CHEMISTRY

BOOKS - MTG GUIDE

ELECTROCHEMISTRY

Illustration

1. Three electrolytic cells A, B and C, containing electrolytes zine sulphate, silver nitrate and copper sulphate respectively, were connected in series. A steady current of 1.5 amperes was passed through

them, until 1.45 g of silver were deposited at the cathode of cell B.

(a) How long did the current flow?

(b) What weights of copper and zinc were deposited?

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2. When a current of eleven amperes is passed through an aqueous solution of $CrCI_3$, it is observed that 6.2 g of Cr are deposited. For how long was the current passed?

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3. The specific conductance of N/50 solution of a cell of KCl at 25°C is 0.002765 mho cm^{-1} . If the resistance of a cell containing this solution is 400 ohm, find out the cell constant.

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4. The conductivity of a 0.12 N solution of an electrolyte of the type $A^{+}B^{-}$ is 0.024 S cm^{-1} . Calculate its (i) equivalent, (ii) molar conductivities.

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5. 0.04 N solution of a weak acid has a specific conductivity 4.23×10^{-4} mho cm^{-1} . The degree of dissociation of acid at this dilution is 0.0612. Calculate the equivalent conductivity of weak acid at infinite dilution

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6. The equivalent conductivity of acetic acid at infinite dilution is 387 mho $cm^2\ eq^{-1}$. At the same temperature for 0.001 M solution of acetic acid, it is 55 mho $cm^2\ eq^{-1}$ What is the degree of dissociation of 0.1 N acetic acid? Assume $1 - \alpha = 1$ for 0.1 N acid.

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7. Claculate the molar conductivity for NH_4OH . Given that molar conductivity for $Ba(OH)_2$, $BaCI_2$ and NH_4CI are 523.28,280.0 and 129.8 $ohm^{-1}\ cm^2\ mol^{-1}$ respectively.

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8. (i) Arrange the following metals in the order in which they displace each other : Al, Cu, Fe, Mg, Zn.

(ii) Electrode potential of metals in their respective solutions are provided. Arrange the metals in their increasing order of reducing power.

$K^+/K = -2.93V$, $Ag^+/Ag = +0.80V$,

$Hg^+/Hg = 0.79V$

$Mg^{2+}/Mg = -2.36V$, $Cr^{3+}/Cr = -0.74V$

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9. Calculate the equilibrium constant for the reaction

$Fe^{2+} + Ce^{4+} \Leftrightarrow Fe^{3+} + Ce^{3+}$

$\left(Given E^{\circ}_{Ce^{4+}/Ce^{3+}} = 1.44V \text{ and } E^{\circ}_{Fe^{3+}/Fe^{2+}} = 0.68V\right)$

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10. Calculate the emf of half cells given below:

(a) pt, H_2 HCl

2 atm, H^+ =0.02" " $E^\circ_{op} = oV$

(b) pt, CI_2 HCI

10 atm, $CI^{\equiv}0.1$ " " $E^\circ_{op} = -1.36$ V

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Neet Cafe Topicwise Practice Questions Cells And Electrode Potential

1. What is the decreasing order of given metals in which they displace each other from the solution of their salts?

A. $Fe < Cu < Zn < AI < Mg$

B. $Cu < Fe < Mg < Zn < AI$

C. $Mg > AI > Zn > Fe > Cu$

D. $Zn > AI > Mg > Cu > Fe$

Answer: C

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2. Given standard electrode potentials:

$K^+/K = -2.93V,\ Ag^+/Ag = +0.80V$

$Hg^{2+}/Hg = +0.79V,\ Mg^{2+}/Mg = -2.37V$

$Cr^{3+}/Cr = -0.74\,\text{V}$

Which acts as a better oxidising agent?

A. Mg^{2+}

B. Cr^{3+}

C. Ag^{+}

D. k^{+}

Answer: C

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3. The tendencies of the electrodes made up of Cu, Zn and Ag to release electrons when dipped in their respective salt solutions decrease in the order

A. $Zn > Ag > Cu$

B. $CU > Zn > Ag$

C. $Zn > Cu > Ag$

D. $Ag > Cu > Zn$

Answer: C

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4. The standard reduction potential at 298 K for the following half cell reactions are given below:

$Zn^{2+}_{(aq)} + 2e^- \rightarrow Zn_{(s)}, E^\circ = -0.762V$

$Cr^{3+}_{(aq)} + 3e^- \rightarrow Cr_{(s)}, E^\circ = -0.740\,V$

$2H^+_{(aq)} + 2e^- \rightarrow H_{2(g)}, E^\circ = 0.0\,V$

$Fe^{3+}_{(aq)} + e^- \rightarrow Fe^{2+}_{(aq)}, E^\circ = 0.77\,V$

Which is the strongest reducing agent?

A. $Zn_{(s)}$

B. $Cr_{(s)}$

C. $H_{2(g)}$

D. $Fe^{2+}_{(aq)}$

Answer: A

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5. The position of some metals in the electrochemical series in decreasing electropositive character is given

below:

Mg > Al> Zn > Cu > Ag

What will happen if a copper spoon is used to stir a solution of aluminium nitrate?

A. The spoon will get coated with aluminium.

B. An alloy of copper and aluminium is formed.

C. The solution becomes blue.

D. There is no reaction.

Answer: D

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6. Which is the correct order of increasing oxidising ability?

A. $Pb^{2+} < Ni^{2+} < Cr^{3+} + < Al^{3+}$

B. $AI^{3+} < Cr^{3+} < Ni^{2+} < Pb^{2+}$

C. $Cr^{3+} < AI^{3+} < Ni^{2+} < Pb^{2+}$

D. $Ni^{2+} < Pb^{2+} < AI^{3+} < Cr^{3+}$

Answer: B

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7. When $\left[Zn^{2+}\right] = \left[Cu^{2+}\right.$ = 1, the electrical potential of Daniell cell is 1.1 V. However,

A. when E_{ext} lt 1.1 V, current flows from Zn to Cu

B. when E_{ext} = 1.1 V, current flows from Cu to Zn

C. when E_{ext} gt 1.1 V, current flows from Zn to Cu

D. when E_{ext} lt 1.1 V, electrons flow from Cu to Zn.

Answer: C

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8. Which of the following will turn blue when placed in the copper vessel?

A. $aq.\ AgNO_3$,

B. aq. NaCl

C. $aq.\ ZnSO_4$

D. $aq.\ Cd(NO_3)2$,

Answer: A

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9. Which of the following ionic combinations may lead to the formation of explosive substance?

(Given: $E^{\circ}_{Ag^{+}/Ag} = 0.80V\Big)$, $E^{\circ}_{CIO_4^{-}/CIO_3^{-}} = 1.23$ V

$E^{\circ}_{N_2/N_3^{-}} = -3.09$ V, $E^{\circ}_{Na^{+}/Na} = -2.71$ V

A. Sodium ion and azide ion

B. Silver ion and perchlorate ion

C. Silver ion and azide ion

D. All of these

Answer: C

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10. Which statement about standard reduction potentials is correct?

A. $E^{\circ}_{H^{-}/H_2}$ gt 0

B. $E^{\circ}_{D^1/D_2}$ lt 0

C. A redox reaction is feasible if sum of SRP of oxidant and that of reductant is a positive quantity

D. $K_2Cr_2O_7$ is stronger oxidising agent than $KMnO_4$ in acidic medium

Answer: C

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11. Which is correct about the reaction between H_2O_2 and O_3 ? (Given: $E^{\circ}_{H_2O_2\,/\,H_2O} = 1/76$ V, $E^{\circ}_{O_3\,/\,O_2} = 2.07$ V)

A. It is a case of mutual reduction.

B. O_3 will oxidise H_2O_2 into O_2 .

C. It is not a redox reaction.

D. H_2O_2 being a stronger oxidising agent will decompose ozone into oxygen.

Answer: B

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12. Red hot carbon will remove oxygen from the oxide 40 and BO but not from MO, while B will remove oxygen from 40. The activity of metals A, B and M in decreasing order is

A. $A > B > M$

B. $B > A > M$

C. $M > B > A$

D. $M > A > B$

Answer: C

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13. A solution contains Pb^{2+} and Fe^{2+} ions. To it some quantity of Fe and Pb is added. Then

[$E^{\circ}_{Fe^{2+}/Fe} = 0.44\,\text{V}$ $E_{pd^{2+}/pd} = 0.126\,\text{V}$]

A. concentration of Pb^{2+} ions will remain unaffected

B. concentration of Pb^{2+} ions will increase

C. concentration of Fe^{2+} ions will increase

D. concentration of Fe^{2+} ions will decrease.

Answer: C

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14. Which of the following statements is true for the electro chemical Daniell cell?

A. Electrons flow from copper electrode to zinc electrode.

B. Current flows from zinc electrode to copper electrode.

C. Cations move towards copper electrode.

D. Cations move towards zinc electrode.

Answer: C

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15. Which among the following is not correct?

