CHEMISTRY

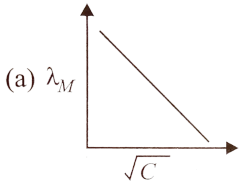
BOOKS - A2Z CHEMISTRY (HINGLISH)

ELECTROCHEMISTRY

Electrolytic Conduction

1. The variation equivalent conductance of stronge electrolyte with $\sqrt{Concentration}$ is correctly shown in the figure.

A.



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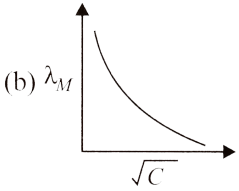

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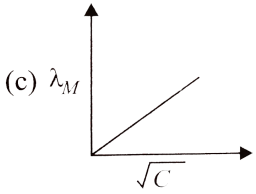
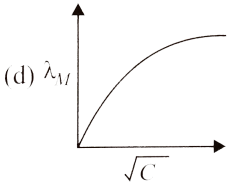


D.



Answer: A

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2. A conductance cell when filled with $0.5MKCI$ solution (conductivity $= 6.67 \times 10^{-3}\Omega^{-1}cm^{-1}$) register a resistance of 243Ω. Its cell constant is .

A. $1.62cm$

B. $1.62cm^{-1}$

C. $1.62dm^{-1}$

D. $1.62m^{-1}$

Answer: B

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

A. 101.5

B. $203.5cm^{-1}$

C. $139.5dm^{-1}$

D. $1.62m^{-1}$

Answer: C

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4. Which has the maximum conductivity ?

A. $\left[Cr(NH_3)_3Cl_3\right]$

B. $\left[Cr(NH_3)_4Cl_2\right]Cl$

C. $\left[Cr(NH_3)_5Cl\right]Cl_2$

D. $\left[Cr(NH_3)_6\right]Cl_3$

Answer: D

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5. Conductance (Siemens, S) is directly proportional to the area of the vessel and the concentration of solution in it and is inversely proprtional to the length of the vessel, then the unit of constant of proportionlity is :

A. $Sm\text{mol}^{-1}$

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

C. $S^{-2}m^1 mol$

D. $S^2 m^2 mol^{-2}$

Answer: B

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6. The conductivity of a saturated solution of $BaSO_4$ is $3.06 \times 10^{-6} ohm^{-1} cm^{-1}$ and its equivalent conductance is $1.53 ohm^{-1} cm^2 \equiv^{-1}$. The K_{sp} for $BaSO_4$ will be .

A. 4×10^{-12}

B. 2.5×10^{13}

C. 25×10^9

D. 10^{-6}

Answer: D

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7. Molar conductance of $0.1M$ acetic acid is $7ohm^{-1}cm^2\text{mol}^{-1}$. If the molar conductance to acetic acid at dinfintie dilution is $380.8\text{ohm}^{-1}cm^2\text{mol}^{-1}$, the value of dissociation constant will be :

A. $226 \times 10^{-5}\text{mol dm}^{-3}$

B. $1.66 \times 10^{-3}\text{mol dm}^{-1}$

C. $1.66 \times 10^{-2}\text{mol dm}^{-3}$

D. $3.33 \times 10^{-5}\text{mol dm}^{-3}$

Answer: D

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

at $0.1M$ is.

A. 100

B. 101

C. 0.01

D. 0.001

Answer: C

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9. Which of the folowing is not correct?

A. The metallic conduction is due to the movement of electrons in the metal

B. The electrolytic conduction is due to the movement of ions in the solution

C. The current carrying ions are not necessarily discharged at the electrodes

D. The metallic conduction inceases with the increase in temperature, whereas that of electrolytic conduction decreases with increase in temperature.

Answer: D

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10. The limiting molar conductivities Λ° for $NaCL$, KBr and KCI are $126, 152$ and $150 Scm^2, ol^{-1}$ respectively . The Λ° fro $NaBrScm^\circ \mathrm{mol}^{-1}$ is :

A. 302

B. 176

C. 278

D. 128

Answer: D

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11. The highest electrical conductivity of the following aqueous solutions is of

A. $0.1M$ acetic acid

B. $0.\ 1M$ chloroacetic acid

C. $0.1M$ fluoroacetic acid

D. $0.1M$ difluoracetic acid

Answer: D

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12. The molar conductance of acetic acid at infinite dilution if Λ° for CH_3COONa, $NACI$ and HCI are 91.0, 126.5 and $426.2 Scm^2 \mathrm{mol}^{-1}$ respectively is :

A. 517.2

B. 552.7

C. 390.7

D. 217.5

Answer: C

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13. Which of the following is correct ?

A. Conductivity of a solution decrease with dilution, whereas molar conductivity inceases with dilution

B. Conductivity of a solution increases with dilution, whereas molar conductivity decreases with dilution

C. Both conductivity and molar conductivity increase with dilution

D. Both conductivity and molar conductivity decrase wihdilution

Answer: A

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14. Which of the following ion is expected to have highest value of molar conductivity at infinity at infinite dilution is the aqueous solution ?

A. Na^+

B. K^+

C. $\frac{1}{2}Ca^+$

D. H^+

Answer: D

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15. For H^+ the value of $\lambda^\infty = 349.8 Scm^2 eq^{-1}$. Calculate the mobilities of H^+ ion and its velocity is it is in a cell in which the electrodes are $5cm$ apart and to which a potential of 2 volts is applied .

A. $3.575 \times 10^{-3} cm^2 \text{volt}^{-1} \sec^{-1}, .43 \times 10^{-3} cm \sec^{-1}$

B. $5.2 \times 10^{-4} cm^2 \text{volt}^{-1} \sec^{-1}, 2.08 \times 10^{-4} cm \sec^{-1}$

C. $3.2 \times 10^{-4} cm^2 \text{voly}^{-1} \sec^{-1}, 1.05 \times 10^{-3} cm \sec^{-1}$

D. None of these

Answer: A

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16. The ionisation constant of a weak electrolytes is 25×10^{-6} and the equivalent conductance of its $0.01M$ solution is $19.6Scm^2eq^{-1}$. The equivalent conductance at infinite dilution of the electrolyte in Scm^2eq^{-1}. is .

A. 50

B. 196

C. 392

D. 384

Answer: C

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17. Conductivity of a strong electrolyte .

A. Increases on dilution

B. Depends on density

C. Decreases on dilution

D. Does not change considerable on dilution

Answer: D

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18. The resistance of a conductivity cell filled with $0.1MKCl$ solution is 100Ω. If R of the same cell when filled with $0.02MKCl$ solution is 520Ω, calculate the conductivity and molar conductivity of $0.02MKCl$ solution. The conductivity of $0.1MKCl$ solution is $1.29Sm^{-1}$.

A. $124 \times 10^{-4} Sm^2 \text{mol}^{-1}$

B. $1240 \times^{-4} \text{mol}^{-1}$

C. $1.\ 24 \times 10^{-4} Sm^2 \text{mol}^{-1}$

D. $12.4 \times 10^{-4} Sm^2 \text{mol}^{-1}$

Answer: A

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19. The equivalent conductance of an infinitely dilute solution of NH_4CI is 150 and the ionic conductance of OH^- and CI^- ions are 198 and 76 respectively. If the equivalent conductance of a $0.01N$ solution of NH_4OH is 9.6 Wat will be its degree of dissociation ?

A. 0.03431

B. 0.0103

C. 0.96

D. 0.414

Answer: A

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20. The molar conductivities Λ°_{NaOAc} and Λ°_{HCI} at infinite dilution is watter at $25^{\circ}C$ are 91.0 and $426.2Scm^{\circ}/$mol respectively. To calculate $\Lambda^{2}_{HOAc,}$ the additional value required is:

A. $\Lambda^{o}_{H_2O}$

B. Λ^{o}_{KCI}

C. $\Lambda^{o}_{N_aOH}$

D. Λ^{o}_{NaCI}

Answer: D

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21. The equivalent conductances of two strong electrolytes at infinite dilution in H_2O (where ions move freely through a solution) at $25^{\circ}C$ are given below:

$\Lambda^{\circ}_{CH_3COOH} = 91.0Scm^{\circ}/$equiv

$\Lambda^{\circ}_{HCI} = 42.2Scm^{2}/$equiv

What additional information/quantity one needs to calculate Λ° of an aqueous solution of acetic actid ?

A. Λ^o of $NaCI$

B. Λ^o of CH_3COOK

C. The limiting equivlent conductance of $H^+\left(\lambda^o_{H+}\right)$

D. Λ° of chloracetic acid $(CICH_2COOH)$

Answer: A

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22. The specific conductance of a $0.1NCKI$ solutin at $23^\circ C$ is $0.012\text{ohm}^{-1}cm^{-1}$. The resistance of cell containing the solution at the same trmprature was contaning the solution at the same temperature was found to be 55 ohm. The cell constant will be .

A. $0.\ 142cm^1$

B. $0.918 cm^1$

C. $0.\ 66 cm^1$

D. $1.12 cm^1$

Answer: C

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23. The molar conductances of $NaCI, HCI$ and CH_3COONa at infinite dilution are $12.45, 426.\ 16$ and $91 \text{ohm}^{-1} cm^2 \text{hol}^{-1}$ respectively. The molar conductance of CH_3COOH at infinite dilution is .

A. $201.\ 28 \text{ohm}^{-1} cm^2 \text{mlo}^{-1}$

B. $698.\ 28 \text{ohm}^{-1} cm^{-1} \text{mlo}^{-1}$

C. $390.71 \text{ohm}^{-1} cm^2 \text{mol}^{-1}$

D. $540.\ 48 \text{ohm}^{-1} mol^{-1}$

Answer: C

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24. At $25^{\circ}C$ specific conductivity of a normal solution of KCI is 0.0022765 ohm. The resistance of cell is 400 ohms. The cell constant is .

A. 0.815

B. 1.106

C. 1.016

D. 2.016

Answer: B

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25. In a conductivity ecll the two patinum electrodes, each of area $10sq.$ Cm si fixed $1.5cm$ apart . The cell contained $0.05N$ solution of a salt. If

the two electrodes are just half dipped into the solution which has a resistance of 50Ω, find equivalent conductance of the salt solution .

A. $120Scm^2eq^{-1}$

B. $160Scm^2eq^{-1}$

C. $120Sm^2eq^{-1}$

D. $125Scm^2eq^{-1}$

Answer: A

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26. The resistance of $aN/10KCI$ solution is 245Ω. Calculate the equivalent conductance of the solution if the electrodes in the cell are $4cm$ apart and each haveing an area of $7.0sq.\ cm.$

A. $23.\ 32cm^2eq^{-1}$

B. $23.\ 23Sm^2eq^{-1}$

C. 2. $332 Scm^2 eq^{-1}$

D. None of these

Answer: A

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27. Calculate molar conductivity at infinite dilution of CH_3COOH if molar conductivity at infinite dilution of CH_3COONa, HCI and $MaCI$ are 91.6, 425.0 and $128.1 Scm^2 \text{mol}^{-1}$.

A. $390.5 Scm^2 \text{mol}^{-1}$

B. $388.5 Scm^2 \text{mol}^{-1}$

C. $490.5 Scm^2 \text{mol}^{-1}$

D. None of these

Answer: B

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28. Resistance of $0.2M$ solution of an electrolue is 50Ω. The specific conductance of the solution is $1.4Sm \wedge (-1)$. The resistance of 0.5 M solution of the same electrolyte is $280.\ \Omega$. The molar conducitivity of $0.5M$ solution of the electrolyte is $Sm^2\text{mol}^{-1}$ is.

A. 5×10^{-4}

B. 5×10^{-3}

C. 5×10^{3}

D. 5×10^{2}

Answer: A

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29. The equivalent conductance of $NaCI$ at concentration C and at infinited dilution are λ_c and $\lambda_{\in f \in ity}$ is given as.

A. $\lambda_c = \lambda_{\text{infty}} + (B)C$

B. $\lambda_c \lambda_{\text{infty}} - (B)C$

C. $\lambda_c = \lambda_{\text{infty}} - (B)\sqrt{C}$

D. $\lambda_c = \lambda_{\text{infty}} + (B)\sqrt{C}$

Answer: C

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30. The molar conductivity of $0.05M$ of solution of an electrolyte is $200\Omega^{-1}cm^2$. The resistance offered by a conductivity cell with cell constant $(1/3)cm^{-1}$ would be about .

A. 11.11Ω

B. 22.22Ω

C. 33.33Ω

D. 44.444Ω

Answer: C

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31. The specific conducitvity of a saturated solution of $AgCI$ is $3.40 \times 10^{6} \text{ohm}^{-1} cm^{-1}$ at $25^{\circ} C$. If $\lambda_{Ag+} = 62.3 \text{ohm}^{-1} cm^{2} \text{mol}^{-1}$ and $\lambda_{CI-} = 67.7 \text{ohm}^{-1} cm^{2} \text{mol}^{-1}$, the solubility of $AgCI$ at $25^{\circ} C$ is.

A. $2.6 \times 10^{-5} \text{mol} L - 1$

B. $3.731 \times 10^{-3} \text{mol} L - 1$

C. $3.731 \times 10^{-5} \text{mol} L - 1$

D. $2.6 \times 10^{-3} gL - 1$

Answer: A

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32. Resistance of $0.2M$ solution of an electrolyte is 50Ω. The specific conductance of the solution is $1.3Sm^{-1}$. If resistance of the $0.4M$ solution of the same electrolyte is 260Ω, its molar conductivity is .

A. $6250Sm^2\text{mol}^{-1}$

B. $6.25 \times 10^{-4}Sm^2\text{mol}^{-1}$

C. $625 \times 10^{-4}Sm^2\text{mol}^{-1}$

D. $62.5Sm^2\text{mol}^{-1}$

Answer: B

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Electrosis And Faraday'S Laws

1. How many faradays are required to reduce 1 mol of MnO_4^- to Mn^{2+}?

A. 1

B. 2

C. 3

D. 5

Answer: D

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2. When during electrolusis of a solution of $AgNO_3$, 9650 coulmbs of charge pass through the electroplationg bath, the mass of silver deposited on the cathode will be:

A. $1.08g$

B. $10.8g$

C. $21.6g$

D. $108g$

Answer: B

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3. Electrolysis of a solution of $MnSO_4$ in aqueous sulphuric acid is a method for the preparation of MnO_2 as per reaction,

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

Passing a current of 27 ampere for 24 hour gives one kg of MnO_2. What is the value of current efficiency ? Write the reaction taking place at the cathode and at the anode.

A. $100\ \%$

B. $95.185\ \%$

C. $80\ \%$

D. $82.951\ \%$

Answer: B

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4. The quantity of electricity needed to electrolyse completely $1M$ solution of $CuSO_4$, $Bi_2(SO_4)_3$, $AICI_3$ and $AgNO_3$ each will be .

A. $2F$. $6F$. $3F$, and 1 F respectively

B. $6F$, $2F$, $3F$ and 1 F respectively

C. $6F$, $2F$, $1F$ and 3 F respectively

D. $6F$, $2F$, $1F$ and 3 F respectively

Answer: A

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5. During the perparation of $H_2S_2O_s$ (per disulphuric acid) O_2 gas is also released at anode as byproduct. When $9.72L$ of H_2 releaseds at cathode and $2.35LO_2$ at anode the weight $H_2S_2O_8$ depostited at the cathode is .

