CHEMISTRY

BOOKS - PATHFINDER CHEMISTRY (BENGALI ENGLISH)

ELECTROCHEMISTRY

Question Bank

1. Which has higher conductance and why? Silver wire at $30°C$ or silver wire at $50°C$?

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2. What is equivalent conductivity?

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3. What is electrochemical equivalent?

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4. What charge is required for the reduction of one mole of MnO_4^- to MnO_2 ?

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5. What are the signs of ΔG and E° cell for spontaneous reaction?

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6. How many faradays of electricity are required to liberate 2 moles of hydrogen gas in electrolysis of a solution?

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7. Define specific resistance?

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8. Why is impossible to obtain the electrode potential for a single half-cell?

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9. What is effect of concentration of ions on electrode potential of an electrode?

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10. Why does a dry cell becomes dead after a long time even if it has not been used?

11. The standard reduction potential values of three metallic cations x,y,z are 0.52 , -3.03 , -1.18v respectively.What will be the order of reducing power of the corresponding metals?

12. Faraday's law of electrolysis are related to the- atomic number of the cation. true or false

13. Faraday's law of electrolysis are related to the- atomic number of the anion. true or false

14. Faraday's law of electrolysis are related to the-equivalent mass of the electrolyte.

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15. Faraday's law of electrolysis are related to the-speed of the cation.true or false

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16. What change would be observed if solution of NaCl is made acidic before electrolysis?

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17. Relation between equivalent conductance (^) and specific conductance (k) is

A. $\Lambda_{eq} = \dfrac{K \times 1000}{C}$

B. $K = \dfrac{\Lambda_{eq} \times 1000}{C}$

C. $\Lambda_{eq} = \dfrac{K \times C}{1000}$

D. None of these

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18. What will happen if the copper anode in a Cu-plating cell is replaced by Zn?

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19. What is the effect of temperature on the electrical conductance of an electrolytic conductor?
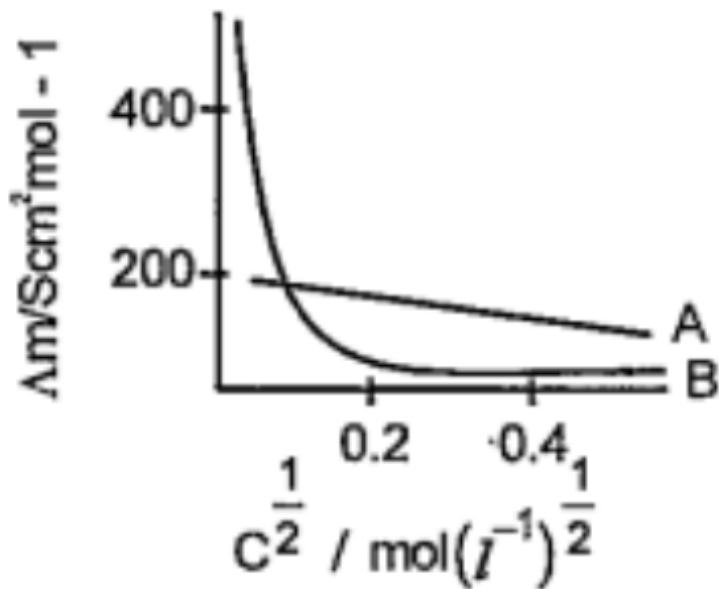
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20. The following curve is obtained with molar conductivity (A_m)(y-axis) is plotted against the square root of concentration $C^{\frac{1}{2}}$(x-axis) for two electrolytes A and B.
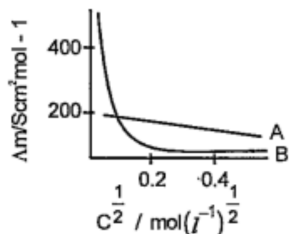
What can you say about the nature of the two electrolytes A and B?

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21. The following curve is obtained with molar conductivity (A_m)(y-axis) is plotted against the square root of concentration $C^{\frac{1}{2}}$(x-axis) for two electrolytes A and B.

How do you account for the increase in molar conductivity A_m for the electrolytes A and B on dilution?

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22. If Zn^{2+}/Zn electrode is diluted 100 times then what will be the change in e.m.f.

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23. What is the role of $ZnCl_2$ in dry cell?

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24. Why blocks of magnesium are often strapped to the steel hulls of ocean going ships?