A. If $E^{\circ}_{A^{n+}/A}$ is negative, H^{+} will be reduced to H_2 by the element A.

B. Compounds of (Zn, Na, Mg) are reduced by hydrogen (H_2) whereas those of noble metals (Cu, Ag, Au) are not reducible.

C. If $E^{\circ}_{A^{n+}/A}$ is positive, A^{n+} will be reduced to A by H_2 .

D. $M\left|M^{n+}\right|\left|H^{+}\right|\,|\,H_2(pt)$ will be spontaneous if $E^{\circ}_{M^{n+}/M}$ is negative.

Answer: B

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16. Standard electrode potentials for Fe electrodes are given as

$Fe^{2+} + 2e^- \rightarrow Fe, E^\circ = -0.44\,\text{V}$

$Fe^{3+} + e^- \rightarrow Fe^{2+}, E^\circ = +0.77\,\text{V}$

Fe^{2+}, Fe^{3+} and Fe blocks are kept together then

A. $\left[Fe^{3+}\right]$ decreases

B. $\left[Fe^{3+}\right]$ increases

C. $\left[Fe^{2+}\right] / \left[Fe^{3+}\right]$ remains unchanged

D. $\left[Fe^{2+}\right]$ decreases.

Answer: A

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17. Given : $E^{\circ}_{Fe^{3+}/Fe} = -0.036$ V $E^{\circ}_{Fe^{2+}/Fe} = -0.439$ V. The value of standard electrode potential for the change, $Fe^{3+}_{(aq)} + e^{-} \rightarrow Fe^{2+}_{(aq)}$ will be

A. -0.072 V

B. 0.385 V

C. 0.770 V

D. -0.270 V

Answer: C

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18. Daniell cell is show as

A. $Zn_{(s)}\left|Zn^{2+}_{(aq)}\right|\left|Cu_{(s)}\right|Cu^{2+}_{(aq)}$

B. $Zn^{2+}_{(aq)}\left|Zn_{(s)}\right|\left|Cu_{(s)}\right|Cu^{2+}_{(aq)}$

C. $Zn_{(s)}\left|Zn^{2+}_{(aq)}\right|\left|Cu^{2+}_{(aq)}\right|Cu_{(s)}$

D. $Zn_{(s)}\left|Cu^{2+}_{(aq)}\right|\left|Zn^{2+}_{(aq)}\right|Cu_{(s)}$

Answer: C

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19. In a cell of normal hydrogen electrode and calomel electrode, the electrode reaction taking place at calomel electrode will be

A. $Hg_2CI_{2(s)} \rightarrow 2Hg_{(I)} + 2CI^- + 2e^-$

B. $2Hg_{(I)} + 2CI^- \rightarrow Hg_2CI_{2(s)} + 2e^-$

C. $Hg_2CI_{2(s)} + 2e^- \rightarrow 2Hg_{(I)} + 2CI^-$

D. none of these.

Answer: C

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20. Two weak acid solutions HA_1 and HA_2 each with the same concentration and having PK_a values 3 and 5 are placed in contact with hydrogen electrode (1 atm, 25 ^oC) and are interconnected through a salt bridge. The emf of the cell is

A. 0.21 V

B. 0.059 V

C. 0.018 V

D. 0.021 V

Answer: B

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21. The following facts are available:

$2A^- + B_2 \rightarrow 2B^- + A_2$

$2C^- + B_2 \rightarrow$ No reaction

$2D^- + A_2 \rightarrow 2A^- D_2$

Which of the following statements is correct?

A. $E^\circ_{C^-/C_2} > E^\circ_{B^-/B_2} > E^\circ_{A^-/A_2} > E^\circ_{D^-/D_2}$

B. $E^\circ_{C^-/C_2} < E^\circ_{B^-/B_2} < E^\circ_{A^-/A_2} < E^\circ_{D^-/D_2}$

C. $E^\circ_{C^-/C_2} < E^\circ_{B^-/B_2} > E^\circ_{A^-/A_2} > E^\circ_{D^-/D_2}$

D. $E^\circ_{C^-/C_2} > E^\circ_{B^-/B_2} < E^\circ_{A^-/A_2} < E^\circ_{D^-/D_2}$

Answer: A

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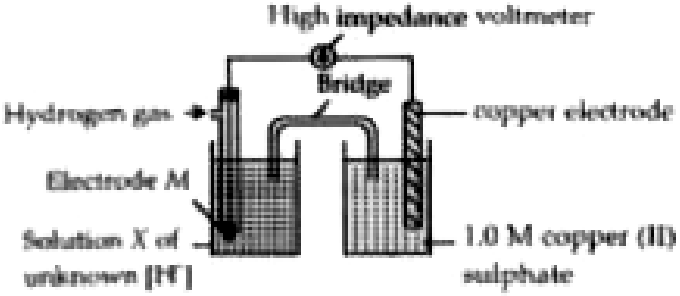
22. A student set up the following apparatus to determine the hydrogen ion concentration of solution X.

The cell is, $M\left|H_{2(g)}\right|2H^{+}_{(aq)}\ \|\ \left|Cu^{2+}_{(aq)}\right|Cu_{(s)}$ The best material for electrode M would be



A. polished copper metal

B. platinum metal coated with platinum oxide

C. copper metal coated with oxide

D. platinum metal coated with finely divided platinum.

Answer: D

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23. Concentration polarization arises because of the

A. different concentrations of solutions in the two half cells

B. changes in the concentration of electrolyte around the electrode from bulk concentration

C. reversible nature of the cell

D. variation in temperature during measurements.

Answer: B

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24. Which of the following statement is incorrect?

A. If salt bridge is removed potential drops to zero.

B. Calomel electrode contains $CaCl_2$ solution in contact with Pt electrode.

C. Quinhydrone electrode is reversible to H^+

D. Lithium batteries are rechargeable batteries.

Answer: B

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25. An aqueous solution containing one mole per litre each $Cu(NO_3)_2, AgNO_3, Hg(NO_3)_2, Mg(NO_3)_2$, being electrolysed using inert electrode. The values of standard electrode potential in volts are

$$\underset{Cu^{2+}|Cu=+0.34}{Ag^+|Ag=+0.80} \quad \underset{Mg^{2+}|Mg=-2.37}{Hg^+|2Hg=+0.79)}$$

With increasing voltage, the sequence of deposition of metal on cathode will be

A. Ag, Hg, Cu, Mg

B. Mg, Cu, Hg, Ag

C. Ag, Hg, Cu

D. Cu, Hg, Ag

Answer: C

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26. A gas z is bubbled through a solution containing x^- and y^- . If the reduction potential are in the order x > y > 2, then

A. y will oxidise z and not x

B. y will oxidise x and not z

C. y will oxidise both x and z

D. y will reduce both x and z.

Answer: A

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27. A student made the following observations in the laboratory

(i) Clean copper metal did not react with 1 molar Pb $(NO_3)_2$ solution.

(ii) Clean lead metal dissolved in a 1 molar $AgNO_3$

solution and crystals of Ag metal appeared. The order of decrease in reducing character of three metals is

A. Cu, Pb, Ag

B. Cu, Ag, Pb

C. Pb, Cu, Ag

D. Pb, Ag, Cu

Answer: C

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28. Indicator electrode is

A. SHE

B. calomel electrode

C. Ag/AgCl electrode

D. quinhydrone electrode.

Answer: D

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29. In an electrochemical cell, the electrons flow from

A. (a) cathode to anode

B. anode to cathode

C. anode to solution

D. solution to cathode.

Answer: B

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30. Saturated solution of KNO_3 , is used to make 'salt bridge because

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

B. (b) velocity of No_3^- , is greater than that of K^+

C. (c) velocities of both K^+ and NO_3^- are nearly the same

D. $KNO + 3$, is highly soluble in water.

Answer: C

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31. Electrode potentials $\left(E^\circ_{red}\right)$ of 4 elements A, B, C and D are -1.36,-0.32, 0,-1.26 V respectively. The decreasing reactivity order of these elements is

A. A, D.B and C

B. C, B, D and A

C. B, D, C and A

D. C, A, D and B

Answer: A

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32. Which one of the following does not hold good for S.H.E?

A. The pressure of hydrogen gas is 1.5 atmosphere.

B. The concentration of H^+ in solution is I M.

C. The temperature is 298 K.

D. The surface of platinum electrode is coated with platinum black

Answer: A

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33. For the electrochemical cell having $E^{\circ}\left(M^{+}/M\right)$ =0.44 V and $E^{\circ}(X/X)$ =0.33 V . From this data, one can deduce that

A. $M+X \rightarrow M^{+}X^{-}$ is the spontaneous reaction

B. $M^+ + X^- \rightarrow M + X$ is the spontaneous reaction

C. E°_{cell} =0.77 V

D. E°_{cell} =-0.77 V`

Answer: B

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34. The reference calomel electrode is made from which of the following?

A. $ZnCl_2$

B. $CuSO_4$

C. Hg_2Cl_2

D. $HgCl_2$

Answer: C

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35. Out of Cu, Ag, Fe and Zn, the metal which can displace all others from their salt solutions is

A. Ag

B. Cu

C. Zn

D. Fe

Answer: C

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36. If half-cell reaction $A + e^- \rightarrow A^-$ has a large negative reduction potential, it follows that

A. A is readily reduced

B. A is readily oxidised

C. A^- is readily reduced

D. A^- is readily oxidised.

Answer: D

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37. Which of the substances Na, Hg, S, Pt and graphite can be used as electrodes in electrolytic cells having aqueous solutions?

A. Na, Pt and graphite

B. Na and Hg

C. Pt and graphite only

D. Na and Sonly

Answer: C

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38. In a Galvanic cell

A. chemical energy is converted into electricity

B. chemical energy is converted into heat

C. electrical energy is converted into heat

D. electrical energy is converted into chemical energy.

Answer: A

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39. Electrode potential data for a few elements is given

$Fe^{3+}_{(aq)} + e^- \rightarrow Fe^{2+}_{(aq)}, E^\circ = +0.77$ V

$AI^{3+}_{(aq)} + 3e^- \rightarrow AI_{(s)}, E^\circ$ =-1.66 V

$Br_{2\,(aq)} + 2e^- \rightarrow 2Br^-_{(aq)}, E^\circ 1 = +1.08$

Based on the data, the reducing power of Fe^{2+} , Al and Br^- will increases inthe order

A. $Br^- < Fe^{2+} < AI$

B. $Fe^{2+} < AI < Br^-$

C. $AI, Br^- < Fe^{2+}$

D. $AI < Fe^{2+} < Br$

Answer: A

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40. The standard reduction potentials of 4 clements are given below. Which of the following will be the most suitable reducing agent?

1 -- 3.04 V, II = -1.90 V, III = 0 V, IV = 1.90 V

A. I

B. II

C. III

D. IV

Answer: A

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41. Fluorine is the best oxidising agent because it has

A. highest electron affinity

B. highest E° reduction

C. highest E° oxidation

D. lowest electron affinity

Answer: B

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42. Zine gives H_2 with H_2SO_4 and HCl but not with HNO_3 because

A. zinc acts as an oxidising agent when reacts with HNO_3

B. HNO_3 is an oxidising agent

C. in electrochemical series zinc is above hydrogen

D. NO_2^- is reduced in preference to hydronium ion.

Answer: D

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43. The cell reaction of the galvanic cell:

$Cu_{(s)}\left|Cu^{2+}_{(aq)}\right| \mid Hg^{2+}_{(aq)}\left|Hg_{(I)}\right.$ is

A. $Hg + Cu^{2+} \rightarrow Hg^{2+} + Cu$

B. $Hg + Cu^{2+} \rightarrow Cu^{+} + Hg^{+}$

C. $Cu + \mathrm{Hg} \rightarrow CuHg$

D. $Cu + Hg^{2+} \rightarrow Cu^{2+} + Hg$

Answer: D

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44. Determine the standard reduction potential for the half cell reaction, $CI_2 + 2e^- \rightarrow 2CI^-$

given $Pt^{2+} + 2CI^- \rightarrow Pt + CI_2, E^\circ_{cell}$ =-0.15 V

$Pt^{2+} + 2e^- \rightarrow \text{pt}, E^\circ$ =1.20 V

A. 1.05 V

B. -1.05 V

C. -1.35 V

D. 1.35 V

Answer: D

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45. Which reaction is not feasible?