A. 87.12

B. 48.65

C. 83.42

D. 51.74

Answer: B

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6. Three faradays of electricity qas passed through an aqueous solution of iron I bromide. The mass of iron metal (atomic mass-56) deposited at thecathode is .

A. $56g$

B. $84g$

C. $112g$

D. $168g$

Answer: B

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7. In an electrolyitc cell of Ag/NO_3Ag, when current is passed, the concentration of $AgNO_3$.

A. Increases

B. Decreases

C. Remains same

D. None of these

Answer: C

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8. If aqueous solutions of $AgNO_3$ is electrolysed using inert electrode the gas evolved at anode is .

A. NO_2

B. O_2

C. H_2

D. N_2O

Answer: B

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9. When the sample of copper with zinc impurityn is to be purified by electrolysis, the appropriate electrode are .

A. pure zinc as cathode and pure copper as anode

B. impure sample as cathode and pure copper as anode

C. impure sample as cathode and pure copper as anode

D. pure copper as cathode and impure sample as anode

Answer: D

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

A. O_2, H_2

B. H_2O_2

C. O_2Na

D. O_2, SO_2

Answer: B

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11. The two aqueous solutions, $A(AgNO_3)$ and B (LiCI), were electrolysed using Pt electrodes. The pH of the resulting solutions will.

A. increase in A and decrease in B

B. decrease in both

C. decrease in both

D. increase in A and decrease in B

Answer: D

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12. The metal that cannot obtained by electrolysis of an aqueous solution of its salts is :

A. Ag

B. Ca

C. Cu

D. Cr

Answer: B

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13. When the electric current is passed through a cell having an electrolyte, the positive ions move towards cathode and negative ions toqards the anode. If the cathode is pulled out of the solution .

A. the positive and negative ion will move towards anode

B. the positive ions will state moving towards the anode whil negative ions will stop moving

C. the negative ions will continut to move towarsa anode while positive ions will stop moving

D. the positive and negative ions will start moving randomly

Answer: D

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14. The sam quantity of electricity is passed through H_2SO_4 and HCI solutins of same concentration. The amount of hudrogen liberated from H_2SO_4 as cmpared to that from HCI is.

A. the same

B. twice as such

C. one half as such

D. dependent on concentration.

Answer: B

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15. When a molten ionic hydride is electrolysed.

A. Hydrogen is liberted at the cathode

B. H-ions produced migrate to the cathode

C. There is no reasction

D. Hydrogen is liberted at the anode

Answer: D

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16. What would be the product of electrolusis if molten ICI_3 is electrlysed ?

A. I_2 is produced at cathode and CI_2 is proluced at anode

B. I_2 is produced at cathode and I_2 is proluced at anode

C. Botg I_2 and VI_2 are liberated at both electrodes

D. ICI_2 is produced at cathode and ICI_4 is produced at anode

Answer: C

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17. Faraday's laws of electrolysis are related to

A. atomic number of the cation

B. atomic number of the anion

C. equivalent mass of the electrolyte

D. speed of the cation

Answer: C

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18. During the electrolysis of the aqueous solution of copper sulphate using Pt electrode, the reaction taking place at anode electrode is

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

B. $2SO_4^{2-} + 2H_2O \rightarrow 2H_2SO_4 + O_2 + 4e$

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

D. $2Cl^- \rightarrow Cl_2 + 2e$

Answer: C

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19. 1 mol each of $AGAgBO_3, CuSO_4$ and $AICI_3$ is electrolysed. The number of faradays rewuired is in the ration of:

A. $1:1:1$

B. $1:2:3:$

C. $3:2:1$

D. $1:3:1$

Answer: B

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20. A solution of $CuSO_4$ is electrolysed for 7 minutes with a current of $0.6A$. The amount of electrictiy passed is equal to.

A. $4.2C$

B. $2.6 \times 10^{-3}F$

C. $126C$

D. $36C$

Answer: B

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21. An electrolytic cell is constructed for preparing hudrogen. For an averge current of 1 amper in the circuit , the time required to produce $450mL$ of hydrogen at NTP is appr.

A. 30 min

B. 1 hour

C. 2 hours

D. 5 hours

Answer: B

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22. One coulomb is equal to

A. 96500

B. charge on 6.24×10^{18} electrons

C. charge on 1 electron

D. noner of the above

Answer: B

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23. If $3F$ of electrictiy is passed through the solutions of $AgNO_3, CuSO_4$ and $Auc = CL_3$, the molar ration of the cations deposited at the cathode is .

A. $1:1:1$

B. $1:2:3$

C. $3:2:1$

D. $6:3:2$

Answer: D

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24. Which of the follwing will not conduct electricity in aqueous solution ?

A. Copper sulphate

B. Common salt

C. Sugar

D. None of these

Answer: C

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25. The metal that cannot obtained by electrolysis of an aqueous solution of its salts is :

A. Ag

B. Cr

C. Cu

D. Mg

Answer: D

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26. Electrolysis involves oxidation and reduction respectively at .

A. Cathode and anode

B. Anode and cathode

C. At both the electrodes

D. None of the above

Answer: B

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27. When the sample of copper with zinc impurityn is to be purified by electrolysis, the appropriate electrode are .

A. Cathode =Pure zine , Anode=Pure copper

B. Cathode=mpure sample, Anode= Pure copper

C. Cathode = Pure copper,Anode, Impure sample

D. Cathode =Impure zinc, Anode= Impure ,sample

Answer: C

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28. The amount of ion discharged during electrolysis is not directly proprtional to

A. Current

B. Time

C. Resistance

D. Chemical equivalent of the ion

Answer: C

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29. In $H_2 - O_2$ fuel cell, $6.72L$ of hydrogen at NTP reacts in 15 minutes, the averge current produced in ampres is .

A. 64.3 amp

B. 643.3 amp

C. $6.\ 43$ amp

D. 0.643 amp

Answer: A

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30. Which of the following is not a non-electrolyte ?

A. Urea

B. Glucose

C. Ethanol

D. Acetic acid

Answer: D

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31. Amount of electricty that can depostit $108g$ of silver from $AgNO_3$ aikyruib ua

A. 1 ampere

B. 1 freaday

C. 1 coulomb

D. None of the above

Answer: B

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32. Rgw atomic weight of Al is 27. When a current of $5F$ is passed through a solution of Al^{+++} ions, the qeight of AL deposited is.

A. $27g$

B. $36g$

C. $39g$

D. $45g$

Answer: D

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33. A certain current liberates $0.5g$ 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. $12.7g$

B. $15.9g$

C. $31.8g$

D. $45g$

Answer: C

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34. On passing $0.1F$ of electricity through aluminimum chloride, the amount of aluminimu metal deposited on cathode is $(A1 = 27)$.

A. $0.27g$

B. $0.3g$

C. $0.9g$

D. $2.7g$

Answer: C

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35. One Faraday of electricity when passed through a solution of copper sulphate deposits .

A. 1 mloe of Cu

B. 1 g ewuivalent of Cu

C. 1 g ewiovalent of Cu

D. 1 molecule of Cu

Answer: C

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36. A current of 2 A was passed for $1h$ through a solution of $CuSO_4$. $0.237g$ of Cu^{2+} ions was discharged at cathode . The current efficiency is .

A. 42.2%

B. 26.1%

C. 10%

D. 40.01%

Answer: C

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37. To deposit $0.6354g$ of copper by electrolysis of aqueous cupric sulpbate solution, the amount of electricity required (in coulmmbs) is.

A. 1930

B. 4825

C. 3860

D. 9650

Answer: A

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38. What is the amount of chlorine evoled when 2 amperes of current is passed for 30 minumtes in an aqueous solution of $NaCI$?

A. $66g$

B. $33g$

C. $1.32g$

D. $99g$

Answer: C

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39. 96500 culombs of electric current liberates from $CuSO_4$ solution.

A. $63.5fCu$

B. $96500gCu$

C. $31.75gCu$

D. $100gCu$

Answer: C

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40. Three faradays of electricity are passed through molten Al_2O_3 aqueous solution of $CuSO_4$ and molten $NaCl$ taken in deffernt

electrolytic cells. The amout of Al, Cu and Na deposited at the cathodes will be in the ration of .

A. 1 mole : 15 ,mole 1 moles

B. 1 mole : 2 moles :3 moles

C. 1 mole : 2 moles : 3 moles

D. 1.5 moles : 2 moles : 3 moles

Answer: A

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41. When electricity is passed through a solution of $AlCl_3$ and $13.5g$ of Al is deposited, the number of $Faradayofe \leq ctricitypassed\mu stbe$ .....F`.

A. 0.50

B. $1. 50$

C. 1.00

D. 2.00

Answer: B

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42. In an electroplating experiment m g of silver is deposited, whe 4 amperes of current flows for 2 mimtes. The amout (in g) of silver deposited by 6 amperes of current flowing for 40 seconds will be .

A. $4m$

B. $m/4$

C. $m/2$

D. $\frac{2}{m}$

Answer: C

Watch Video Solution

43. $2.5F$ of electricity is passed through a $CuSO_4$ solution. The number of gm equivalent of `Cu deposited on anode is .

A. $Zero$

B. 2.5

C. 1.25

D. 5.0

Answer: B

Watch Video Solution

44. The amount of silver deposited by passing $241.25C$ of current through silver nitrated solution is .

A. $2.7g$

B. $2.7mg$

C. $0.54g$

D. $0.\ 27g$

Answer: D

Watch Video Solution

45. Charge required to liberated $11.5g$ sodium is .

A. $96500C$

B. $0.1F$

C. $1.5F$

D. $0.5F$

Answer: D

Watch Video Solution

46. In electrolysis of dilute H_2SO_4 using platinum electrodes .

A. Cl_2 is obtained at cathode

B. NH_3 is produced at anode

C. h_2 is evolved at cathode

D. O_2 is produced

Answer: C

Watch Video Solution

47. A solution containing $1mol$ per litre of each $Cu(NO_3)_2$, $AgNO_3$, and $Hg_2(NO_3)_2$ is being electrolyzed by using inert electrodes. The values of standard electrode potentials in volts (reduction potential) are

$Ag|Ag^{\oplus} = +0.80, 2Hg|Hg_2^{2+} = +0.79$

$Cu|Cu^{2+} = +0.34, Mg|Mg^{2+} = -2.37.$

With increasing voltage, the sequence of deposition of metals at the cathode will be

A. Ag, Hg, Cu, Mg

B. Mg, Cu, Ag

C. Cu, Hg, Ag

D. Ag, Hg, Cu

Answer: D

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48. Aluminium oxide may be electorlysed at $1000^{\circ}C$ to furnish aluminim metal (Atomic Mass $= 27$ amu, $1F = 96,500C$). The cathode reaction is

$Al^{3} + 3d^{-} \rightarrow Al^{\circ}$

To prepare $5.12kg$ of aluminimu metal by this method woold require .

A. $5.49 \times 10^4 C$ electricity

B. $1.83 \times 10^7 C$ of elctricity

C. $5.94 \times 10^7 C$ of electricity

D. $5.49 \times 10^1 C$ of electricity

Answer: C

Watch Video Solution

49. During electrolysis of an aqeous solution of sodium sulphate if 2.4 Lof oxygen at STP was liberated at anode. The volume of hydrogen at STP, liberated at cathode would be:

A. $1.2L$

B. $2.4L$

C. $2.6L$

D. $4.8L$

Answer: D

Watch Video Solution

50. A current of strength $2.5A$ was passed through $CuSO_4$ solution for 6 minute 264 seconds. The amount of copper deposited is (At. Of $Cu = 63.5, 1F = 96500C$) .

A. $0.3175g$

B. $1.028g$

C. $0.51g$

D. $6.35g$

Answer: C

Watch Video Solution

51. When electricity is passed through a solution of $AlCl_3$ and $13.5g$ of Al is deposited, the number of $Faradayofe \leq ctricitypassed\mu stbe$ .....F`.

A. $1.5F$

B. $0.5F$

C. $1.0F$

D. $2.0F$

Answer: A

Watch Video Solution

52. A current of $0.75A$ is passed through an acidic solution of $CuSO_4$ for 10 minutes. The vlume of oxygen liberated at anode (at STP) will be.

A. $0.261sm^3$

B. $0.261cm^3$

C. $0.261 \times 10^2 mL$

D. $0.\ 2661m^3$

Answer: C

Watch Video Solution

53. The density of Cu is $8.94gcm^{-3}$. The quantity of electricity neede to plate an area $10cm \times 10cm$ to a thickenss of $10^{-2}cm$ using $CuSO_4$ solution qould be .

A. $13586C$

B. $27172C$

C. $40758C$

D. $20348C$

Answer: B

Watch Video Solution

Fuel Cell And Batteries

1. During discharge of a lead storage cell the density of sulphuric acid in the cell:

A. Inceasing

B. Decreasing

C. Remains unchanged

D. Initially increases but decrease subsequentily

Answer: B

Watch Video Solution

2. An example of a simple fuel cell is :

A. lead storage battery

B. $H_2 - O_2$ cell

C. Deaniel cell

D. Ldeclanche cell

Answer: B

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3. The formation of rust on the surface of iron occurs through the reaction (s) .

A. $Fe^{2+}(aq) + O_2(g) + 4H_2O(l) \rightarrow 2Fe_2O_3(s) + 8H^+$

B. `Fe (s) rarr Fe^(2+) (aq) = 2e ^(-) (at anode)

C. $O_2(g) + 4H^+(aq)4e^- \rightarrow 2H_2O$ (l) (at cathode)

D. all of these above

Answer: B

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4. When iron is rusted, it is

A. reduced

B. oxidised

C. evaporated

D. decomposed

Answer: D

Watch Video Solution

5. Some of the batteries are rechareable:

I.Fuel cell , II, IV and V`

III. Lead-storage, IV. Nickel-Cadmimium,

V.Lithium .

Select the batteries which can be recharged.

A. I. Fuel cell

B. II. Dry cell,

C. III. Lead-storage,

D. IV. Nickel-Cadmium,

Answer: B

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6. Which of the following would occur when lead storage cell is charged?

A. sulphuric Acid is Consumed

B. sulphuric Acid is formed

C. lead sulphate is formed

D. Lead is Consumed

Answer: B

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7. Which of the following statements is true for fuel cells ?

