CHEMISTRY

BOOKS - NARENDER AVASTHI CHEMISTRY (HINGLISH)

ELECTROCHEMISTRY

Exercise

1. A cell reaction would be spontaneous if the cell potential and $\triangle_r G$ are respectively:

A. positive and negative

B. negative,negative

C. zero,zero

D. positive,zero

Answer: A

Watch Video Solution

2. which of the following statement is correct?

A. cathode is -ve terminal in both ,galvanic and electrolytic cells

B. Anode is +ve terminal in both,galvanic and electrolytic cells

C. cathode and node are -ve terminal in electrolytic and galvanic cell respectively.

D. Cathode and node are +ve terminal in electroytic and galvanic cell.

Answer: C

Watch Video Solution

3. Electrolytes when dissolved in water dissociate into ions because:

A. they are unstable

B. tge water dussolves it.

C. the force of repulsion increases

D. the force of electrostatic attraction is broken down by water.

Answer: D

Watch Video Solution

4. The electric charge required for electrode deposition of one gram-equivalent of a substance is :

A. one ampere per second

B. 96500 coulombs per second

C. one ampere for one hour

D. charge on one mole of electrons

Answer: D

Watch Video Solution

5. The amount of an ion liberated on an electrode during electrolysis does not depend upon:

A. conductance of the solution

B. current strength

C. time

D. electrochemical equivalent of the element

Answer: A

Watch Video Solution

6. How many electrons are there in one coulomb of electricity?

A. 6.023×10^{23}

B. `1.64xx10^(-24)

C. 6.24×10^{18}

D. 6.24xx10(-24)

Answer: C

Watch Video Solution

7. How many coulombs are provided by a current 0.010 mA in the calculator battery that can operate for 1000 hours?

A. 1

B. 10

C. 0.01

D. 36

Answer: D

Watch Video Solution

8. How many minutes are required to deliver 3.21×10^6 coulombs using a current of 500 A used in the commercial production of chlorine?

A. 8.3

B. 5.3×10^4

C. 6420

D. 107

Answer: D

Watch Video Solution

9. Passage of a current for 548 seconds through a siver coulometer results in the deposition of 0.746g of silver.What is the current (in A)?

A. 1.22

B. 1.16

C. 1.07

D. 1

Answer: A

Watch Video Solution

10. Electrolysis can be used to determine atomic masses. A current of 0.550 A deposits 0.55g of a certain metal in 100 minutes. Calculate the atomic mass of the metal if eq. mass=mole. Mass/3

A. 100

B. 45

C. 48.25

D. 144.75

Answer: C

Watch Video Solution

11. Beryllium occurs naturally in the form of beryl. The metal is produced from its ore by electrolysis after the ore has been converted to the oxide and then to the chloride.How many grams of Be(s) is deposited form a

$BeCl_2$ solution by a current of 5.0 A that flows for 1.0 h? (Atomic weight:Be=9)

A. 0.84

B. 1.68

C. 1.42

D. 1.08

Answer: A

Watch Video Solution

12. How many minutes will it take to plate out 5.2g of cr from a $Cr_2(SO_4)_3$ solution using a current of 9.65 A ? (Atomic mass:Cr=52.0)

A. 200

B. 50

C. 100

D. 103

Answer: B

Watch Video Solution

13. Calculate the current (in mA) required to deposite 0.195g of platinum metal in 5.0 hours from a solution of $\left[PtCl_6^{2-}\right.$:(Atomic mass:Pt=195)

A. 310

B. 31

C. 21.44

D. 5.36

Answer: C

Watch Video Solution

14. How many Faradays are required to reduce 0.25g of Nb (V) to the metal?

A. 2.7×10^{-3}

B. 1.3×10^{-2}

C. 2.7×10^{-2}

D. 7.8×10^{-3}

Answer: B

Watch Video Solution

15. One gm metal M^{3+} was discharged by the passage of 1.81×10^{23} electrons.What is the atomic mass of metal?

A. 33.35

B. 133.4

C. 66.7

D. None of these

Answer: D

Watch Video Solution

16. Total charge required to convert three moles of Mn_3O_4 to MnO_4^{c-2} in present of alkaline medium

A. 5F

B. 10F

C. 20F

D. None of these

Answer: C

Watch Video Solution

17. The electrolytic decomposition of dilute sulphuric acid with platinum electrode, cathodic reaction is :

A. reduction of H^+

B. oxidation of `SO_4^(2-)

C. reduction SO_3^{2-}

D. oxidation of H_2O

Answer: A

Watch Video Solution

18. Which one of the following metals can not be obtained on electrolysis of aqueous solution of its salts?

A. mg

B. Ag

C. Cu

D. Cr

Answer: A

Watch Video Solution

19. A solution of sodium sulphate in water is electrolysed using inert electrodes. The products at the cathode and anode are respectively.

A. H_2, O_2

B. O_2, H_2

C. O_2, Na

D. $H_2, S_2O_8^{2-}$

Answer: A

Watch Video Solution

20. The passage of current through a solution of certain electrolyte results in the evolution of H_2(g) at cathode and Cl_2(g) at anode. The electrolytic solution is :

A. $water$

B. $aq.\ H_2SO_4$

C. $aq.\ NaCl$

D. aq. $CuCl_2$

Answer: C

Watch Video Solution

21. When an aqueous solution of H_2SO_4 is electrolysed, the ion discharged at anode is

A. H^-

B. OH^-

C. SO_4^{2-}

D. O_2

Answer: D

Watch Video Solution

22. An aqueous solution of Na_2SO_4 is electrolysed using Pt electrodes. The products at the cathode and anode are respectively:

A. H_2, SO_2

B. O_2, $NaOH$

C. H_2, O_2

D. O_2, SO_2

Answer: C

Watch Video Solution

23. If Pt is used as cathode in the electrolysis of aqueous NaCl solution, the ion reduced at cathode is :

A. H^+

B. Na^+

C. OH^-

D. Cl^-

Answer: A

Watch Video Solution

24. A dilute aqueous solution of $CuSo_4$ is electrolysed using platinum electrods. The products at the anode and cathode are:

A. O_2, H_2

B. H_2, O_2

C. O_2, Cu

D. $S_2O_8^{2-}$, H_2

Answer: C

Watch Video Solution

25. what products are formed during the electrolysis of concentrated aqueous solution of sodium chloride?

(I) Cl_2(g) at anode (II) NaOH as electrolyte (III) H_2(G) At cathode

A. I only

B. I and II only

C. I and III only

D. I,II and III

Answer: D

Watch Video Solution

26. Which of the following aqueous solution produces metal after electrolysis?

A. $K_2Cr_2O_7$

B. $KMnO_4$

C. CH_3COONa

D. $CuCl_2$

Answer: D

Watch Video Solution

27. How much time is required for complete decomposition of 4 moles of water using 4 ampere?

A. 3.86×10^5sec

B. 1.93×10^5sec

C. 96500sec

D. 48250sec

Answer: B

Watch Video Solution

28. An aqueous solution containing $1M$ each of $Au^{3+}, Cu^{2+}, Ag^{+}, Li^{+}$ is being electrolysed by using inert electrodes. The value of standard potentials are :

$E^{\circ}_{Ag^{+}/Ag} = 0.80V, E^{\circ}_{Cu^{+}/Cu} = 0.34V$ and

$E^{\circ}_{Au^{+3}/Au} = 1.50, E^{\circ}_{Li^{+}/Li} = -3.03V$

will increasing voltage, the sequence of deposition of metals on the cathode will be :

A. Li,Cu,Ag,Au

B. Cu,Ag,Au

C. Au,Ag,Cu

D. Au,Ag,Cu,Li

Answer: C

Watch Video Solution

29. If 0.50L of a 0.60M $SnSo_4$ solution is electrolysed for a period of 30.0min using a current of 4.60 A. If inert electrods are used, what is the final concentration of Sn^{2+} remaining in the solution?[at.mass of Sn=119]

A. 0.342M

B. 0.544M

C. 0.389M

D. 0.514M

Answer: D

Watch Video Solution

30. A 100.0mL dilute solution of Ag^+ is electrolysed for 15.0 minutes with a current of 1.25mA and the silver is removed completely. What was the initial $\left[Ag^+\right]$?

A. 2.32×10^{-1}

B. 2.32×10^{-4}

C. 2.32×10^{-3}

D. 1.16×10^{-4}

Answer: D

Watch Video Solution

31. A 250.0 mL sample of a 0.20M Cr^{3+} is electrolysed with a current of 96.5 A. If the remaining $\left[Cr^{3+}\right]$ is 0.1 M, the duration of process is:

A. 25sec

B. 225sec

C. 150sec

D. 75sec

Answer: D

Watch Video Solution

32. The element indium is to be obtained by electrolysis of a molten halide of the element. Passage of a current of 3.20 A for a period of 40.0 min results in formation of 3.05 g of In. what is the oxidation state of indium in the halide melt? (Atomic mass of In=114.8)

A. 3

B. 2

C. 5

D. 1

Answer: A

Watch Video Solution

33. An electrolysis of a oxytungsten complex ion using 1.10 A for 40min produces 0.838 g of tungsten. What is the charge on tungsten in the material? (Atomic mass of W=184)

A. 6

B. 2

C. 4

D. 1

Answer: A

Watch Video Solution

34. In the electrolysis of aqueous $NaCl$,what volume of Cl_2(g) is produced in the time that it takes to liberate 5.0 liter of H_2(g) ? Assume that both gases are measured at STP.

A. 5

B. 2.5

C. 7.5

D. 10

Answer: A

Watch Video Solution

35. How many grams of Cr are deposited in the electrolysis of solution of $Cr(NO_3)_3$ in the same time that it takes to deposite 0.54g of Ag in a silver coulometer arranged in series with the $Cr(NO_3)_3$ cell? (Atomic mass: Cr=52.0,Ag=108)

A. 0.0866

B. 0.0288

C. 0.173

D. 0.22

Answer: A

Watch Video Solution

36. In the electolysis of a $CuSO_4$ solution, how many grams of Cu are plated out on the cathode in the time that it takes to liberate 5.6 litre of O_2(g) , measured at 1 atm and 273 K, at the node?

A. 31.75

B. 14.2

C. 4.32

D. None of these

Answer: A

Watch Video Solution

37. Ammonium perchlorate, NH_4ClO_4 , used in the solid fuel in the booster rockets on the space shuttle, is prepared from sodium perchlorate, $NaClO_4$, which is produced commercially by the electrolysis of a hot, stirred solution of sodium chloride. How many faradays are required to produce 1.0kg of sodium perchlorate?

$NaCl + 4H_2O \rightarrow NaClO_4 + 4H_2$

A. 40.3

B. 18.3

C. 31.6

D. 65.3

Answer: D

Watch Video Solution

38. In the commercial preparation of aluminum,aluminum oxide (Al_2O_3) is electrolysed at 1000° C. How many coulombs of electricity are required

to give 54kg of aluminum ? Assume following reaction takes place at cathode:

$Al^{3+} + 3e^- \rightarrow Al$

A. 17.3×10^8

B. 3.21×10^7

C. 1.82×10^4

D. 57.6×10^7

Answer: D

Watch Video Solution

39. When molten lithium chloride (LiCl) is electrolysed, lithium metal is formed at the cathode. If current efficiency is 75% then how many grams of lithium are liberated when 1930 C charge pass through the cell? (Atomic mass of Li=7)

A. 0.105

B. 0.12

C. 0.28

D. 0.24

Answer: A

Watch Video Solution

40. Sodium metal is produced commercial by the electrolysis of molten sodium chloride and chlorine is produced as a by product. How many litres of chlorine at 1.8 atm and 27° C will be produced if a current of 1.0×10^{3} A is passed through NaCl (l) for 9.65 h?

A. 2463

B. 460

C. 1800

D. 1231.6

Answer: A

Watch Video Solution

41. H_2(g) and O_2(g), can be produced by the electrolysis of water. What total volume (in L) of O_2 and H_2 are produced at 1 atm and 273K when a current of 30 A is passed through a K_2SO_4 (aq) solution for 193 min?

A. 20.16

B. 40.32

C. 60.48

D. 80.64

Answer: C

Watch Video Solution

42. The cost of 2Rs/kWh of operating an electric motor for 10hours takes 10amp at 110V is:

A. 79200 Rs

B. 22000Rs

C. 220Rs

D. 22Rs

Answer: D

Watch Video Solution

43. A 1 M solution of H_2SO_4 is electrolysed. Select correct statement in respect of products obtain at anode and cathode respectively:

Given : $2SO_4^{2-} \rightarrow S_2O_8^{2-} + 2e^-, E^\circ = -1.23V$

$H_2O(l) \rightarrow 2H^+(aq) + 1/2O_2(g) + 2e^-, E^\circ = -1.23V$

A. concentration of H_2SO_4 remain constant, H_2, O_2

B. concentration of H_2SO_4 remain constant, O_2, H_2

C. concentration of H_2SO_4 remain constant, O_2, H_2

D. concentration of H_2SO_4 remain constant, $S_2O_8^{2-}$, H_2

Answer: B

Watch Video Solution

44. Cadmium amalgam is prepared by electrolysis of a sodium of $CdCl_2$ using a mercury cathode. How long should a current of 4 A be passed in order to prepare 10% by mass Cd in Cd-Hg amalgam on cathode of 4.5 g Hg? (atomic mass of Cd=112)

A. 400sec

B. 215.40 sec

C. 861.6 sec

D. 4308.8 sec

Answer: D

Watch Video Solution

45. Use of electrolysis is .

A. electrorefining

B. electroplating

C. both (a) and (b)

D. None of these

Answer: C

Watch Video Solution

46. When a solution of $AgNO_3$ (1 M) is electrolysed using platinum anode and copper cathode, what are the products obtained at two electrodes?