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25. Why rusting of iron is quicker in saline water than in ordinary water? Explain.
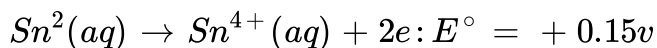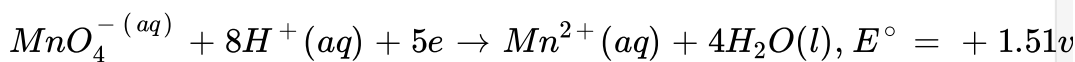
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26. A current of one ampere is flowing through a wire. Calculate the number of electrons flowing through the cross-section of the wire per second?

27. The specific conductance of a 0.12 N solution of an electrolyte is

$2.4 \times 10^{-2} SCm^{-1}$. Calculate its equivalent conductivity,

28. Two half cell reactions of an electrochemical cell are:

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

$Sn^2(aq) \rightarrow Sn^{4+}(aq) + 2e: E^\circ = +0.15v$

Construct the redox equation and predict if this reaction favours the

formation of reactants of products shown in the equation.

29. Dilution normally helps in increasing the electrical conductivity of

an electrolyte . But it has an advance effect as well. Explain......

**30.** On electrolysing $CuSO_4$ solution. In presence of Pt the solution becomes colourless why?

31. 0.369 gm of copper was deposited an passing 0.750 A of current through a $CuSO_4$ solution for 25 minutes . Calculate the atomic mass of copper.

32. In an experiment 0.40 F was passed through 400 ml of 1M solution of NaCl . What would be the ph of the solution after electrolysis?

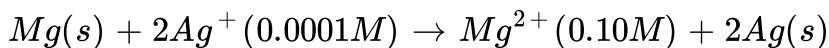**33.** The following chemical reaction is occuring in an electrochemical cell:

$$Mg(s) + 2Ag^+ (0.0001M) \rightarrow Mg^{2+} (0.10M) + 2Ag(s)$$
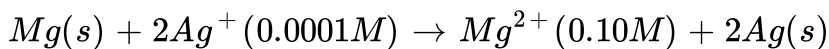
The $E°$ values for $M\dfrac{g^{2+}}{M}g = -2.36V$, $A\dfrac{g^+}{A}g = 0.81V$ for the cell calculate/ write

$E°$ value for the electrode $2A\dfrac{g^+}{A}g$

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34. The following chemical reaction is occuring in an electrochemical cell:

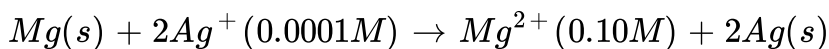$$Mg(s) + 2Ag^+ (0.0001M) \rightarrow Mg^{2+} (0.10M) + 2Ag(s)$$

The $E°$ values for Mg^{2+}/Mg =-2.36V , Ag^+/Ag =0.81V for the cell calculate/ write

standard cell potential $E° (cell)$

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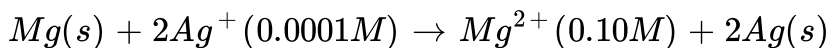**35.** The following chemical reaction is occuring in an electrochemical cell:

$$Mg(s) + 2Ag^+ (0.0001M) \rightarrow Mg^{2+}(0.10M) + 2Ag(s)$$

The E° values for $Mg^{2+}/Mg = -2.36V$, $Ag^+/Ag = 0.81V$ for the cell calculate/ write

Cell potential E°_{cell}

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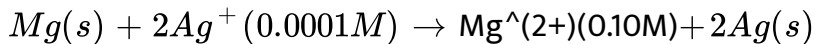**36.** The following chemical reaction is occuring in an electrochemical cell:

$$Mg(s) + 2Ag^+ (0.0001M) \rightarrow Mg^{2+}(0.10M) + 2Ag(s)$$

The E° values for $M\dfrac{g^{2+}}{M}g = -2.36V$, $A\dfrac{g^+}{A}g = 0.81V$ for the cell calculate/ write

symbolic representation of the above cell

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37. The following chemical reaction is occuring in an electrochemical cell:

$$Mg(s) + 2Ag^+(0.0001M) \rightarrow Mg\char`^(2+)(0.10M) + 2Ag(s)$$

The E° values for $Mg(2+)/Mg = -2.36V$, Ag+ /Ag $= 0.81V$ for the cell calculate/ write

Will the above cell reaction be spontaneous?

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38. At what p(H) will hydrogen electrode at 298K show an electrode potential of -0.118V when H_2 gas is bubbled at 1 atm pressure?

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39. The molar conductivities of acetic acid at 298K at the molar concentration of 0.1 is 5.20 Scm^2mol^{-1} . Calculate the degree of dissociation of acetic acid.

