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① $G = \frac{1}{R} = \Omega^{-1}, S, mho$ (G: Conductance)

② $K = \frac{1}{\rho} = \frac{1}{\Omega m} = \Omega^{-1}m^{-1}, Sm^{-1}, mho\,m^{-1}$ (K → kappa → Conductivity)

③ $G^* = \frac{l}{A}$ → Unit (m^{-1}) (Cell constant)

$G^* = \frac{R}{\rho} = K$ → kappa (conductivity)

G → Conductance

As $R = \rho\frac{l}{A}$

$\frac{R}{\rho} = \frac{l}{A}$

④ $\lambda_m = \frac{K}{C}$ → Kappa, C → Concentration (Molarity)

Molar conductivity — $Sm^2 mol^{-1}$

⑤ $\lambda_m = KV$ for 1 mole as $C = \frac{n}{V}$ → 1 mole

$\lambda_m = \frac{K}{C} = \frac{K \times V}{n \to 1\,mole}$

⑥ $\alpha = \frac{\lambda_m}{\lambda^\circ_m}$ (degree of dissociation)

⑦ $\lambda_m = \lambda^\circ_m - A\sqrt{C}$ (λ_m: Molar Conductivity; λ°_m: Limiting Molar Conductivity)

⑧ $K_\alpha = \frac{C\alpha^2}{1-\alpha}$, $\frac{C\alpha \cdot C\alpha}{C - C\alpha} = \frac{C^2\alpha^2}{C(1-\alpha)}$

(1) $E_{cell} = E^\circ_{cell} - \frac{0.059}{n} \log \frac{[Pxd^n]^q}{[Red^n]^b}$ [Nerst eqⁿ]

(2) $\log k = \frac{n E^\circ_{cell}}{0.059}$ or $\frac{n F E^\circ_{cell}}{2.303 RT}$ (eqᵐ constant with E°_{cell})
K

(3) $\Delta G_n = -\frac{nF}{W = Q} \frac{E^\circ_{cell}}{V}$ [ΔG_n with E°_{cell}]

(4) $\Delta G_n = -RT \ln k$
or
$\Delta G_n = -2.303 RT \log k$
→ [ΔG_n with eqᵐ constant
K]