Given :

$E^{\circ}_{cu^{2+}|cu} = +0.34\text{volt}, E^{\circ}_{O_2,H^+|H_2O} = +1.23\text{volt}, E^{\circ}_{H^+|H_2} = +0.0\text{volt}E$

A. $Cu \to Cu^{2+}$ at anode, $Ag^+ \to Ag$ at cathode

B. $H_2O \to O_2$ at anode, $Cu^{2+} \to Cu$ at cathode

C. $H_2O \to O_2$ at anode, $Ag^+ \to Ag$ at cathode

D. $NO_3^{-} \to NO_2$ at anode, $Ag^+ \to Ag$ at cathode

Answer: C

Watch Video Solution

47. Which of the following statement is correct about Galvanic cell?

A. It converts chemical energy into electrical energy

B. It converts electrical energy into chemical energy.

C. It converts metal from its free state to the combined state.

D. It converts electrolyte into individual ions.

Answer: A

Watch Video Solution

48. E° for $Cl_2(g) + 2e^- \rightarrow 2Cl^-$ (aq) is 1.36 V, E° for Cl^- (aq) $\rightarrow 1/2cl_2(g) + e^-$ is:

A. 1.36V

B. -1.36V

C. -0.68

D. 0.68V

Answer: B

Watch Video Solution

49. when two half-cells of electrode potential of E_1 and E_2 are combined to form a half cell of electrode potential E_3 , then

(when $n_1, n_2 \text{and} n_3$ are no. of electrons exchanged in first second and combined half-cells:

A. $E_3 = E_2 - E_1$

B. $E_3 = \frac{E_1 n_1 + E_2 n_2}{n_3}$

C. $E_3 = \frac{E_1 n_1 + E_2 n_2}{n_3^2}$

D. $E_3 = E_1 - E_2$

Answer: B

Watch Video Solution

50. The function of a salt bridge is to :

A. maintain electrical neutrally of both half cells

B. increases the cell potential at the positive electrode

C. decrease the cell potential at the negative electrode

D. eliminate the impurities present in the electrolyte

Answer: A

Watch Video Solution

51. Saturated solution of KNO_3 with agar-agar is used to make 'salt bridge' because:

A. size of K^+ is greater than that of NO_3^-

B. velocity of NO_3^- is greater than that of K^+

C. velocity of K^+ and NO_3^- are nearly the same

D. both velocity and size of K^+ and NO_3^- ions are nearly same

Answer: C

Watch Video Solution

52. A salt bridge may contain:

A. a saturated solution of KCl and agar-agar

B. a saturated solution of KNO_3 and agar-agar

C. a saturated solution of NH_4NO_3 and agar-agar

D. all of these

Answer: D

Watch Video Solution

53. The nature of curve of E°_{cell} vs. log K_c is :

A. straight line

B. parabola

C. hyperbola

D. elliptical curve

Answer: A

Watch Video Solution

54. Consider the following equations for a cell reaction

$A + B \Leftrightarrow C + D, E^{\circ} = x\text{volt}, K_{eq} = K_1$

$2A + 2B \Leftrightarrow 2C + 2D, E^{\circ} = y\text{volt}, K_{eq} = K_2$ then:

A. $x = y, k_1 + k_2$

B. $x = 2y, K_1 = 2K_2$

C. $x = y, K_1^2 = K_2$

D. $X^2 = y, K_1^2 = K_2$

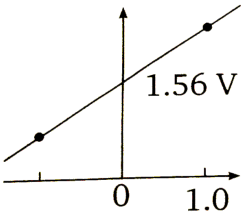
Answer: C

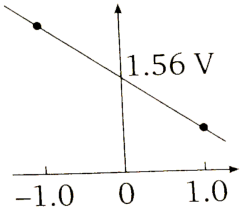
Watch Video Solution

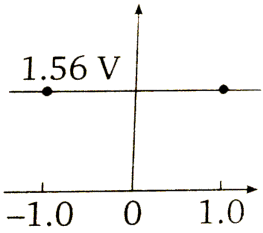
55. Which graph correctly correlates E_{cell} as a function of concentration for the cell

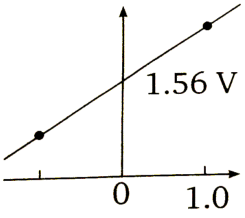
$Zn(s) + 2Ag^+(aq) \rightarrow Zn^{2+}(aq) + 2Ag(s), E_{cell}^{\circ} = 1.56V$

y-axis: E_{cell}, X-axis: $\log_{10} \dfrac{[Zn^{2+}]}{[Ag^+]^2}$

A. 

B. 

C. 

D. 

Answer: B

Watch Video Solution

56. The Nernst equation E=E°-RT/nF in Q indicates that the Q will be equal to equilibrium constant K_c when:

A. E=E°

B. RT/nF=1

C. E=zero

D. $E^{\circ} = 1$

Answer: C

Watch Video Solution

57. The cell reaction $2Ag^{+}(aq) + H_2(g) \rightarrow 2H^{+}(aq) + 2Ag(s)$,best represented by :

A. $Ag(s)|Ag^{+}(\mathrm{aq})||H^{+}(aq)|H_2(g) \mid Pt(s)$

B. $Pt(s)|H_2(g)|H^{+}(aq)||Ag^{+}(aq) \mid Ag(s)$

C. $Ag(s)|Ag^{+}(\mathrm{aq})||H_2(g)|H^{+}(aq) \mid Pt(s)$

D. $Ag^+(\mathrm{aq})|Ag(s)||H_2(g)|H^+(aq)$

Answer: B

Watch Video Solution

58. The cell reaction $Hg_2Cl_2(s) + cu(s) \rightarrow cu^{2+}(aq) + 2Cl^-(aq) + 2Hg(l)$,best represented by :

A. $cu(s)\left|cu^{2+}(aq)\right||Hg_2Cl_2(s)\left|Hg(l)\right.$

B. $cu(s)\left|cu^{2+}(aq)\right||Hg(l)\left|HgCl_2(s)\right.$

C. $cu(s)\left|cu^{2+}(aq)\right||Cl^-(aq)\left|Hg_2Cl_2(s)\right|Hg(l)|Pt(s)$

D. $Hg_2Cl_2(s)\left|Cl^-(aq)\right|\left|Cu^{2+}(aq)\right|Cu(s)$

Answer: C

Watch Video Solution

59. The cell reaction

$Cr_2O_7^{2-}(aq) + 14H^+(aq) + 6Fe^{2+}(aq) \rightarrow 6Fe^{3+}(aq) + 2Cr^{3+}(aq) + 7H$

is best represented by:

A. $Pt(s)\left|Fe^{2+}(aq), Fe^{3+}(aq)\right||Cr\_2O_7^{2-}(aq), Cr^{3+}(aq)\left|Pt(s)\right.$

B. $Pt(s)\left|Cr_2O_7^{2-}(aq), Cr^{+3}(aq)\right||Fe^{3+}(aq), Fe^{+2}(aq)\left|Pt(s)\right.$

C. $Fe^{2+}(aq)\left|Fe^{3+}(aq)\right||Cr_2O_7^{2-}(aq)\left|Cr^{3+}(aq)\right.$

D. $Cr_2O_7^{2-}(aq)\left|Cr^{3+}(aq)\right||Fe^{3+}(aq)\left|Fe^{2+}(aq)\right.$

Answer: A

Watch Video Solution

60. Select the correct cell reaction of the cell $Ag(s) \mid Ag^+(aq)||cu^{2+}(aq)|cu(s)$:

A. $2Ag(s) + cu(s) \rightarrow cu^{+2}(aq) + 2Ag^+(aq)$

B. $cu(s) + 2Ag^+(aq) \rightarrow cu^{2+}(aq) + 2Ag(s)$

C. $2Ag(s) + cu^{2+}(aq) \rightarrow cu(s)(aq) + 2Ag^{+}(aq)$

D. $cu^{2+}(aq) + 2Ag^{+}(aq) \rightarrow 2Ag(s) + cu(s)$

Answer: C

Watch Video Solution

61. Select the correct cell reaction of the cell $Pt(s)|Cl_2(g)|Cl^{-}(aq)||Ag^{+}(aq) \mid Ag(s)$:

A. $Cl_2(g) + Ag^{+}(aq) \rightarrow Ag(s) + 2Cl^{-}(aq)$

B. $Cl_2(g) + Ag(s) \rightarrow 2Cl^{-}(aq) + Ag^{+}(aq)$

C. $2Cl^{-}(aq) + 2Ag^{+}(aq) \rightarrow 2Ag(s) + Cl_2(g)$

D. $AgCl(s) \rightarrow Ag^{+}(aq) + Cl^{-}(aq)$

Answer: C

Watch Video Solution

62. Standard electrode potential of SHE at 298 K is :

A. 0.05V

B. 0.10V

C. 0.50V

D. 0.00V

Answer: D

Watch Video Solution

63. The e.m.f of the following galvanic cells:

A. $Zn|z^{2+}(1M)||Cu^{2+}(1M)|Cu$

B. $Zn|z^{2+}(0.1M)||Cu^{2+}(1M)|Cu$

C. $Zn|z^{2+}(1M)||Cu^{2+}(0.1M)|Cu$

D. $Zn|z^{2+}(0.1M)||Cu^{2+}(0.1M)|Cu$

Answer: D

Watch Video Solution

64. Based on the cell notation for a spontaneous reaction, at the anode:

$Ag(s)|AgCl(s)|Cl^-(aq)||Br^-(aq)|Br_2(l)|C(s)$

A. AgCl gets reduced

B. Ag gets oxidized

C. Br^- gets oxidized

D. Br_2 gets reduced

Answer: B

Watch Video Solution

65. Given the listed standard electrode potentials, what is E° for the cell:

$4BiO^+(aq) + 3N_2H_5^+(aq) \rightarrow 4Bi(s)3N_2(g) + 4H_2O)l) + 7H^+(aq)$

$N_2(g) + 5H^+(aq) + 4e^- \rightarrow N_2H_5^+(aq), E^\circ = -0.23V$

$BiO^+(aq) + 2H^+(aq) + 3e^- \rightarrow Bi(s) + H_2O(l), E^\circ = +0.32V$

A. 0.55

B. 0.34

C. 1.88

D. 0.09

Answer: A

Watch Video Solution

66. what is the standard electrode potential for the reduction of HClO?

$HClO(aq) + H^+(aq + 2e^- \rightarrow Cl^-(aq) + H_2O(l)$

Given: $Cr^2(aq) \rightarrow Cr^{3+}(aq) + e^-, E^\circ = 0.41V$

$HClO(aq) + H^+(aq) + 2Cr^{2+}(aq) \rightarrow 2Cr^{3+}(aq) + H_2O(l), E^\circ = 1.80$

A. 1.39

B. 1.54

C. 1.22

D. 0.9

Answer: A

Watch Video Solution

67. The E° for the following cell is +0.34 V. In(s)|In $(OH)_3(aq)||Sb_2^-(AQ)|Sb(s)$.

Using $E^\circ = -1.0V$ for the In $(OH)_3|$ In, couple, calculate E° for the $Sb_2^-|$Sb half-reaction:

A. -1.34

B. 0.66

C. 0.82

D. -0.66

Answer: D

Watch Video Solution

68. From the fllowing half-cell reactions and their standard potentials ,what is the smallest possible standard e.m.f for spontaneous reactions?

$PO_4^{3-}(aq) + 2H_2O(l) + 2e^- \rightarrow HPO_3^{2-} + 3OH^-(aq), E^\circ = -1.05V$

$PbO_2(s) + H_2O(l) + 2e^- \rightarrow PbO(s) + 2OH^-(aq), E^\circ = +0.28V$

Watch Video Solution

69. Determine which substance is the best reducing agent in Q. no. 69 :

A. HPO_3^{2-}

B. PO_4^{3-}

C. IO^-

D. IO_3^-

Answer: A

Watch Video Solution

70. Which substance is the best oxidizing agent in Q. no. 69?

A. IO_3^-

B. IO^-

C. PbO

D. PO_4^{3-}

Answer: A

Watch Video Solution

71. Consider the following half-cell reaction and associated standerd half-cell potentials and determine the maximum voltage thatr can be obtained by combination resulting in spontenous process :

$AuBr_4^-(aq) + 3e^- \rightarrow Au(s) + 4BR^-(aq), E^\circ = -086V$

$Eu^{3+}(aq) + e^- \rightarrow Eu^{2+}(aq), E^\circ = -043V$

$Sn^{2+}(aq) + 2e^- \rightarrow Sn(s), E^\circ = -0.14V$

$IO^-(aq) + H_2O(l) + 2e^- \rightarrow I^-(aq) + 2OH^-, E^\circ = +0.49V$

A. $+0.72$

B. $+1.54$

C. $+1.00$

D. $+1.35$

Answer: D

Watch Video Solution

72. The position of some metals in the electrochemical series in decreasing electropositeve character is given as $Mg > Al > Zn > Cu > Ag$. What will happen if a copper spoon is used to stir a solution of aluminimum nitrate ?