A. $2KI + Br_2 \rightarrow 2KBr + I_2$

B. $2KBr + I_2 \rightarrow 2KI + Br_2$

C. $2KBr + CI_2 \rightarrow 2KCI + Br_2$

D. $2H_2O + 2F_2 \rightarrow 4HF + O_2$

Answer: B

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46. The standard reduction potential values of the three metallic cations X, Y and Z are 0.52, -3.03, and

-1.18 V respectively. The order of reducing power of the corresponding metals is

A. $Y > Z > X$

B. $X > Y > Z$

C. $Z > Y > X$

D. $Z > X > Y$

Answer: A

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47. Stronger the oxidising agent, greater is the

A. reduction potential

B. oxidation potential

C. ionic behaviour

D. none of these.

Answer: A

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48. The reaction that takes place at anode is

A. ionisation

B. reduction

C. oxidation

D. hydrolysis.

Answer: C

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49. Chlorine cannot displace

A. fluorine from NaF

B. iodine from Nal

C. bromine from NaBr

D. none of these.

Answer: A

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50. The standard reduction potential of Zn and Ag in water at 298 K are,

$Zn^{2+} + 2e^- \rightarrow Zn, E^\circ$ =-0.76 V and

$Ag^+ + e^- \rightarrow Ag, E^\circ$ =+0.80 V

Which of the following reactions takes place?

A. $Zn^{2+}_{(aq)} + Ag^+_{(aq)} \rightarrow Zn_{(aq)} + Ag_{(s)}$

B. $Zn_{(s)} + Ag_{(aq)} \rightarrow Zn^{2+}_{(aq)} + Ag^+_{(aq)}$

C. $Zn^{2+}_{(aq)} + 2Ag_{(s)} \rightarrow 2Ag^+_{(aq)} + Zn_{(s)}$

D. $Zn_{(s)} + 2Ag^{+}_{(aq)} \rightarrow Zn^{2+}_{(aq)} + 2Ag_{(s)}$

Answer: D

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Neet Cafe Topicwise Practice Questions Nernst Equation

1. The standard emf of the cell,

$Cd_{(s)} \left| CdCI_{2(aq)} (0.1M) \right| \left| AgCI_{(aq)} \right| Ag_{(s)}$

in which the cell reaction

$Cd_{(s)} + 2AgCI_{(s)} \rightarrow 2Ag_{(s)} + Cd^{2+}_{(aq)} + 2CI^{-}_{(aq)}$

is 0.6915 V at 0 $^{\circ}C$ and 0.6573 V at 25 $^{\circ}C$. The enthalpy change of the reaction at 25 $^{\circ}C$ is

A. +48.179 KJ

B. -205.5 KJ

C. +123.5 KJ

D. -167.26 KJ

Answer: B

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2. Consider the following equation 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. $x = y, K_1 = \frac{1}{K_2}$

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

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

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

Answer: C

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3. The E° for the cell reaction,

$Cu_{(s)} + 2Ag^+_{(aq)} \rightarrow Cu^{2+}_{(aq)} 2Ag_{(s)}$ is 0.46 V, what is its equilibrium constant?

A. 15.6

B. 4×10^{16}

C. 4×10^{15}

D. 1.56×10^{15}

Answer: C

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4. A cell with two electrodes, one of grey tin and the other of white tin, both dipping in solution of $(NH_4)_2\ SnCl_6$ showed zero e.m.f. at 18 °C. What conclusion may be drawn from this?

A. The e.m.f. developed at the electrode-solution phase boundary cancels the normal e.m.f.

B. Grey tin being non metallic ceases to provide a reversible electrode reaction.

C. Electrode surface develops a protective layer and the cell develops a very large internal resistance.

D. The free energy change of the cell becomes zero.

Answer: D

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5. E° for the cell, $Zn\left|Zn_{(aq)}^{2+}\right|\left|Cu_{(aq)}^{2+}\right|Cu$ is 1.10 V at 25 $^{\circ}C$. The equilibrium constant for the reaction

$$Zn + Cu_{(aq)}^{2+} \Leftrightarrow Cu + Zn_{(aq)}^{2+}$$

is of the order of

A. 10^{-37}

B. 10^{37}

C. 10^{-17}

D. 10^{17}

Answer: B

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6. The standard electrode potential $E^{\circ}\ OCI^{-}/CI^{-}$ and $CI^{-}/\frac{1}{2}CI_2$ respectively are 0.94 V and - 1.36 V. The E° value for OCH/CI, will be value for $CI^{-}/\frac{1}{2}CI_2$ will be

A. -0.42 V

B. -2.20 V

C. 0.52 V

D. 1.04 V

Answer: A

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7. The free energy change is related to equilibrium constant as

A. ΔG =RT In K

B. $-\Delta G$ =RT log K

C. $-\Delta G$ =2.303 RT log K

D. $-\Delta G$ =(RT log K)/2.303

Answer: C

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8. $Cd_{(s)} + Pd^{2+}_{(aq)} \rightarrow Cd^{2+}_{(aq)} + Pd_{(s)}$

Free energy change for the above cell reaction at 25 $^{\circ}C$ is (Given: E°)

A. -52.11 KJ

B. 102.1 KJ

C. -102.1 KJ

D. 53.46 KJ

Answer: A

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Neet Cafe Topicwise Practice Questions Conductance Of Electrolytic Solutions

1. The molar conductance of NH_4OH at 0.01 M concentration is 11.3 $ohm^{-1}\ cm^2\ mol^{-1}$. The degree of dissociation of is (molar conductance at infinite dilution=271.1))

A. 0.042

B. 0.013

C. 0.126

D. 0.41

Answer: A

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2. The increase in the molar conductivity of HCl with dilution is due to

A. increase in the self ionisation of water

B. hydrolysis of HCI

C. decrease in the self ionisation of water

D. decrease in the interionic forces.

Answer: D

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3. The increase in the value of molar conductivity of acetic acid with dilution is due to

A. decrease in interionic forces

B. increase in degree of ionisation

C. increase in self ionisation of water

D. none of these.

Answer: B

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4. Which one of the following statements is incorrect?

A. Specific conductivity decreases with dilution

B. Equivalent and molar conductivities increase with dilution

C. $A\infty$ for a weak electrolyte cannot be found by extrapolation of the graph between A and concentration to zero concentration.

D. Molar conductivity of a strong electrolyte increases with dilution because ionization increases with dilution

Answer: D

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5. Electrolytes when dissolved in water dissociate into ions because

A. they are unstable

B. water dissolves it

C. the force of repulsion increases

D. the forces of electrostatic attraction are broken down by water.

Answer: D

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6. Molten sodium chloride conducts electricity due to the presence of

A. free electrons

B. free ions

C. free molecules

D. atoms of sodium and chlorine.

Answer: B

View Text Solution

7. The correct order of equivalent conductance at infinite dilution of LiCl, NaCl and KCl is

A. $LiCl > NaCl > KCI$

B. $KCI > NaCl > Lici$

C. $NaCl > KCI > LiCl$

D. $LiCl > KCI > NaCl$

Answer: B

View Text Solution

8. Specific conductance of 0.1 M nitric acid is $6.3 \times 10^{-2}\ ohm^{-1}\ cm^{-1}$. The molar conductance of the solution is

A. 630 $ohm^{-1}\ cm^{2}\ mol^{-1}$

B. 315 $ohm^{-1}\ cm^2\ mol^{-1}$

C. 6.300 $ohm^{-1}\ cm^2\ mol^{-1}$

D. 63.0 $ohm^{-1}\ cm^2\ mol^{-1}$

Answer: A

View Text Solution

9. The ionic conductances of Al^{3+} and so_4^{2-} at infinite dilution are x and y $ohm^{-1}\ cm^2\ mol^{-1}$ respectively. If Kohlrausch law is valid, then molar conductance of aluminium sulphate at infinite dilution will be

A. 3x + 2y

B. 2x + 3y

C. 2x + 2y

D. 3x + 3y

Answer: B

View Text Solution

10. The molar conductance of 0.001 M acetic acid is 50 $ohm^{-1}\ cm^2\ mol^{-1}$. The maximum value of molar conductance of acetic acid is 250 $ohm^{-1}\ cm^2\ mol^{-1}$. What is the degree of dissociation (C) of acetic acid?

A. 0.5

B. 0.2

C. 0.3

D. 0.4

Answer: B

View Text Solution

11. The unit of molar conductance of an electrolyte solution will be

A. ohm^{-1} cm mol^{-1}

B. mho $cm^2\ mol^{-1}$

C. ohm $cm^2\ mol^{-1}$

D. $ohm^{-1}\ cm^{-1}\ mol^{-1}$

Answer: B

View Text Solution

12. The ionisation constant of a weak electrolyte is 25×10^{-6} while the equivalent conductance of its 0.01 M solution is 19.6 S $cm^2\ eq^{-1}$. The equivalent conductance of the electrolyte at infinite dilution (in S $cm^2\ eq^{-1}$) will be

A. 250

B. 196

C. 392

D. 384

Answer: C

View Text Solution

13. A big irregular shaped vessel contained water, the conductivity of which was $2.56 \times 10^{-5}\ cm^{-1}$. 500 g of NaCl was then added to the water and the conductivity after the addition of NaCl, was found to

be 3.10×10^{-5} S cm^{-5} !. The capacity of the vessel if it is fully filled with water (Λ_m° of NaCl = 149.9) is

A. 4587.9×10^2 L

B. 3.4752×10^5 L

C. 5467.5×10^2 L

D. 2.3725×10^5 L

Answer: D

View Text Solution

14. Molar conductances of $BaCl_2$, H_2SO_4 and HCl at infinite dilutions are x_1 x_2 , and x_3 respectively.

Equivalent conductance of $BaSO_4$ at infinite dilution will be

A. $\frac{x_1 + x_2 - x_3}{2}$

B. $\frac{x_1 - x_2 - x_3}{2}$

C. $2(x_1 + x_2 - x_3)$

D. $\frac{x_1 + x_2 - 2x_3}{2}$

Answer: D

View Text Solution

15. An increase in equivalent conductance of a strong electrolyte with dilution is mainly due to

A. increase in ionic mobility of ions.

B. 100% ionisation of electrolyte at normal dilution

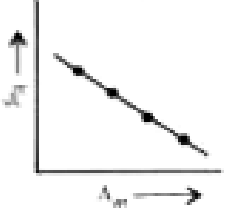
C. increase in both i.e., number of ions and ionic mobility of ions

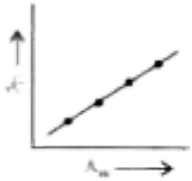
D. increase in number of ions.

