.6×10^{-2} M

D. 4×10^{-4} M

Answer: D

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536. if the solubility of product of lead iodide(PbI_2) is `3.2xx10^(-8) its solubility will be:

A. 2×10^{-3} M

B. 1×10^{-4} M

C. 1.6×10^{-5} M

D. 1.8×10^{-5} M

Answer: A

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537. The solubility product of salt AB_2 is 4×10^{-9} at 373K . The solubility of AB_2 in boiling water will be :

A. 4×10^{-3} M

B. 4×10^{-4} M

C. 1×10^{-10} M

D. 1×10^{-3} M

Answer: D

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538. The solubility of is 0.0015 gm /lit. The solubility product of AgCl will be :

A. 2×10^{-10}

B. 1.1×10^{-10}

C. 3.1×10^{-10}

D. 4.1×10^{-10}

Answer: B

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539. A saturated solution of calcium fluoride contains 2×10^{-4} mole of the salt per litre of the solution its K_sp is :

A. 8×10^{-18}

B. 3.2×10^{-11}

C. 4×10^{-6}

D. 1.43×10^{-9}

Answer: B

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540. IF the concentration of CrO_4^{2-} ion in a saturated solution of silver chromate be 2×10^{-4} M solubility of sodium chloride is :

A. 4×10^{-8}

B. 8×10^{-12}

C. 32×10^{-12}

D. 6×10^{-12}

Answer: C

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541. K_sp for sodium chloride is 36 $mo\frac{l^2}{l}iter^2$. The solubility of sodium chloride is :

A. 1/36 M

B. 1/6 M

C. 6 M

D. 3600 M

Answer: C

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542. The solubility of Agcl $\left(K_sp = 1.2 \times 10^{-10}\right)$ in a 0.10 M NaCl solution is :

A. 0.1 M

B. 1.2×10^{-6} M

C. 1.2×10^{-9} M

D. 1.2×10^{-10} M

Answer: C

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543. 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

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

A. 4×10^{-6}

B. 8×10^{-12}

C. 6×10^{-12}

D. 32×10^{-9}

Answer: D

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545. The dissociation constant of two weak acids are K_1 and K_2 their relative strength can given by:

A. $\sqrt{\dfrac{K_1}{K_2}}$

B. $K_1 + K_2$

C. $K_1 - K_2$

D. sqrt(K_1xxK_2)

Answer: A

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546. $K_b$for the hydrolysis reaction : $B^{+}+H_2O \Leftrightarrow BOH+H^{+}$ is

`1.0xx10^(-6) the hydrolysis constant of the salt is :

A. 10^{-6}

B. 10^{-7}

C. 10^{-8}

D. 10^{-9}

Answer: C

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547. The dissociation constant of NH_4OH is $1.8 \times 10^{-5} predictthehydrolysiscons \tan tof$NH_4Cl`

A. 1.8×10^{-19}

B. 1.8×10^{-5}

C. 5.55×10^{-5}

D. 5.55×10^{-10}

Answer: D

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548. The ph of 1 M aqueous solution of the weak acid HA is 6.0.Find its dissociation constant.

A. 10^{-6}

B. 10^{-12}

C. 1

D. 6

Answer: B

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549. A solution of ph 2.0 is more acidic than the one with ph 6.0 by a factor of

A. 3

B. 4

C. 3000

D. 10000

Answer: D

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550. In a mixture of CH_3COOH and CH_3COONa the ratio of salt to acid concentration is increased by ten folds Thr ph of the solution will increase by :

A. zero

B. 1

C. 2

D. 3

Answer: B

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551. 0.1 M acetic acid solution is titrated against 0.1M NaOH solution. What would be the difference in Ph between 1/4 and 3/4 stages of neutralisation of acid :

A. 2 log 3/4

B. 2log1/4

C. log1/3

D. 2log3

Answer: D

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552. The dissociation of water at $25^{\circ} C$ is 1.9×10^{-7} percent and the density of water is 1 $g\frac{m}{c}m_3$ the ionisation constant of water is :

A. 3.42×10^{-6}

B. 3.42×10^{-8}

C. 1.0×10^{-14}

D. 2.0×10^{-16}

Answer: D

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553. If Pk_b for CN^- at $25^\circ C$ is 4.7. Find the pH of 0.5 M aqueous NaCN solution,

A. 12

B. 10

C. 11.5

D. 11

Answer: C

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554. 50% neutralisation of a solution of formic acid ($K_a = 2 \times 106(-4))$ with NaOH would result in a solution having a hydrogen ion concentration of :

A. 2×10^{-4}

B. 3.7

C. 2.7

D. 1.85

Answer: A

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555. The pH of pure water at $25^{\circ}C$ and $35^{\circ}C$ are 7 and 6 respectively. What is the heat of formation of water from H^{+} and OH^{-} ?

