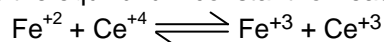


Single Correct Answer Type

- How many kJ of energy is spent when a current of 4 amp passes for 200 second under a potential of 115 V?
(A) 52 kJ (B) 72 kJ (C) 82 kJ (D) 92 kJ
- Calculate molar conductivity at infinite dilution of CH_3COOH if molar conductivity at infinite dilution of CH_3COONa , HCl and NaCl are 91.6, 425.0 and $128.1 \text{ S cm}^2 \text{ mol}^{-1}$ -
(A) $390.5 \text{ S cm}^2 \text{ mol}^{-1}$ (B) $388.5 \text{ S cm}^2 \text{ mol}^{-1}$ (C) $490.5 \text{ S cm}^2 \text{ mol}^{-1}$ (D) None of these
- Molar conductance of 0.1 M acetic acid is $7 \text{ ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$. If the molar conductance of acetic acid at infinite dilution is $380.8 \text{ ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$, the value of dissociation constant will be
(A) $226 \times 10^{-5} \text{ mol dm}^{-3}$ (B) $1.66 \times 10^{-3} \text{ mol dm}^{-3}$
(C) $1.66 \times 10^{-2} \text{ mol dm}^{-3}$ (D) $3.442 \times 10^{-5} \text{ mol dm}^{-3}$
- If $E^\circ_{\text{Fe}^{2+}/\text{Fe}}$ is x_1 , $E^\circ_{\text{Fe}^{3+}/\text{Fe}}$ is x_2 then $E^\circ_{\text{Fe}^{3+}/\text{Fe}^{2+}}$ will be :
(A) $3x_2 - 2x_1$ (B) $x_2 - x_1$ (C) $x_2 + x_1$ (D) $2x_1 + 3x_2$
- The EMF of the cell $\text{Ni} | \text{Ni}^{2+} || \text{Cu}^{2+} | \text{Cu(s)}$ is 0.59 volt. The standard reduction electrode potential of copper electrode is 0.34 volt. The standard reduction electrode potential of nickel electrode will be
(A) 0.25 volt (B) - 0.25 volt (C) - 0.50 volt (D) - 0.025 volt
- The standard oxidation potentials of Zn and Ag is water at 25°C are,
 $\text{Zn(s)} \longrightarrow \text{Zn}^{2+} + 2\text{e}$
 $[E^\circ = 0.76 \text{ V}]$
 $\text{Ag(s)} \longrightarrow \text{Ag}^+ + \text{e}$
 $E^\circ = - 0.80 \text{ V}$
Which reaction actually takes place :
(A) $\text{Zn(s)} + 2\text{Ag}^+(\text{aq}) \longrightarrow \text{Zn}^{2+} + 2\text{Ag(s)}$ (B) $\text{Zn}^{2+} + 2\text{Ag}^+(\text{s}) \longrightarrow 2\text{Ag}^+(\text{aq}) + \text{Zn(s)}$
(C) $\text{Zn(s)} + 2\text{Ag(s)} \longrightarrow \text{Zn}^{2+}(\text{aq}) + \text{Ag}^+(\text{s})$ (D) $\text{Zn}^{2+}(\text{aq}) + \text{Ag}^+(\text{aq}) \longrightarrow \text{Zn(s)} + \text{Ag(s)}$
- Given that E° values of Ag^+/Ag , K^+/K , Mg^{+2}/Mg and Cr^{+3}/Cr are 0.80V, - 2.93V, - 2.37V, and - 0.74 V, respectively. Which of the following orders regarding the reducing power of metal is correct ?
(A) $\text{Ag} > \text{Cr} > \text{Mg} > \text{K}$ (B) $\text{Ag} < \text{Cr} < \text{Mg} < \text{K}$
(C) $\text{Ag} > \text{Cr} > \text{K} > \text{Mg}$ (D) $\text{Cr} > \text{Ag} > \text{Mg} > \text{K}$
- 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 & to minimize liquid-liquid junction potential
(D) To increase liquid-liquid junction potential
- A current of strength 2.5amp was passed through CuSO_4 solution for 6 minute 265 seconds. The amount of copper deposited is (At wt. of Cu = 63.5); 1 faraday = 96500 coulombs
(A) 0.3175 g (B) 1.028 g (C) 0.514 g (D) 6.35 g
- The current of 9.65 A is passed for 3hrs between nickel electrodes in 0.5L of a 2M solution of $\text{Ni}(\text{NO}_3)_2$, the molarity of solution after electrolysis would be
(A) 0.46M (B) 0.625M (C) 2M (D) 1.25M
- When electricity is passed through a solution of AlCl_3 , 13.5 g of Al is discharged. The amount of charge passed is ($\text{Al} = 27$)
(A) 1.5 F (B) 0.5 F (C) 1.0F (D) 2.0F