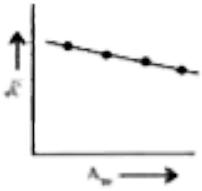
Answer: A

View Text Solution

16. Which of the following curve gives the variation of Λ_m with $\sqrt{C}$ for CH_3COOH ?

A. 

B. 

C. 

D. none of these.

Answer: D

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17. The conductivity of 0.001028 mol L^{-1} acetic acid is 4.95×10^{-5} S cm^{-1} . Calculate its dissociation constant, if Λ_m° , for acetic acid is 390.5 S $cm^2\ mol^{-1}$

A. 1.78×10^{-5} mol L^{-1}

B. 1.87×10^{-5} mol L^{-1}

C. 0.178×10^{-5} mol L^{-1}

D. 0.0178×10^{-5} mol L^{-1}

Answer: A

View Text Solution

18. The molar ionic conductivities of NH_4^+ and OH^- at infinite dilution are 72 and 198 $ohm^{-1}\ cm^2$ respectively. The molar conductivity of a centinormal NH_4OH solution at the same temperature is found to be 9 $ohm^{-1}\ cm^2$. The percentage dissociation of NH_4OH at this concentration will be

A. 0.0333

B. 0.0714

C. 0.125

D. 0.0454

Answer: A

View Text Solution

View Text Solution

19. An electrolyte

A. forms complex ions in solution

B. gives ions only when electricity is passed

C. possesses ions even in solid state

D. gives ions only when dissolved in water.

Answer: C

View Text Solution

20. Pure water does not conduct electricity because it

A. has low boiling point

B. is almost unionised

C. is neutral

D. is readily decomposed.

Answer: B

View Text Solution

21. A cell constant is generally found by measuring the conductivity of aqueous solution of

A. $BaCl_2$

B. KCl

C. NaCl

D. $MgCl_2$

Answer: B

View Text Solution

22. Which of the following is a strong electrolyte?

A. $Ca(NO_3)_2$

B. HCN.

C. CH_3COOH

D. NH_4OH

Answer: A

View Text Solution

23. The unit of equivalent conductivity is

A. ohm cm

B. $ohm^{-1}\ cm^2\ (\text{gequivalent})^{-1}$

C. ohm cm^2 (g equivalent)

D. S cm^{-2}

Answer: B

View Text Solution

24. The resistance of 1 N solution of acetic acid is 250 ohm, when measured in a cell of cell constant 1.15 cm^{-1} . The equivalent conductance (in $ohm^{-1}\ cm^2\ \equiv^{-1}$) of 1 N acetic acid is

A. 4.6

B. 9.2

C. 18.4

D. 0.023

Answer: A

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View Text Solution

25. The specific conductance of 0.1 M NaCl solution is $1.06 \times 10^{-2}\ ohm^{-1}\ cm^{-1}$ Its molar conductance in $ohm^{-1}\ cm^2\ mol^{-1}$ lis

A. 1.06×10^2

B. 1.06×10^3

C. 1.06×10^4

D. 53

Answer: A

View Text Solution

26. Molar ionic conductivities of a bivalent electrolyte are 57 and 73. The molar conductivity of the solution will be

A. 130 S $cm^2\ mol^{-1}$

B. 65 S $cm^2\ mol^{-1}$

C. 260 S $cm^2\ mol^{-1}$

D. 187 S $cm^2\ mol^{-1}$

Answer: A

View Text Solution

27. The unit of specific conductivity is

A. ohm cm^{-1}

B. ohm cm^{-2}

C. ohm^{-1} cm

D. $ohm^{-1}\ cm^{-2}$

Answer: D

View Text Solution

28. The specific conductance of a 0.1 N KCl solution at 23 $^{\circ}C$ is 0.012 $ohm^{-1}\ cm^{-1}$. The resistance of cell

containing the solution at the same temperature was found to be 55 ohm. The cell constant will be

A. 0.142 cm^{-1}

B. 0.66 cm^{-1}

C. 0.918 cm^{-1}

D. 1.12 cm^{-1}

Answer: B

View Text Solution

29. At infinite dilution in the aqueous solution of $BacI_2$, molar conductivity of Ba^{2+} and Cl^{-} ions are

127.32 S cm^2 /mol and 76.34 S cm^2 /mol, respectively. What is the molar conductivity for $BaCl_2$ at same dilution?

A. 280 S $cm^2\ mol^{-1}$

B. 330.98 S $cm^2\ mol^{-1}$

C. 90.98 S $cm^2\ mol^{-1}$

D. 203.6 S $cm^2\ mol^{-1}$

Answer: A

View Text Solution

30. Specific conductivity of a solution

A. increases with dilution

B. decreases with dilution

C. remains unchanged with dilution

D. depends on mass of electrolyte

Answer: B

View Text Solution

31. The substance having highest conductivity at room temperature among the following is

A. 0,1 N HCl

B. 0.1 N NaCl

C. graphite

D. glass

Answer: C

View Text Solution

32. Molar conductivity of a solution is 1.26×10^2 $ohm^{-1}\ cm^2\ mol^{-1}$. Its molarity is 0.01. Its specific conductivity will be

A. $1.26 \times 10^{-25}\ ohm^{-1}$ `cm^(-1)

B. $1.26 \times 10^{-3}\ ohm^{-1}\ cm^{-1}$

C. $1.26 \times 10^{-4}\ ohm^{-1}\ cm^{-1}$

D. 0.0063 $ohm^{-1}\ cm^{-1}$

Answer: B

View Text Solution

33. What is the cell constant of a cell of KCl containing N/50 solution if the conductivity and resistance of cell is 0.002765 S cm^{-1} and 400 ohm respectively.

A. 6.91 cm^{-1}

B. 1.106 cm^{-1}

C. 14.46 cm^{-1}

D. 2.212 cm^{-1}

Answer: B

View Text Solution

34. Resistance of a decinormal solution of a salt occupying a volume between Platinum electrodes 1.8 cm apart and 5.4 cm^2 in area was found to be 32 ohm. Equivalent conductivity of solution in S $cm^2\ eq^{-1}$ is

A. 104.1 S $cm^2\ eq^{-1}$

B. 10.41 S $cm^2\ eq^{-1}$

C. 1.041 S $cm^2\ eq^{-1}$

D. 1041 S $cm^2\ eq^{-1}$

Answer: A

View Text Solution

35. A 0.05 M KOH solution offered a resistance of 31.6 ohm in a conductivity cell of cell constant 0.367 cm^{-1} at 298 K What is the equivalent conductance of KOH solution?

A. 0.2322 S $cm^2\ eq^{-1}$

B. 2.322 S $cm^2\ eq^{-1}$

C. 23.22 S $cm^2\ eq^{-1}$

D. 232.28 S $cm^2\ eq^{-1}$

Answer: D

View Text Solution

36. Cell constant of a cell containing N/10 KCl solution at 18 $^\circ C$ with specific conductivity 1.12×10^{-2} mho cm^{-1} and resistance 65 ohm is

A. 0.728 cm^{-1}

B. 0.580 cm^{-1}

C. 0.172 cm^{-1}

D. 0.0172 cm^{-1}

Answer: A

View Text Solution

37. Two platinum electrodes, each of area 10 sq. cm are fixed 1.5 cm apart in a conductivity cell. The cell contain 0.05 N solution of a salt with resistance 50 ohm. What is the equivalent conductivity of the salt solution?

A. 66.6 S $cm^2\ eq^{-1}$

B. 15 S $cm^2\ eq^{-1}$

C. 60 S $cm^2\ eq^{-1}$

D. 6.66 S $cm^2\ eq^{-1}$

Answer: C

View Text Solution

38. Which of the following is not a strong electrolyte?

A. NaCl

B. KNO_3

C. NH_4OH

D. $FeSO_4$

Answer: C

View Text Solution

39. The equivalent conductivity of 0.1 M weak acid is 100 times less than that at infinite dilution. The degree of dissociation is

A. 100

B. 10

C. 0.01

D. 0.001

Answer: C

View Text Solution

40. Kohlrausch law states that at

A. infinite dilution, each ion makes definite contribution to conductance of an electrolyte whatever be the nature of the other ion of the electrolyte

B. infinite dilution, each ion makes definite contribution to equivalent conductance of an electrolyte, whatever be the nature of the other ion of the electrolyte

C. finite dilution, each ion makes definite contribution to equivalent conductance of an electrolyte, whatever be the nature of the other ion of the electrolyte

D. infinite dilution each ion makes definite contribution to equivalent conductance of an electrolyte depending on the nature of the other ion of the electrolyte

Answer: A

View Text Solution

41. The ionic conductance of following cations at a given conc. is in the order

A. $Li^+ < Na^+ < K^+ < Rb^+$

B. $Li^+ > Na^+ > K^+ > Rb^+$

C. $Li^+ < Na^+ > K^+ > Rb^+$

D. $Li^+ = Na^+ < K^+ < Rb^+$

Answer: A

View Text Solution

42. According to Kohlrausch law, the limiting value of molar conductivity of an electrolyte, A_2B is

A. $\lambda^{\infty}_{(A^+)} + \lambda^{\infty}_{(B^-)}$

B. $\lambda^{\infty}_{(A^+)} - \lambda^{\infty}_{(B^-)}$

C. $2\lambda^{\infty}_{(A^+)} + \frac{1}{2}\lambda^{\infty}_{(B^-)}$

D. $2\lambda^{\infty}_{(A^+)} + \lambda^{\infty}_{(B^-)}$

Answer: D

View Text Solution

Neet Cafe Topicwise Practice Questions Electrolytic Cells And Electrolysis

1. How much time approximately would it take in minutes to deposit 1.18 g of metallic copper on a

metal object when a current of 2.0 A is passed through the electrolytic cell containing Cu^{2+} ions?