A. 84.55 kcal/mol

B. 84.55 kcal/mol

C. 74.55 kcal/mol

D. None of these

Answer: B

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556. What is the Ph of a solution obtained by mixing 10 ml of 0.1 M HCl and 40 ml of 0.2M H_2SO_4?

A. 1.4865

B. 0.4865

C. 0.4685

D. 3

Answer: C

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557. Calculate the ph of solution obtained by mixing 100 ml of 0.1 M HCl and 9.9 ml of 1.0m H_2SO_4.

A. 3.0409

B. 3.4049

C. 2.0409

D. None

Answer: A

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558. What ids the resultant ph of solution of mixing 200 ml of an aqueous solution of HCl (ph=2.0) is mixed with 300 ml of an aqueous solution of NaOH (PH=12)?

A. 11.031

B. 11.301

C. 10

D. None

Answer: A

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559. What volume of 1 M sodium formate solution should be added to 50 ml of 0.05 M formic acid to produce a buffer solution of (ph=4$(PK_a$of formic acid =3.80)?

A. 39 ml

B. 39.62 ml

C. 40 ml

D. 40.62 ml

Answer: B

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560. How many mole of HCl are required to prepare one litre of buffer solution (conataining NaCN+HCl) of ph 8.5 using 0.01 g formula weight of NaCN(K_(HCN)=4.1xx10^(-10)?

A. 8.85×10^{-3}

B. 8.75×10^{-2}

C. 8.85×10^{-4}

D. 8.85×10^{-2}

Answer: A

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561. Find the composition of an acidic buffer mixture made up of HA AND naA of total molarity 0.29 having ph 4.4 and $K_a = 1.8 \times 10^{-5}$ in terms of concentration of salt and acid respectively:

A. 0.09 M and 0.20 M

B. 0.20 M and 0.09 M

C. 0.1 M and 0.19 M

D. 0.19 M and 0.10 M

Answer: A

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562. A weak acid HA after treatment with 12 ml of 0.1M strong base BOH has a PH of 5 . At the end point the volume of same base required is 26.6 ml .what is the value K_a acid ?

A. 1.8×10^{-5}

B. 8.12×10^{-6}

C. 1.8×10^{-6}

D. 8.2×10^{-5}

Answer: B

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563. Zn salt is mixed with $(NH_4)_2 Sofmolarity 0.021 MCalc\underline{a}tetheamount$ZN^(2+)` remains unprecipitated in 12 ml of this solution.

A. 1.677×10^{-22} g

B. 1.767×10^{-22} g

C. 2.01×10^{-23} g

D. None of these

Answer: A

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564. What is the PH at which $Mg(OH)_2$ begins precipitate from a solution containing 0.10 M $Mg^{2+} ions$. [K_sp of Mg(OH)_2 = 1xx10^(-11)]`

A. 5

B. 9

C. 4

D. 10

Answer: B

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565. 18 ml of mixture of acetic acid and sodium acetate required 6 ml of 0.1 M NaOH For Neutrilisation of the acid and 12 ml of 0.1 M HCl for reaction with salt Seperately . If Pk_a of the acid is 4.75 What is the pH pf the mixture.

A. 5.05

B. 4.75

C. 4.5

D. 4.6

Answer: A

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566. A certain ion B^- has an Arhenius constant of basic character (equ. Constant $:2.8 \times 10^{-7}$) What is the equilibrium constant for lowry bronstad character.

A. 2.8×10^{-7}

B. 3.57×10^{-8}

C. 3.57×10^{8}

D. 2.8×10^{7}

Answer: D

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567. Acetic acid and propionic acid have K_a value 1.75×10^{-5} and 1.3×10^{-5} respectively at a certain temperature. An equimolar solution of a mixture of the two acid is partially neutralised by NaOH. How is the ratio of the contents of acetate and proponate ions related to the K_a value and the molarity ?

A. ionisation fraction of acids

B. The ratio is unrelated to the K_a values

C. The ratio is unrelated to the molaity

D. The ratio is unrelated to the PH of the solution

Answer: A

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568. The ionisation constant of NH_4^+ in water is 5.6×10^{-10} at $25^\circ C$ the rate constant for the reaction of NH_4^+ and OH^- to form NH_3 and H_2O at $25^\circ C$ IS 3.4×10^{10}L mol/sec Find the rate constant for proton transfer from water to NH_3?

A. $6.07 \times 10^5 s^{-1}$

B. $6.07 \times 10^{-10} s^{-1}$

C. $6.07 \times 10^{-5} s^{-1}$

D. $6.07 \times 10^{10} s^{-1}$

Answer: A

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569. If $PK_b$for fluoride ion at $25^\circ C$ is 10.83. predict the ionisation constant of hydrofluoric acid in water at this temperature.

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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570. Approximate PH of 0.10 M aqueous H_2S solution having K_1 and K_2 for H_2S at $25^\circ C$ are 10^{-7} and 10^(-13)` respectively is :

A. 4

B. 5

C. 6

D. 8

Answer: A

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571. Which of the following species is more soluble in water ?