12. What is the equilibrium constant for reaction

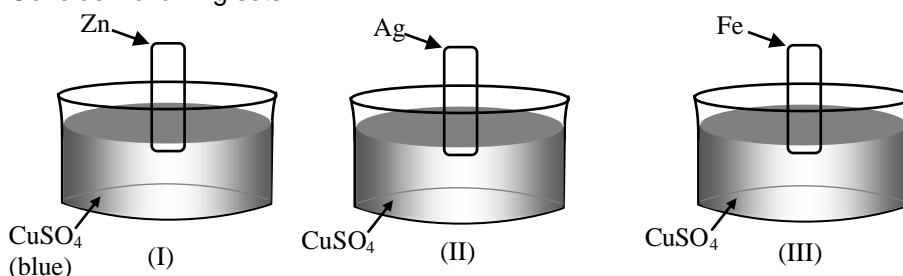


Given

$$E^{\circ}\text{Ce}^{+4}/\text{Ce}^{+3} = 1.44\text{V}$$

and $E^{\circ}_{\text{Fe}^{+3}/\text{Fe}^{+2}} = 0.68\text{V}$

- (A) $K_C = 1.3 \times 10^{10}$ (B) $K_C = 3.2 \times 10^{10}$ (C) $K_C = 7.6 \times 10^{12}$ (D) $K_C = 7.6 \times 10^5$
13. The standard reduction potentials E° , for the half reactions are as :
- $\text{Zn} = \text{Zn}^{2+} + 2e^{-}$, $E^{\circ} = +0.76\text{V}$
 $\text{Fe} = \text{Fe}^{2+} + 2e^{-}$, $E^{\circ} = 0.41\text{V}$
- The emf for the cell reaction,
 $\text{Fe}^{2+} + \text{Zn} \rightarrow \text{Zn}^{2+} + \text{Fe}$ is-
- (A) -0.35V (B) $+0.35\text{V}$ (C) $+1.17\text{V}$ (D) -1.17V
14. The equivalent conductivity of 0.1 M weak acid is 100 times less than that at infinite dilution. The degree of dissociation of weak electrolyte at 0.1 M is –
- (A) 100 (B) 10 (C) 0.01 (D) 0.001
15. Consider following sets :



Blue colour solution changes to colourless (or fades) in :

- (A) I, II, III (B) I, II (C) II, III (D) I, III
16. Consider following half-cell reactions :
- $\text{Cu}^{2+} + 2e^{-} \longrightarrow \text{Cu}$ $E^{\circ} = 0.34\text{V}$
 $\text{Zn}^{2+} + 2e^{-} \longrightarrow \text{Zn}$ $E^{\circ} = -0.76\text{V}$
 $\text{SO}_4^{2-} + 4\text{H}^{+} + 2e^{-} \longrightarrow \text{SO}_2 + 2\text{H}_2\text{O}$ $E^{\circ} = 1.17\text{V}$
- Hence, select correct statement (s) :
- (A) Cu reacts with dil. H_2SO_4 forming H_2 and SO_2
 (B) Cu reacts with concentrated H_2SO_4 forming SO_2
 (C) Zn reacts with concentrated H_2SO_4 forming SO_2
 (D) Both (B) and (C)
17. 1 mol each of AgNO_3 , CuSO_4 and AlCl_3 is electrolysed. Number of faradays required are in the ratio of :
- (A) 1 : 1 : 1 (B) 1 : 2 : 3 (C) 3 : 2 : 1 (D) 1 : 3 : 1
18. What products are formed during the electrolysis of a concentrated aqueous solution of sodium chloride ?
 I : $\text{Cl}_2(\text{g})$ II : $\text{NaOH}(\text{aq})$ III : $\text{H}_2(\text{g})$
- (A) I only (B) I and II (C) I and III (D) I, II and III
19. When an electric current is passed through an aqueous solution of sodium chloride-
- (A) H_2 is evolved at the anode (B) Oxygen is evolved at the cathode
 (C) Its pH progressively decreases (D) Its pH progressively increases
20. In the electrolysis of CuCl_2 solution using Cu electrodes the mass of cathode increases by 3.18g. What happened at the other electrode-
- (A) 0.05 mole of Cu^{2+} ions passed into solution (B) 0.112 litre of Cl_2 was liberated
 (C) 0.56 litre O_2 was liberated (D) 0.1 mole of Cu^{2+} ions passed into the solution

Numerical based

21. The emf of the cell $M / \text{Metal nitrate (0.01M)} // \text{Metal nitrate (0.1M)} / M$ is found to be 0.0591 V at 298 K. The valency of metal in metal nitrate is
22. Cost of electricity for the production of X Litre H_2 at STP at cathode is at rate of Rs.1. Then the cost of electricity for the production of X Litre of O_2 gas at anode will be (Assume one mole of electron as one unit electricity).
23. Among the ions $\text{H}^+, \text{Li}^+, \text{K}^+, \text{Rb}^+, \text{Cs}^+$ in aqueous medium at infinite dilution at 25°C How many number of ions having more ionic molar conductivities than that of Na^+ ion
24. A 250 ml sample of 0.2M Cr^{+3} is electrolysed with a current of 96.5 A. If the remaining $[\text{Cr}^{+3}]$ is 0.1 M, then time taken for this process is – minutes 15 seconds
25. The conductivity of 0.1 N NaOH solution is 0.022 scm^{-1} when equal volume of 0.1N HCl solution is added, the conductivity of resultant solution is decreased to 0.005 scm^{-1} . The equivalent conductivity in $\text{scm}^2 \text{ equivalent}^{-1}$ of NaCl solution is $x \times 10^2$. The x value is

KEY

1. D	2. B	3. D	4. A	5. B
6. A	7. B	8. D	9. C	10. C
11. A	12. C	13. B	14. C	15. D
16. D	17. B	18. D	19. D	20. A
21. 1	22. 2	23. 4	24. 1	25. 1

** Wish You^{est} all the Best **