A. they are more efficient

B. they are free from pollution

C. they runs till reactant are active.

D. all of the above.

Answer: D

Watch Video Solution

8. Metals can be prevented from rusting by .

A. They are more efficient

B. The are free from pollution

C. They rum till reactanis are active

D. All of these

Answer: A

Watch Video Solution

9. Which electrolyte is used in dry cell ?

A. Connecting iron to more electropositive metal cathodic protection

B. Commecting iron to more electropositive metal anodic protection

C. Connecting iron to less electropositive metal anodic protection

D. Connecting iron to less electropositive metal cahtodic protection

Answer: B

Watch Video Solution

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

A. $2H_2O + O_2 + 4e^- \rightarrow 4OH^-$

B. $2H_2 + O_2 \rightarrow 2H_2O(l)$

C. $H^+ + OH^- \rightarrow H_2O$

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

Answer: A

Watch Video Solution

Construction And Working Of A Cell, Electrochemical Series And Its Applications

1. In a gavlanic cell.

A. Chemical reaction produces electrical energy

B. Electrical energy produces chemical reaction

C. Reduction occurs at anode

D. Oxidation occurs at cathode

Answer: A

Watch Video Solution

2. The standard potentials at $25^\circ C$ for the following half reactions are given against them

$Zn^{2+} + 2e^- \rightarrow Zn, E^0 = -0.762V$

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

When zinc dust is added to a solution of magnesium chloride .`

A. No reaction will take place

B. Zinc chloride is formed

C. Zinc dissolve in solution

D. Magnesium is preciptiated

Answer: A

Watch Video Solution

3. Which of the following statement is correct ?

A. In SHE, the pressure of dibydrogen gas should e low and pH of solution should be zero.

B. In th reaction $H_2O_2 + O_3 \rightarrow 2H_2O + O_2$ is oxidised to H_2O.

C. The absolute value of electrode potental cannot be determined .

D. According to IUPAC conventions. The standard electrode potential pertains to oxidation reactions only.

Answer: C

View Text Solution

4. If Θ denotes standard reduction potentical, which is true:

A. $E_{\text{cell}}^{\circ} = \Phi_R - \Phi_L$

B. $E = E_{\text{left}} + E_{\text{right}}$

C. ` E=E_(right) - E_(left)

D. E=- [E_("righ")+ E_("left")]

Answer: A

Watch Video Solution

5. Enf of a cell in terms of reduction potential of its left and right electrodes is :

A. $E = E_{\text{left}} - E_{\text{right}}$

B. $E = E_{\text{left}} + E_{\text{right}}$

C. $E = E_{\text{left}} - E_{\text{right}}$

D. $E = E_{\text{left}} + E_{\text{right}}$

Answer: C

Watch Video Solution

6. In which of the follwing cells net cell reaction is :

A. $Ag|AfCl(s)|KCl(aq)\ ||\ |NH_4NO_3AgNO_3|Ag$

B. $Ag|AfCl(s)|Cl(a)\ |\ Ag$

C. $Ag|AfNO_3||NH_4NO_3||KCl(aq)|AgCl\ |\ Ag$

D. All of the above

Answer: A

View Text Solution

7. Which of the following is //are function (s) of salt bredge ?

A. It completes the electrical circuit with electrons flowing from one electrode to the other through extermal wires and a flow of ions between the two compartments through salt bridge

B. it minimised the liquid-liquid junction potential

C. both are correct

D. none of there

Answer: C

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8. The standard cell potential for the electrochemical cell $Af/Af^{+}||AgI/Ag, E^{0}_{AfI(s)/Ag} = -0.151V,$

$E^{\circ}_{Ag^{+}/Ag} = 0.799V.$

A. $+0.950V$

B. $-0.950V$

C. $-28V$

D. $-1.4V$

Answer: B

Watch Video Solution

9. E° for $F_2 + 2e \rightarrow 2F^{-}$ is $2.8V$, E° for `1/2 F_2 +e rarr F^- is .

A. $2.8V$

B. $1.4vV$

C. $-2.8V$

D. $-1.4v$

Answer: A

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10. The $E_{M^{3+}/M^{2+}}$ values for Cr, Mn, Fe and Co are $0.41, +1.57, +0.77$ and $+1.97V$ respectively. For which one of these metals the change in oxidation state from $=2$ to 3 is easiest :

A. Co

B. Mn

C. Fe

D. Cr

Answer: D

Watch Video Solution

11. Standared reduction electrode potenitals of three metals A, B and C are $= 0.5V$, $-3.0V$, and $-1.2V$ respectively. The reducing power of these metals are :

A. $B > C > A$

B. $A > B > C$

C. $C > B > A$

D. $A > C > B$

Answer: A

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12. Salt bridge contains:

A. calomel

B. corrosive sublimate

C. H_2O

D. agar-agar paste

Answer: D

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13. In wich of the following electrochemical cell the overall cell reaction is :

$$Zn(s) + H_2SO_4(aq) \rightarrow ZnSO_4(aq) + H_2(g)$$

A. $Zn|H_2SO_4(aq)|H_2(g) \mid Pt$

B. $Zn|H_2SO_4(aq)|H_2(g) \mid Pt$

C. $Zn|ZnSO_4(aq)|H_2SO_4(aq)|H_2(g)|Pt$

D. $Zn|ZnSO_4(aq)|H_2SO_4(aq)|H_2(g)|Pt$

Answer: D

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14. Civen E° for $Cu^{2+} \to Cu^+$ is $+0.15V$ and $Cu^+ \to Cu$ is $+0.05V$

Calculate E° for $Cu^{2+} \to Cu$.

A. $+0.325V$

B. $+0.125V$

C. $+0.250V$

D. $+0.\ 160V$

Answer: A

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15. Two half cells have reduction potentials $-0.76V$ and $-0.13V$ respectively . A galvanic cell is made from these two half cells . Which of

the following statements is correct ?

A. Electrode of half-cell potential $-0.76V$ serve as cathode

B. Electrode of half-cell potential $-0.76V$ serve as anode

C. Electrode of half-cell potential $-0.76V$ serve as anode

D. Delctrode of half-cell potential $-0.76V$ see as positive electrode and $-$ 0.13 V` as negative electrode

Answer: B

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16. Consider the following E° values .

E^0 _ $\left(\left(Fe^{3+}/Fe^{2+}\right) = +0.77V,\right.$

$E^{\circ}_{Sn^{2+}/Sn} = -15.V$ The E°_{cell} for the reaction ,

$Sn(s) + 2Fe^{3+}_{aq} \rightarrow 2Fe^{2+}_{aq.} + Sn^{2+}_{aq.}$ is :

A. $0.63V$

B. $1.40V$

C. $0.91V$

D. $1.668V$

Answer: C

Watch Video Solution

17. Consider the cell potential $E_{Mg^{2+}/Mg}\hat{}\circ = -2.37V$ and $E^{\circ}_{Fe^{3+}/Fe} = -0.04V$. The best reducing agent would be .

A. MG^{2+}

B. Fe^{3+}

C. MG

D. Fe

Answer: C

Watch Video Solution

18. If a spoon of copper metal is placed in a solution of ferrous sulphate:

A. Cu will precipitate out

B. iron will precipitate

C. Cu and Fe will precipitate

D. no reaction will take place

Answer: D

Watch Video Solution

19. The position of some metals in the electrochemical series in dectreasing 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 will get caoated with aluminim

B. An alloy of alumimim and copper is formed

C. The solution becomes blue

D. There is no reaction

Answer: D

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20. For $Zn^{2+}/Zn, E^{\circ} = -0.76V$, for $Ag^{+}/AfE^{\circ} = 0.799V$. The correct statement is .

A. the reaction Zn getting reduced Ag gettig oxidized is spontaneous

B. Zn undergoes reduction and Ag is oxdized

C. Zn undrgoes oxidation `Ag+gets reduced

D. No suitable answer

Answer: C

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

A. A is readily reduced

B. A is readily oxdised

C. A^- is readily reduced

D. A is readily oxidised

Answer: B

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22. Oxidising power of chlorine in aqueous solution can be determined by the parameters indicated below

$$\frac{1}{2}CL_2(g) \xrightarrow{\frac{1}{2}\Delta_{diss}H^{\Theta}} Cl(g) \xrightarrow{\Delta H_{Eg}^{\Theta}}$$

$$Cl^-(g) \xrightarrow{\Delta_{hyd}H^{\Theta}} Cl^-(aq)$$

The energy involved in the conversion of $\frac{1}{2}Cl_2(g)$ to $Cl^-(aq)$

(Using the data $\Delta_{diss}H_{Cl_2}^{\Theta} = 240KJmol^{-1}$)

$\Delta_{Eg}H_{Cl}^{\Theta} = -349KJmol^{-1}$,

$\Delta_{Eg}H_{Cl}^{\Theta} = -381KJmol^{-1}$) will be

A. $+142kJ\text{mol}^{-1}$

B. $-610kJ\text{mol}^{-1}$

C. $-850kJ\text{mol}^{-1}$

D. $+120kJ\text{mol}^{-1}$

Answer: B

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23. Four alkali metals P, Q, R and S are having respectively standard electrode potentials as $-3.05V$, $-1.66V$, $-0.40V$ and $0.80V$. Which one will be th most reducing agent ?

A. P

B. Q

C. R

D. S

Answer: A

Watch Video Solution

24. KCl can be used in salt bridge as an electrolyte in which of the following cells ?

A. $Zn|ZnCl_2||AgNO_3|Ag$

B. $Pb|Pb(NO_3)_2||Cu(NO_3)_2|Cu$

C. $CU|CuSO_4||AuCl_3|Au$

D. $Fe|FeSO_4|\ |\ Pb(NO_3)_2)\ |\ Pb$

Answer: C

View Text Solution

25. The reaction

$1/2H2(g) + AgCl(s) \rightarrow H^{\oplus}(aq) + Cl^{c-}(aq) + Ag(s)$ occurs in the galvanic cell.

A. $A\frac{f}{A}gCl(s)KCl(sol)\ |\ |AgNO_3(sol)|Ag$

B. $P\frac{t}{H_2}(g_{\square})|HCl(sol)||AgNO_3(sol)|Ag$

C. $P\frac{t}{H_2}(gol)\ |\ |AgNO_3(sol)|Ag$

D. $P\frac{t}{H_2}(g_{\square})|HCl(sol)||AgNO(sol)|Ag$

Answer: C

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26. The gas X at $1atm$ is bubbled through a solution containing a mixture of $1MY^{c-}$ and $1MZ^{c-}$ at $25^{\circ}C$. If the order of reduction potential is $Z > Y > X$, then

A. Cl will oxdise Br and not F

B. Cl will oxidise F and not BR

C. Cl will oxidise both Br and F

D. Cl will reduce both Br and F

Answer: A

Watch Video Solution

27. In which of the following reaction H_2O_2 acts as a reducing agents?

$A.\ H_2O_2 + 2H^{\oplus} + 2e^{-} \rightarrow 2H_2O$

B. $H_2O_2 - 2e^{-2} \rightarrow O_2 + 2H^{\oplus}$

C. $H_2O_2 + 2e^{-} \rightarrow 2OH^{\ominus}$

D. $H_2O_2 + 2OH^{\ominus} - 3e^{-} \rightarrow O_2 + 2H_2O$

A. 1.2

B. 3, 4

C. 1, 3

D. 2, 4

Answer: D

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28. The oxidation ptentials of Zn, Cu, Ag, H_2 and Ni are $0.76, -34, -0.80. 0. 00, 0. 25$ volt, respectively. Which of the following reactions will provide maximum voltage ?

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

B. $Zn + 2Ag^{+} \rightarrow 2Ag + Zn^{2+}$

C. $H_2 + Cu^{2+} \rightarrow 2H^{+} + Cu$

D. $H_2 + Ni^{+2} \rightarrow 2H^{+} + Ni$

Answer: B

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29. Which statement is reue in regard to a spontaneous redox reaction ?

A. E°_{red} is always negative

B. E°_{cell} is always positive

C. E°_{OX} is always positive

D. E°_{cell} is always negative

Answer: B

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30. Normal aluminimum electrode cupled with normal hydrogen electrode gives an emf of $1.66V$. So the standard electrode potential of aluminimu is ,

A. $-1.66V$

B. $+1.66V$

C. $-0.83V$

D. $+0.83V$

Answer: A

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31. Give, $E^o_{Cr^{3+}/Cr} = -0.74V$, $E^o_{CnO_2^-} = 1.36V$,

Based on the data given above, strongest oxidizing agent will be .

A. Cl

B. Cr^{3+}

C. Mn^{2+}

D. MnO_4^-

Answer: D

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32. Which one of the following will increase the voltage of the cell ?

$(T = 298K)$

$Sn + 2Ag^+ \rightarrow Sn^{2+} + 2Ag.$

A. increase in the size of silver rod

B. increase in the concentrationnnnn of Sn^{+2} ions

C. increase in the concentrationnnnn of Ag^{+2} ions

D. none of the above

Answer: C

Watch Video Solution

33. The standard potentials at $298K$ for the following halfreactions are as given

$Zn^{2+} + 2e \underset{\longleftarrow}{\longrightarrow} ZnE^o = -\frac{0}{762}V.$

$2H^+ + 2E \rightarrow H_2(g) E^o = 0.000V$

$Cr^{3+} + 3e \underset{\longleftarrow}{\longrightarrow} CrE^o = -0.740V$

$Fe^{3+} 2e \rightarrow Fe^{2+} E^o = 0.772V$

Which of the following is the strongest reducing agent ?

A. Zn (s)

B. Cr

C. $H_2(g)$

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

Answer: A

Watch Video Solution

34. Given, $E^o_{Fe^{3+}/Fe} + 3eE^o = -0.036V$
$E^o_{Fe^{3+}/Fe} = -0.439V$

The value of standard electrode ptoential for the charge,

A. $-0.072V$

B. $0.385V$

C. $0.770V$

D. $-0.\ 270V$

Answer: C

Watch Video Solution

35. Given that E^o values of $Ag^+/Ag, K^+/K, Mg^{2+}/Mg$ and Cr^{3+}/Cr are $0.08V$, $-2.93V$, $-237V$ and $-0.\ 74V$ respectively. Therefore the order for the reducing power of the metal is .

A. $Ag > Cr > Mg > K$

B. $K > Mg > Cr > Ag$

C. $Ag > Cr > K > Mg$

D. $Cr > Ag > Mg > K$

Answer: B

Watch Video Solution

36. Consider the Galvanic cell $Zn^{-}|ZnSO_4| \mid CuSO_4 + Cu^{\oplus}$ the reaction at cathode is .

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

B. $Zn^{2+} + 2e^{-} \rightarrow Zn$

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

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

Answer: A

Watch Video Solution

37. When a copper wire is placed I a solution of $AgNO_3$, the solution acquires blue colour. This due to the formation of .

A. Soluble complex of copper with $AgNO_3$

B. $Cu^+ ions$

C. Cu^{2+} ions

D. cu^- ion by the reduction of Cu

Answer: C

Watch Video Solution

38. When a rod of metal A is dipped in an aqueous solution of metal B (concentration of B^{2+} ion being 1 M) at $25^{\circ}C$, the standard electrode potentials are $A^{2+}/A = -0.76$ volts, $B^{2+}/B = +0.34$ volts .

A. A will graduall dissolve

B. Water will decompose into H_2 and O_2

C. No reaction will occur

D. B will deposite on A

Answer: D

Watch Video Solution

39. The correct order of cahemical reactiveit with qater according to elecrrochemical seies .

A. $Mg > zn > Cu > K$

B. $K > Mg > Zn > Cu$

C. $K > Zn > Mg > Cu$

D. $Cu > Zn > Mg > K$

Answer: B

Watch Video Solution

40. The standard reduction potential for Fe^{2+}/Fe and Sn^{2+}/Sn electrodes are -0.44 and -0.14 volt respectively. For the given cell reaction $Fe^{2+} + Sn \rightarrow Fe + Sn^{2+}$, the standard EMF is.

A. $-0.30V$

B. $-0.58V$

C. $+0.58V$

D. $+0.\ 30V$

Answer: A

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41. The reaction is spontaneous if the cell potenital is .

