

PC-2(C): ELECTROCHEMISTRY-1

LESSION-3

In this lesson only highlights are made a guidance to self-study

ELECTROLYTIC CODUCTANCE

- 1. CODUCTANCE** – Metallic (*electronic*) & Electrolytic (*ionic*) conductance
- 2. DIFFERENT TYPES OF ELECTROLYTIC CODUCTANCE:** Conductance, C
Specific conductance, κ ; Molar, μ_c & Equivalent, λ_c conductances - μ_∞ & λ_∞
- 3. MEASUREMENT OF μ_c & λ_c :** R , κ , μ_c & λ_c
- 4. FACTORS AFFECTING CODUCTANCE μ_c & λ_c :** Concentration, C , T &
Dielectric constant , D .
- 5. PLOT OF μ_c or λ_c vs \sqrt{C}** (Weak & Strong electrolyte)
- 6. CONCEPT μ_∞ & λ_∞ :** Kohlraush Law
- 7. IONIC CODUCTANCE at infinite dilution μ_∞** ($\text{cm}^2 \text{ ohm}^{-1} \text{ mol}^{-1}$)

Cation	μ_∞	Anion	μ_∞
H^+	349.83	Cl^-	76.34
Na^+	50.11	Br^-	78.40
K^+	73.52	I^-	76.80
Li^+	38.70	OH^-	198.50
NH^+	73.40	NO_3^-	71.44
Ag^+	61.92	HCO_3^-	44.50
Ba^{2+}	127.30	SO_4^{2-}	159.60
Ca^{2+}	104.00	CH_3COO^-	40.89

8. RELAXATION & ELECTROPHORETIC EFFECTS

9. DEBYE-HUCKEL-ONSAGAR (DHO) EQUATION

$$\lambda_c = \lambda_\infty - \left\{ \frac{82.4}{(DT)^{1/2}\eta} + \frac{8.2 \times 10^5}{(DT)^{3/2}} \lambda_\infty \right\} \sqrt{C} = \lambda_\infty - \{A + B \lambda_\infty\} \sqrt{C}$$

For water at 298 K , A = 60.20 ; B = 0.229

10. EXPERIMENTAL VERIFICATION OF DHO EQUATION

Prof. Dr. A. DAYALAN