A. The spoon gets coated with aluminium

B. Aan alloy of aluminium and copper is formed

C. No reaction occurs

D. The solution starts turning blue

Answer: C

Watch Video Solution

73. Zn can displace :

A. Mg from its aqueos solution

B. Cu from its aqueos solution

C. Na from its aqueos solution

D. Al from its aqueos solution

Answer: B

Watch Video Solution

74. Based on the following information arrange four metals A, B, C and D in order of decreasing ability to act as reducing agents :

(I) Only A,B, and C react with $1MHCl$ to give $H_2(g)$

(II) When C is added to solutions of the other metal ions, metallic B and D are formed

(III) Metal C dows not reduced A^{n+}

A. $C > A > B > D$

B. $C > A > D > B$

C. $A > C > D > B$

D. $A > C > B > D$

Answer: D

Watch Video Solution

75. When an aqueous solution of $CuSO_4$ is sstirred with a silver spoon then :

A. Cu^{+} will be formed

B. Ag^{+} will be formed

C. Cu^{2+} will be deposited

D. None of these

Answer: D

Watch Video Solution

76. Based on the following informations arrange four metals, A,B,C and D in order of increasing ability to act as reducing agents :

(I) Only C react with 1 M HCl to give H_2(g)

(II) When A is added to solution of the other metal ions, mettalic D is formed but not B or C

A. $D > A > C > B$

B. $A > D > C > B$

C. $B > D > A > C$

D. $D > A > B > C$

Answer: D

Watch Video Solution

77. In the reaction :

$43Fe(s) + 3O_2(g) \rightarrow 4Fe^{3+}(aq) + 6O^{2-}(aq)$

which of the following statement is incorrect ?

A. It is a redox reduction

B. Fe is reducing agent

C. O_2 is an oxidizing agent

D. Fe is reducing to Fe^{3+}

Answer: D

Watch Video Solution

78. Which of the following is displaced by Fe ?

A. Ag

B. Zn

C. Na

D. All of these

Answer: A

Watch Video Solution

79. The standerd potential at 25° for the following Half rection is given :

$Zn^{2+} + 2e^- \rightarrow Zn, E^\circ = -0.762V$

$Mg^{2+} + 2e^- \rightarrow Mg, E^\circ = -2.37V$

When Zinc dust is added to the solution of $MgCl_2$.

A. $ZnCl_2$ is formed

B. Mg is percipitaed

C. Zn dissolved in the solution

D. No reaction take place

Answer: D

Watch Video Solution

80. The element which can displace three other halogens from their compound is :

A. F

B. Cl

C. Br

D. I

Answer: A

Watch Video Solution

81. Using the standerd half-cell potential listed, calculate the equilibrium constant for the reaction :

$Co(s) + 2H^+(aq) \rightarrow Co^{2+}(aq) + H_2(g)$ at 298 K

$Co^{2+}(aq) + 2e^- \rightarrow Co(s) E^\circ = -0.277V$

A. 2.3×10^9

B. 4.8×10^4

C. 4.8×10^7

D. 4.8×10^{11}

Answer: A

Watch Video Solution

82. The E° at 25°C for the following reaction is 0.22 V. Calculate the equilibrium constant at 25°C :

$H_2(g) + 2AgCl(s) \rightarrow 2Ag(s) + 2HCl(aq)$

A. 2.8×10^7

B. 5.2×10^8

C. 5.2×10^6

D. 5.2×10^3

Answer: A

Watch Video Solution

83. Electrode potential of the half Pt(s)|Hg(l)|$Hg_2Cl_2(s)|Cl^-(aq)$ can be incresed by :

A. Increasing $[Cl^-]$

B. decreasing $[Cl^-]$

C. Increasing $Hg_2Cl_2(s)$

D. decreasing $Hg(l)$

Answer: A

Watch Video Solution

84. The equillibrium constant for thefollowing general reaction is 10^{30}. Calculate E° for the cell at 298 K.

$2X_2(s) + 3Y^{2+}(aq) \rightarrow 2X_2^{3+}(aq) + 3Y(s)$

A. $+0.105V$

B. $+0.2955V$

C. 0.0985 V

D. -0.2955 V

Answer: B

Watch Video Solution

85. A solution containing H^+ and D^+ ions is in equilibrium with a mioxture of H_2 and D_2 gases at 25°C. If the partial pressures of both gases are 1.0 atm, find the ratio of $[D^+]/[H^(+)]:(Given:$ E_(D^(+)//(D_(2)))^(@)=-0.003V`]

A. 1.23

B. 1.12

C. 0.11

D. 1

Answer: B

Watch Video Solution

86. The E° at 25°C for the following reaction is 0.55 V. Calculate the ΔG° in kJ/mol :

$$4BiO^+(aq) + 3N_2H_5^+ \rightarrow 4Bi(s) + 3N_2(g) + 4H_2O(l) + 7H^+$$

A. -637

B. -424

C. -106

D. -318.5

Answer: A

Watch Video Solution

87. Use the following standard electrode potentials, calculate ΔG° in kJ/mol for the indicated reaction :

$5Ce^{4+}(aq) + Mn^{2+}(aq) + 4H_2O(l) \rightarrow 5Ce^{3+}(aq) + MnO_4^-(aq) + 8H^+$

$MnO_4^-(aq) + 8H^+(aq) + 5e^- \rightarrow Mn^{2+}(aq) + 4H_2O(l), E^{\circ} = +1.51V$

$Ce^{4+}(aq) + e^= \rightarrow Ce^{3+}(aq) \qquad E^{\circ} = +1.61V$

A. -9.65

B. -24.3

C. -48.25

D. -35.2

Answer: C

Watch Video Solution

88. Consider an electrochemical cell in which the following reaction occurs and predict which changes will decrease the cell voltage :

$$Fe^{2+}(aq) + Ag^{+}(aq) \rightarrow Ag(s) + Fe^{3+}(aq)$$

A. I

B. II and III

C. II

D. I and II

Answer: D

Watch Video Solution

89. Consider the following equation for an electrochemical cell reaction. Which of the following changes in condition will increase the cell voltage ?

$$H_2(g) + PbCl_2(s) \rightarrow Pb(s) + 2HCl(aq)$$

(I) addition of concentrated $HClO_4$ in the cell solution

(II) Increase the pressure of $H_2(g)$ (III) increase the amount of Pt

A. III

B. I and II

C. II and III

D. II

Answer: D

Watch Video Solution

90. The standard electrode potential for the following reaction is $+1.33$ V. What is the potential at pH=2.0?

$$Cr_2O_7^{2-}(aq, 1M) + 14H^+(aq) + 6e^- \rightarrow 2Cr^{3+}(aq, 1M) + 7H_2O(l)$$

A. $+1.820V$

B. $+1.990V$

C. $+1.608$ V

D. $+1.0542$ V

Answer: D

Watch Video Solution

91. The standard electrode potential for the following reaction is -0.57 V.

What is the potential at pH=12.0 ?

$TeO_3^{2-}(aq, 1M) + 3H_2O(l) + 4e^- \rightarrow Te(s) + 6OH^-(aq)$

A. $-017V$

B. $+0.21V$

C. $-0.39V$

D. +1.95 V`

Answer: C

Watch Video Solution

92. Co$|Co^{2+}(C_2||Co^{2+}(C_1|$Co, for this cell, ΔG is negative if :

A. $C_2 > C_1$

B. $C_1 > C_2$

C. $C_1 = C_2$

D. unpredictable

Answer: B

Watch Video Solution

93. What will be the emf for the given cell ?

$Pt|H_2(g, P_1)|H^+(aq)|H_2(g, P_2)|Pt$

A. $\frac{RT}{F}.\text{in}\frac{P_1}{P_2}$

B. $\frac{RT}{2F}.\text{in}\frac{P_1}{P_2}$

C. $\frac{RT}{F}.\text{in}\frac{P_2}{P_1}$

D. None of these

Answer: B

Watch Video Solution

94. For the electro chemical cell $Pt(s)\left|\underset{1atm}{H_2(g)}\right|H^+(1M)\ ||\ |Cu^{2+}(1M)|Cu(s)$, which one of the following statements are true ?

A. H^+ ions are formed at anode and Cu is deposited at cathode.

B. H_2 liberated at cathode and Cu is deposited at anode.

C. Oxidation occurs at cathode

D. Reduction occurs at anode

Answer: A

Watch Video Solution

95. In a concentration cell the same reagents are present in both the anode and the cathode compartments , but at different concentrations. Calculate the emf of a cell of a cell containing 0.40 M. Cr^{3+} in one compartment and 1.0 M Cr^{3+} in the other if Cr electrodes are used in both.

A. 0.028 V

B. 0.249 V

C. 0.083 V

D. 0.125 V

Answer: A

Watch Video Solution

96. A 1.0 M solution of Cd^{2+} is added to excess iron and the system is allowed to reach equillibrium. What is the concentration of Cd^{2+} ?

$Cd^{2+}(aq) + Fe(s) \rightarrow Cd(s) + Fe^{2+}(aq), E^{\circ} = 0.037$

A. 0.195

B. 0.097

C. 0.053

D. 0.145

Answer: C

Watch Video Solution

97. The measured voltage for the reaction with the indicated concentration is 1.50 V. Calculate E°.

$Cr(s) + 3Ag^+(aq, 0.10M) \rightarrow 3Ag(s) + Cr^{3+}(aq, 0.30M)$

A. 1.35

B. 1.4

C. 1.65

D. 1.55

Answer: D

Watch Video Solution

98. Calculate the standard voltage that can be obtained from an ethane oxygen fuel cell at 25° C

A. $+0.91$

B. $+0.54$

C. $+0.72$

D. $+1.08$

Answer: D

Watch Video Solution

99. $I_2(s) \mid I^-$(0.1M) half cell is connected to a H^+ (aq)|H_2(1 bar)|Pt half celland e.m.f. is found to be 0.7714 V. If $E^\circ_{I_2|I^-}$=0.535 V, find the pH of

$H^+ \mid H_2$ half cell.

A. 1

B. 3

C. 5

D. 7

Answer: B

Watch Video Solution

100. Estimate the E^{c-} reduction for $Cu \mid CuS$ electrode.

Given : K_{sp} of $CuS = 8.0 \times 10^{-36}$, $E^{c-}_{\cdot(Cu|Cu^{2+})} = -0.34V$

A. 1.034 V

B. 1.0 V

C. $-0.694V$

D. 0.694 V

Answer: C

Watch Video Solution

101. Given the folowing standerd electrode potentials, the K_{sp} for $PbBr^2$ is :

$PbBr_2(s) + 2e^- \rightarrow Pb(s) + 2Br^-(aq), E^\circ = -0.248V$

$Pb^{2+}(aq) + 2e^- \rightarrow Pb(s), E^\circ = -0.126V$

A. 7.4×10^{-5}

B. 4.9×10^{-14}

C. 5.2×10^{-6}

D. 2.3×10^{-13}

Answer: A

Watch Video Solution

102. The standerd free energy change for the following reaction is -210kJ / mol. What is the standerd cell potential?

A. $+0.752$

B. $+1.09$

C. $+0.420$

D. $+0.640$

Answer: B

Watch Video Solution

103. At equilibrium :

A. $E^{\circ}_{\text{cell}} = 0, \Delta G^{\circ} = 0$

B. $E^{\circ}_{\text{cell}} = 0, \Delta G = 0$

C. both are correct

D. none is correct

Answer: B

Watch Video Solution

104. The E° at 25°C for the following reaction at the indicated concentrations is 1.50 V. Calculate the ΔG in kJ/mol 25°C :

A. -140.94

B. -295

C. -212

D. -422.83

Answer: D

Watch Video Solution

105. If $E^{\circ}_{Au^{+}/Au}$ is 1.69 V and $E^{\circ}_{Au^{3+}/Au}$ is 1.40 V, then $E^{\circ}_{Au^{+}/Au^{3+}}$ will be :

A. 0.9 v

B. 0.945 V

C. 1.255 V

D. None of these

Answer: D

Watch Video Solution

106. Consider the following standard electrode potentials and calculate the eqillibrium constant at 25°C for the indicated disproportional reaction :

$3Mn^{2+}(aq) \rightarrow Mn(s) + 2Mn^{3+}(aq)$

$Mn^{3+}(aq) + e^- \rightarrow Mn^{2+}(aq), E^\circ = 1.51V$

$Mn^{2+}(aq) + 2e^- \rightarrow Mn(s), E^\circ = -1.185V$`

A. 1.2×10^{-43}

B. 2.4×10^{-73}

C. 6.3×10^{-92}

D. 1.5×10^{-62}

Answer: C

Watch Video Solution

107. A galvanic cell is composed of two hydrogen electrods, one of which is a standard one. In which of the following solutions should the other electrode be immersed to get maximum e.m.f:

A. 0.1M HCl

B. 0.1 M H_2SO_4

C. 0.1 M NH_4OH

D. 0.01 M HCOOH

Answer: C

Watch Video Solution

108. $Ag|AgCl|Cl^-(C_2)||Cl^-(C_1)||AgCl\mid Ag$ for this cell ΔG is negative if :

A. $C_1 = C_2$

B. $C_1 > C_2$

C. $C_2 > C_1$

D. Both (a) and (c)\

Answer: C

Watch Video Solution

109. By how much is the oxidizing power of $Cr_2O_7^{2-}|Cr^{3+}$ couple decreased if the H^+ concentration is decreased from 1M to 10^{-30}M at 25° C?