A. Negative

B. positive

C. Zero

D. Infinite

Answer: B

Watch Video Solution

42. The oxdation potentiasl of following half-cell reactions are given $Zn \to Zn^{2+} + 2e^-, E^o = -0.76V, Fe \to Fe^{2+} + 2e^-, E^\circ = 0.44V$ what will be the emf of cell, whose cell -reaction is $Fe^{2+}(aq) + Zn(s) \to Zn^{2+}(aq) + Fe.$

A. $-1.20V$

B. $-0.\ 32V$

C. $+1.32V$

D. $+1.20V$

Answer: C

Watch Video Solution

43. Standard electrode potential of cell $H_2||H^+||Ag^+|Ag$ is ,.

A. $1.2V$

B. $-0.20V$

C. $-1.2V$

D. $0.8V$

Answer: D

Watch Video Solution

44. Consider the following E^o values :

$E_{Fe^{3+}/Fe^{2+}} = +0.77V$

$E_{Sn^{2+}/Sn} = -0.14V$

Under standard conditions the potential for reaction

$Sn(s) + 2Fe^{3+}(aq) \rightarrow 2Fe^{2+}(sq) + Sn^{2+}(aq)$ is.

A. $0.63V$

B. $1.40V$

C. $1.68V$

D. $0.91V$

Answer: D

Watch Video Solution

45. For the feasibility of a redox reaction in a cell, the emf should be.

A. Fixed

B. positive

C. Zero

D. Negative

Answer: B

Watch Video Solution

46. The standared reduction potntial E^o for the half-reactions are as.

$Zn = Zn^{2+} + 2e^-, E^o = +76V$

$Fe = Fe^{2+} + 2e^-, E^o = +0.41V.$

The EMF for cell recaction $Fe^{2+} = Zn \to Zn^{2+} + Fe$ is.

A. $+0.35V$

B. $-0.35V$

C. $+1.17V$

D. $-1.17V$

Answer: A

Watch Video Solution

47. The gas X at $1atm$ is bubbled through a solution containing a mixture of $1MY^{c-}$ and $1MZ^{c-}$ at $25^{\circ}C$. If the order of reduction potential is $Z > Y > X$, then

A. Y will reduce both X and Z

B. Y will oxidize Z and not X

C. Y will oxidize both X and Z

D. Y will oxidize X and not Z

Answer: D

Watch Video Solution

48. The EMF of the cell Ni $|Ni|Ni^{2+}$ | $|Cu^{2+}|Cu(s)$ is 0.59 volt. The standard reduction electrode potential fo copper electrode si 0.34 volt. The standard reduction electorde ptential of nickel electrode will be.

A. $0.\ 25$ volt

B. $-0.\ 25kJ$

C. $106.\ 15kJ$

D. $53.\ 07kJ$

Answer: B

Watch Video Solution

49. The standard EMF of a Daniell cell is 1.10 volt. The maximum electrical work obtained from the Daniell cell is .

A. $212.3KJ$

B. $175.4KJ$

C. $106.15KJ$

D. $53.07KJ$

Answer: A

Watch Video Solution

50. The standard potentials at $298K$ for the following halfreactions are as given

$Zn^{2+} + 2e \underset{\longleftarrow}{\longrightarrow} ZnE^o = -\frac{0}{762}V.$

$2H^+ + 2E \rightarrow H_2(g)E^o = 0.000V$

$Cr^{3+} + 3e \underset{\longleftarrow}{\longrightarrow} CrE^o = -0.740V$

$Fe^{3+}2e \rightarrow Fe^{2+}E^o = 0.772V$

Which of the following is the strongest reducing agent ?

A. Zn

B. Cr

C. H2

D. Fe^2+

Answer: D

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51. The standard oxidation potentials of Ze and Ag in water at $25^\circ C$ are

$Zn(s) \rightarrow Zn^{2+} + 2e \qquad [E^\circ = 0.76V]$

$Ag(s) \rightarrow Ag^{+} + e \qquad [E^\circ = -0.80V]$

Which of the following reactions actually takes place ?

A. Zn^(2+) = 2A g (s) rarr 2 Ag^(+) (aq) + Ag^(+) (s)`

B. Zn(s) + 2 ag (s) rarr Zn^(2=) (aq) = Ag^(+) (s)`

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

D.

Answer: A

Watch Video Solution

52. Given that E^o values of $Ag^+/Ag, K^+/K, Mg^{2+}/Mg$ and Cr^{3+}/Cr are $0.08V$, $-2.93V$, $-237V$ and $-0.74V$ respectively. Therefore the order for the reducing power of the metal is .

A. $Ag > Cr > Mg > K$

B. $Ag < Cr < Mg < K$

C. $Ag > Cr > K > Mg$

D. $Cr > Ag > Mg > K$

Answer: B

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53. Which of the following is not a function of salt bridge ?

A. To maintain electrical neutrality of the solution

B. To complete the circuit so that current can flow

C. To prevent voltage drop and to minimize liquid-liquid junction potential

D. To increase liquid-liquid junction potential

Answer: D

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54. The following facts are availabel :

$2A^{c-} + B_2 \rightarrow 2B^- + A_2,$

$2C^{c-} + B_2 \rightarrow Noreaction,$

$2D^{c-} + A_2 \rightarrow 2A^{c-} + D_2$

Which of the following statement is correct ?

A. $E^{\circ}_{W^-/W_2} > E^{\circ}_{Y(-)/Y_2} > E^{\circ}_{X^-/X_2} > E^{\circ}_{Z^-/Z_2} > E^{\circ}_{Z^-/Z_2}$

B. $E^{\circ}_{W^-/W_2} > E^{\circ}_{Y(-)/Y_2} > E^{\circ}_{X^-/X_2} > E^{\circ}_{Z^-/Z_2} > E^{\circ}_{Z^-/Z_2}$

C. $E^{\circ}_{W^-/W_2} > E^{\circ}_{Y(-)/Y_2} > E^{\circ}_{X^-/X_2} > E^{\circ}_{Z^-/Z_2} > E^{\circ}_{Z^-/Z_2}$

D. $E^{\circ}_{W^-/W_2} > E^{\circ}_{Y(-)/Y_2} > E^{\circ}_{X^-/X_2} > E^{\circ}_{Z^-/Z_2} > E^{\circ}_{Z^-/Z_2}$

Answer: B

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55. $MnO_4^- + 8H^= + 5e^- \rightarrow Mn^{2+} + 4H_2O$

If H^+ concentration is decreaded from 1M to $10^{-4}M$ at $25^{\circ}C$.

A. the otential decreases by $0.38V$ with decrease in oxidising power

B. the potential increases by $0.30V$ with increase in oxidising power

C. the potential dereases by $0.25V$ with decreases in oxidising power

D. the potential dercreases by $0.38V$ without affecting oxidising power

Answer: A

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56. Saturatd solution of KNO_3 is used to mke salt bridge because .

A. Velocity of K^+ is greater than that of NO_3^2

B. Velocity of NO_3^- is greater htan that of K^+

C. KNO_3 is highly soluble in qater

D.

Answer: C

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57. The electrode potential becomes equal to standard electrode potential when reactants and products concentaration ratio is .

A. equal to 1

B. greater than 1

C. less than 1

D. none of the above

Answer: A

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58. ΔG° of the cell reaction

$AgCl(s) = \frac{1}{2}H_2(g) = Ag(s)H^+ + Cl^-$ is $-21.52kJ.$

ΔG^2 of $2AgCl(s) + H_2(g) = 2Ag(s) + 2H^+ 2Cl^-$ is .

A. $-21.52kJ$

B. $-10.76kJ$

C. $-43.04kJ$

D. $43.04kJ$

Answer: C

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59. The emf of given cell $Pt - H_2|H^+|H_2 - Pt$ is :

A. $\frac{RT}{F}\frac{\log P_1}{P_2}$

B. $\frac{RT}{2F}\log e\frac{p_1}{P_2}$

C. $\frac{RT}{F} - \frac{\log P_\circ}{P_1}$

D. None of these

Answer: B

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60. Emf of the cell

$Ni\left|Ni^{2+}(0.1M)\right|Au^{3+}(1.0M)$ Au will be

$E^{\circ}_{Ni/Ni(2+)} = 0.5 = 25.\ E^{\circ}_{Au/Au^{3+}} = 1.5V.$

A. $1.\ 75V$

B. $+1.\ 7795V$

C. $= 0.\ 775V$

D. $-1.7795V$

Answer: B

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61. Which statements is true about a spontaneous cell reaction in galvanic cell?

A. $E_{cell}^{\circ} > 0, \Delta G^{\circ} < 0,$ and $Q < K$

B. $E_{cell}^{\circ} > 0, \Delta G^{\circ} < 0,$ and $Q < K$

C. $E_{cell}^{\circ} > 0, \Delta G^{\circ} < 0,$ and $Q < K$

D. $E_{cell} > 0, \Delta G < 0,$ and $Q < K$

Answer: D

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62. If the pressure of H_2 gas is increase from (1) atm to 100 atm. Keeping H^+ concentration constatn at 1 M, the veltage of hydrogen half cell at $25^{\circ}C$ will be .

A. $0.0591V$

B. $0.\ 59V$

C. $0.0295V$

D. $0.118V$

Answer: A

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63. For the redox change ,

$$Zn_s + \underset{0.1M}{F}\ uCu^2 + \ \rightarrow \underset{Zn^{2+}}{1M} + Cu_{(s)},$$

Taking place in a cell E°_{cell} is 1.10 volt . E_{cell} for the cell would be :

A. $1.07V$

B. $0.82V$

C. $2.14V$

D. $180V$

Answer: A

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64. The reduction prtential of hydrgen delctrode when placed I buffer solution is fournd to be $-0.423V$. The pH of the buffer is .

A. 10

B. 4

C. 7

D. 12

Answer: C

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65. The standard emf for the cell cell reaction $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$ is 1.10 volt at $25^{\circ}C$. The emf for the cell reaction when $0.1MCu^{2+}$ and $0.1MZN^{2+}$ solutions are used at $25^{\circ} = C$ is .

A. 1.10 volt

B. 0.110 volt

C. -1.10volt

D. -0.110 volt

Answer: A

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66. How many kJ of energy is spent when a currebnt of (4) amp passes for 200 second under a potential of $115V$?

A. $52kJ$

B. $72kJ$

C. $82kJ$

D. $92kJ$

Answer: D

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67. In which of the following electrochemical cell, overall cell reaction is :

$HgO(s) + H_2(g) \rightarrow HgE + H_2O(e).$

A. $Pt|H_2(g)|H^+(aq)|HgO(s)|Hg|Hg€|Pt$

B. $Pt|H_2(g)|NaOH(aq)|HgO(s)|HgE \mid Pt$

C. $Pt|H_2(g)|H^+||NaOH(aq)|HgO(s)|Hg€ \mid Pt$

D. $Pt|H-2(g)|H^+||HgO(s)|Hg€|Pt$

Answer: B

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68. The standard emf of a cell having one electron change is found to be $0.591V$ at $25^\circ C$, The equilibrium constant of the reaction is :

A. 1.0×10^{30}

B. 1.0×10^{5}

C. 1.0×10^{10}

D. 1.0×10^{1}

Answer: C

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69. Given, $E^{o}_{Fe^{3+}/Fe} + 3eCrE^{o} = -0.036V$
$E^{o}_{Fe^{3+}/Fe} = -0.439V$

The value of standard electrode ptoential for the charge,

A. $(-0.036 - 0.439)V$

B. $(-0.36 + 0.439)V$

C. $[3(-0.036) + 2(-0.439) + 2(-0.439)]V$

D. $[3(-0.36) - 2(-0.439)]V$

Answer: D

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70. In a cell that untillizes the reaction ,

$Zn_{(s)} + 2H^{+}_{(aq)} \rightarrow Zn^{2+}_{(aq.)} + H_{2(g)}$, adedition of H_2SO_4 to cathode compartment will :

A. increase the E and shift equilibrium to the left

B. lower the E and shift equilibrium to the right

C. increase the E and shift equilibrium to the right

D. lower the E and shift equilibrium to the left

Answer: C

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71. The thermodynamic efficiency of cell is given by

A. $\Delta H / \Delta G$

B. $nFE / \Delta G$

C. $nFE / \Delta H$

D. nFE°

Answer: C

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72. The reaction

$1/2H2(g) + AgCl(s) \rightarrow H^{\oplus}(aq) + Cl^{c-}(aq) + Ag(s)$ occurs in the galvanic cell.

A. $Ag / AgCl(s) / KCl(solution0AgNO_3(sol)Ag$

B. $Pt / H_2(g) / HCl(sol) / AgNO_3(sol) / Ag$

C. $Pt / H - 2(g) / HCl(sol) / AgCl(s) / Ag$

D. $PtH_2(g) / KCI \frac{sol}{A} gCl(s) / Ag$

Answer: C

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73. The reduction potential of a half-cell consisting of a Pt electrode immersed in $1.5MFe^{2+}$ and $0.015MFe^{3+}$ solutin at $25^\circ C$ is $\left(E^\circ_{Fe^{3+}/Fe^{2+}} = 0.770V\right)$ is .

A. $0.\ 652V$

B. $0.88V$

C. $0.\ 710V$

D. $0.850V$

Answer: A

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74. The highest electrical conductivity of the following aqueous solutions is of

A. $0.1M$ acetice acid

B. 0.1 M chloroacetic acid

C. $0.1M$ fluoroacetic acid

D. $1.1M$ difluoroacetic acid

Answer: A

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75. Given that $E^{\circ}\left(Zn^{2+}/Zn\right) = -0.763V$ and $E^{\circ}\left(Cd^{2+}/Cd\right) = -0.403V$, the emf of the following cell : $Zn/Zn^{2+}(a = 0.04) \mid \mid Cd^{2+}(a = 0.2)$ ce is given by ,

A. $E = -.36 + [0.059/2][\log(0.004/0.2)]$

B. $E = +36 + [0.059/2][\log(0.004/0.2)]$

C. $E = -0.36 + [\odot 059/2][\log(0.2/0.004)]$

D. $E = -0.36 + [\odot 059/2][\log(0.2/0.004)]$

Answer: B

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76. A huydrgen electrode is dipped is a solution of $pH = 3.0$ at $25^\circ C$ The potential fo the cell will be .

A. $0.177V$

B. $0.087V$

C. $-0.177V$

D. $0.059V$

Answer: C

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77. Given standard electrode potentials

$Fe^{2+} + 2e^- \rightarrow Fe, E^\circ = -0.44V$ .....(1)

$Fe^{3+} + 3e^- \rightarrow Fe, E^\circ = -0.036V$ .....(2)

The standard electrode potential E° for

$Fe^{3+} + e^- \rightarrow Fe^{2+}$ is.

A. $-0.476V$

B. $-0.404V$

C. $0.404V$

D. $+0.772V$

Answer: D

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78. The cell , $Zn\left|Zn^{2+}(1M)\right| \mid Cu^{2+}(1M)Cu\left(E_{\text{cell}}^{\circ}=1.10V\right)$,

Was allowed to be completely discharfed at $298K$. The relative concentration of $2+$ to $Cu^{2+}\left[\frac{Zn^{2=}}{Cu^{2+}}\right]$ is :

A. abtukig(24.08)

B. 37.3

C. $10^{37.3}$

D. 9.65×10^{4}

Answer: C

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79. The correct representation of Nernst`s equaion is .