A. 10 min

B. 20 min

C. 30 min

D. 40 min

Answer: C

View Text Solution

2. When same quantity of electricity is passed for half an hour, the amount of Cu and Cr deposited are

respectively 0.375 g and 0.30 g. Ratio of electrochemical equivalent of Cu and Cr is

A. 0.8

B. 1.25

C. 2.5

D. 1.62

Answer: B

View Text Solution

3. How many coulombs of electricity are required for the oxidation of 1 mole of H_2O to O_2 ?

A. 9.65×10^4 C

B. 4.825×10^5 C

C. 1.93×10^5 C

D. 1.93×10^4 C

Answer: C

View Text Solution

4. How much current is required to deposit 0.195 g of Pt from a solution containing $[PtCI_6]^{2-}$ ion with a time period of 2 hrs? (At. mass of Pt = 195)

A. 0.054 A

B. 0.214 A

C. 0.428 A

D. 0.027 A

Answer: A

View Text Solution

5. The amount of electricity required to deposit 0.9 g of aluminium when the electrode reaction is

$AI^{3+} + 3e^{-} \rightarrow AI,$ (atomic mass of Al = 27)

A. 9.65×10^{3} C

B. 1.93×10^{4} C

C. 9.65×10^4 C

D. 4.34×10^5 C

Answer: A

View Text Solution

6. Electrolysis involves oxidation and reduction respectively at

A. anode and cathode

B. cathode and anode

C. at both the electrodes

D. none of these.

Answer: A

View Text Solution

7. An electric current is passed through an aqueous solution of the given substance. Which one shall decompose?

A. Urea

B. Glucose

C. Silver nitrate

D. Ethyl alcohol

Answer: C

View Text Solution

8. 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. O_2, SO_2

Answer: A

View Text Solution

9. On electrolysing a solution of dilute H_2SO_4 between platinum electrodes, the gas evolved at the anode is

A. SO_2

B. SO_3

C. O_2

D. H_2

Answer: C

View Text Solution

10. During the electrolysis of fused NaCl, which reaction occurs at anode

A. chloride ions are oxidised

B. chloride ions are reduced

C. sodium ions are oxidised

D. sodium ions are reduced.

Answer: A

View Text Solution

11. Electrolysis of aqueous HCl solution produces

A. H_2 gas at the anode

B. H_2 gas at the cathode

C. Cl_2 gas at the cathode

D. Cl_2 and O_2 gases both at the anode.

Answer: B

View Text Solution

12. The passage of current liberates H_2 at cathode and Cl_2 at anode. The solution is

A. copper chloride in water

B. NaCl in water

C. H_2SO_4

D. water.

Answer: B

View Text Solution

13. In electrolysis of aqueous copper sulphate, the gas at anode and cathode is

A. O_2 and H_2

B. SO_2 and H_2

C. H_2 and O_2

D. SO_3 and O_2

Answer: A

View Text Solution

14. Sodium is made by the electrolysis of a molten mixture of about 40% NaCl and 60% $CaCl_2$ because

A. $CaCl_2$ helps in conduction of electricity

B. this mixture has a lower melting point than NaCl

C. Ca^{2+} can displace Na from NaCl

D. Ca^{2+} can reduce NaCl to Na.

Answer: B

View Text Solution

15. Amount of electricity that can deposit 108 g of silver from $AgNO_3$ solution is

A. 1 ampere

B. 1 coulomb

C. 1 faraday

D. none of these.

Answer: C

View Text Solution

16. When 9.65 coulombs of electricity is passed through a solution of silver nitrate (atomic weight of Ag = 107.87, taken as 108) the amount of silver deposited is

A. 10.8 mg

B. 5.4 mg

C. 16.2 mg

D. 21.2 mg

Answer: A

View Text Solution

17. Three Faradays electricity was passed through an aqueous solution of iron (II) bromide. The weight of iron metal (at. wt. -56) deposited at the cathode (in g) is

A. 56

B. 84

C. 112

D. 168

Answer: B

View Text Solution

18. A silver cup is plated with silver by passing 965 coulombs of electricity, the amount of silver deposited is

A. 9.89 g

B. 107.87 g

C. 1.0787 g

D. 1.002 g

Answer: C

View Text Solution

19. The atomic weight of Al is 27. When a current of 5 F is passed through a solution of Al^{3+} ions, the weight of Al deposited is

A. 27 g

B. 36 g

C. 45 g

D. 39 g

Answer: C

View Text Solution

20. A certain current liberated 0.50 g of hydrogen in 2 hours. How many grams of copper can be liberated by the same current flowing for the same time in a copper sulphate solution

A. 12.7 g

B. 15.9 g

C. 31.8 g

D. 63.5 g

Answer: B

View Text Solution

21. What weight of copper will be deposited by passing 2F of electricity through a cupric salt (Atomic weight of Cu = 63.5)?

A. 2.0 g

B. 3.175 g

C. 63.5 g

D. 127.0 g

Answer: C

View Text Solution

22. In an electroplating experiment mg of silver is deposited, when 4 Amperes of current flows for 2 minutes. The amount (in g) of silver deposited by 6 amperes of current flowing for 40 seconds will be

A. 4 m

B. m/2

C. m/4

D. 2 m

Answer: B

View Text Solution

23. On passing 3 Ampere of electricity for 50 minutes, 1.8 g metal is deposited. The equivalent mass of metal is

A. 20.5

B. 25.8

C. 19.3

D. 30.7

Answer: C

View Text Solution

24. The desired amount of charge for obtaining one mole of Al from Al^{3+}

A. 3×96500 C

B. 96500 C

C. $\frac{96500}{3}$ C

D. $\frac{96500}{2}$ C

Answer: A

View Text Solution

25. How many Faradays are required to generate one gram atom of magnesium from $MgCl_2$?

A. 1

B. 2

C. 33

D. 4

Answer: B

View Text Solution

26. To deposit 0.6354 g of copper by electrolysis of aqueous cupric sulphate solution, the amount of electricity required (in Coulombs) is

A. 9650

B. 4825

C. 3860

D. 1930

Answer: D

View Text Solution

27. When 0.04 F of electricity is passed through a solution of $CaSO_4$, then the weight of Ca^{2+} metal deposited at the cathode is

A. 0.2 g

B. 0.4 g

C. 0.6 g

D. 0.8 g

Answer: D

View Text Solution

28. A current 2.0 A passed for 5 hours through a molten metal salt deposits 22.2 g of metal (at. wt. = 177). The oxidation state of the metal in the metal salt is

A. $+1$

B. $+2$

C. $+3$

D. $+4$

Answer: C

View Text Solution

29. How many atoms of calcium will be deposited from a solution of $CaCl_2$ by a current of 25 mA flowing for 60 seconds?

A. 4.68×10^{18}

B. 4.68×10^{15}

C. 4.68×10^{12}

D. 4.68×10^{9}

Answer: A

View Text Solution

30. What is the amount of chlorine evolved when 2 ampere of current is passed for 30 minutes in an aqueous solution of NaCl?

A. 66 g

B. 1.32 g

C. 33 g

D. 99 g

Answer: B

View Text Solution

31. On passing current through KCl solution, 19.5 g of potassium is deposited. If the same quantity of electricity is passed through a solution of aluminium chloride, the amount of aluminium deposited is

A. 4.5 g

B. 9.0 g

C. 13.5 g

D. 27 g

Answer: A

View Text Solution

32. A current being passed for two hours through a solution of an acid liberates 11.2 litre of oxygen at NTP at anode. What will be the amount of copper deposited at the cathode by the same current when passed through a solution of copper sulphate for the same time?

A. 16 g

B. 63 g

C. 31.5 g

D. 8 g

Answer: B

View Text Solution

33. When an electric current is passed through acidified water 112 mL of hydrogen gas at NT.P. is collected at the cathode in 965 seconds. The current passed, in amperes is

A. 1

B. 0.5

C. 0.1

D. 2

Answer: A

View Text Solution

34. How much chlorine will be liberated on passing one ampere current for 30 minutes through NaCl solution?

A. 0.66 mole

B. 0.33 mole

C. 0.66 g

D. 0.33 g

Answer: C

View Text Solution

35. The number of electrons involved in redox reactions when a foraday of electricity is passed through an electrolyte in solution is

A. 6×10^{23}

B. 6×10^{-23}

C. 96500

D. 8×10^{19}

Answer: A

View Text Solution

36. The number of electrons passing per second through a cross-section of copper wire carrying 10^6 amperes of current per second is found to be

A. 1.6×10^{-19}

B. 1.6×10^{-35}

C. 1.6×10^{-16}

D. 1.6×10^{-12}

Answer: D

View Text Solution

37. When 96500 coulomb of electricity is passed through a copper sulphate solution, the amount of copper deposited will be

A. 0.25 mole

B. 0.50 mole

C. 1.00 mole

D. 2.00 mole

Answer: B

View Text Solution

38. AI_2O_3 is reduced by electrolysis at low potentials and high currents. If 4.0×10^4 amperes of current is passed through molten AI_2O_3 for 6 hours, what mass of aluminium is produced? (Assume 100% current efficiency, at mass of Al = 27 g mol^{-1})

A. 8.1×10^4 g

B. 2.4×10^5 g

C. 1.3×10^4 g

D. 9.0×10^3 g

Answer: A

View Text Solution

39. Three Faradays of electricity are passed through molten Al_2O_3 aqueous solution of $CuSO_4$ and molten NaCl taken in different electrolytic cells. The amount of Al, Cu and Na deposited at the cathodes will be in the ratio of

A. I mole : 2 mole : 3 mole

B. 3 mole : 2 mole : 1 mole

C. I mole : 1.5 mole : 3 mole

D. 1.5 mole : 2 mole : 3 mole

Answer: C

View Text Solution

40. An electrolytic cell contains a solution of Ag_2SO_4 and have platinum electrodes. A current is passed until 1.6 g of O_2 has been liberated at anode. The amount of silver deposited at cathode would be