A. 0.001 V

B. 0.207 V

C. 0.441 V

D. 0.414 V

Answer: D

Watch Video Solution

110. The temperature coefficient of a cell whose operation is based on the reaction

$Pb(s) + HgCl_2(aq) \rightarrow PbCl_2(aq) + Hg(l)$ is :

$\left(\frac{dE}{dT}\right)_P = 1.5 \times 10^{-4} VK^{-1}$ at 298 K

The change in entropy (in J/k mol) during the operation is :

A. 8627

B. 57.9

C. 28.95

D. 14.475

Answer: C

Watch Video Solution

111. The thermodynamic efficiency of cell is given by

A. $\frac{\triangle H}{\triangle G}$

B. $\frac{nFE}{\triangle G}$

C. $\frac{nEF}{\triangle H}$

D. nFE°

Answer: C

Watch Video Solution

112. calculate the value of equilibrium constant $\left(K_f\right)$ for the reaction:

$Zn^{2+}(aq) + 4OH^{-}(aq) \Leftrightarrow Zn(OH)_4^{2-}(aq)$

Given: $Zn^{2+}(aq) + 2e^{-} \rightarrow Zn(s0, E^{\circ} = -0.76V$

$Zn(OH)_4^{2-}(aq) + 2e^- \rightarrow Zn(s) + 4OH^-(aq), E^\circ = -1.36V$

$2.303\frac{RT}{F} = 0.06$

A. 10^{10}

B. 2×10^{10}

C. 10^{20}

D. None of these

Answer: C

Watch Video Solution

113. Which of the following statement is false for fuel cell?

A. They are more efficient

B. They are free from pollution

C. They run till reactants are active

D. Fuel burned with O_2

Answer: D

Watch Video Solution

114. When a lead storage battery is charged it acts as:

A. a fuel cell

B. an electrolytic cell

C. a galvanic cell

D. a concentration cell

Answer: B

Watch Video Solution

115. The metal that forms a self-protecting film of oxide to prevent corrosion is:

A. Na

B. Al

C. Cu

D. Au

Answer: B

Watch Video Solution

116. Rusting of iron is catalyzed by which of the following?

A. Fe

B. Zn

C. O_2

D. H^+

Answer: D

Watch Video Solution

117. Which of the following is a highly corrosive salt?

A. Hg_2Cl_2

B. $HgCl_2$

C. $FeCl_2$

D. $PbCl_2$

Answer: B

Watch Video Solution

118. In electrochemical corrosion of metals, the metal undergoing corrosion:

A. acts as anode

B. acts as cathode

C. undergoes reduction

D. None

Answer: A

Watch Video Solution

119. When an acid cell is charged, then:

A. voltage of cell increases

B. resistance of cell increases

C. eletrolyte of cell dilutes

D. None of these

Answer: A

Watch Video Solution

120. Electrolytic conduction is due to the movement of :

A. electrons

B. ions

C. atoms

D. electrons as well as ions

Answer: B

Watch Video Solution

121. Molten sodium chloride conducts electricity due to the presence of:

A. free electron

B. free ions

C. free molecules

D. atoms of sodium and chlorine

Answer: B

Watch Video Solution

122. Pure water does not conduct electricity because it :

A. is neutral

B. is readily decomposed

C. is almost totally unionized

D. has a low boiling point

Answer: C

Watch Video Solution

123. The relation among conductance (G), specific conductance (K) and cell constant (l/A) us :

A. $G = k\frac{l}{A}$

B. $G = k\frac{A}{l}$

C. $Gk = \frac{l}{A}$

D. G=kAL

Answer: B

Watch Video Solution

124. If x is specific resistance (in Scm^2mol^{-1}) given by:

A. $\frac{1000X}{Y}$

B. $1000\frac{Y}{X}$

C. $\frac{1000}{XY}$

D. $\frac{XY}{1000}$

Answer: C

Watch Video Solution

125. Equivalent conductivity can be expressed in terms of specific conductance (k) and concentration (N) in gram equivalent dm^{-3} as:

A. $k \times N$

B. $\frac{k \times 1000}{N}$

C. $\frac{k \times N}{1000}$

D. $k \times N \times 1000$

Answer: B

Watch Video Solution

126. Resistance of a decimolar solution between two electrodes 0.02 meter apart and 0.0004 m^2 in area was found to be 50 ohm. Specific conductance (k0 is :

A. $0.1Sm^{-1}$

B. $1Sm^{-}$

C. $10Sm^{-1}$

D. $4 \times 10^{-4}Sm^{-1}$

Answer: B

Watch Video Solution

127. Resistance of 0.1 M KCl solution in a conductance cell is 300 ohm and conductivity is $0.013Scm^{-1}$. The value of cell constant is :

A. $3.9cm^{-1}$

B. $39m^{-1}$

C. $3.9m^{-1}$

D. None of these

Answer: A

Watch Video Solution

128. Ionisation constant of a weak acid (HA) in terms of A_m^∞ and A_m is:

A. $K_a = \dfrac{C\Lambda_m^\infty}{\Lambda_m - \Lambda^\infty}$

B. $K_a = \dfrac{C\Lambda_m^2}{\Lambda_m^\infty(\Lambda_m^\infty - \Lambda_m)}$

C. $K_a = \dfrac{C\Lambda(\Lambda_m^\infty)^2}{\Lambda_m^\infty(\Lambda_m^\infty - \Lambda_m)}$

D. None of these

Answer: B

Watch Video Solution

129. When a concentrated solution of an electrolyte is diluted

A. its specific conductance increases

B. its equivalent conductivity decreases

C. its specific conductivity decreases and equivalent conductivity increases

D. Both specific and equivalent conductivity increases

Answer: C

Watch Video Solution

130. Molar conductivity of a solution of an electrolyte AB_3 is 150 Scm^2mol^{-1} . If it ionises as $AB_3 \rightarrow A^{3+} + 3B^-$, its equivalent conductivity will be :

A. 150 (in Scm^2eq^{-1})

B. 75 (in Scm^2eq^{-1})

C. 50 (in Scm^2eq^{-1})

D. 80 (in Scm^2eq^{-1})

Answer: C

Watch Video Solution

131. Equivalent conductivity of $Fe_2(SO_4)_3$ is relative to molar conductivity by the expression :

A. $\Lambda_{eq} = \Lambda_m$

B. $\Lambda_{eq} = \Lambda_m / 3$

C. $\Lambda_{eq} = 3\Lambda_m$

D. $\Lambda_{eq} = \Lambda_m / 6$

Answer: D

Watch Video Solution

132. The limiting equivalent conductivity of $NaCl, KCl$ and KBr are $126.5, 150.0$ and $151.5 Scm^2 eq^{-1}$, respectively. The limiting equivalent ionic conductance for Br^- is $78 Scm^2 eq^{-1}$. The limiting equivalent ionic conductance for Na^+ ions would be :

A. 128

B. 125

C. 49

D. 50

Answer: D

Watch Video Solution

133. The specific conductance of a saturated solution of silver bromide is $kScm^{-1}$. The limiting ionic conductivity of Ag^{+} and Br^{-} ions are x and y respectively. The solubility of silver4 vromide in gL^{-1} is : (molar mass of AgBr=188)

A. $\frac{k \times 1000}{x - y}$

B. $\frac{k}{x + y} \times 188$

C. $\frac{k \times 1000 \times 188}{x + y}$

D. $\frac{x + y}{k} \times \frac{1000}{188}$

Answer: C

Watch Video Solution

134. The resistance of $0.1N$ solution of formic acid is $200ohm$ and cell constant is $2.0cm^{-1}$. The equivalent conductivity (in Scm^2eq^{-1}) of $0.1N$ formic acid is :

A. 100

B. 10

C. 1

D. None of these

Answer: A

Watch Video Solution

135. A conductance cell was filled with a 0.02 M KCl solution which has a specific conductance of $2.768 \times 10^{-3} ohm^{-1} cm^{-1}$. If its resistance is 82.4 ohm at 25° C the cell constant is:

A. $0.2182 cm^{-1}$

B. $0.2281 cm^{-1}$

C. $0.2821 cm^{-1}$

D. $0.2381 cm^{-1}$

Answer: B

Watch Video Solution

136. The equivalent conductance of Ba^{2+} and Cl^{c-} are $63.5 ohm^{-1} cm^2 eq^{-1}$ and $76 ohm^{-1} cm^2 eq^{-1}$, respectively, at infinite dilution . The equivalent conductance $\left(\text{ in } oh^{-1} cm^2 \right)$ of $BaCl_2$ at infinite dilution will be

A. 203

B. 279

C. 101.5

D. 139.5

Answer: A

Watch Video Solution

137. Unit of ionic mobility is :

A. $mV^{-1}s^{-1}$

B. $m^2V^{-2}s^{-1}$

C. $m^2V^{-1}s^{-1}$

D. $m^{-2}Vs^{-1}$

Answer: C

Watch Video Solution

138. A_{AgCl}^{∞} can be obtained:

A. by extraplotation of the graph Λ and $\sqrt{C}$ to zero concentration

B. by known values of Λ^{∞} of $AgNO_3$, HCl and HNO_3

C. both (a) and (b)

D. None of these

Answer: B

Watch Video Solution

139. The conductance of a salt solution (AB) measured by two parallel electodes of area $100cm^2$ separated by 10cm was found to be $0.0001\Omega^{-1}$. If volume enclosed between two electrode contain 0.1 mole of salt, what is the molar conductivity $\left(Scm^2mol^{-1}\right)$ of salt at same concentration:

A. 10

B. 0.1

C. 1

D. None of these

Answer: B

Watch Video Solution

140. The conductivity of a strong electrolyte:

A. increases on dilution

B. decrease on dilution

C. does not change with dilultion

D. depends upon density of electrolytes

Answer: B

Watch Video Solution

141. The increases in equivalent conductivity of a weak electrolyte with dilution is due to :

A. increase in degree of dissociation and decrease in ionic mobility

B. decrease in degree of dissociation and decrease in ionic mobility

C. increase in degree of dissociation and increase in ionic mobility

D. increase in degree of dissociation and increase in ionic mobility

Answer: C

Watch Video Solution

142. Strong electrolytes are those which:

A. conduct electricity

B. dissolve readily in water

C. dissolve into ions at high dilution

D. completely dissociation into ions

Answer: D

Watch Video Solution

143. The electric conduction of a salt solution in water depends on the :

A. size of its molecules

B. shape of its molecules

C. size of solvent molecules

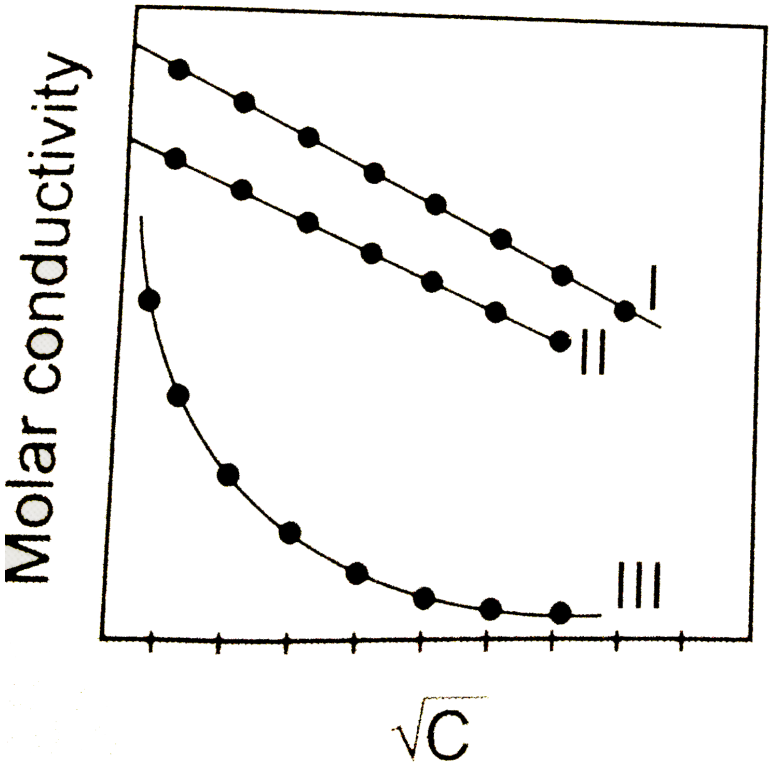
D. extent of its ionization

Answer: D

Watch Video Solution

144. A graph was plotted between molar conductivity of various electrolytes (NaCl, HCl and NH_4OH) and $\sqrt{C}$ (in molL^{-1}) . Correct set is

:



A. I(NaCl),II(HCl) , III(NH_4OH)

B. I(HCl),II(NaCl) , III(NH_4OH)

C. I(NH_4OH), II(NaCl), III(HCl)

D. I(NH_4OH), II(HCl) , III(NaCl)

Answer: B

Watch Video Solution

145. Which of the following is arranged in increasing order of ionic mobility?

A. $I^- < Br^- < Cl^- < F^-$

B. $F^- < Cl^- < Br^- < I^-$

C. $F^- < I^- < Cl^- < Br^-$

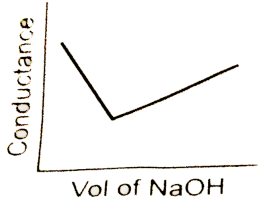
D. $F^- < Cl^- < I^- < Br^-$

Answer: B

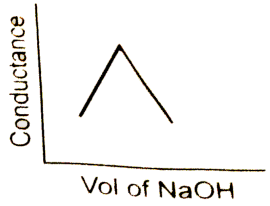
Watch Video Solution

146. HNO_3(aq) is titrated with NaOH(aq) condutomatrically, graphical representation of the titration is :

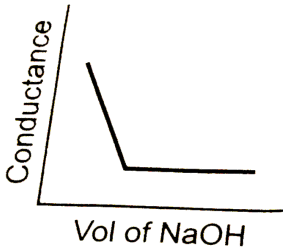
A.