A. $E_{M^{n+}/M}=E_{M^{n+}/M}^{\circ}+\frac{n}{0.591}\log\left(M^{n+}\right)$

B. $E_{M^{n+}/M}\Big)=E_{M^{n+}/M}^{\circ}+\frac{n}{0.591}\log\left(M^{n+}\right)$

C. $E_{M^{n+}/M} = E^{\circ}_{M^{n+}/M} + \frac{n}{0.591}\log\left(M^{n+}\right)$

D. None of the above

Answer: C

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80. Given $E^{\circ}_{Cr^{3+}/cr} = -0.72V$, $E^{\circ}_{Fe^{2+}/Fe} = -0.42V$. The potential for the cell

$Cr\left|Cr^{3+}(0.1M)\right|\left|FE^{2+}(0.01M)\right|$ Fe is .

A. $0.\ 26V$

B. $0.\ 339V$

C. $-0.399V$

D. $-0.\ 26V$

Answer: A

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81. The standard reduction potential for $Cu^{2+} \mid Cu$ is $+0.34V$. Calculate the reduction potential at$pH = 14$ for the above couple . K_{sp} of $Cu(OH)_2$ is 1.0×10^{-19}

A. $-0.22V$

B. $+0.22V$

C. $-0.34V$

D. $+0.34V$

Answer: A

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82. The emf of the following three galvanic cells :

1. $Zn / Zn^{2+}(1M) \mid \mid Cu^{2+}(1M) / Cu$

2. $Zn / ZN^{2+}(1M) \mid \mid Cu^{2+} / cu$3. Zn//Zn^(2+) (1 M) || Cu^(2+) (0.1 M)

Cu$arerepersentedby$E_1, E_2, E_3` which of the following statement is true ?

A. $E_1 > E_2 > E_3$

B. $E - 3 > E_2 > E_1$

C. $E_3 > E_1 > E_2$

D. $E_2 > E_1 E_3$

Answer: D

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83. Cosoder the reactopm: $(T = 298K)$

$Cl_2(g) + 2BR^-(aq) \rightarrow 2Cl^-(aq) + Br_2(aq.)$

The emf of he cell, when $\left[Cl^- = (Br_2\right] = \left[Br^-\right] = 0.01M$ and Cl_2 gas is at 1 atm pressure, will be :

(E° for the above reaction is $= 29$ volt).

A. $0.\ 54$volt

B. $0.\ 35$ volt

C. $0.\ 24$ volt

D. -0.29 volt

Answer: B

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84. Given below are the half -cell reactions

$Mn^{2+} + 2e^{-} \rightarrow Mn, E^{\circ} = -1.\ 18V$

$2\left(Mn^{3+} = E^{-} \rightarrow Mn^{2+}\right).\ E^{\circ} = +1.5V$

The E° for $Mn^{2+} \rightarrow Mn + 2Mn^{3+}$ will be.

A. $-2.69V$, the reaction will not will not occur

B. $-2.\ 69V$, the reaction will occur

C. $-0.\ 33V$, the reaction will not occur

D. $-0.33V$ the reaction will occur

Answer: A

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85. The Gibbs energy for the decomposition of Al_2O_3 at

$$\frac{2}{3}Al_2O_3 \rightarrow \frac{4}{3}Al = O_2 \Delta_r G = +966 kJ \text{mol}^{-1}$$

The potential differnce needed for electrolytic reduction of Al_2O_3 at $500^\circ C$ is at least.

A. $4.5V$

B. $3.0V$

C. $2.5V$

D. $5.0V$

Answer: C

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86. Which one of the following will increase the voltage of the cell ?

$(T = 298K)$

$Sn + 2Ag^+ \rightarrow Sn^{2+} + 2Ag.$

A. increase in concentration of Sn^{2+}

B. Increase in size of silver rod

C. Increase in the concentration of Ag^+

D. none of these

Answer: C

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87. The half-cell reduction potential of a hydrogen electrode at $pH = 10$ will be

A. $0.59V$

B. $-0.59V$

C. $0.059V$

D. $-0.059V$

Answer: B

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88. $Pt|Cl_2(P_2)|HCl(0.\ M)|Pt|Cl_2(P_2)$, cell reaction will be spontaneous if :

A. $P_1 = P_2$

B. $P_1 > P_2$

C. $P_2 > P_1$

D. $P_1 = P_2 = 1$ atm

Answer: C

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89. The reduction potential of hudrogen electrode is $-118mV$. The concentration of H^+ in the solution is .

A. $0.01M$

B. $2M$

C. $10^{-4}M$

D. $1M$

Answer: A

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90. The potential of the Daniell cell,

$Zn\left|\begin{matrix}ZnSO_4\\(1M)\end{matrix}\right|\left|\begin{matrix}CuSO_4\\(1M)\end{matrix}\right|Cu$ was reported by Buckbee, Surdzial, and Metz at $E^\circ = 1.1028 - 0.41 \times 10^{-3}T + 0.72 \times 10^{-5}T^2$ where T is

the Celsius temperature. Calculate ΔS° for the cell reaction at $235^{\circ}C$

,,

A. -45.32

B. -34.52

C. -25.43

D. -55.39

Answer: D

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91. The EMF of the following cell :

$Cd(s)|CdCl_2(0.10M)|AgCl(s) \mid Ag(s)$ is $0.6915V$ at $0^{\circ}C$ and $0.6753V$ at $25^{\circ}C$. The ΔH of reaction in kJ at $25^{\circ}C$ is

A. $-17kJ$

B. $-234.7kJ$

C. $+123.5$

D. $-167.26kJ$

Answer: D

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Section B - Assertion Reasoning

1. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

copper reacts with hudrochloric acid and ilberates hudrogen from the solution of dilute hydrochloric acid.

Hydrogen is below copper in the electrochemical series.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: D

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2. Assertion: E° for Mn^{3+}/Mn^{2+} is more positive than Cr^{3+}/Cr^{2+}

Reason: The third ionisation energy of Mn is larger than that of Cr.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: B

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3. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Molar conductiveiy of a weak electrolyte at infinite dilution cannot be determined experimentally .

Kohlrausch's low help to find the molar conductiveiy of a weak electrolyte at infinite dilution.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: B

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4. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Assertion : Molar conductiveiy of a weak electrolyte at infinite dilution cannot be determined experimentally .

Reason : Kohlrausch's low help to find the molar conductiveiy of a weak electrolyte at infinite dilution.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: A

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5. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Conductiveity always always decreases with the decreased in concentration of both the weak and strong electrolytes.

Number of ion per unit volume linearly decreases in both electrolytes.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: C

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6. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

The cell potential of mercury cell is $1.35V$, which remains constant .

In mercury cell, the electrolute is a paste of KOH and ZnO.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: A

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7. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Specifice conductiviy of an electrolytic solution decreases with dilution , whereas molar conductiviy increase with dilution .

Specific conductivirty is the conductance of a specific amount of the electorolyte, whereas molar conductivity is for 1 mole of the electrolyte.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: C

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8. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

The cell constant of a conductivity cell depends upon the nature of material of the electrodes .

The electrodes of the cell are coated with platinum black to avoid polacrization effects.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: D

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9. Assertion(A): When acidified $ZnSO_4$ solution is electrolyzed between Zn electrodes, it is Zn that is deposited at the cathode and $H_2(g)$ is not evolved.

Reason (R): The electrode potential of Zn is more negative than

hydrogen as the overpotential for hydrogen evolution in Zn is quite large.

A. If both the assertion and reason are true but the reason is not the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is true

Answer: A

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10. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Electrolyss of an aqueous solution of KI gives I_2 at the anode but that

of KF gives O_2 at the anode and not f_2

F_2 is more reactive than I_2

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: B

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11. Assertion (A): Equivalent conductance increase with dilution for an electrolyte solution.

Reason (R): The number of ions per litre of electrolyte increases with dilution.

A. If both the assertion and reason are true but the reason is not the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is true

Answer: B

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12. Assertion (A): The electrolysis of $NaCl$ solution gives $H_2(g)$ at cathode and $Cl_2(g)$ at anode.

Reason (R): Cl_2 has higher oxidation potential than H_2O

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: C

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13. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

When 2 faraday of electricity is passed through $0.1MH_2SO_4(aq)$, 11.2 liter O_2 evolved at STP.

Molecular weight of oxygen is 32.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: B

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14. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Gold chloride $(AuCl_3)$ solution cannot be stored in a vessel made of copper , iron, nickel chromium, zinc or tin,

Gold is very prectous metal .

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: B

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15. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Copper is dissolved at anode and deposited at cathode when Cu electrodes are used and electrolyted is $1MCuSO_4$ (aq) solution .

SOP of Cu is less than SOP of waer and SRP of Cu is greate than SRP of water .

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: C

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16. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

The cell potential of mercury cell is $1.35V$ which remanins constant.

In mercury cell, the electrolyte is a passte of KOH and HgO.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: B

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17. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

On dilution the equivalen tas well molar conductivity of the solution increases .

With dilution, the number of crurrent carruing particles per cm^3 increases.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: C

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18. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

The electrode ptential os SHK is zero only at $25^\circ C$ and not at other

temperature.

SHE is a standard reference electrodes.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: D

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19. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Absolute value of E°_{ced} of an electrode cannot be determinde .

Neigher oxdation nor reduction can take place alone.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: B

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20. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

$E^{\circ}_{\text{cell}} = 0$ for a chloride ion concentration cell .

For this concentration cell where $E_{\text{cell}} = \frac{\text{RT}}{\text{nF}} In \frac{[Cl^-]_{LHS}}{[Cl^-]_{RHS}}$.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: B

Watch Video Solution

21. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Ig $\left(\frac{dE_{cell}}{dT}\right)_p > 0$ for a cell reaction then ΔS is positive .

$\Delta S = nFT\left(\frac{dE}{dT}\right)_p$.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: C

Watch Video Solution

22. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

If an aqueous solution of NaCl is electrolysed, the product obtained at the cathode is H_2 gas and not Na`.

Gases are liberated fasted faster than the metals during the electrolysis of an electrolyte.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: C

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AIPMT/NEET Questions

1. Electode potential of Zn^{2+}/Zn is $-0.7V$ and that of $Cu^{2+}/Cusi = 0.34V$. The EMF of the cell consttructed between these two elctrodes is .

A. $2.10V$

B. $0.42V$

C. $-1.1V$

D. $-0.42V$

Answer: A

Watch Video Solution

2. Consider the cell reaction :

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

If $E^{c-}{}_{\cdot Mg^{2+}|Mg(s)}$ and $E^{c-}{}_{\cdot Cu^{2+}|Cu(s)}$ are -2.37 and $0.34V$, respectively. $E^{c-}{}_{\cdot cell}$ is

A. $2.03V$

B. $-2.\ 03V$

C. $=2.\ 71V$

D. $-2.\ 71V$

Answer: C

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3. On the bassis of the information available from the reaction $\frac{4}{3}Al+O_2\rightarrow\frac{2}{3}Al_2O_3.\ \Delta G=-827kJ\text{mol}^{-1}$ of O_2 the minimum emf required to carry out an electorlysis of Al_2O_3 is $\left(F=96500C\text{mol}^{-1}\right)$

A. $8.56V$

B. $2.14V$

C. $4.\ 28$ V`

D. $6.42V$

Answer: B

Watch Video Solution

4. The electrolytic conductance si a direct measure of .

A. $E_2 = 0 \neq E_1$

B. $E_1 > E_2$

C. $E_1 < E_2$

D. E_1 =E_2`

Answer: D

View Text Solution

5. The emf of a Daniell cell at $298K$ is $E_1 Zn|\underset{(0.01M)}{NnSO_4}||\underset{(1.0M)}{CuSO_4}|Cu$

when the concentration of

$ZnSO_4$ is $1.0M$ and that of $CuSO_4$ is $0.01M$ the emf changed to E_2

what is the relationship between E_1 and E_2 .

A. $1.54V$

B. $-154V$

C. $-0.\ 19V$

D. $+\frac{0}{019}V$

Answer: B

Watch Video Solution

6. The statdard electrode potential of the half cells is given below:

$Zn^{2+} + 2e^- \rightarrow Nn, E = -7.\ 62V,$

$Zn^{2+} + 2e^{-} \rightarrow Nn, E = -7.81V,$

The emf of the cell $Fe^{2+} + Zn \rightarrow Zn^{2+} + De$ is ,

A. $1.54V$

B. $-1.54V$

C. $-\frac{0}{19}V$

D. $+0.19V$

Answer: C

Watch Video Solution

7. An electric current is passed through silver nitrated solution using silver electrodes . $10.79g$ of silver qas found to be deposited on the cathode fi the same amount of electricity is passed through copper sulphate solutin using copper electrodes. the weihgt of copper deposited on teh cathode is .

A. $6.4G$

B. $2.3g$

C. $12.8g$

D. $3.2g$

Answer: D

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8. A quantity of electrical charge that brigns about the depositiion of $4.5gAl$ from Al^{3+} at the cathode will also produce the following volume (STP) of $H_2(g)$ from $H^{\oplus}$ at the cathode.

A. $11.2L$

B. $44.8L$

C. $5.6L$

D. $22.4L$

Answer: C

Watch Video Solution

9. A hyptherical electrochemical cell is given as $A^{\ominus}|A^{+}(xM)||B^{+}(yM)|B^{\ominus}$ The emf masured is $+0.20V$. The cell reaction is .

A. The cell raction cannot be prdicted

B. $1A + B^{+} \rightarrow A^{+} + B$

C. $A^{+} + B \rightarrow A + B^{+}$

D. $A^{+} + e^{-} \rightarrow A, V^{+}e^{-} \rightarrow B$

Answer: B

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10. If $e^{\circ}_{Fe^{2+}/Fe} = -0.441V$. And $E^{o}_{Fe^{3+}/Fe^{2+}} = 0.771V$. The standard emf of the reaction $Fe + 2Fe^{3+} \rightarrow 3Fe^{2+}$ will be .

A. $1.653V$

B. $0.11V$

C. $0.330V$

D. $1.212V$

Answer: D

Watch Video Solution

11. The equilbrium constant for the reaction : $Cu + 2Ag^{+}(aq) \rightarrow Cu(2+)(aq) + 2Ag, E^{\circ} = 0.46V$ at $299K$ is

A. 2.0×10^{10}

B. 3.9×10^{15}

C. $0.330V$

D. $1.212V$

Answer: B

Watch Video Solution

12. On the basis of the folwing E° values, the strongest oxidizing agent is

$[Fe(CN)_6]_4^- \rightarrow [Fe(CN)_5]^{3-} + 3^-, E^\circ = -0.35V$

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

A. Fe^{2+}

B. Fe^{3+}

C. $[Fe(CN)_6]^{3-}$

D. $[Fe(CN)_6]^{4-}$

Answer: B

Watch Video Solution

13. Standard free energies of formation (I kJ/mol) at $298K$ are $-237.2,\ -394.4$ and -8.2 for $H_2O(1), CO_2(g)$ and pentange (g) , respectively . The value of E°_{cell} for the pentane-oxygen fuel cell is .