A. 107.88 g

B. 1.6 g

C. 0.8 g

D. 21.60 g

Answer: D

View Text Solution

41. The number of Faradays needed to reduce 4 g equivalents of Cu^{2+} to Cu metal will be

A. 1

B. 2

C. 1/2

D. 4

Answer: D

View Text Solution

42. When electricity is passed through the solution of $AICI_3$ 13.5 g of Al are deposited. The number of Faradays must be

A. 0.5

B. 1

C. 1.5

D. 2

Answer: C

View Text Solution

43. The atomic weight of Fe is 56. The weight of Fe deposited from $FeCl_3$ solution by passing 0.6 F of electricity is

A. 5.6 g

B. 11.2 g

C. 22.4 g

D. 33.6 g

Answer: B

View Text Solution

44. A current of 0.25 A is passed through $CuSO_4$ solution placed in voltameter for 45 minutes. The amount of Cu deposited on cathode is (at. weight of Cu = 63.6)

A. 0.20 g

B. 0.22 g

C. 0.25 g

D. 0.30 g

Answer: B

View Text Solution

45. Faraday's constant is defined as

A. charge carried by 1 electron

B. charge carried by one mole of electrons

C. charge required to deposit one mole of substance

D. charge carried by two moles of electrons.

Answer: B

View Text Solution

46. How many Faradays are required to reduce 1 mol of $Cr_2O_7^{2-}$ to Cr^{3+} in acidic medium?

A. 2

B. 3

C. 5

D. 6

Answer: D

View Text Solution

47. In the electrolysis of water, one faraday of electrical energy would evolve

A. one mole of oxygen

B. one g atom of oxygen

C. 8 g of oxygen

D. 22.4 litres of oxygen.

Answer: C

View Text Solution

48. An electric current is passed through silver nitrate solution using silver electrodes and 10.79 g of silver was found to be deposited on the cathode. If the same amount of electricity is passed through copper sulphate solution using copper electrodes, the weight of copper deposited on the cathode is

A. 6.4 g

B. 12.8 g

C. 1.6 g

D. 3.2 g

Answer: D

View Text Solution

49. A galvanic cell is set up from a zinc bar weighing 50 g and 1.0 litre, 1.0 M, $CuSO_4$ solution. How long would the cell run, assuming it delivers a steady current of 1.0 ampere

A. 48 hrs

B. 41 hrs

C. 21 hrs

D. 1 hr

Answer: C

View Text Solution

50. The electric charge for electrode deposition of one gram equivalent of a substance is

A. one ampere per second

B. 96,500 coulombs per second

C. one ampere for one hour

D. charge on one mole of electrons.

Answer: D

View Text Solution

51. Consider the following: (i) $2H_2O_{(I)} \rightarrow O_{2(g)} + 4H^+_{(aq)} + 4e^-$,

$E^\circ_{cell} = +1.23\,V$

(ii) $2SO^{2-}_{4(aq)} \rightarrow S_2O^{2-}_{8(aq)} + 2e^-$, $E^\circ_{cell} = +1.96\,V$

Which of the following statements is true?

A. In the electrolysis of dil. H_2SO_4 , (i) is preferred at the anode.

B. In the electrolysis of conc. H_2SO_4 (1) is preferred at the anode.

C. In the electrolysis of dil. H_2SO_4 , (ii) is preferred at the anode.

D. In the electrolysis of conc. H_2SO_4 , both (i) and (ii) occur at anode.

Answer: A

View Text Solution

52. 2.5 Faradays of electricity is passed through solution of $CuSO_4$. The number of gram equivalents

of copper deposited on the cathode would be

A. 1

B. 2

C. 2.5

D. 1.25

Answer: C

View Text Solution

53. How many coulombs of electricity are required for the oxidation of one mol of water to dioxygen?

A. 1.93×10^4 C

B. 19.3×10^5 C

C. 9.65×10^4 C

D. 1.93×10^5 C

Answer: D

View Text Solution

54. A current of 2 A was passed for 2 h through a solution of $CuSO_4$ and 3 g of Cu^{2+} ions were discharged at cathode. The current efficiency is

A. 0.422

B. 0.261

C. 0.63

D. 0.4001

Answer: C

View Text Solution

55. t passed through the solution. After sometimes it was found that the colour of copper sulphate disappeared with evolution of gas at the electrode. The colourless solution contains

A. platinum sulphate

B. copper hydroxide

C. copper sulphate

D. sulphuric acid.

Answer: D

View Text Solution

56. How much electricity in terms of Faradays is required to produce 40.0 g of Al from molten Al_2O_3 ?

A. 4.47 F

B. 4.44 F

C. 5.45 F

D. 6.43 F

Answer: B

View Text Solution

57. Calculate the number of electrons lost during electrolysis of 2 g Cl ions?

A. 4.69×10^{24} electrons

B. 3.39×10^{22} electrons

C. 7.39×10^{22} electrons

D. 3.59×10^{23} electrons

Answer: B

View Text Solution

58. The quantity of electricity which deposits 1.08 g of silver from $AgNO_3$ solution is

A. 96500 coulombs

B. 9650 coulombs

C. 965 coulombs

D. 96.5 coulombs

Answer: C

View Text Solution

59. During electrolysis of aqueous $CuSO_4$ solution, suppose cathode is withdrawn from the solution. Then

A. both cations and anions will move towards anode

B. both cations and anions will move randomly

C. cations will move towards anode and anions stop moving

D. anions will move towards anode and cations stop moving

Answer: B

View Text Solution

60. Aluminium oxide may be electrolysed at 1000 $^{\circ}C$ to furnish aluminium metal (At. mass=27 amu, 1 Faraday -96500 coulombs). The cathode reaction is,

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

To prepare 5.12 kg of aluminium metal by this method would require

A. 5.49×10^4 C of electricity

B. 5.49×10^1 C of electricity

C. 5.49×10^7 C of electricity

D. 1.83×10^7 C of electricity

Answer: C

View Text Solution

61. The equivalent weight of A is double that of B. During electrolysis of salt containing B, one gram B is deposited at cathode. If same coulombs of current is

passed through solution containing 4, then weight of A deposited will be

A. 1 g

B. 2 g

C. 3 g

D. 4 g

Answer: B

View Text Solution

62. Certain gram equivalents of an ion is reduced to the element when it absorbs 6×10^{22} electrons. The

number of equivalents of the ion is

A. 0.1

B. 0.01

C. 0.001

D. 0.0001

Answer: A

View Text Solution

63. A current of 0.5 amperes is passed for 30 minutes through a voltmeter containing $CuSO_4$ solution. Find the weight of Cu deposited.

A. 3.18 g

B. 0.318 g

C. 0.296 g

D. 0.150 g

Answer: C

View Text Solution

64. The time required to coat a metal surface of 80 cm^2 with 5×10^{-3} cm thick layer of silver (density 1.05 g cm^{-3}) with a passage of 3 A current through a silver nitrate solution is

A. 115 s

B. 125 s

C. 135 s

D. 143 s

Answer: B

View Text Solution

65. The clectrochemical equivalent of an element is 0.0003292. Its equivalent weight will be

A. 32.9

B. 31.78

C. 108

D. 63.5

Answer: B

View Text Solution

66. Electrolysis of a solution of HSO, ions produces $S_2O_8^{2-}$. Assuming 75% current efficiency, what current should be employed to achieve a production rate of 1 mol of $S_2O_8^{2-}$ per hour?

A. 71.47 A

B. 35.7 A

C. 142.96 A

D. 285.93 A

Answer: A

View Text Solution

67. Which one of the following reactions occurs at the anode on electrolysis of aqueous solution of $CuCI_2$?

A. $Cu \rightarrow Cu^{2+} + 2e^-$

B. $2CI^- \rightarrow CI_2 + 2e^-$

C. $2H_2O \rightarrow O_2 + 4H^+ + 4e^-$

D. $4CI^- + 2H_2O \rightarrow 4HCI + O_2 + 4e^-$

Answer: B

View Text Solution

68. When quantity of electricity passed is one Faraday then the mass deposited at the electrode is equal to

A. one gram atomic weight

B. one gram equivalent weight

C. electrochemical equivalent

D. none of the above.

Answer: B

View Text Solution

69. The amount of substance deposited by the passage of 1 amp of current for 1 second is equal to

A. equivalent mass

B. molecular mass

C. electrochemical equivalent

D. specific equivalent.

Answer: C

View Text Solution

70. A current of 9.65 ampere flowing for 10 minutes deposits 3.0 g of the metal which is monovalent. The atomic mass of the metal is

A. 10

B. 50

C. 30

D. 96.5

Answer: B

View Text Solution

71. When electricity is passed through molten $Al_2O_3 + Na_3AlF_6$ and 13.5 g of Al are deposited, the number of Faraday must be

A. 0.5

B. 1

C. 1.5

D. 2

Answer: C

View Text Solution

72. A certain current liberates 0.5 g of hydrogen in 2 h. How many grams of copper can be liberated by the same current flowing for the same time in a copper sulphate solution?