A. $M(OH)_3 : K_sp = 10^{-35}$

B. $M(OH) : K_sp = 10^{-30}$

C. $M(OH) : K_sp = 10^{-28}$

D. $MOH : K_sp = 10^{-26}$

Answer: A

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572. The self ionisation constant for pure formic acid K=$\left[HCOOH_2^{+}\right]$ $\left[HCOO^{-}\right]$ has been estimated a $10^{-6} at r\infty m temperature. The density of f$ or $mic acid is 1.22\frac{g}{}$cm^3` find the percentage of formic acid molecules in pure formic acid converted to formate ion.

A. 0.002%

B. 0.004%

C. 0.006%

D. 0.008%

Answer: B

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573. Liquid ammonia ionises to a slight extent. At $-50^{\circ}C$ its self ionisation constant K_{NH_3}=$\left[NH_4^{+}\right]\left[NH_2^{-}\right]$=$10^{-30}$ How many amide ions are present per cm^3 of pure liquid ammonia . (Assume N= 6.0×10^{23})?

A. 6×10^6 ions

B. 6×10^5 ions

C. 6×10^{-5} ions

D. $6 \times 106(-6)$ ions

Answer: B

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574. What is the concentration of fluoracetic acid (K_a of acid = 2.6×10^{-3}) Which is required to get $[H^+]$=1.50×10^{-3} M ?

A. 0.865 M

B. 2.37×10^{-3}M

C. 2.37×10^{-4}M

D. 2.37×10^{-2}M

Answer: B

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575. What molar concentration of NH_3 provides a $\left[OH^{-}\right]$ OF 1.5×10^{-3} ? (K_b= 1.8xx10^(-5)):

A. 0,125 M

B. $\left(0.125 + 1.5 \times 10^{-3}\right)$ M

C. $\left(0.125 - 1.5 \times 10^{-3}\right)$ M

D. `1.5xx10^(-3) M

Answer: A

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576. 1 ml of 0.1 N Hcl is added to 999 ml solution of NaCl . The PH of the resulting solution will be :

A. 7

B. 4

C. 2

D. 1

Answer: B

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577. What is the volume of water needed to dissolve 1 g of $BaSO_4$ $\left(K_sp = 1.1 \times 10^{-10}\right)$ at $25^\circ C$?

A. 820 litre

B. 410 litre

C. 205 litre

D. None of these

Answer: B

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578. The solubility of $BaSO_4$ in water is 0.00233 g per litre at $30^\circ C$. The solubility of $BaSO_4$ in 0.1M $(NH_4)_2SO_4$ solution at the same temperature is :

A. 10^{-5} mol/lit

B. 10^{-6} mol/lit

C. 10^{-8} mol/lit

D. 10^{-9} mol/lit

Answer: D

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579. Formic acid is 4.6% dissociated in a 0.1 N solution at $20^\circ C$. The ionisation constant of formic acid is :

A. 21×10^{-4}

B. 21

C. 0.21×10^{-4}

D. 2.1×10^{-4}

Answer: D

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580. The dissociation constants of two acid HA_1 and HA_2 are 2.9×10^{-4} and 1.8×10^{-5} respectively The relative strengths of the acid will be :

A. 1:4

B. 4:1

C. 1:16

D. 16:1

Answer: B

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581. In the hydrolytic equilibrium

$A^{-+} H_2O \Leftrightarrow HA + OH^- \quad K_a = 1.0 \times 10^{-5}$. The degree of hysrolysis of 0.001 M solution of the salt is :

A. 10^{-3}

B. 10^{-4}

C. 10^{-5}

D. 10^{-6}

Answer: A

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582. For preparing a buffer solution of pH 6 BY mixing sodium acetate and acetic acid the ratio of concentration of salt and acid $\left(K_a = 10^{-5}\right)$ Should be :

A. 1:10

B. 10:1

C. 100:1

D. 1:100

Answer: B

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583. At $20^{\circ} C$ the $\left[Ag^{+}\right]$ in a saturated solution of Ag_2CrO_4 is 1.5×10^{-4} M find the solubility product of Ag_2CrO_4 :

A. 3.375×10^{-12}

B. 1.6875×10^{-10}

C. 1.6875×10^{-12}

D. 1.6875×10^{-11}

Answer: C

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584. Let the solubilities of AgCl in H_2O 0.01 M $CaCl_2$ 0.01 M NaCl and 0.05 M $AgNO_3$ be S_1, S_2, S_3, S_4 respectively. What is the correct relationship between the quantities?

A. $S_1 > S_2 > S_3 > S_4$

B. $S_1 > S_2 = S_3 > S_4$

C. $S_1 > S_3 > S_2 > S_4$

D. $S_4 > S_3 > S_2 > S_1$

Answer: C

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