A. $2.\ 0968V$

B. $1.0968V$

C. $0.0968V$

D. $1.\ 968V$

Answer: B

Watch Video Solution

14. The correct order of mobility of alkali metal ions in aqueous solution is

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

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

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

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

Answer: B

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15. Kohlrausch` s law states that at :

A. Infinite dilution, each ionmakes definited contribution to equivalent conductance of an electrolyte depending on the nature of the other ion of the electrolyte

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

C. Infinite dilution, each ion makes definite contribution to equivalent conductance of an electrolyte whaterve be the bature of the other ion of the elecrolyte .

D. Finte dilution each ion mkes defintie contribution to equivalent conductance of an electrolyted, whaterver be the nature of the other ion electrolyte.

Answer: C

Watch Video Solution

16. Goven :

(i) $CU^{2+} + 2e^- \rightarrow Cu, E^\circ = 0.337V$

(ii) $Cu^{2+} + e^- \rightarrow Cu^+, E^2 = 0.153V.$

A. $0.38V$

B. 0.52

C. 0.90

D. 0.30

Answer: B

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17. Al_2O_3 is reduced by electrolysis at ow potentials and high currents, If 4.0×10^4 amperes of current is passed through molten Al_2O_3 fro 6 hours , what mass of aluminum is produced ? (Assume 100% current efficiency gt At mass of $Al = 27g$ "mol"^(-))`.

A. $1.3 \times 10^4 G$

B. $9.0 \times 10^3 g$

C. $8.05 \times 10^4 g$

D. $2.4 \times 10^5 g$

Answer: C

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18. The correct value of emf of cell is given by

(i) $E_{\text{cell}} = E_{OP}$ andode $- E_{RP}$ cathode (ii) (i) $E_{\text{cell}} = E_{RP}$ andode - E _(RP)$cathode(iii)(i)$E_("cell") = E_(OP) and ode- E _(RP)` cathode .

A. (iii) and (i)

B. (i) and (ii)

C. (iii) and (iv)

D. (ii) and (iv)

Answer: D

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19. For the reduction of silver ions with copper metal, the standard cell potential is $0.46V$ at $25^\circ C$. The value of Standard Gibbs energy ΔG°

will be.

A. $-89.\ kJ$

B. $-89.\ 0J$

C. $-44.\ 5kJ$

D. $-98.\ 0kJ$

Answer: A

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20. An increases in equivalent conductivity of strong electrolyte with dilution is mainly due to .

A. Increase in ionic mobility of ions

B. $100\ \%$ ionisation of electrolyte at normal dilution

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

D. Increases in number of ions

Answer: A

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21. The electrode pptenticals for

$Cu^{2+}(aq) + e^- \rightarrow Cu^+(aq)$

and $Cu^+(aq) + e^- \rightarrow Cu(s)$

are $+0.15V$ and $+0.\ 50V$ repectively. The value of $E^{\circ}_{cu^{2+}/Cu}$ will be.

A. $0.150V$

B. $0.325V$

C. $0.\ 500V$

D. $0.\ 650V$

Answer: B

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22. Standard electrode potential for Sn^{4+}/Sn^{2+} couple is $+0.15V$ and that for the Cr^{3+}/Cr coule is $-0.74V$. These two coules in their standard state are connected to made a cell. The cell potential wil be .

A. $+1.83V$

B. $+1.19V$

C. $+0.18V$

D. $+0.89V$

Answer: D

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23. Standared reduction electrode potenitals of three metals A, B and C are $=0.5V$, $-3.0V$, and $-1.2V$ respectively. The reducing power of these metals are :

A. $X > Y > Z$

B. Standard electrode potentila fo three metals X, Y and Z are $-1.2V,\ +0.5V$ and $-3oV$ respectively. The reducting power of these metals will be .

C. $Y > z > X$

D. $Y > X > Z$

Answer: B

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24. If $E^{\ominus}_{cell}$ for a given reaction is negative, which gives the correct relationships for the values of $\Delta G^{\ominus}$ and K_{eq}?

A. $\Delta G^{\circ} > 0, K(eq) < 1$

B. $\Delta G^{\circ} > 0 K_{eq}, K)(eq) > 1$

C. $\Delta G^{\circ} < 0, K_{eq} > 1$

D. $Z > X > Y$

Answer: A

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25. Standrd reduction potentials of the half reactions are given below :

$F_2(g) + re^- \rightarrow 2F^-(aq) E^\circ = +2.85V$

$Cl_2(g) + 2e^- \rightarrow 2Cl^{-(aq)}, E^2 = +1.36V$

$Br_2(i) + 2e^- \rightarrow 2Br(aq), E^2 = +1.06V$

$I_2(s) + 2e^- \rightarrow 2I^-(aq), E^2 = +.53V.$

The strongest oxidizing and reducing agents respectively

A. F_2 and I^-

B. Br_2 and Cl^-

C. Cl_2 and Br^-

D. Cl_2 and I_2

Answer: A

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26. Limiting molar conductivity of NH_4OH I e.,

$\Lambda_m(NH_4OH)$ is equal to .

A. $\Lambda_m(NH_4OH) + \Lambda_m(NH_4Cl) - \Lambda_m(HCl)$

B. $\Lambda_m(NH_4OH) + \Lambda_m(Na_OH) - \Lambda_m(HCl)$

C. $\Lambda_m(NH_4OH) + \Lambda_m(NsCl) - \Lambda_m(HCl)$

D. $\Lambda_m(NH_4OH) + \Lambda_m(NaCl) - \Lambda_m(HCl)$

Answer: B

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27. Molar conductiveiy $[\Lambda_m]$ at infinite dilution of Na CL, HCl and CH_3COONa are $126.4, 425, 9$ and $910 Scm^2 \text{mol}^{-1}$ respectively, Λ_m for CH_3COOH will be ,

A. $425.5 Scm^2 mol^{-1}$

B. $180.5 Scm^2 \text{mol}^{-1}$

C. $290, 8 Scm^2 \text{mol}^{-1}$

D. $390.\ 5 cm^2 \text{mol}^{-1}$

Answer: D

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28. A button cell used in watches functions as following

$Zn(s) + Ag_2O(s) + H_2O(l)$

$2Ag(s) + Zn^{2+}(aq) = 2OH^{-(aq)}$

If half cell potentials are

$Zn^{2+}(aq) + 2e^- \rightarrow Zn(s), E^\circ = -0.\ 76V$

$Af_2O(s) + H_2O(l) + 2e^- \rightarrow$

$2Ag(s) + 2OH^{-(aq)}, E^\circ = 0.\ 34V.$

The cell potential will be .

A. $0.42V$

B. $0.\ 84V$

C. $1.10V$

D. $1.34V$

Answer: C

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29. At $25^\circ C$ molar conductance of 0.1 molar qqueous solution of ammonimum bhydroxide si $9.54\text{ohm}^{-1}cm^2\text{mol}^{-1}$ and at infinite dilution its molar conductance si $238\text{ohm}^{-1}cm^2\text{mol}^{-1}$. The degree of ionisatiov and temperature is .

A. $20.\ 800\ \%$

B. $4.\ 008\ \%$

C. $40.\ 800\ \%$

D. 2.080%

Answer: B

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30. A hydrogen gas electrode is made by dipping platinum wire in a solution of HCl or $pH = 10$ and by passing bydrogen gas around the platinum wire at one atm pressure . The oxidation potential of electrode would be ?

A. $0.59V$

B. $0.118V$

C. $1.18V$

D. $0.059V$

Answer: A

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31. In order to completely oxidize $0.1mol$ of MnO_4^{2-} to permanganate ion. The quantity of electricity required is

A. $96500C$

B. $2 \times 96500C$

C. $9650C$

D. $96.\ 50C$

Answer: C

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32. A device that convers energy of combustion of fueles like hydrogen and methane, directly into electrical energy is known as .

A. dynamo

B. Ni-Ced cell

C. fuel cell

D. electrolytic cell

Answer: C

Watch Video Solution

33. Aqueous solution of which of the following compounds is the best conductor of electric current?

A. Ammonia , NH_3

B. Fuctose, $C_6H_{12}O)6$

C. Acetic acid, $C_2H_4O_2$

D. Hudrochloric acid, HCl

Answer: B

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Watch Video Solution

34. The emf of a Daniell cell at $298K$ is $E_1 Zn|\underset{(0.01M)}{NnSO_4}||\underset{(1.0M)}{CuSO_4}|Cu$ when the concentration of $ZnSO_4$ is $1.0M$ and that of $CuSO_4$ is $0.01M$ the emf changed to E_2 what is the relationship between E_1 and E_2 .

A. $E_1 < E_2$

B. $E_1 > E_2$

C. $E_2 = 0 \neq E_1$

D. E_1 =E_2`

Answer: D

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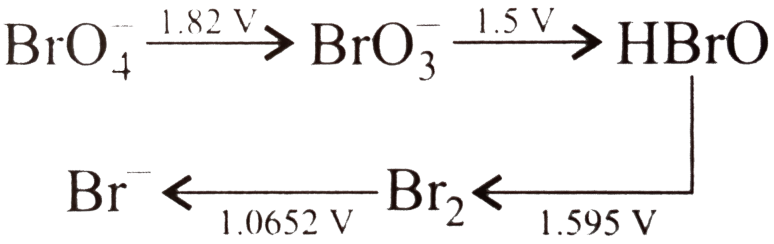
35. Consider the change in oxidation state of Bromine corresponding to different emf values as shown in the diagram below :



The the species undergoing dispropprtionation is .

A. BrO_3^-

B. BrO_4^-

C. Br_2

D. $HBrO$

Answer: D

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AIIMS Questions

1. During the electrolysis of an electrplyte, the number of ions produced , is directly proportional to the .

A. time consume

B. electrochemical equivalent of elctrolysis

C. quantity of electricricity passed

D. mass of electrons

Answer: C

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2. During the electrolysis of fused $NaCl$, which reaction occurs at anode ?

A. Cholride ions are oxdized

B. Choloride ions are reduced

C. Sodim ions are oxdised

D. Sodim ions reduced

Answer: A

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3. In eelctrolysis 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

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4. Use of electrolysis is .

A. Electroplating

B. electrorefining

C. both (a) and (b)

D. none of these

Answer: C

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5. During electrolysis, the species disharged at cathode are .

A. ions

B. cation

C. anion

D. all of these

Answer: B

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6. Electrolysis of molten anphdrous calcium chloride produces .

A. calcium

B. phosphorus

C. sulphur

D. sodium

Answer: A

Watch Video Solution

7. Amount of electricty that can depostit $108g$ of silver from $AgNO_3$ aikyruib ua

A. 1 ampere

B. 1 coulomb

C. 1 faraday

D. None of the above

Answer: C

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8. On passing one faraday of elecricity throuth the electrolytic cells containing Ag^{+}, Ni^{+3} and Cr^{+3} ion solutions, the deposited Ag $(AT.\ Wt.\ = 108) Ni (At.\ Wt = 59)$ and $Cr (Atwt.\ = 52)$ is .

A. Ag, $108 g Ni$, $29.\ 5 g Cr 17.3 g$

B. Ag, $108 g Ni$, $59.0.\ 5 g Cr 52.0 g$

C. Ag, $108.0 g Ni$, $108.0.\ 5 g Cr 108.0 g$

D. Ag, $108 g Ni$, $117.5.\ 5 g Cr 166.0 g$

Answer: a

Watch Video Solution

9. What is the amount of chlorine evoled when 2 amperes of current is passed for 30 minumtes in an aqueous solution of $NaCI$?

A. $66g$

B. $1.\ 32g$

C. $33g$

D. $99g$

Answer: B

Watch Video Solution

10. The number of electrons required to deposit $1g$ atom of aluminium (At. Wt. = 27) from a solution of aluminium cholride will be (wher N is Avogadro's number)

A. $1N$

B. $2N$

C. $3N$

D. $4N$

Answer: C

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11. From the solution of which of the following one faraday of electricity will liberate one gram atom of metal

A. $NaCl$

B. $BaCl_2$

C. $CuSO_4$

D. $AlCl_3$

Answer: A

Watch Video Solution

12. If 0.5 amp current is passed through acidified silver nitrate solution for 10 minutes. The mass of silver deposited on cathode, is (eq. wt. of silver nitrate = 108).

A. $0.\ 235g$

B. $0.336g$

C. $0.\ 536g$

D. $0.\ 636g$

Answer: C

Watch Video Solution

13. Charge required to liberated $11.5g$ sodium is .

A. $0.5F$

B. $0.1F$

C. $1.5F$

D. 96500 coulombs

Answer: A

Watch Video Solution

14. Which of the following conducts electricity ?

A. Fused NaCl

B. CO_2

C. Br_2

D. Si

Answer: A

Watch Video Solution

15. Which of the following shows electrical conduction ?

A. Potassium

B. Graphite

C. Diamond

D. Sodium

Answer: B

Watch Video Solution

16. Which of the following statements is not applicable to electrolytic conductors ?

A. New products show up at the elctrodes

B. Ions are responsible for corryig the current

C. Shows a positive temperature coefficient for conductance

D. A single stream of electrons flows from cathode to ande

Answer: D

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17. When the electric current is passed through a cell having an electrolyte, the positive ions move towards cathode and negative ions toqards the anode. If the cathode is pulled out of the solution .

A. The positive and negative ion will move towards anode

B. The positive and negative ion will move towards anode, the the negative ions will stop moving

C. the negative ions will continut to move towarsa anode while positive ions will stop moving

D. the positive and negative ions will start moving randomly

Answer: D

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18. Which of the following reaction is reaction is used to make a fuel cell .

A. $Cd(s) + 2Ni(OH)_3(s) \rightarrow CedO(s) = 2Ni(OH) + H_2O(l)$

B. $Pb(s) + PbO_2(s) + 2H_2SO_4(aq) \rightarrow 2PbSO_4(s) + 2H_2O(l)$

C. $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$

D. $2Fe(s) + O_2(g) + 4H^+) \rightarrow 2Fe^{2+}(aq) + 2H_2O(l)$

Answer: C

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19. In electrolysis of dilute H_2SO_4 using platinum electrodes .

A. H_2 is evolved at cathode

B. nH_3 is produced at anode

C. Cl_2 is obtained at cathode

D. O_2 is produced

Answer: A

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20. An electrochemical cell is used to convert

A. potential energy changes into kinetic energy

B. kinetic energy changes into potntial energy

C. chemical energy changes into electrical energy

D. electrical energy changes into chemical energy

Answer: C

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21. Which of the following statement is true for the electrochemical Daniell cell ?

A. Electrons flow from copper electrode to zinc electrode

B. Current flows from zinc electrode to copper electrode

C. Cations move toward copper electrode which is cathode

D. Cations move toward zinc electrode

Answer: C

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22. The chemical reaction , $2AgCl(s) \rightarrow 2HCl(aq) + 2Ag(s)$ taking place in a galvanic cell is represented by the notation .