A. 12.7 g

B. 15.8 g

C. 31.8 g

D. 63.5 g

Answer: B

View Text Solution

73. What weight of copper will be deposited by passing 2 Faradays of electricity through a cupric salt? (At. wt. of Cu = 63.5)

A. 2 g

B. 3.175 g

C. 63.5 g

D. 127.0 g

Answer: C

View Text Solution

74. What will be the weight of silver deposited on passing 965 coulombs of electricity in solution of $AgNO_3$?

A. 1.08 g

B. 2.16 g

C. 0.54 g

D. 0.27 g

Answer: A

View Text Solution

75. The mass of copper that will be deposited at cathode in electrolysis of 0.2 M solution of copper sulphate when a quantity of electricity equal to that required to liberate 2.24 L of hydrogen from 0.1 M aqueous H_2SO_4 is passed will be (At. mass of Cu = 63.5)

A. 1.59 g

B. 3.18 g

C. 6.35 g

D. 12.70 g

Answer: C

View Text Solution

View Text Solution

76. Time required to deposit one millimole of aluminium metal by the passage of 9.65 amperes through molten electrolyte containing aluminium ion is

A. 30 s

B. 10 s

C. 30,000 s

D. 10,000 s

Answer: A

View Text Solution

77. 96500 C of electricity liberates from $CuSO_4$ solution

A. 63.5 g of Cu

B. 31.75 g of Cu

C. 96500 g of Cu

D. 100 g of Cu

Answer: B

View Text Solution

78. The number of coulombs required for the deposition of 107.870 g of silver is

A. 96500

B. 48250

C. 1933000

D. 10000

Answer: A

View Text Solution

79. An electric current is passed through silver voltmeter connected to a water voltmeter. The cathode of the silver voltmeter is 0.108 g more at the end of the electrolysis. The volume of oxygen evolved at STP is

A. 56 cm^3

B. 550 cm^3

C. 5.6 cm^3

D. 11.2 cm^3

Answer: C

View Text Solution

80. 4.5 g of aluminium (at. mass 27 amu) is deposited at cathode from a molten electrolyte containing Al^{+} ions by a certain quantity of electric charge. The volume of hydrogen produced at STP from H^{+} ions in a solution by the same quantity of electric charge will be

A. 44.8 L

B. 11.2 L

C. 22.4 L

D. 5.6 L

Answer: D

View Text Solution

81. How many coloumbs of electricity are required for the reduction of Imol of MnO_4^- to Mn^{2+} ?

A. 96500 C

B. 1.93×10^5 C

C. 4.83×10^5 C

D. 5.62×10^5 C

Answer: C

View Text Solution

82. If 3 faradays of electricity is passed through the solutions of $AgNO_3$, $CuSO_4$ and $AuCl_3$, the molar ratio of the cations deposited at the cathodes will be

A. 1: 1 : 1

B. 1 : 2 : 3

C. 3: 2 : 1

D. 6 : 3 : 2

Answer: D

View Text Solution

83. What is the quantity of electricity (in coulombs) required to deposit all the silver from 250 mL of 1 M $AgNO_3$ solution? (Ag = 108)

A. 2412.5

B. 24125

C. 4825

D. 28250

Answer: B

View Text Solution

84. Cd amalgam is prepared by electrolysis of a solution of $CaCl_2$ using a mercury cathode. Current of how much ampere must be passed for 100 seconds in order to prepare 20% Cd-Hg amalgam on a cathode of 2 g mercury? (At. wt. of Cd = 112.40)

A. 34.32 ampere

B. 8.58 ampere

C. 4.29 ampere

D. 17.16 ampere

Answer: B

View Text Solution

85. On passing 5 ampere current through an aqueous solution of an unknown salt of Pd for 2.15 hour, 10.64 g of Pd^{n+} get deposited at cathode. The value of n is (At.wt. of Pd = 106.4)

A. 2

B. 3

C. 3.5

D. 4

Answer: D

View Text Solution

86. MnO_2 is prepared by electrolysis of aqueous solution of $MnSO_4$ as per reaction

$$Mn^{2+}_{(aq)} + 2H_2O \rightarrow MnO_{2(s)} + 2H^{+}_{(aq)} + H_{2(g)}$$

Passing a current of 25 A for 30 hours gives one kg of MnO_2 . What is the current efficiency? (Mol. wt. of Mno_2 =87)

A. 0.2054

B. 0.25

C. 0.492

D. 0.8216

Answer: D

View Text Solution

View Text Solution

87. Calculate the weight of metal deposited when a current of 15 ampere with 75% current efficiency is passed through the cell for 2 hours. (Electrochemical equivalent of metal = 4×10^{-4})

A. 32.4 g

B. 43.2 g

C. 57.6 g

D. 16.2 g

Answer: A

View Text Solution

88. The quantity of electricity required to liberate 112 cm^3 of hydrogen at STP from acidified water is

A. 965 C

B. 1 Faraday

C. 0.1 F

D. 96500 C

Answer: A

View Text Solution

89. Same amount of electric current is passed through solutions of $AgNO_3$ and HCl. If 1.08 g of silver is obtained in the first case, the amount of hydrogen liberated at STP in the second case is

A. 112 cm^3

B. 22400 cm^3

C. 224 cm^3

D. 1.008 g

Answer: A

View Text Solution

90. At STP, 1.12 litre of H_2 is obtained on flowing a current for 965 seconds in a solution. The value of current is

A. 10

B. 1

C. 1.5

D. 2

Answer: A

View Text Solution

91. In a solution of $CuSo_4$ how much time will be required to precipitate 2 g copper by 0.5 ampere current?

A. 12157.48 sec

B. 102 sec

C. 510 sec

D. 642 sec

Answer: A

View Text Solution

92. On passing 0.1 faraday of electricity through fused sodium chloride, the amount of chlorine liberated is (At. Mass of Cl = 35.45)

A. 35.45 g

B. 70.9 g

C. 3.545 g

D. 17.77 g

Answer: C

View Text Solution

93. Electrochemical equivalent of an element is

A. $\frac{\text{Atomic}Weight \times \text{Valency}}{96500}$

B. $\frac{\text{Atomic}Weight \times 96500}{\text{Valency}}$

C. $\frac{\text{Atomic}Weight}{\text{Valency} \times 96500}$

D. $\frac{\text{Valency} \times 96500}{\text{Atomic}Weight}$

Answer: C

View Text Solution

94. In electrolysis of NaCl when Pt electrode is taken then H_2 is liberated at cathode while with Hg cathode

it forms sodium amalgam because

A. Hg is more inert than Pt

B. more voltage is required to reduce H^+ at Hg than at Pt

C. Na gets dissolved in Hg while it does not dissolve in Pt

D. concentration of H_+ ions is larger when Pt electrode is taken.

Answer: B

View Text Solution

Neet Cafe Topicwise Practice Questions Batteries Fuel Cells And Corrosion

1. Equal quantities of electricity are passed through three voltameters containing $FeSO_4$, $Fe_2(SO_4)_3$ and $Fe_2(SO_3)_3$. Consider the following statements :

1. The amount of iron deposited in $FeSO_4$ and $Fe_2(SO_4)$ are equal.

2. The amount of iron deposited in $Fe(NO_3)_3$ is two third of the amount of iron deposited in $FeSO_4$

3 The amount of iron deposited in $Fe_2(SO_4)_3$ and $Fe(NO_3)_3$ is equal

The correct statements is/are

A. 1 only

B. 1 and 2 only

C. 2 and 3 only

D. 3 only

Answer: C

View Text Solution

2. Zinc is used to protect iron from rusting because

A. $E^{\circ}_{red} of Zn > E^{\circ}_{red}$ of Fe

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

C. zinc does not melt easily

D. zinc is cheap.

Answer: B

View Text Solution

3. During the charging of lead storage battery, the reaction at anode is represented by

A. $Pb^{2+} + SO_4^{2-} \rightarrow PbSO_4$

B. $PbSO_4 + H_2O \rightarrow PbO_2 + SO_4^{2-} + 2H^+$

C. $Pb \rightarrow Pb^{2+} \_ 2e^-$

D. $Pb^{2+} + 2e^- \rightarrow Pb$

Answer: B

View Text Solution

4. In electrochemical corrosion of metals, the metal undergoing corrosion

A. becomes anode

B. becomes cathode

C. becomes inert

D. none of these.

Answer: A

View Text Solution

View Text Solution

5. A secondary cell is one which

A. can be recharged

B. can be recharged by passing current through it in the same direction

C. can be recharged by passing current through it in the opposite direction

D. cannot be recharged.

Answer: C

View Text Solution

6. In $H_2 - O_2$ fuel cell the reaction occurring at cathode is

A. $O_{2(g)} + 2H_2O_{(I)} + 4e^- \rightarrow 4OH^-_{(aq)}$

B. $H^+_{(aq)} + OH^-_{(aq)} \rightarrow H_2O_{(I)}$

C. $2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(I)}$

D. $H^+ + e^- \rightarrow \frac{1}{2}H_2$

Answer: A

View Text Solution

Check Your Neet Vitals

1. What is the E_{cell} of the given cell?

$$Zn\left|Zn^{2+}(2M)\right|\left|Zn^{2+}(10M)\right|Zn$$

A. Zero

B. 0.0206 V

C. 5.00 V

D. Datavis insufficient

Answer: B

View Text Solution

2. In $H_2 - O_2$ fuel cell, which of the following is correct when an alkali is used as electrolyte?

A. At anode : $H_{2(g)} + 2OH^-_{aq} \rightarrow 2H_2O_I + 2e^-$

B. At cathode : $H_2O_I + \frac{1}{2}O_{2(g)} + 2e^- \rightarrow 2OH^-_{aq}$

C. Net reaction: $H_{2(g)} + \frac{1}{2}O_{2_g} \rightarrow H_2O_I$

D. All of these

Answer: D

View Text Solution

3. KCl, $BaCl_2$ and $AICI_3$ are used as electrolytes in three different cells connected in series. If 3 F charge is passed, the molar ratio of masses of K, Ba and Al deposited at cathodes will be

A. 1 : 1 : 1

B. 1 : 2 : 3

C. 3 : 2 : 1

D. none of these.

Answer: D

View Text Solution

4. The ionic mobility of alkali metal ions in aqueous solution is maximum for

A. K^+

B. Rb^+

C. Li^+

D. Na^+

Answer: B

View Text Solution

5. A dilute aqueous solution of Na_2SO_4 is electrolysed using platinum electrodes. The products

at the anode and cathode are respectively

A. O_2, H_2

B. $S_2O_8^{2-}. Na$

C. O_2, Na

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

Answer: A

View Text Solution

6. From the following E values of half cells

(i) $A + e^- \rightarrow A^-, E^\circ = -0.24\,\text{V}$

(ii) $B^- + e^- \rightarrow B^{2-}, E^\circ = +1.25\,\text{V}$

(iii) $C^- + 2e^- \rightarrow C^{3-}, E^\circ = -1.25\,\text{V}$

(iv) $D + 2e^- \rightarrow D^{2-}, E^\circ = +0.68\,\text{V}$

What combination of two half cells would result in a cell with the largest potential?

A. (ii) and (iii)

B. (ii) and (iv)

C. (i) and (iii)

D. (i) and (iv)

Answer: A

View Text Solution

7. The quantity of electricity required to liberate 112 cm of hydrogen at STP from acidified water is

A. 0.1 faraday

B. 96500 coulomb

C. 965 coulomb

D. 10 faraday.

Answer: C

View Text Solution

8. A cell is containing two H electrodes. The negative electrode is in contact with a solution of 10^{-6} M H^{+} ions. The e.m.f. of the cell is 0.118 V at 25 $^{\circ}C$ What is the $\left[H^{+}\right]$ at positive electrode?

