



All the Important Formulae that a student should know from....

XII Chemistry

CHAPTER 3 - ELECTROCHEMISTRY

1. $E^{\circ}_{\text{cell}} = E^{\circ}_{\text{cathode}} - E^{\circ}_{\text{anode}}$
2. $E = E^{\circ} - \frac{0.059}{n} \log \frac{1}{[M^{n+}]}$ (At 298 K)
3. $E_{\text{cell}} = E^{\circ}_{\text{cell}} - \frac{2.303RT}{nF} \log \frac{[\text{Anode ion}]}{[\text{Cathode ion}]}$
4. $E^{\circ}_{\text{cell}} = \frac{0.059}{n} \log K_c$ (At 298 K)
5. $\Delta G^{\circ} = -nFE^{\circ}_{\text{cell}}$
6. $R = \rho \frac{l}{A} = \frac{1}{\kappa} \frac{l}{A}$
7. Conductance: $G = \frac{1}{R}$
8. Conductivity = Conductance \times Cell constant
9. $\kappa = \frac{1}{\rho} = \frac{1}{R} \left(\frac{l}{A} \right) = G \frac{l}{A}$
10. Cell constant and is denoted by the symbol G^*
11. $\Lambda_m = \frac{\text{Specific conductance}}{\text{Molarity}} = \frac{\kappa}{C}$
12. $\Lambda_m = \frac{\kappa \times 1000}{C}$
Remember:
Unit of Λ_m in above formula is $\text{Scm}^2\text{mol}^{-1}$
13. $\alpha = \frac{\Lambda_m^c}{\Lambda_m^0}$
14. $K_a = \frac{c\alpha^2}{1-\alpha}$



15. Kohlrausch's Law of independent migration of ions:

If the limiting molar conductivity of the cations is denoted by λ_+^0 and that of the anions by λ_-^0 then the limiting molar conductivity of electrolyte is:

$$\Lambda_m^0 = v_+ \lambda_+^0 + v_- \lambda_-^0$$

Where v_+ and v_- are the number of cations and anions per formula of electrolyte.

16. Faraday constant: It is equal to 96487 C mol^{-1} or approximately equal to 96500 C mol^{-1} .