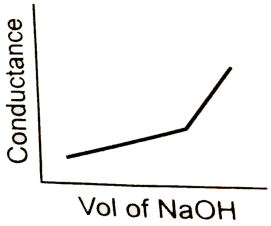
B.



C.



D.

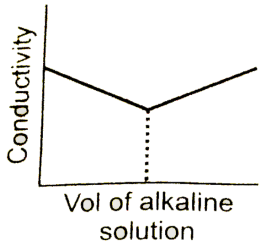


Answer: A

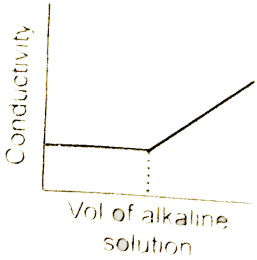
Watch Video Solution

147. which of the following plots will obtained for a conductometric titration of strong acid against a weak base?

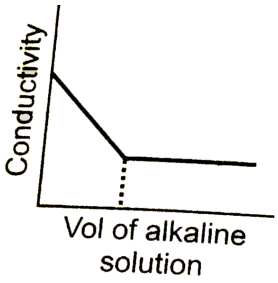
A.



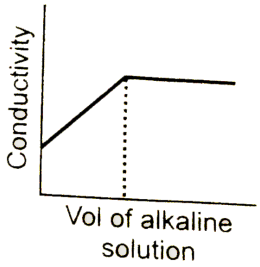
B.



C.



D.

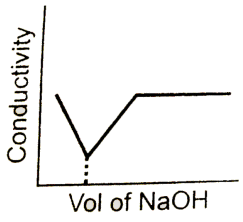


Answer: C

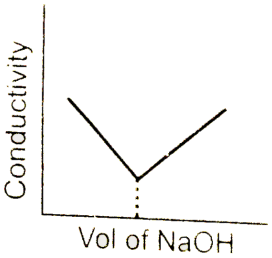
Watch Video Solution

148. conductometric titration curve of a equimolar mixture of a HCl and HCN with NaOH(aq) is :

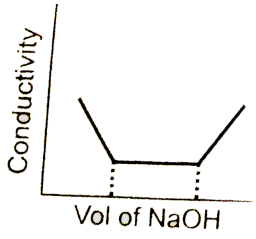
A.



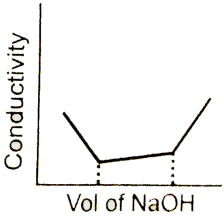
B.



C.



D.



Answer: D

Watch Video Solution

149. In the Hall process, aluminium is produced by the electrolysis of molten Al_2O_3. How many second would it take to produce enough aluminium by the Hall process to make a case of 24 cans of auminium soft-drink, if each can uses 5.0g of Al, a current of 9650amp is employed and the current efficiency of the cell is 90%:

A. 203.2

B. 148.14

C. 333

D. 6.17

Answer: B

Watch Video Solution

150. 108 g fairly concentrated solution of $AgNO_3$ is electrolysed by using 0.1 F charge the mass of resulting solution is

A. 94g

B. 11.6g

C. 96.4g

D. None of these

Answer: C

Watch Video Solution

151. The electolysis of acetate solution produces ethane according to reaction:

$2CH_3COO^- \rightarrow C_6H6(g) + 2CO_2(g) + 2e^-$

The current efficiency of the process is 80% . What volume of gases would be produced at 27° C and 740 torr, if the current of 0.5 amp is used though the solution for 96.45 min?

A. 6.0L

B. 0.60L

C. 1.365L

D. 0.91L

Answer: D

Watch Video Solution

152. A layer of chromium metal 0.25 mm thick is to be plated on an auto bumper with a total area of $032m^2$ from a solution cantaining CrO_4^{2-}? What current flow is required for this electroplating if the bumper is to be plated in 60s ? The density of chromium metal is $7.20g/cm^3$

A. 4.9×10^3A

B. 1.78×10^3A

C. 5.3×10^4A

D. 10.69×10^6A

Answer: D

Watch Video Solution

153. 100mL of 0.5 M $CuCO_4$ (aq) solution was electrolysed using inert electrodes by passing current till the pH of the resulting solution was 2. The solution after electrolysis was Calculate the required volume (in mL) of $Na_2SO_2O_3$:

A. 112.5mL

B. 100mL

C. 125mL

D. None of these

Answer: A

Watch Video Solution

154. A fuel cell develops an electrical potential from the combustion of butane at 1 bar and 298 K

$C_4H_{10}(g) + 6.5O_2(g) \rightarrow 4CO_2(g) + 5H_2O(l),\ \triangle_r G^\circ = -2746kJ/mol$

what is E° of a cell?

A. 4.74V

B. 0.547V

C. 4.37V

D. 1.09V

Answer: D

Watch Video Solution

155. The cell $Pt \mid H_2(g, 01$ bar) $\left|H^+(aq), pH = x\right|\left|Cl^-(1M)\right|Hg_2Cl_2|Hg|Pt$ has emf of 0.5755 V at $25^\circ C$ the SOP of calomel electrode is $-0.28V$ then pH of the solution will be

A. 11

B. 4.5

C. 5.5

D. None of these

Answer: C

Watch Video Solution

156. For a cell reaction $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$ $\triangle_r S^\circ_{198} = -0.32KJ/k$. What is the value of $\triangle_f H^\circ_{298}(H_2O, l)$?

Given: $O_2(g) + 4H^+(aq) + 4e^- \rightarrow 2H_2O(l), E^\circ = 1.23V$

A. $-285.07 kJ/mol$

B. $-570.14 kJ/mol$

C. $285. kJ/mol$

D. None of these

Answer: A

Watch Video Solution

157. The standard reduction potential of normal calomel electrode and reduction potential of saturated calomel electrodes are 0.27 and 0.33 volt respectively. What is the concentration of Cl^- in saturated solution of KCL?

A. 0.1M

B. 0.01M

C. 0.001M

D. None

Answer: A

Watch Video Solution

158. Determine the potential of the following cell:

$Pt|H_2(g, 0.1\text{bar})|H^+(aq, 10^{-3}M||MnO_4^-)(aq), 0.1M)$

$Mn^{2+}(aq, 0.01M), H^+(aq, 0.01M) \mid Pt$

Given : $E^\circ_{MnO_4^- \mid Mn^{2+}} = 1.51V$

A. 1.54V

B. 1.48V

C. 1.84V

D. none of these

Answer: B

Watch Video Solution

159. For the cell,

$Pt|Cl_2(g, 0.4\text{bar})|Cl^-(aq, 0.1M)||Cl^-(aq), 0.01M)|Cl_2(g, 0.2\text{bar})|pt$

A. 0.051V

B. -0.051

C. 0.102V

D. 0.0255V

Answer: A

Watch Video Solution

160. The chlorate ion can disproportinate in basic solution according to reaction,

$2ClO_3^- \Leftrightarrow ClO_2^- + ClO_4^-$

what is the equilibrium concentration of perchlorate ions from a solution initially at 0.1 M in chlorate ions at 298 K?

Given: $E^\circ_{Cl_4^-|ClO_3^-} = 0.36V \text{and} E^\circ_{Cl_3^-|ClO_2^-} = 0.33V \text{at} 298K$

A. 0.019 M

B. 0.024M

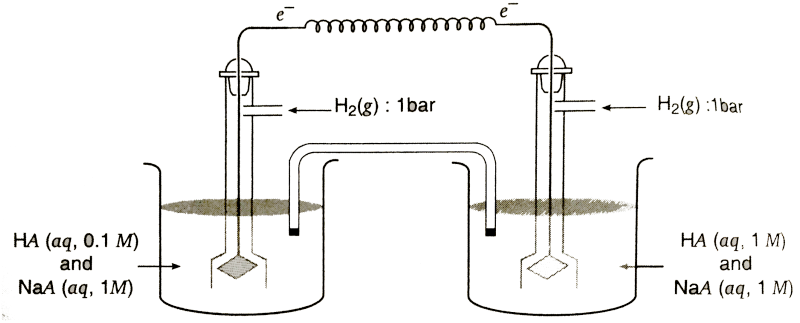
C. 0.1M

D. 0.19M

Answer: A

Watch Video Solution

161. A cell diagram shown below contains of one litre of buffer solution of $HA(PK_a = 4)$ and NaA in both compartments. What is the cell e.m.f?



A. 0.03V

B. 0.06V

C. -0.06V

D. None of these

Answer: B

Watch Video Solution

162. Given the cell:

$Cd(s)|Cd(OH)_2(s)|NaOH(aq, 0.01M)|H_2(g, 1\text{bar})|Pt(s)$

with $E_{cell} = 0.0V$. if$E^{\circ}_{Cd^{2+}|Cd} = -0.39V$, then$K_{sp}ofCd(OH_2)$is:

A. 0.1

B. 10^{-13}

C. 10^{-15}

D. None of these

Answer: C

Watch Video Solution

163. calculate the e.m.f (in V) of the cell:

$Pt|H_2(g)|BOH(Aq)||HA(Aq)|H_2(g)|Pt,$

0.1bar 1M 0.1M 1bar

Given : $K_a(HA) = 10^{-7}, K_b(BOH) = 10^{-6}$

A. 0.39V

B. 0.36V

C. 0.93V

D. None of these

Answer: A

Watch Video Solution

164. Calculate the potential of a half cell having reaction : $Ag_2S(s) + 2e^- \Leftrightarrow 2Ag(s) + S^{2-}(aq)$ in a solution buffered at $pH = 3$

and which is also saturated with 0.1 MH_2S(aq):

[Given:$K_{sp}(Ag_2S) = 10^{-49}, K_{a1} \cdot K_{a2} = 10^{-21}$]

A. 1.18

B. 0.19

C. -0.19V

D. none of these

Answer: C

Watch Video Solution

165. The conductivity of 0.1 n NaOH solution is 0.022 Scm^{-1}.When equal volume of 0.1 N HCl solution is added, the conductivity of resultant solution is decreased to 0.0055 S cm^{-1} . The equivalent conductivity of NaCl solution is :

A. 0.0055

B. 0.11

C. 110

D. None of these

Answer: C

Watch Video Solution

166. In above question after formation of NaCl, further 0.1 N HCl is added, the volume of which is double to that of the first portion added, the conductivity increases to 0.018 Scm^{-1}. The value of $bid \wedge_{} (eq)(HCl)$ is [assume no change in equivalent conductivity of NaCl(aq)]:

A. 330 Scm^2eq^{-1}

B. 305 Scm^2eq^{-1}

C. 415 Scm^2eq^{-1}

D. 360 Scm^2eq^{-1}

Answer: B

Watch Video Solution

167. Given the following molar conductivity at 25° C:, HCl,426 $\Omega^{-1}cm^2mol^{-1}$, NaCl, $126\Omega^{-1}cm^2mol^{-1}$, NaC(sodium crotonate), $83\Omega^{-1}cm^2mol^{-1}$. What is the dissciation constant of crotonic acid,if the conductivity of a 0.001 M crotonic acid solution is $3.83 \times 10^{-5}\Omega^{-1}cm^{-1}$?

A. 10^{-5}

B. 1.11×10^{-5}

C. 1.11×10^{-4}

D. 0.01

Answer: B

Watch Video Solution

168. Equivalent conductivity of $BaCl_2, H_2SO_4$ and HCl, are $x_1, x_2 \text{and} x_3 Scm^{-1}eq^{-1}$ at infinite dilution. If conductivity of saturated $BaSo_4$ solution is xScm^{-1}, then K_{sp} of $BaSO_4$ is :

A. $\frac{500x}{(x_1+x_2-x_3)^2}$

B. $\frac{10^6x^2}{(x_1+x_2-2x_3)^3}$

C. $\frac{2.5\times10^5x^2}{(x_1+x_2-2x_3)^2}$

D. $\frac{0.25x^2}{(x_1+x_2-2x_3)^2}$

Answer: C

Watch Video Solution

169. The conductivity of 0.001M Na_2SO_4 solution is $2.6\times10^{-4}Scm^{-1}$ and increases to $7.0\times10^{-4}Scm^{-1}$, When the solution is saturated with $CaSO_4$. The molar conductivities of Na^+ and Ca^{2+} are 50 and 120 Scm^2mol^{-1}, respectively. Neglect conductivity of used water. What is the solubility product fo $CaSO_4$?

A. 4×10^{-6}

B. 1.57×10^{-3}

C. 4×10^{-4}

D. 1.52×10^{-4}

Answer: A

Watch Video Solution

170. The dissociation constant of n-butyric acid is 1.6×10^{-5} and the molar conductivity at infinite dilution is $380 \times 10^{-4} Sm^2 mol^{-1}$. The specific conductance of the $0.01M$ acid solution is

A. 1.52×10^{-5}S

B. 1.52 S

C. 1.52×10^{-3}S

D. 1.52×10^{-4}S

Answer: B

Watch Video Solution

171. Three electrolytic cells X,Y,Z containing solution of NaCl, $AgNO_3$ and $CuSO_4$ respectively are connected in series combination. During electrolysis 21.6gm of silver deposits at cathode in cell Y. Which is incorrect statement.