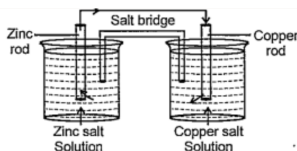Given that $\lambda_{H^+}^\infty$ and $\lambda_{CH_3COO^-}^\infty$ are 349.8 and $40.9 ohm^{-1} cm^2 mol^{-1}$ respectively.

40. A solution of $CuSO_4$ is electrolysed between copper electrodes by a current of 10 Amperes passing for one hour. What changes occur at the electrodes and in the solution?
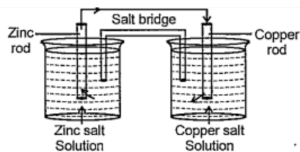
41. Following is the figure of electrochemical cell having the redox reaction.
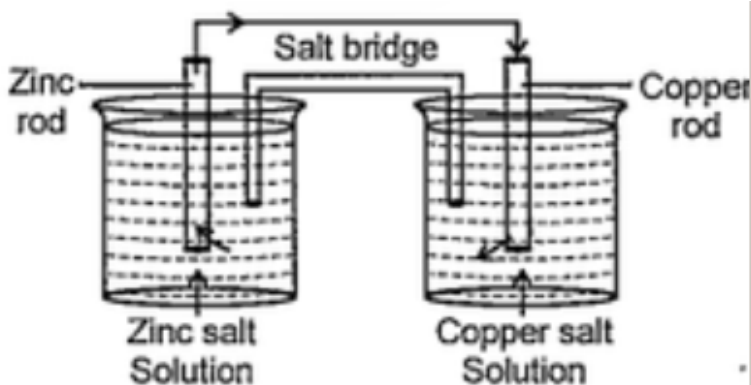

Name the positive and negative terminals.

42. Following is the figure of electrochemical cell having the redox reaction.
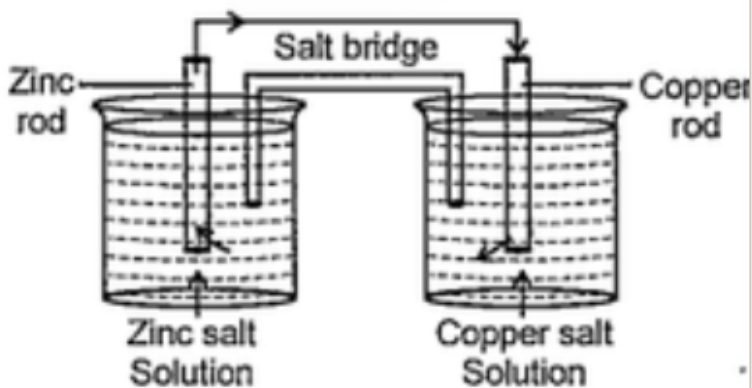

What is the function of salt bridge?

43. Following is the figure of electrochemical cell having the redox reaction.

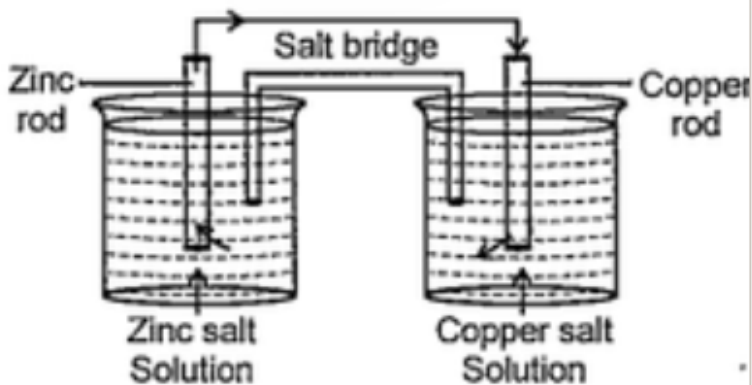What is direction of flow of current?

44. Following is the figure of electrochemical cell having the redox reaction.

What is the standard cell potential of this cell ?

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45. Following is the figure of electrochemical cell having the redox reaction.

Write the redox reaction that is taking place.

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46. What is the cathode and anode in a mercury cell?

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47. Which electrolyte is used in the cell?

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48. What is the cell potential of this cell?

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49. Why Mercury cell voltage remain constant throughout its life?

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50. What the overall cell reaction.

> ▶ Watch Video Solution

51. A current of 1.50 was passed through on electrolyte solution containing $AgNO_3$ solution with inert electrodes. The weight of Ag deposited was 1.50g . How long did the current flow?

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52. What is the cathode and anode in a mercury cell?

53. Give reactions taking place at the two electrodes if these are made up of Ag.

54. How many bridging oxygen atoms are present in P_4O_{10}

A. (A) 6

B. (B) 4

C. (C) 2

D. (D) 5

Answer:

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