A. $Pt|H_2(g), 1\text{bar}|1MKCl(aq)|AgCl(s)|Ag(s)$

B. $Pt(s)|H_2(g), 1\text{bar}|1\text{bar}|aMHCl(aq)| \ | \ 1Mag^+(aq)Ag(s)$

C. $Pt(s) + H_2(g).1|\text{bar}|MHCl(aq)|AgCl(s)|Ag(s)$

D. $Pt(s) + H_2(g).1|\text{bar}|MHCl(aq)|AgCl(s)|Ag(s)$

Answer: C

View Text Solution

23. Which one of the following metals cannot veolve H_2 from acids or H_2O from its componds ?

A. Hg

B. Al

C. Pb

D. Fe

Answer: A

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24. Electode potential of Zn^{2+}/Zn is $-0.7V$ and that of $Cu^{2+}/Cusi = 0.34V$. The EMF of the cell consttructed between these two elctrodes is .

A. $1.10V$

B. $0.42V$

C. $-1.1V$

D. $-0.42V$

Answer: A

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25. Given standard electode potenitals

$Fe^{2+} + 2e^- \to Fe, E^\circ = -0.44V$ .....(1)

$Fe^{3+} + 2e^- \to Fe, E^\circ = -0.036V$ .....(2)

The standard electrode pptential E° for

$Fe^{2+} + e \to Fe^{2+}$ is.

A. $-0.476V$

B. $-0.404V$

C. $+0.404V$

D. $+0.772V$

Answer: D

Watch Video Solution

26. Consider the cell reaction :

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

If $E^{c-}_{\cdot Mg^{2+}|Mg(s)}$ and $E^{c-}_{\cdot Cu^{2+}|Cu(s)}$ are -2.37 and $0.34V$, respectively. $E^{c-}_{\cdot cell}$ is

A. $2.03V$

B. $-20.3V$

C. $+2.71V$

D. $-2.71V$

Answer: C

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27. Which of the following statements is true for fuel cells ?

A. They ar more efficient

B. They are fee from pollution

C. The run till reactants are active

D. All of these

Answer: D

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28. The emf of a galvanic cell, with electrode potentials of silver $= +0.80V$ and that of copper $= +0.34V$, is .

A. $-1.1V$

B. $+1.1V2$

C. $+0.46V$

D. $+0.76V$

Answer: C

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Watch Video Solution

29. Which of the following is highly corrosive salt ?

A. $FeCl_2$

B. $+1.1V$

C. $+0.46V$

D. $+0.76V$

Answer: d

View Text Solution

30. The standared reduction potntial E^o for the half-reactions are as.

$Zn = Zn^{2+} + 2e^-, E^o = +76V$

$Fe = Fe^{2+} + 2e^-, E^o = +0.41V.$

The EMF for cell recaction $Fe^{2+} = Zn \to Zn^{2+} + Fe$ is.

A. $-0.35V$

B. $+0.35V$

C. $+1.17V$

D. $-1.17V$

Answer: b

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31. Conductance (Siemens, S) is directly proportional to the area of the vessel and the concentration of solution in it and is inversely proprtional to the length of the vessel, then the unit of constant of proportionlity is :

A. $Sm\text{mol}^{-1}$

B. $Sm^2\text{mol}^{-1}$

C. $S^{-2}m^2$ mol

D. $S^2m^2\text{mol}^{-2}$

Answer: B

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32. The standard emf of a cell having one electron change is found to be $0.591V$ at $25^\circ C$, The equilibrium constant of the reaction is :

A. 1^{-10}

B. 29.5×10^{-2}

C. 10

D. 1×10^1

Answer: D

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33. On the bassis of standard electrode potential of redox couples given below, find out which of the following is the strongest oxdising afent .

$\left(E^{\circ} value: Fe^{3+}\right) = +0.77C, I_{2(g)} \mid I = +\frac{0}{54}V,$

$Cu^{2+} \mid Cu = +34V, Ag^{+} \mid Ag = +0.80V\right).$

A. Fe^{3+}

B. $I_2(g)$

C. Cu^{2+}

D. Ag^{+}

Answer: D

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34. Celll equation : $A = 2B^{+} \rightarrow A^{2+} + 2B$

$A^{2+} + 2e \rightarrow A$

$E^\circ = +0.34V$ and $\log_{10} K = 15.6$ at $300K$ for cell reactions Find E° for $B^+ + e \to B$

Given $\left[\frac{2.303RT}{nF} = 0.059\right]$ at $300K$.

A. 0.80

B. 1.26

C. -0.64

D. $+0.94$

Answer: A

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Assertion-Reasoning Questions

1. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

The conductance measurement of an electrolytic solution is made by using two condutivity cells having defferent cell constants gives different values of conductance.

The conductivity of solution obtained will be different but conductivity of solution would be same ,

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: b

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2. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Conductance of a solution can be obtained by designing the apparatus based on Wheatstone bridge principle.

Meter bridge used to detect the resistance of metal wire can be used to read out the conductance of solutions,

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: c

Watch Video Solution

3. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

According to Kohlrausch's law the molar conductivity of a strong electrolyte at infinite dilution is sum of molar conductivities of its ions.

The current carried by cation and anion is alwaus equal.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: c

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4. Assertion (A): For a Daniell cell : $Zn|Zn^{2+}||Cu^{2+}|Cu$ with $E_{cell} = 1.1V$, the application of opposite potential greater than $1.1V$ results into the flow of electron from cathod to anode. Reason (R): Zn is deposited at anode and Cu is dissolved at cathode

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: c

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5. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Rusting of iron is an example of corrosion.

Rusting of iron is dercreased by acids and electrolytes.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: c

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6. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

The electrical resistance of a column of $0.5MNaOH$ solution of diameter $1cm$ and length $50cm$ is $5.55 \times 10^3 \text{ohm}$.

Its resistivity is equal to $75.234\Omega cm$.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: c

Watch Video Solution

7. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Gavanised iron does not rust .

Zinc has a more negative electrode potential than iron .

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: a

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8. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

Speed of ions depends upon nature of ions only.

Mobility of ions depends upon mass, charge and size of ions only.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: d

Watch Video Solution

9. Assertion (A): 1 Faraday of electricity deposits $1g$ equivalent of Ag, Cu or Al.

Reason $(R): 1mo \leq$ of electrons are required to reduce $1moleofAg^{\oplus}$ or $\frac{1}{2}moleofCu^{2+}$ or $\frac{1}{3}$mole of Al^{3+} ions.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: b

Watch Video Solution

10. The questions consist of two atatements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

If standard reduction potential for the reaction $Ag^{+} = 2e^{-A}g$ is 0.80 volt, then for the raction $2Ag^{+} = 2e^{-} = 2e^{-2}Ag$, it will be $1, 60$ volt .

If concentration of Ag^{+} ions is doubled , the standard electrode potential is also doubled.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: d

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Section D - Chapter End Test

1. Faraday's laws of electrolysis are related to

A. atomic number of the cation

B. atomic number of the cation

C. Equivalent weight fo the electrolyte

D. speed of the cation

Answer: C

Watch Video Solution

2. The requrierd charege for one equivalent weifht of silver deposited on cathode is.

A. $9.65 \times 10^7 C$

B. $9.65 \times 10^4 C$

C. $9.65 \times 10^3 C$

D. $9.65 \times 10^5 C$

Answer: B

Watch Video Solution

3. The anode mud obtained during electrorefining of copper may contain.

A. Sn and Ag

B. Pb and Zn

C. Ag and Au

D. Fe and Ni

Answer: C

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4. Conductance (Siemens, S) is directly proportional to the area of the vessel and the concentration of solution in it and is inversely proprtional to the length of the vessel, then the unit of constant of proportionlity is :

A. $Smmol^{-1}$

B. $Sm^2\text{mol}^{-1}$

C. $s^{-2}m^2\text{mol}^{-1}$

D. S^2 m2 "mol"^(-2)`

Answer: B

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5. Given $l/a = 0.5cm^{-1}, R = 50\text{ohm}, N = 1.0.$ The equivalent conductance of the electrolytic cell is .

A. $10\text{ohm}^{-1}cm^2mol^{-1}$

B. $20\text{ohm}^{-1}cm^2mol^{-1}$

C. $300\text{ohm}^{-1}cm^2mol^{-1}$

D. $100\text{ohm}^{-1}cm^2mol^{-1}$

Answer: A

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6. The molar conductances of $NaCI, HCI$ and CH_3COONa at infinite dilution are $12.45, 426.16$ and $91\text{ohm}^{-1}cm^2\text{hol}^{-1}$ respectively. The molar conductance of CH_3COOH at infinite dilution is .

A. $201.28ohm^{-1}cm^2\text{mol}\hat{}(-1)$

B. $39071\text{ohm}^{-1}cm^2\text{mol}^{-1}$

C. $698.28\text{ohm}^{-1}cm^2\text{mol}^{-1}$

D. $540.48ohm^{-1}cm^2mol^{-1}$

Answer: B

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7. The position of some metals in the electrochemical series in decreasing electropositive 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 will get coated with Al

B. An alloy of Cu and Al is formed

C. The solution becomes blue

D. There is no reaction

Answer: D

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8. The standard potentials at $298K$ for the following halfreactions are as given

$Zn^{2+} + 2e \underset{\longleftarrow}{\longrightarrow} ZnE^o = -\frac{0}{762}V.$

$2H^+ + 2E \rightarrow H_2(g) E^o = 0.000V$

$Cr^{3+} + 3e \underset{\longleftarrow}{\longrightarrow} CrE^o = -0.740V$

$Fe^{3+} 2e \rightarrow Fe^{2+} E^o = 0.772V$

Which of the following 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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9. A solution containing one mole per litre of each $Cu(NO_3)_2, AgNO_3, Hg_2(NO_3)_2$ is being electrolysed by using inert electrodes. The values of standard electrode potentials in volts (reduction potentials) are

$Ag^+/Ag = +0.80V, HG_2^{2+}/Hg = +0.79V$

$Cu^+/Cu = +0.34V, Mg^{2+}/Mg = -2.37V$

With increasing valtage, the sequence of deposition of metals on the 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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10. When a copper wire is placed I a solution of $AgNO_3$, the solution acquires blue colour. This due to the formation of .

A. Cu^{2+} ions

B. Cu^{2+} ions

C. Soluble complex of coopper with $AgNO_3$

D. cu^{-} ion by the reduction of Cu

Answer: A

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11. The standard reduction potential for Fe^{2+}/Fe and Sn^{2+}/Sn electrodes are -0.44 and -0.14 volt respectively. For the given cell reaction $Fe^{2+} + Sn \rightarrow Fe + Sn^{2+}$, the standard EMF is.

A. $+.030V$

B. $-0.58V$

C. $+0.58V$

D. $-0.30V$

Answer: D

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12. For the redox change ,

$$Zn_s + \underset{0.1M}{F}\ uCu^{2} + \ \rightarrow \underset{Zn^{2+}}{1M} + Cu_{(s)},$$

Taking place in a cell E°_{cell} is 1.10 volt . E_{cell} for the cell would be :

A. 2.14 volt

B. 1.80 volt

C. 1.07 volt

D. 0.82 volt

Answer: C

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13. Standared reduction electrode potenitals of three metals A, B and C are $= 0.5V$, $-3.0V$, and $-1.2V$ respectively. The reducing power of these metals are :

A. $B > C > A$

B. $A > B > C$

C. $C > B > A$

D. $A > C > b$

Answer: A

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14. The standard emf of a cell having one electron change is found to be $0.591V$ at $25^\circ C$, The equilibrium constant of the reaction is :

A. 1×10^{-10}

B. 29.5×10^{-2}

C. 10

D. 1×10^{10}

Answer: d

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15. For the electrochemical cell, $\left(M \mid M^{\oplus}\right) \mid \mid \left(X^{c-} \mid X\right)$, $E^{c-}{}_{\cdot(M^{\oplus} \mid M)} = 0.44V$, and $E^{c-}{}_{\cdot(X \mid X^{c-})} = -0.33V$.

From this data, one can conclude that

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

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

C. $E^{\circ}_{cell} = 0..77V$

D. $E^{\circ}_{cell} = 0..77V$

Answer: B

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16. Given :

(i) $CU^{2+} + 2e^- \rightarrow Cu, E^\circ = 0.337V$

(ii) $Cu^{2+} + e^- \rightarrow Cu^+, E^2 = 0.153V Then E^0 f$ or $Cu^+ + e^- \rightarrow Cu.$

A. $-0.49V$

B. $0.49V$

C. $-0.38V$

D. $0.38V$

Answer: D

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17. In a cell that untillizes the reaction ,

$Zn_{(s)} + 2H^{+}_{(aq)} \rightarrow Zn^{2+}_{(aq.)} + H_{2(g)}$, adedition of H_2SO_4 to cathode compartment will :

A. Increase the E and shift equilibrium to the right

B. Lower the E and shift equilibrium to the left

C. Lower the E and shift equilibrium to the left

D. Increase the E and shift equilibrium to the right

Answer: A

Watch Video Solution

18. The standard emf of a cell having one electron change is found to be $0.591V$ at $25^{\circ}C$, The equilibrium constant of the reaction is :

A. 1.0×10^{10}

B. 1.0×10^5

C. 1.0×10^1

D. 1.0×10^{30}

Answer: A

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19. The mass of copper deposited from a solution of $CuSO_4$ by passage of $45A$ current for 965 second is

(Mol . Wt. pf Copper $= 63.5$).

A. $15.875g$

B. $1.585g$

C. $4825g$

D. $96500g$

Answer: B

Watch Video Solution

20. A solution of a salt of a metal was electrolysed for 150 minutes with a current of 0.15 amperes. The weight fo metal deposted was $0.783g$. The equivalent weight to the metal is .

A. $55.97g$

B. $65.97g$

C. $75.97g$

D. $85.97g$

Answer: A

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21. The resistance of $0.01NNaCl$ solution at $25^{\circ}C$ is 200Ω . Cell constant of conductivity cell is $1cm^{-1}$. The equivalent conductance is .

A. $5 \times 10^2 \Omega cm^2 eq^{-1}$

B. $6 \times 10^3 \Omega cm^2 eq^{-1}$

C. $7 \times 10^4 \Omega cm^2 eq^{-1}$

D. $8 \times 10^5 \Omega cm^2 eq^{-1}$

Answer: A

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22. The metal that cannot obtained by electrolysis of an aqueous solution of its salts is :

A. Ag

B. Mg

C. Cu

D. Cr

Answer: B

Watch Video Solution

23. When the sample of copper with zinc impurityn is to be purified by electrolysis, the appropriate electrode are .

A. Cathode=Pure zine,Anode= Pure copper

B. Cathode= Impure, sample. Anode = Pure copper

C. Cthode=Imure zinc, Anode= Impure sample

D. Cathode,=Pure copper, Anode= Impure sample

Answer: D

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24. In an electrolytic cell, the flow of electrons is form

A. Cathode to anode in solution

B. Cathode to anode theough external suppply

C. Cathode to anode through internal supply

D. Anode to cathode through internal supply

Answer: C

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

A. H_2, O_2

B. O_2H_2

C. O_2, Na

D. O_2, SO_2

Answer: A

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26. Which of the following liberate hydrogen on reaction with dilute H_2SO_4 ?

A. Fe

B. Cu

C. Al

D. Hg

Answer: A

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27. When during electrolusis of a solution of $AgNO_3$, 9650 coulmbs of charge pass through the electroplationg bath, the mass of silver deposited on the cathode will be:

A. $1.08g$

B. $10.\ 8g$

C. $21, .\ 6g$

D. $108g$

Answer: B

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28. These question consist of two statements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

For a cell raction $Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$, at the

equilibrium, voltmeter gives zero reading.