A. 6.35 gm copper deposits at cathode in cell z

B. 2.24 litre Cl_2 is liberated(at 1atm and 273 K) at anode in cell X

C. 2.24 litre O_2 is liberated(at 1atm and 273 K) at anode in cell Y

D. 2.24 litre H_2 is liberated(at 1atm and 273 K) at anode in cell X

Answer: C

Watch Video Solution

172. During electrolysis of H_2SO_4(aq) with high charge density, $H_2S_2O_8$ formed as by product. In such electrolysis 22.4L $H_2(g)$ and 8.4 L $O_2(g)$ liberated at 1 atm and 273 K at electrode. The moles of $H_2S_2O_8$ formed is :

A. 0.25

B. 0.5

C. 0.75

D. 1

Answer: A

Watch Video Solution

173.

$Zn(s)\left|Zn(CN)_4^{2-}(0.5M), CN^-(0.01)||Cu(NH_3)_4^{2+}(0.5M), NH_3(1M)\right|C$

Given: $K_f \text{of} Zn(CN)_4^{-2} = 10^{16}$, $K_f \text{of} Cu(NH_3)_4^{2+} = 10^{12}$,

$E^{\circ}_{Zn|Zn^{2+}} = 0.76V, E^{\circ}_{Cu^{+2}|Cu} = 0.34V, \frac{2.303RT}{F} = 0.06$

The emf of above cell is :

A. 1.22V

B. 1.10V

C. 0.98V

D. None of these

Answer: C

Watch Video Solution

174. The cell potential (E_{cell}) of a reaction is related as $\triangle G = -nFE_{cell}$, where

$\triangle$ `$Grepresents \max . usefe \leq ctricalw$ or $kn = n \odot ofmo \leq sofe \leq$

d(/_\G)=(/__rV)dp-(/__rS),dT$atcons \tan tpressure$d(/_\G)=-(/__rS).dT

$\because Atcons \tan tpressure$/_\G=/_\H-T./_\S $\therefore \triangle G \underset{+}{=} H + T\frac{d(\triangle G)}{(dT)_P}$

$\left(\frac{dE_{cell}}{dT}\right)_P$ is known as temperture coefficient of the e.m.f of the cell.

The temperature coefficient of the e.m.f of cell, $\left(\frac{dE}{dT}\right)_P$ si given by:

A. $\frac{nF}{\triangle S}$

B. $\frac{\triangle S}{nF}$

C. $\frac{\triangle S}{nFT}$

D. #REF!

Answer: B

Watch Video Solution

175. The cell potential (E_{cell}) of a reaction is related as $\triangle G = -nFE_{cell}$, where $\triangle$ `Grepresents max . usefe ≤ ctricalw or kn = n ⊙ ofmo ≤ sofe ≤

d(/_\G)=(/__rV)dp-(/__rS),dT$atcons\tan tpressure$d(/_\G)=-(/__rS).dT

$\because Atcons\tan tpressure$/_\G=/_\H-T./_\S $\therefore \triangle G \underset{+}{=} H + T\frac{d(\triangle G)}{(dT)_P}$

$\left(\frac{dE_{cell}}{dT}\right)_P$ is known as temperture coefficient of the e.m.f of the cell.

At 300 k, $\triangle$ `$Hf$ or $thereaction$Zn(s)+AgCl(s)toZnCl_2(aq)+2Ag(s) $is-218K\frac{J}{m}olwhi\leq thee.m.\ ofthecellwas1.015V.$ ((dE)/(dT))_p` of the cell is :

A. $-4.2\times10^{-4}VK^{-1}$

B. $-3.\ .81\times10^{-4}VK^{-1}$

C. $0.11VK^{-1}$

D. $7.62\times10^{-4}VK^{-1}$

Answer: B

Watch Video Solution

176. The cell potential (E_{cell}) of a reaction is related as $\triangle G=-nFE_{cell}$, where $\triangle$ `$Grepresents\ \max.\ usefe\leq ctricalw$ or $kn=n\odot ofmo\leq sofe\leq$ d(/_\G)=(/__rV)dp-(/__rS),dT$atcons\tan tpressure$d(/_\G)=-(/__rS).dT $\because Atcons\tan tpressure$/_\G=/_\H-T./_\S $\therefore\ \triangle G\underset{+}{=}H+T\frac{d(\triangle G)}{(dT)_P}$

$\left(\frac{dE_{cell}}{dT}\right)_P$ is known as temperture coefficient of the e.m.f of the cell.

Calculate `/_\`S for the given cell reaction in Q. no. 2:

A. -73.53J/Kmol

B. 83.53J/Kmol

C. 100J/Kmol

D. None of these

Answer: A

Watch Video Solution

177. molar conductivity($bid \wedge_m$) is defined as conducting power of the ions producedd by 1 mole of an electrolyte in a solution. $bid \wedge_m = \frac{K}{C}$

Where k is conductivity $\left(Scm^2mol^{-1}\right)$ and C is molar concentration $\left(\in mol/cm^3\right)$

The molar conductivity of 0.04 M solution of $MgCl_2$ is 200 Scm^3mol^{-1} at 298 k. A cell with electrodes that are 2.0cm^2 in surface area and 0.50cm apart is filled with $MgCl_2$ solution

How much current will flow when the potential difference between the two electrodes is 5.0V?

A. 156.25V

B. 0.16A

C. 160A

D. None of these

Answer: B

Watch Video Solution

178. In a hydrogen oxyge fuel cell, electricity is produced. In this process H_2(g) is oxided at anode and O_2(g) reduced at cathode

Given: Cathode $O_2(g) + 2H_2O(l) + 4e^- \rightarrow 4OH^-(aq)$

Anode $H_2(g) + 2OH^-(aq) \rightarrow 2H_2O(l) + 2e^-$

4.48 litre H_2 at 1atm and 273 k oxidised in 9650 sec.

The current produced is (in amp):

A. 1A

B. 2A

C. 4A

D. 8A

Answer: C

Watch Video Solution

179. In a hydrogen oxyge fuel cell, electricity is produced. In this process H_2(g) is oxided at anode and O_2(g) reduced at cathode

Given: Cathode $O_2(g) + 2H_2O(l) + 4e^- \rightarrow 4OH^-(aq)$

Anode $H_2(g) + 2OH^-(aq) \rightarrow 2H_2O(l) + 2e^-$

4.48 litre H_2 at 1atm and 273 k oxidised in 9650 sec.

The mass of water produced is :

A. 7.2g

B. 3.6g

C. 1.8g

D. 0.9g

Answer: B

Watch Video Solution

180. In a hydrogen oxyge fuel cell, electricity is produced. In this process H_2(g) is oxided at anode and O_2(g) reduced at cathode

Given: Cathode $O_2(g) + 2H_2O(l) + 4e^- \rightarrow 4OH^-(aq)$

Anode $H_2(g) + 2OH^-(aq) \rightarrow 2H_2O(l) + 2e^-$

4.48 litre H_2 at 1atm and 273 k oxidised in 9650 sec.

If current produced in fuel cell, is used for the deposition of Cu^{+2} in 1L,2M $CuSO_4$(aq) solution for 241.25 sec using Pt. electrode, the pH of solution after electrolysis is:

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

181. A saturated solution in $AgX\left(K_{sp}=3\times10^{-12}\right)$ and $AgY\left(K_{sp}=10^{-12}\right)$ has conductivity $0.4\times10^{-6}\Omega^{-1}cm^{-1}$.

Given: Limiting molar conductivity of $Ag^{+}=60\Omega^{-1}cm^{2}mol^{-1}$

Limiting molar conductivity of $X^{-}=90\Omega^{-1}cm^{2}mol^{-1}$

The conductivity of Y^{-} is (in $\Omega^{-1}cm^{-1}$):

A. 1.45×10^{-7}

B. 1.45×10^{-5}

C. 1.45×10^{-9}

D. None of these

Answer: A

Watch Video Solution

182. If the e.m.f of a galvanic cell is neagative, it implies that:

A. the cell reaction is spontaneous

B. the cell reaction is non-spontaneous

C. the cell reaction is exothermic

D. the cell is working in reverse direction

Answer: A::B

Watch Video Solution

183. Select correct statement(s) about electrolysis:

A. Electric current is used to drive a non -spontaneous reaction

B. $\triangle G$ is positive for chemical process during electrolysis

C. Cations and anions are moved toward the anode and cathode respectively

D. Over voltage is generally associated with evolution of O_2 gas

Answer: A::B::D

Watch Video Solution

184. If the half-cell reaction $A + e^- \rightarrow A^-$ has a large negative reduction potentials, it follows that:

A. A is readly reduced

B. A is readily oxidised

C. A^- is readily reduced

D. A^- is readily oxidised

Answer: D

Watch Video Solution

185. Which of the following statements is correct? If $E^{\circ}_{Cu^{2+}|Cu} = 0.34V \text{and} E^{\circ}_{H^{+}|H_2} = -0.0V$

A. Cu^{2+} ions can be reduced by H_2(g)

B. cu can be oxidised

C. Sn^{2+} ions can be reduced by H_2

D. Sn can be oxidized by Cu^{2+}

Answer: A::D

Watch Video Solution

186. The oxidation potential of hydrogen half-cell will be negative if:

A. $p(H_2) = 1atm \text{and} \left[H^{+}\right] = 1M$

B. $p(H_2) = 1atm \text{and} \left[H^{+}\right] = 2M$

C. $p(H_2) = 0.2atm \text{and} \left[H^{+}\right] = 1M$

D. $p(H_2) = 0.2 atm \text{and} \left[H^+\right] = 0.2M$

Answer: B::C

Watch Video Solution

187. which of the following arrangement will procedure oxygen at anode during electrolysis?

A. Dilute H_2SO_4 with Pt electrodes

B. Fused NaOH with inert electrodes

C. Dilute H_2SO_4 with Cu electrodes

D. Concentrated aq. NaCl with Pt electrodes

Answer: A::B

Watch Video Solution

188. When an aqueous concentrated solution of lithium chloride is electrolysed using inert electrodes:

A. Cl_2 is liberated at the anode

B. Li is deposited at the cathode

C. as the current flows. pH of the solution around the cathode remains constant

D. as the current flows, pH of the solution around the cathode increases

Answer: A::D

Watch Video Solution

189. Oxygen and hydrogen gas are produced at the anode and cathode during the electrolysis of fairly concentration aqueous solution of :

A. K_2SO_4

B. $AgNO_3$

C. H_2SO_4

D. NaOH

Answer: A::C::D

Watch Video Solution

190. During the purification of copper by electrolysis:

A. the anode used is made of copper ore

B. pure copper is deposited on the cathode

C. the impurities such as Ag, Au present in solution as ions

D. concentration of $CuSO_4$ solution remains constant during dissolution of Cu

Answer: A::B::D

Watch Video Solution

191. When a lead storage battery is discharged:

A. SO_2 is evolved

B. lead sulphate is produced at both electrodes

C. sulphuric acid is consumed

D. water is formed

Answer: B::C::D

Watch Video Solution

192. Which of the following is characteristic of the cathode in a voltaic cell?

A. It may gain weight during reaction

B. Electrons flow to it through the external circuit

C. It is where oxidation occurs

D. it receives electrons from ions in solution

Answer: A::B

Watch Video Solution

193. In an electrochemical process, a salt bridge is used:

A. to maintain electrical neutrality in each solution

B. to complete the external circuit so that current can flow for long time

C. to mix the solution of anodic and cathodic compartment

D. to supply voltage

Answer: A

Watch Video Solution

194. For a reaction in a galvanic cell the value of $- \triangle G^{\circ}$ at certain temperature is not necessarily equal to:

A. nFE°

B. RT In K

C. $T.\ \triangle S^{\circ} - \triangle H^{\circ}$

D. zero

Answer: B::D

Watch Video Solution

195. Given that $E^{\cdot}_{Fe^{2+}/Fe} = -0.44V, E^{\circ}_{Fe^{3+}/Fe^{2+}} = 0.77V$ if Fe^{2+}, Fe^{3+} and Fe solid are kept together then

A. the concentration of Fe^{3+} increases

B. the concentration of Fe^{3+} decreases

C. the mass of Fe increases

D. the concentration of Fe^{2+} decreases

Answer: B

Watch Video Solution

196. which of the following statements are correct regarding to galvanic cell?

