

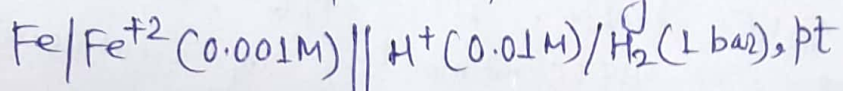
Electrochemistry

Q-1 Which of the following is Nernst equation.

- (i) $E = E^\circ + \frac{0.0591}{n} \log \frac{[M^{n+}]}{[M]}$ (ii) $E = E^\circ_{\text{cell}} - \frac{2.303RT}{nF} \log \frac{1}{[M^{n+}]}$
(iii) Both of (iv) None of these.

Q-2 Define the term molar conductivity of a solⁿ and how molar conductivity change with change in concentration of a solⁿ weak and strong electrolyte.

Q-3. Calculate emf of the following cell at 298K.



[Given $E^\circ_{\text{cell}} = \text{Fe}^{2+}/\text{Fe} = -0.44\text{V}$, $E^\circ_{\text{cell}} \text{H}^+/\text{H}_2 = 0.00\text{V}$]

Q-4 The molar conductivity of 0.025 mol/L CH_3COOH is $46.1 \text{ S cm}^2/\text{mol}$. Calculate its degree of dissociation and dissociation constant. Given $\lambda^\circ(\text{H}^+) = 349.6 \text{ S cm}^2 \text{ mol}^{-1}$ and $\lambda^\circ(\text{CH}_3\text{COO}^-) = 54.6 \text{ S cm}^2/\text{mol}$

Q-5. Define Kohlrausch law?

Q-6. Which of the following is unit of λ_m .

- (i) $\text{S}^2 \text{ m}^2 \text{ mol}$ (ii) $\text{S m}^2 \text{ mol}^{-1}$ (iii) $\text{S m}^2 \text{ mol}^{-1}$ (iv) (i) and (ii)

Q-7 The conductivity of electrolytic solⁿ depend on.

- (i) Size of ions
(ii) Nature of solvent
(iii) Concentration of electrolyte
(iv) All of these.

Q. 8. A solution of CuSO_4 is electrolysed for 600 s with a current of 1.5 amperes. What is the mass of copper deposited at the cathode?

Q. 9. Define electrochemical cell. What happens if external potential applied becomes greater than E_{cell} of electrochemical cell.

Q. 10. Calculate ΔG° for Ca^{2+} and Mg^{2+} from data given table. $H^\circ = 349.6$, $\Delta G^\circ = 50.1 \text{ kJ mol}^{-1}$
 $\text{Ca}^{2+} \quad 119.05 \text{ kJ mol}^{-1}$, $\text{SO}_4^{2-} = 160.05 \text{ kJ mol}^{-1}$
 $\text{Mg}^{2+} = 106.05 \text{ kJ mol}^{-1}$, $\text{Cl} = 76.35 \text{ kJ mol}^{-1}$