At the equilibrium, there is no change in teh concentration of Cu^{2+} and Zn^{2+} .

A. If both the assertion and reason are true but the reason is the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: A

Watch Video Solution

29. These question consist of two statements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

$Ni/Ni^{2+}(1.0M)\ ||\ |Au^{3+}(1.0M)|Au$, for this cell emf is $1.75V$ if $E^{\circ}_{Au^{3+}/Au} = 1.50$ and $E^{2}_{Ni^{3+}/Ni} = 0.25V$.

Emf of the cell $= E^{\circ}_{\text{cathode}} - E^{\circ}_{\text{anode}}$.

A. If both the assertion and reason are true but the reason is the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: A

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30. These question consist of two statements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses :

The resistivity for a substance is its resistance when it is one meteer ling and its area of crosss section is one square meter.

The SI units of resistivity are ohm metre Ωm and ohm centimeter Ωcm.

A. If both the assertion and reason are true but the reason is ont the correct explanation of assertion

B. If both the assertion and reason are true but the reason is not the correct explanation of assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is rue

Answer: B

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Others

1. How many faradays are required to reduce 1 mol of MnO_4^- to Mn^{2+}?

A. 1

B. 2

C. 3

D. 5

Answer: D

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2. When during electrolusis of a solution of $AgNO_3$, 9650 coulmbs of charge pass through the electroplationg bath, the mass of silver deposited on the cathode will be:

A. $1.08g$

B. $10.8g$

C. $21.6g$

D. $108g$

Answer: B

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3. Electrolysis of a solution of $MnSO_4$ in aqueous sulphuric acid is a method for the preparation of MnO_2 as per reaction,

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

Passing a current of 27 ampere for 24 hour gives one kg of MnO_2. What is the value of current efficiency ? Write the reaction taking place at the cathode and at the anode.

A. $100\ \%$

B. $95.185\ \%$

C. $80\ \%$

D. 82.951%

Answer: B

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4. The quantity of electricity needed to electrolyse completely $1M$ solution of $CuSO_4$, $Bi_2(SO_4)_3$, $AICI_3$ and $AgNO_3$ each will be .

A. $2F$. $6F$. $3F$, and 1 F respectively

B. $6F$, $2F$, $3F$ and 1 F respectively

C. $6F$, $2F$, $1F$ and 3 F respectively

D. $6F$, $2F$, $1F$ and 3 F respectively

Answer: A

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5. During the perparation of $H_2S_2O_s$ (per disulphuric acid) O_2 gas is also released at anode as byproduct. When $9.72L$ of H_2 releaseds at cathode and $2.35LO_2$ at anode the weight $H_2S_2O_8$ depostited at the cathode is .

A. 87.12

B. 48.65

C. 83.42

D. 51.74

Answer: B

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6. Three faradays of electricity qas passed through an aqueous solution of iron I bromide. The mass of iron metal (atomic mass-56) deposited at thecathode is .

A. $56g$

B. $84g$

C. $112g$

D. $168g$

Answer: B

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7. In an electrolyitc cell of Ag/NO_3Ag, when current is passed, the concentration of $AgNO_3$.

A. Increases

B. Decreases

C. Remains same

D. None of these

Answer: C

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8. If aqueous solutions of $AgNO_3$ is electrolysed using inert electrode the gas evolved at anode is .

A. NO_2

B. O_2

C. H_2

D. N_2O

Answer: B

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9. When the sample of copper with zinc impurityn is to be purified by electrolysis, the appropriate electrode are .

A. pure zinc as cathode and pure copper as anode

B. impure sample as cathode and pure copper as anode

C. impure sample as cathode and pure copper as anode

D. pure copper as cathode and impure sample as anode

Answer: D

Watch Video Solution

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

A. O_2, H_2

B. H_2O_2

C. O_2Na

D. O_2, SO_2

Answer: B

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11. The two aqueous solutions, $A(AgNO_3)$ and B (LiCl), were electrolysed using Pt electrodes. The pH of the resulting solutions will.

A. increase in A and decrease in B

B. decrease in both

C. decrease in both

D. increase in A and decrease in B

Answer: D

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12. The metal that cannot obtained by electrolysis of an aqueous solution of its salts is :

A. Ag

B. Ca

C. Cu

D. Cr

Answer: B

Watch Video Solution

13. When the electric current is passed through a cell having an electrolyte, the positive ions move towards cathode and negative ions toqards the anode. If the cathode is pulled out of the solution .

A. the positive and negative ion will move towards anode

B. the positive ions will state moving towards the anode whil negative ions will stop moving

C. the negative ions will continut to move towarsa anode while positive ions will stop moving

D. the positive and negative ions will start moving randomly

Answer: D

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14. The sam quantity of electricity is passed through H_2SO_4 and HCI solutins of same concentration. The amount of hudrogen liberated from H_2SO_4 as cmpared to that from HCI is.

A. the same

B. twice as such

C. one half as such

D. dependent on concentration.

Answer: B

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15. When a molten ionic hydride is electrolysed.

A. Hydrogen is liberted at the cathode

B. H-ions produced migrate to the cathode

C. There is no reasction

D. Hydrogen is liberted at the anode

Answer: D

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16. What would be the product of electrolusis if molten ICI_3 is electrlysed ?

A. I_2 is produced at cathode and CI_2 is proluced at anode

B. I_2 is produced at cathode and I_2 is proluced at anode

C. Botg I_2 and VI_2 are liberated at both electrodes

D. ICI_2 is produced at cathode and ICI_4 is produced at anode

Answer: C

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17. Faraday's laws of electrolysis are related to

A. atomic number of the cation

B. atomic number of the anion

C. equivalent mass of the electrolyte

D. speed of the cation

Answer: C

Watch Video Solution

18. During the electrolysis of the aqueous solution of copper sulphate using Pt electrode, the reaction taking place at anode electrode is

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

B. $2SO_4^{2-} + 2H_2O \rightarrow 2H_2SO_4 + O_2 + 4e$

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

D. $2Cl^- \rightarrow Cl_2 + 2e$

Answer: C

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19. 1 mol each of $AGAgBO_3, CuSO_4$ and $AICI_3$ is electrolysed. The number of faradays rewuired is in the ration of:

A. $1:1:1$

B. $1:2:3:$

C. $3:2:1$

D. $1:3:1$

Answer: B

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20. A solution of $CuSO_4$ is electrolysed for 7 minutes with a current of $0.6A$. The amount of electrictiy passed is equal to.

A. $4.2C$

B. $2.6 \times 10^{-3}F$

C. $126C$

D. $36C$

Answer: B

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21. An electrolytic cell is constructed for preparing hudrogen. For an averge current of 1 amper in the circuit , the time required to produce $450mL$ of hydrogen at NTP is appr.

A. 30 min

B. 1 hour

C. 2 hours

D. 5 hours

Answer: B

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22. One coulomb is equal to

A. 96500

B. charge on 6.24×10^{18} electrons

C. charge on 1 electron

D. noner of the above

Answer: B

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23. If $3F$ of electrictiy is passed through the solutions of $AgNO_3, CuSO_4$ and $Auc = CL_3$, the molar ration of the cations deposited at the cathode is .

A. $1:1:1$

B. $1:2:3$

C. $3:2:1$

D. $6:3:2$

Answer: D

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24. Which of the follwing will not conduct electricity in aqueous solution ?

A. Copper sulphate

B. Common salt

C. Sugar

D. None of these

Answer: C

Watch Video Solution

Watch Video Solution

25. The metal that cannot obtained by electrolysis of an aqueous solution of its salts is :

A. Ag

B. Cr

C. Cu

D. Mg

Answer: D

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26. Electrolysis involves oxidation and reduction respectively at .

A. Cathode and anode

B. Anode and cathode

C. At both the electrodes

D. None of the above

Answer: B

Watch Video Solution

27. When the sample of copper with zinc impurityn is to be purified by electrolysis, the appropriate electrode are .

A. Cathode =Pure zine , Anode=Pure copper

B. Cathode=mpure sample, Anode= Pure copper

C. Cathode = Pure copper,Anode, Impure sample

D. Cathode =Impure zinc, Anode= Impure ,sample

Answer: C

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28. The amount of ion discharged during electrolysis is not directly proprtional to

A. Current

B. Time

C. Resistance

D. Chemical equivalent of the ion

Answer: C

Watch Video Solution

29. In $H_2 - O_2$ fuel cell, $6.72L$ of hydrogen at NTP reacts in 15 minutes, the averge current produced in ampres is .

A. 64.3 amp

B. 643.3 amp

C. 6.43 amp

D. 0.643 amp

Answer: A

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30. Which of the following is not a non-electrolyte ?

A. Urea

B. Glucose

C. Ethanol

D. Acetic acid

Answer: D

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31. Amount of electricty that can depostit $108g$ of silver from $AgNO_3$ aikyruib ua

A. 1 ampere

B. 1 freaday

C. 1 coulomb

D. None of the above

Answer: B

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32. Rgw atomic weight of Al is 27. When a current of $5F$ is passed through a solution of Al^{+++} ions, the qeight of AL deposited is.

A. $27g$

B. $36g$

C. $39g$

D. $45g$

Answer: D

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33. A certain current liberates $0.5g$ 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. $12.7g$

B. $15.9g$

C. $31.8g$

D. $45g$

Answer: C

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34. On passing $0.1F$ of electricity through aluminimum chloride, the amount of aluminimu metal deposited on cathode is $(A1 = 27)$.

A. $0.27g$

B. $0.3g$

C. $0.9g$

D. $2.7g$

Answer: C

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35. One Faraday of electricity when passed through a solution of copper sulphate deposits .

A. 1 mloe of Cu

B. 1 g ewuivalent of Cu

C. 1 g ewiovalent of Cu

D. 1 molecule of Cu

Answer: C

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36. A current of 2 A was passed for $1h$ through a solution of $CuSO_4$. $0.237g$ of Cu^{2+} ions was discharged at cathode . The current efficiency is .

A. 42.2%

B. 26.1%

C. 10%

D. 40.01%

Answer: C

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37. To deposit $0.6354g$ of copper by electrolysis of aqueous cupric sulpbate solution, the amount of electricity required (in coulmmbs) is.

A. 1930

B. 4825

C. 3860

D. 9650

Answer: A

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38. What is the amount of chlorine evoled when 2 amperes of current is passed for 30 minumtes in an aqueous solution of $NaCI$?

A. $66g$

B. $33g$

C. $1.32g$

D. $99g$

Answer: C

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39. 96500 culombs of electric current liberates from $CuSO_4$ solution.

A. $63.5fCu$

B. $96500gCu$

C. $31.75gCu$

D. $100gCu$

Answer: C

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40. Three faradays of electricity are passed through molten Al_2O_3 aqueous solution of $CuSO_4$ and molten $NaCl$ taken in deffernt electrolytic cells. The amout of Al, Cu and Na deposited at the cathodes will be in the ration of .

A. 1 mole : 15 ,mole 1 moles

B. 1 mole : 2 moles :3 moles

C. 1 mole : 2 moles : 3 moles

D. 1.5 moles : 2 moles : 3 moles

Answer: A

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41. When electricity is passed through a solution of $AlCl_3$ and $13.5g$ of Al is deposited, the number of $Faradayofe \leq ctricitypassed\mu stbe$ .....F`.

A. 0.50

B. $1.\ 50$

C. 1.00

D. 2.00

Answer: B

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42. In an electroplating experiment m g of silver is deposited, whe 4 amperes of current flows for 2 mimtes. The amout (in g) of silver deposited by 6 amperes of current flowing for 40 seconds will be .

A. $4m$

B. $m/4$

C. $m/2$

D. $\frac{2}{m}$

Answer: C

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43. $2.5F$ of electricity is passed through a $CuSO_4$ solution. The number of gm equivalent of `Cu deposited on anode is .

A. $Zero$

B. 2.5

C. 1.25

D. 5.0

Answer: B

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44. The amount of silver deposited by passing $241.25C$ of current through silver nitrated solution is .

A. $2.7g$

B. $2.7mg$

C. $0.54g$

D. $0.27g$

Answer: D

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45. Charge required to liberated $11.5g$ sodium is .

A. $96500C$

B. $0.1F$

C. $1.5F$

D. $0.5F$

Answer: D

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46. In electrolysis of dilute H_2SO_4 using platinum electrodes .

A. Cl_2 is obtained at cathode

B. NH_3 is produced at anode

C. h_2 is evolved at cathode

D. O_2 is produced

Answer: C

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47. A solution containing $1mol$ per litre of each $Cu(NO_3)_2$, $AgNO_3$, and $Hg_2(NO_3)_2$ is being electrolyzed by using inert electrodes. The values of standard electrode potentials in volts (reduction potential) are

$Ag|Ag^{\oplus} = +0.80, 2Hg|Hg_2^{2+} = +0.79$

$Cu|Cu^{2+} = +0.34, Mg|Mg^{2+} = -2.37.$

With increasing voltage, the sequence of deposition of metals at the cathode will be

A. Ag, Hg, Cu, Mg

B. Mg, Cu, Ag

C. Cu, Hg, Ag

D. Ag, Hg, Cu

Answer: D

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48. Aluminium oxide may be electorlysed at $1000^{\circ}C$ to furnish aluminim metal (Atomic Mass $= 27$ amu, $1F = 96,500C$). The cathode reaction is

$Al^{3} + 3d^{-} \rightarrow Al^{\circ}$

To prepare $5.12kg$ of aluminimu metal by this method woold require .

A. $5.49 \times 10^{4}C$ electricity

B. $1.83 \times 10^{7}C$ of elctricity

C. $5.94 \times 10^{7}C$ of electricity

D. $5.49 \times 10^{1}C$ of electricity

Answer: C

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49. During electrolysis of an aqeous solution of sodium sulphate if 2.4 Lof oxygen at STP was liberated at anode. The volume of hydrogen at STP, liberated at cathode would be:

A. $1.2L$

B. $2.4L$

C. $2.6L$

D. $4.8L$

Answer: D

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50. A current of strength $2.5A$ was passed through $CuSO_4$ solution for 6 minute 264 seconds. The amount of copper deposited is (At. Of $Cu = 63.5, 1F = 96500C$) .

A. $0.3175g$

B. $1.028g$

C. $0.51g$

D. $6.35g$

Answer: C

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51. When electricity is passed through a solution of $AlCl_3$ and $13.5g$ of Al is deposited, the number of $Faradayofe \leq ctricitypassed\mu stbe$ .....F`.

A. $1.5F$

B. $0.5F$

C. $1.0F$

D. $2.0F$

Answer: A

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52. A current of $0.75A$ is passed through an acidic solution of $CuSO_4$ for 10 minutes. The vlume of oxygen liberated at anode (at STP) will be.

A. $0.261sm^3$

B. $0.261cm^3$

C. $0.261 \times 10^2 mL$

D. $0.\ 2661m^3$

Answer: C

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53. The density of Cu is $8.94gcm^{-3}$. The quantity of electricity neede to plate an area $10cm \times 10cm$ to a thickenss of $10^{-2}cm$ using $CuSO_4$ solution qould be .

A. $13586C$

B. $27172C$

C. $40758C$

D. $20348C$

Answer: B

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