A. A reaction is spontaneous from right to left if $E_{cell} > 0$

B. A reaction occurs from right to left if $E_{cell} < 0$

C. If the system is at equilibrium no net reaction occurs

D. E_{cell} is temperature-independent

Answer: A::B::C

Watch Video Solution

197. Which of the following are concentration cell?

A. $Pt|\underset{P_1}{H_2(g)}|HCl|\underset{P_2}{H_2(G)}\ |\ Pt$

B. $Cd, \underset{(a_1)}{(Hg)}|\ \underset{(C)}{C\ d^{2+}}|\underset{a_2}{(Hg)}, Cd$

C. $Zn(s)|\underset{c_1}{Zn^{2+}}||\underset{c_2}{Cu^{2+}}|Cu$

D. $Ag|AgCl|\underset{c_1}{Cl^-(aq)}||\underset{c_2}{Br^-(aq)}|AgBr|Ag$

Answer: A::B::D

Watch Video Solution

198. In electrolyte concentration cell:

A. the electrode material and the solution in both half-cells are composed of the same substances

B. only the concentrations of solutions of ther same substances is different

C. $E_{cell}^{\circ} = 0$

D. the Nernst equations reduces to $E_{cell} = -\left(\frac{0.0591}{n}\right)$ log Q at $25^{\circ} C$

Answer: A::B::C::D

Watch Video Solution

199. The standard electrode of a metal ion $\left(Ag \mid Ag^{\oplus}\right)$ and metal $-$ insoluble salt anion $\left(Ag|AgCl|Cl^{c-}\right)$ are related as

A. $E_{Ag^{+}|Ag}^{\circ} = E_{Cl^{(-)}|AgCl|Ag}^{\circ} + \frac{RT}{F} InK_{sp}$

B. $E_{Cl^{(-)}|AgCl|Ag}^{\circ}$ = E_(Ag^+"|"Ag)^(@)+(RT)/FInK_(sp)`

C. $E_{Cl^{(-)}|AgCl|Ag}^{\circ}$ = E_(Ag^+"|"Ag)^(@)-(RT)/FIn([Cl^-])/K_(sp)`

D. $E_{Cl^{(-)}|AgCl|Ag}^{\circ}$ = E_(Ag^+"|"Ag)^(@)-(RT)/FIn([Cl^-])/K_(sp)`

Answer: B

Watch Video Solution

200. Which of the following units is correctly matched?

A. SI units of conductivity is Sm^{-1}

B. SI units of molar conductivity is Scm^2mol^{-1}

C. SI unit of conductance is S^{-1}

D. All of these

Answer: A

Watch Video Solution

201. Which of the following statements is/are correct?

A. The conductance of one cm^3 (or 1 $unit^3$) of a solution is called specific conductance

B. Specific conductance increases while molar conductivity decreases on progressive dilution

C. The limiting equivalent conductivity of weak electrolyte cannot be determined exactly by extraplotation of the plot of $bid \wedge_{eq}$ against $\sqrt{c}$

D. The conductance of metals is due to the movement of free electrons

Answer: A::C::D

Watch Video Solution

202. Given: $Pt(s)|_{P_1 atm} C l_2(g)|Cl^-(C_1)||Cl^-(Cl_2)|_{P_2 atm_2} Cl(g)|Pt(s)$

identify in which of following condition working of cell takes place:

A. $C_1 > C_2 \text{and} P_1 = P_2$

B. $P_1 > P_2 \text{and} C_1 = C_2$

C.

D. $P_1 < P_2 \text{and} C_1 = C_2$

Answer: A::B

Watch Video Solution

203. 1000mL 1M $CuSO_4$(aq) is electrolysed by 9.65 A current for 100 sec using Pt-electrode which is /are correct statements?

A. Blue colour intensity decreases during electrolysis

B. Blue colour intensity remains constant if Cu-electrode used.

C. pH of solution is 8 after electrolysis.

D. 28mL of CH_4 at 1 atm and 273 K required for its combustion by O_2, liberated during electrolysis.

Answer: A::B::D

Watch Video Solution

204. Column-1 and column-II contains four entries each. Entries of column-I are to be matched with some entries of column-II .One or more than one entries of column-I may have the matching with the same entries of column-II

Column–I	Column–II
(A) Dilute solution of HCl	(P) O_2 evolved at anode
(B) Dilute solution of NaCl	(Q) H_2 evolved at cathode
(C) Concentrated solution of NaCl	(R) Cl_2 evolved at anode
(D) Fairly concentrated solution of $AgNO_3$	(S) Ag deposition at cathode

Watch Video Solution

205. Column-1 and column-II contains four entries each. Entries of column-I are to be matched with some entries of column-II .One or more than one entries of column-I may have the matching with the same entries of column-II

Column–I	Column–II (SRP)
(A) $F_2 + 2e^- \rightleftharpoons 2F^-$	(P) 0.54
(B) $Cl_2 + 2e^- \rightleftharpoons 2Cl^-$	(Q) 1.09
(C) $Br_2 + 2e^- \rightleftharpoons Br^-$	(R) 1.36
(D) $I_2 + 2e^- \rightleftharpoons 2BI^-$	(S) 2.87

Watch Video Solution

206. Column-1 and column-II contains four entries each. Entries of column-I are to be matched with some entries of column-II .One or more than one entries of column-I may have the matching with the same entries of column-II

Column–I	Column–II
(A) $Pt\|Fe^{3+}, Fe^{2+}$	(P) Metal-metal ion half-cell
(B) $Pt\|H_2\|H^+$	(Q) Gas-gas ion half-cell
(C) $Pt\|Hg\|Hg_2^{2+}$	(R) Oxidation-reduction half-cell
(D) $Pb\|PbSO_4\|SO_4^{2-}$	(S) Metal-sparingly soluble salt half-cell

Watch Video Solution

207. Column-1 and column-II contains four entries each. Entries of column-I are to be matched with some entries of column-II .One or more than one entries of column-I may have the matching with the same entries of column-II

Column–I (Property)	Column–II (Unit)
(A) Conductance	(P) Sm^{-1}
(B) Conductivity	(Q) $S^{-1}m$
(C) Molar conductivity	(R) Sm^2mol^{-1}
(D) Resistivity	(S) S

Watch Video Solution

208. Column-1 and column-II contains four entries each. Entries of column-I are to be matched with some entries of column-II .One or more than one entries of column-I may have the matching with the same entries of column-II

Column–I (Ion)	Column–II (Molar Conductivity)
(A) H^+	(P) 350
(B) Na^+	(Q) 50
(C) Li^+	(R) 39
(D) Cs^+	(S) 77

Watch Video Solution

209. Column-1 and column-II contains four entries each. Entries of column-I are to be matched with some entries of column-II .One or more than one entries of column-I may have the matching with the same entries of column-II

Column-I	Column-II
(A) Galvanic cell	(P) Used in space craft
(B) Electrolytic cell	(Q) No transformation of electrical energy into chemical energy
(C) Dead battery	(R) Cell reaction is spontaneous
(D) Fuel cell	(S) Cell reaction is non-spontaneous

Watch Video Solution

210. STATEMENT -1: E°_{cell} is negative for electrolytic cell.

STATEMENT-2: $\triangle G^{\circ}$ is +ve for electrolyte cell

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-1

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-1

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

Watch Video Solution

211. STATEMENT-1: when 2 faraday of charge is passed through 0.1 M H_2SO_4 (aq) ,11.2 litre O_2 evolved at STP.

STATEMENT-2: Molecular mass of oxygen is 32

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-1

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-2

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: B

Watch Video Solution

212. STATEMENT-1: Copper is dissolved at anode and deposited at cathode when Cu electrodes are used and electrolyte is 1 M $CuSO_4$ (aq) solution.

STATEMENT-2: SOP of Cu is less than SOP of water and SRP of Cu is greater than SRP of water.

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-1

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-3

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: C

Watch Video Solution

213. STATEMENT-1: 1 coulomb charge deposits 1 g-equivalent of a substance.

STATEMENT-2: 1 faraday is charge is charge on 1 mole of electrons.

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-1

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-1

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: D

Watch Video Solution

214. STATEMENT-1: If SRP of substance is -0.3V, its reduction is possible at cathode.

STATEMENT-2: Reduction potential of water lies between 0 to -0.8274 V at 25°

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-1

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-1

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

Watch Video Solution

215. STATEMENT-1: If SRP of substance is -0.5V, then reduction of substance is possible only in basic medium .

SRP of water is -0.8274V and at reduction potential is zero at pH=7

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-4

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-6

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: C

Watch Video Solution

216. STATEMENT-1: The voltage of mercury cell remains constant for longer period of time.

STATEMENT-2: It is because net cell reaction does not involve ions.

A. If both the statements are TRUE and STATEMENTS-1 is the correct explantion of STATEMENTS-2

B. If both the statements are TRUE but STATEMENTS-1 is NOT the correct explanation of STATEMENTS-2

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

Watch Video Solution

217. STATEMENT-1: lead storage battery is a galvanic cell without salt bridge.

STATEMENT-2: A secondary cell is rechargeable cell.

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-6

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-8

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: B

Watch Video Solution

218. STATEMENT-1: The SRP of three metallic ions A,B,C are -0.3,-0.5,0.8 volt respectively, so oxidizing power of ions is CgtAgtB.

STATEMENT-2: Higher the SRP, higher the oxidizing power.

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-7

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-9

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

Watch Video Solution

219. STATEMENT-1: If SOP of substance is less than -1.23 V and over voltage=0V, then its oxidation in its aqueous solution is not possible at 298 K. ,

STATEMENT-2: Standard reduction potential (SRP) of water is +1.23V.

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-8

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-10

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: C

Watch Video Solution

220. STATEMENT-1: We cannot add the electrode potential in order to get electrode potential of third electrode if no. of moles of electrons exchanged are not same.

STATEMENT-2: Electrode potential is an extensive property

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-9

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-11

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: C

Watch Video Solution

221. STATEMENT-1: E°_{cell}=0

f or $achl$ or $ideionconcentrationcell. STATEMENT-2: F$ or $thiscor$

E_(cell)=(RT)/(nF)In([Cl^-]_(LHS)/([Cl^-]_(RHS)`

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-10

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-12

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: B

Watch Video Solution

222. STATEMENT-1: If $\left(\frac{dE_{cell}}{dT}\right)_P > 0$, For a cell reaction then $\triangle$ `$Sispositive. STATEMENT-2:$/_\SnFT((dE)/(dT))_p`

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-11

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-13

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: C

Watch Video Solution

223. STATEMENT-1: Molar conductivity indreases with decrease in concentration for weak electrolysis.

STATEMENT-2: No. o fions increases and o. of ions per unit volume decreases due to dilution.

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-12

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-14

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: A

Watch Video Solution

224. STATEMENT-1: Conductivity decreases with the decreases is concentration both the weak and strong electolytes.

STATEMENT-2: No. of ions per unit volume linearly decreases in both electrolytes.

A. If both the statements are TRUE and STATEMENTS-2 is the correct explantion of STATEMENTS-13

B. If both the statements are TRUE but STATEMENTS-2 is NOT the correct explanation of STATEMENTS-15

C. If STATEMENTS-1 is TRUE and STATEMENTS-2 is FALSE

D. If STATEMENT-1 is FALSE and STATEMENT-2 is TRUE

Answer: C

Watch Video Solution

225. How many faradays are required for reduction of 1mol $C_6H_5NO_2$ into `C_6H_5NH_2?

Watch Video Solution

226. What is the equivalent mass of O_2 in the following reaction , $H_2O + \frac{1}{2}O_2 + 2e^- \rightarrow 2OH^-$?

Watch Video Solution

227. The amount of electricity which release 2.0g of gold from a gold salt is same as that which dissolves 0.967g of copper anode during the electrolysis of copper sulphate solution. What is the oxidation number of gold in the gold ion ? (At mass of Cu=63.5,Au=197)

Watch Video Solution

228. when molten salt was elctrolysed for 5 min with9.65 A current , 0.18g of the metal was deposited. Calculate the Eq. mass of metal.

Watch Video Solution

229. During the electrolysis of a concentrated brine solution, Calculated the moles of chlorine gas produced by the passage of 4F electricity.

Watch Video Solution

230. Calculate the cell potential (in V) if `/_\` G=-96.5kJ/mol and n=1

Watch Video Solution

231. If K_c for the reaction

$Cu^{2+}(aq) + Sn^{2+}(aq) \rightarrow Sn^{4+}(aq) + Cu(s)$

at 25° C is represented as 2.6×10^y then find the value of y.

(Given:$E^\circ_{Cu^{2+}|Cu} = 0.34V$, $E_{Sn^{4+}|Sn^{2+}\hat{}(\circ)} = 0.15V$

Watch Video Solution

232. If $\triangle G^\circ$ for the half cell $MnO_4^-|MnO_2$ in an acid solution is -xF then find the value of x.(Given: $E^\circ_{MnO_4^-|Mn^{2+}} = 1.5V$, $E^\circ_{MnO_2|Mn^{2+}} = 1.25V$)

Watch Video Solution

233. If the equilibrium constant for the reaction $Cd^{2+}(aq) + 4NH_3(aq) \Leftrightarrow Cd(NH_3)_4^{2+}(aq)$ is 10^x then find the value of x.

(Given: $E^{\circ}_{Cd^{2+}|Cd} = -0.4V$, $E^{\circ}_{Cd(NH_3)_4^{2+}|Cd} = -0.61V$)

Watch Video Solution

234. At What pH oxidation potential of water is -0.81V ?

Watch Video Solution

235. The resistance of a conductivity cell containing 0.001M KCl solution at 298K is 1500Ω. What is the cell constant (in mm^{-1}) if the conductivity of 0.001M KCl solution is $2 \times 10^{-3} Smm^{-1}$

Watch Video Solution

236. Molar conductivity at infinitre dilution of KCl,HCl and CH_3COOK are 0.013,0.038 and 0.009 Sm^2mol^{-1} respectively at 291K. If conductivity of 0.001M CH_3COOH is $2.72 \times 10^{-3} Sm^{-1}$ then find % degree of dissociation of CH_3COOH

Watch Video Solution

237. Molar conductivity of aqueous solution of HA is $200 Scm^2mol^{-1}$, pH of this solution is 4

Calculate the value of $pK_a(HA)$ at $25^\circ C$.