A. 10^{-4} M

B. 10^{-6} M

C. 10^{-2} M

D. 10^{-8} M

Answer: A

View Text Solution

9. The equivalent conductance of NaCl at concentration C and at infinite dilution are λ_C and λ_∞ , respectively. The correct relationship between λ_C and λ_∞ is given as (where, the constant B is positive)

A. $\lambda_C = \lambda_\infty + (B)\sqrt{C}$

B. $\lambda_C + \lambda_\infty - (B)C$

C. $\lambda_C + \lambda_\infty - (B)C$

D. $\lambda_C = \lambda_\infty - (B)\sqrt{C}$

Answer: D

View Text Solution

10. For the cell, $Zn\left|Zn^{2+}(1M)\right|\left|Cu^{2+}(1M)\right|Cu$, E°_{cell} is 1.10 V, $E^{\circ}_{Cu^{2+}/Cu} = 0.34$ V and for the cell, $Cu\left|Cu^{2+}(1M)\right|\left|Ag^{+}(1M)\right|Ag$, $E^{\circ}_{cell} = 0.46$ V hence, E°_{cell} of the cell $Zn\left|Zn^{2+}(1M)\right|\left|Ag^{2+}(1M)\right|Ag$ is

A. - 0.40 V

B. + 0.04 V

C. + 0.30 V

D. + 1.56 V

Answer: D

View Text Solution

11. The standard electrode potential values of the elements A, B and C are 0.68, -2.50 and - 0.50 V respectively. The order of their reducing powers is

A. $C > B > A$

B. $A > C > B$

C. $A > B > C$

D. $B > C > A$

Answer: D

View Text Solution

12. Cu_{aq}^{+} is unstable in solution and undergoes simultaneous oxidation and reduction according to the reaction :

$2Cu_{aq}^{+} \Leftrightarrow Cu_{aq}^{2+} + Cu_s$

What will be the value of E° for the reaction?

(Given : $E^\circ Cu^{2+}/Cu = 0.34$ V and $E^\circ_{Cu^{2+}/Cu^{+}} = 0.15$ V)

A. + 0.49 V

B. + 0.38 V

C. - 0.19 V

D. - 0.38 V

Answer: B

View Text Solution

13. Consider the following half-cell reactions :

I. $A + e^- \rightarrow A^-, \ E^\circ$ =0.96 V

II. $B^- + e^- \rightarrow B^{2-}, \ E^\circ = -0.12$ V

III> $C^+ + e^- \rightarrow C, \ E\circ = +0.18$ V

IV. $D^{2+} + 2e^- \rightarrow D, \quad E\circ = -1.12$ V What combination of two half-cells will result in the largest potential?

A. I and II

B. I and III

C. I and IV

D. II and IV

Answer: C

View Text Solution

14. Standard electrode potential for Sn^{4+}/Sn^{2+} couple is +0.15 V and that for the Cr^{3+}/Cr couple is -0.74 V. These two couples in their standard state are connected to make a cell. The cell potential will be

A. + 1.83 V

B. + 1.19 V

C. + 0.89 N

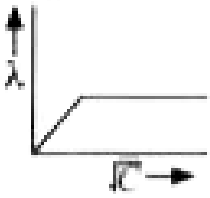
D. + 0.18 V

Answer: C

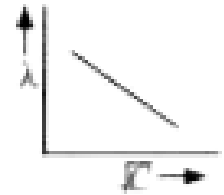
View Text Solution

15. The variation of equivalent conductance of weak electrolyte with $\sqrt{C}$ is correctly shown in which of the following figures?

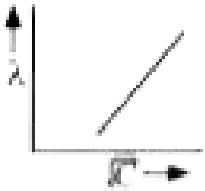
A.



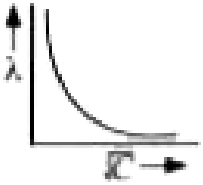
B.



C.



D.



Answer: D

View Text Solution

16. Which has minimum potential for the half cell reaction : $2H^+ + 2e^- \rightarrow H_2$?

A. 1.0 M HCl

B. 1.0 M NaOH

C. Pure water

D. A solution with pH=4

Answer: B

View Text Solution

17. The molar conductivity of 0.025 mol L^{-1} methanoic acid is 46.1 S $cm^2 mol^{-1}$. Calculate its dissociation constant.

(Given $\lambda_{2(H^+)^\circ} = 349.6$ S $cm^2 mol^{-1}$ and $\lambda^\circ_{HCOO^-} = 54.6 S Cm^2 mol^{-1}$)

A. 3.14×10^{-3}

B. 3.67×10^{-4}

C. 4.15×10^{-4}

D. 5.21×10^{-3}

Answer: B

View Text Solution

18. If $E^{\circ}_{Fe^{2+}/Fe} = x_1 V, E^{\circ}_{Fe^{3+}/Fe^{2+}} = x_2 V$, what is the $E^{\circ}_{Fe^{3+}/Fe}$?

A. $\frac{2x_1 + x_2}{4}$

B. $\frac{2x_1 + x_2}{3}$

C. $\frac{2x_1 + x_2}{2}$

D. $2x_1 + x_2$

Answer: B

View Text Solution

19. Following two half cells form a complete cell which has ΔG° (in kJ) value

$$2H^{+} + 1/2O_2 + 2e^{-} \rightarrow H_2O, E^{\circ} = +1.23V$$
$$Fe^{2+} + 2e^{-} \rightarrow Fe_{(s)}, \quad E^{\circ} = -0.44V$$

A. -122

B. -222

C. -322

D. -422

Answer: C

View Text Solution

20. Zinc is used to protect iron from rusting. This is because

A. E°_{red} red of Zn is greater than that of Fe

B. E°_{OX} of Zn is greater than that of Fe

C. E°_{red} of Zn is nearly equal to that of Fe

D. Zn is cheap

Answer: B

View Text Solution

21. $Li^+/Li = -3.05V$, $Ba^{2+}/Ba = -2.73V$,

$Mg^{2+}/Mg = -2.37\,V$

The correct order as per reducing power is

A. $Li > Ba > Mg$

B. $Li^+ > Ba^{2+} > Mg^{2+}$

C. $Mg > Ba > Li$

D. $Mg^{2+} > Ba^{2+} > Li^+$

Answer: A

View Text Solution

22. $\Lambda^{\circ} CICH_2COONa = 224\ ohm^{-1}\ cm^2\ \text{g}\ eq^{-1}$, $\Lambda^{\circ} NaCI = 38.2\ ohm^{-1}\ cm^2\ \text{g}\ eq^{-1}$, $\Lambda^{\circ} HCI = 203\ ohm^{-1}\ cm^2\ \text{g}\ eq^{-1}$, what is the value of $\Lambda^{\circ} CICH_2COOH$?

A. 59.5 $ohm^{-1} cm^2$ g eq^{-1}

B. 289.5 $ohm^{-1} cm^2$ g eq^{-1}

C. 388.8 $ohm^{-1} cm^2$ g eq^{-1}

D. 59.5 $ohm^{-1} cm^2$ g eq^{-1}

Answer: C

View Text Solution

23. Given :

$Zn^{2+}/Zn = -0.76V, Mg^{2+}/Mg = -2.37V,$

then the correct statement about the reaction

$Zn_{(s)} + MgCI_{2(aq)} \rightarrow$

A. solid zinc dissolves

B. zinc chloride precipitates

C. magnesium chloride precipitates

D. no reaction takes place.

Answer: D

View Text Solution

24. For a cell reaction involving two electron change, the standard EMF of the cell is 0.295 V at 25 $^{\circ}C$. The equilibrium constant of the reaction at 25 $^{\circ}C$ will be

A. 29.5×10^{-2}

B. 10

C. 1×10^{10}

D. 2.95×10^{-10}

Answer: C

View Text Solution

25. The half cell potential of a hydrogen electrode at pH = 10 will be

A. -0.50 V

B. -0.59 V

C. 0.059 V

D. none of these.

Answer: B

View Text Solution

Aipmt Neet Mcqs

1. For the reduction of silver ions with copper metal, the standard cell potential was found to be + 0.46 V at 25 $^{\circ}C$. The value of standard Gibb's energy, $\Delta^{\circ}C$ will be (F = 96500 C mol^{-1})

A. -89.0 KJ

B. -89.0 J

C. -44.5 KJ

D. -98.0 KJ

Answer: A

View Text Solution

2. An increase in equivalent conductance of a strong electrolyte with dilution is mainly due to

A. increase in ionic mobility of ions

B. 100% ionisation of electrolyte at normal dilution

C. increase in both i.e., number of ions and ionic mobility of ions

D. increase in number of ions

Answer: A

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3. Which of the following expressions correctly represents the equivalent conductance at infinite dilution of $Al_2(SO_4)_3$. Given that $\Lambda^\circ_{AI^{3+}}$ and $\Lambda^\circ_{SO_4^{2-}}$ are the equivalent conductances at infinite dilution of the respective ions?

A. $2\Lambda^\circ_{AI^{3+}} + 3\Lambda^\circ_{SO_4^{2-}}$

B. $\Lambda^\circ_{AI^{3+}} + \Lambda^\circ_{SO_4^{2-}}$

C. $\left(\Lambda^\circ_{AI^{3+}} + \Lambda^\circ_{SO_4^{2-}}\right) \times 6$

D. $\frac{1}{3}\Lambda^\circ_{AI^{3+}} + \frac{1}{2}\Lambda^\circ_{SO_4^{2-}}$

Answer: B

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4. Consider the following relations for emf of an electrochemical cell (i) EMF of cell = (Oxidation potential of anode) - (Reduction potential of cathode)

(ii) EMF of cell - (Oxidation potential of anode) + (Reduction potential of cathode)

(iii) EMF of cell = (Reductional potential of anode) + (Reduction potential of cathode)

(iv) EMF of cell = (Oxidation potential of anode) - (Oxidation potential of cathode)

Which of the above relations are correct?

A. (iii) and (i)

B. (i) and (ii)

C. (iii) and (iv)

D. (ii) and (iv)

Answer: D

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5. Standard electrode potential of three metals X, Y and Z are-1.2 V, +0.5 V and -3.0 V respectively. The reducing power of these metals will be

A. $Y > Z > X$

B. $Y > x > Z$

C. $Z > X > Y$

D. $X > Y > Z$

Answer: C

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