Given $\wedge_M^\infty (NaA) = 100 scm^2mol^{-1}$,

$\wedge_M^\infty (HCl) = 425 Scm^2mol^{-1}$,

$\wedge_M^\infty (NaCl) = 125 Scm^2mol^{-1}$

Watch Video Solution

238. The standard reduction potential of a silver chloride electrode (metal-sparingly soluble salt electrode) is 0.029 V and for silver electrode

is 0.80V. If the moles of AgCl that can dissolve in 10 L of a 0.01 M NaCl solution is represted as 10^{-z} find the value of Z.

Watch Video Solution

Level 1 Q 1 To Q 30

1. The electrolysis of a solution resulted in the formation of H_2(g) at the anode. The solution is :

A. AgCl(aq)

B. $H_2SO_4(aq)$

C. highly concentrated NaCl(aq) solution

D. $CuCl_2(aq)$

Answer: B

View Text Solution

Level 1 Q 91 To Q 120

1. The Zn acts as sacrified of cathodic protection to prevent rusting of iron because:

A. E°_{OP} of $Zn < E^{\circ}_{OP}$ of Fe

B. E°_{OP} of $Zn > E^{\circ}_{OP}$ of Fe

C. E°_{OP} of $Zn = E^{\circ}_{OP}$ of Fe

D. Zn is cheaper than iron

Answer: B

View Text Solution

Level 2

1. If the equilibrium constant for the reaction $H^{+}(aq) + OH^{-}(aq) \Leftrightarrow H_2O(l)$ is 10^{13} at certain temperature then

what is the E° for the reaction,

$2H_2O(l) + 2e^- \Leftrightarrow H_2(g) + 2OH^-(aq)$

A. 4.74V

B. 0.547V

C. 4.37V

D. 1.09V

Answer: B

View Text Solution

2. What is the potential of an electrode which originally contained 0.1 MNO_3^- and $0.4MH^+$ and which has been treated by 80% of the cadmium necessary to reduce all the NO_3^- to NO(g) at 1 bar?

Give: $NO_3^- + 4H^+ + 3e^- \rightarrow NO + 2H_2O, E^{\circ} = 0.96V, \log 2 = 0.3$

A. 0.84V

B. 1.08V

C. 1.23V

D. 1.36V

Answer: A

View Text Solution

3. Copper reduces NO_3^- into NO_2 depending upon concentration of HNO_3 in solution Assuming $\left[Cu^{2+}\right] = 0.1M$, and$P_{NO} = P_{NO_2} = 10^{-3}$ bar, at which concentration of HNO_3, Thermodynamic tendency for reduction of NO_3^- into NO and NO_2 by copper is same ?

Given:

$E^{\circ}_{cu^{2+}|cu} = +0.34\text{volt}, E^{\circ}_{NO_3^-|NO} = +0.96\text{volt}, E^{\circ}_{NO_3^-|NO_2} = +0.76\text{volt}$

A. $10^{1.23}M$

B. $10^{0.56}M$

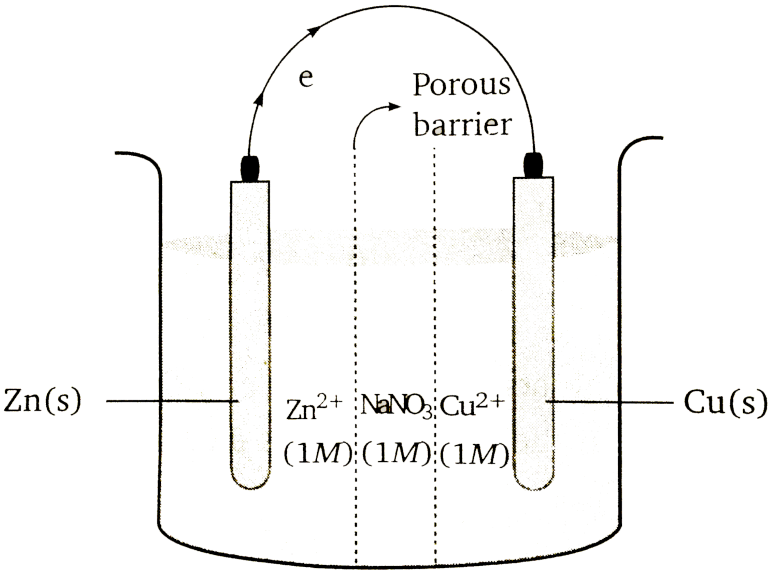
C. $10^{0.66}M$

D. `10^(0.12)M

Answer: C

View Text Solution

Level 3 Passage



1.

A Galvanic cell consits of three compartment as shown in figure. The first compartment contain $ZnSO_4$(1M) and III compartment contain $CuSO_4$ (1M). The mid compartment contain $NaNO_3$ (1M). Each compartment contain 1L solution:

$E^{\circ}_{Zn^{2+}/Zn} = -0.76, E^{\circ}_{Cu^{2+}/Cu} = +0.34,$

The concertation of Zn^{2+} in first compartment after passage of 0.1 F charge will be:

A. 1M

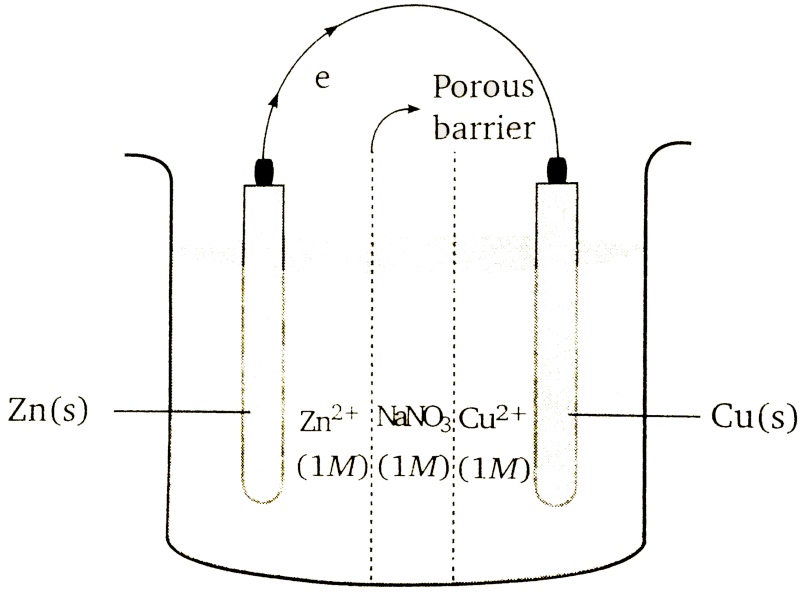
B. 1.05M

C. 1.025M

D. 0.5M

Answer: C

View Text Solution



2.

A Galvanic cell consits of three compartment as shown in figure. The first compartment contain $ZnSO_4$(1M) and III compartment contain $CuSO_4$ (1M). The mid compartment contain $NaNO_3$ (1M). Each compartment contain 1L solution:

$E^{\circ}_{Zn^{2+}/Zn} = -0.76, E^{\circ}_{Cu^{2+}/Cu} = +0.34$

The concentration of NO_3^- in mid compartment after passage of 0.1 F of charge will be:

A. 0.95M

B. 0.90M

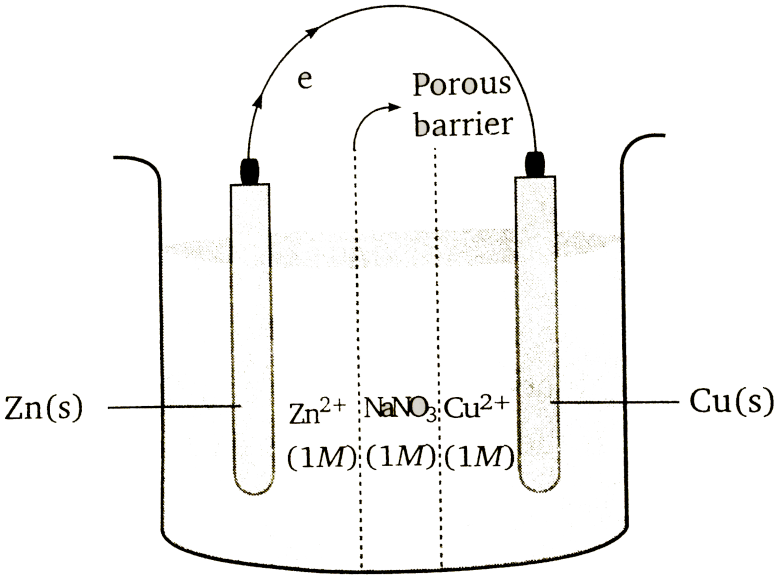
C. 0.975M

D. 1.05M

Answer: A

View Text Solution

3.



A Galvanic cell consits of three compartment as shown in figure. The first compartment contain $ZnSO_4$(1M) and III compartment contain $CuSO_4$ (1M). The mid compartment contain $NaNO_3$ (1M). Each compartment contain 1L solution:

$E^{\circ}_{Zn^{2+}/Zn} = -0.76, E^{\circ}_{Cu^{2+}/Cu} = +0.34$

The concentration of SO_4^{2-} ions in III compartment after passage of 0.1 F of charge will be:

A. 1.05M

B. 1.025M

C. 0.95M

D. 0.975M

Answer: D

View Text Solution

4. molar conductivity$(bid \wedge_m)$ is defined as conducting power of the ions producedd by 1 mole of an electrolyte in a solution. $bid \wedge_m = \frac{K}{C}$ Where k is conductivity $\left(Scm^2mol^{-1}\right)$ and C is molar concentration $\left(\in mol/cm^3\right)$

The molar conductivity of 0.04 M solution of $MgCl_2$ is 200 Scm^3mol^{-1} at 298 k. A cell with electrodes that are 2.0cm^2 in surface area and 0.50cm

apart is filled with $MgCl_2$ solution.

Conductance of $MgCl_2$ solution is :

A. 8×10^{-3}S

B. 32S

C. 0.032S

D. None of these

Answer: C

View Text Solution

5. A saturated solution in $AgX\left(K_{sp} = 3 \times 10^{-12}\right)$ and $AgY\left(K_{sp} = 10^{-12}\right)$ has conductivity $0.4 \times 10^{-6}\Omega^{-1}cm^{-1}$.

Given: Limiting molar conductivity of $Ag^{+} = 60\Omega^{-1}cm^{2}mol^{-1}$

Limiting molar conductivity of $X^{-} = 90\Omega^{-1}cm^{2}mol^{-1}The \lim it \in gmolarconductivityofY^(-)is(\in$ Omega^(-1)cm^2mol^(-1)`):

A. 290

B. 2900

C. 2.9

D. None of these

Answer: A

View Text Solution

Level 3 One Or More Answers Are Correct

1. Which is/are correct statement?

A. No corrosion takes place in vaccum

B. Corrosion is protected by electroplating

C. During rusting $Fe_2O_3 \cdot xH_2O$ formed

D. In presence of electrolyte, corrosion takes place with greater rate

Answer: A::B::C::D

View Text Solution

2. A dilute solution of KCl was placed between two Pt electrodes 10cm apart across which a potential difference of 10 volt was applied. Which is /are correct statement (Given: molar conductivity of K^+ at infinite dilution is 96.5 Scm^2mol^(-1)`)

A. Ionic mobility of K^+ is $10^{-3} cm^2 \sec^{-1} \text{volt}^{-1}$

B. The speed of K^+ is 10^{-3} cm $\sec^{-1}$

C. Distance travelled by K^+ in 5×10^3 sec is 5cm

D. The potential gradient is 1.0 volt cm^{-1}

Answer: A::B::C::D

View Text Solution

3. Given:

$$Pt(s)|\underset{1\text{bar}_2}{H}(g)|0.1MNH_4OH(aq)||0.1MCH_3COOH(aq)|\underset{1\text{bar}_2}{H}(g)|Pt(s)$$

$$pK_b(NH_4OH) = 5, (CH_3COOH) = 5, \frac{2.303RT}{F} = 0.06$$

Volume of 0.1 m NH_4OH in anode half cell=100ML

Volume of 0.1 M CH_3COOH in cathode half cell =100mL

Which is /are correct statement?

A. The emf of given cell is 0.48V.

B. The emf of given cell is 0.36V when 50mL,0.1M NaOH added to cathode compartment

C. The emf of given cell is 0.36V when 50mL 0.1M HCl added to anode compartment

D. The emf of given cell is 0.192V when 100mL 0.1M NaOH added to anode compartment

Answer: A::B::C

View Text Solution

Level 3 Match The Column

1. Column-1 and column-II contains four entries each. Entries of column-I are to be matched with some entries of column-II .One or more than one entries of column-I may have the matching with the same entries of column-II

Column–I	Column–II
(A) If SOP of substance lies between −1.23 to −0.81 V	(P) Oxidation of substance is not possible
(B) If SOP of substance lies between −0.81 V to −0.40 V	(Q) Oxidation possible only in acidic medium
(C) If SOP is less than −1.23 V	(R) Oxidation possible in any medium
(D) If SOP is greater than −0.40 V	(S) Oxidation easily takes place

View Text Solution

Level 3 Subjective Problems

1. A solution containing $1MXSO_4(aq)$ and $1MYSO_4(aq)$ is electrolysed. If conc. Of X^{2+} is $10^{-z}M$ when deposition Y^{2+} and X^{2+} starts simultaneously, calculate the value of Z.

Given: $\frac{2.303RT}{F} = 0.06$

$E^{\circ}_{x^{2+}|X} = -0.12V, E^{\circ}_{Y^{2+}|Y} = -0.24V$

View Text Solution