

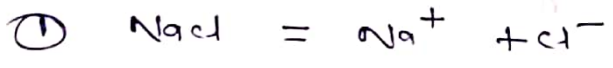
Equivalent Conductance (Λ)

Equivalent conductance is defined as the total conductance produced by 1 gm equivalent of an electrolyte.

Molar Conductance (Λ_m)

Molar Conductance is defined as the total conductance produced by 1 mole of an electrolyte.

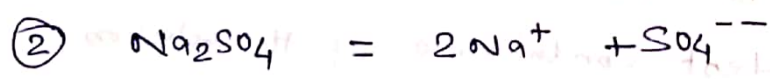
for example -



1 mol = 1 mol 1 mol

1 eq. 1 eq.

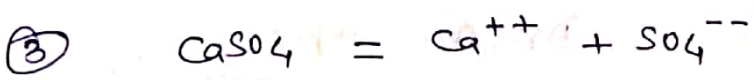
$\Lambda_m = \Lambda$



= 2 mol 1 mol

= 2 eq. 2 eq.

$\Lambda_m = 2\Lambda$



1 mol 1 mol

2 eq. 2 eq.

$\Lambda_m = 2\Lambda$

$$\Lambda = \frac{R \times 1000}{C}$$

① 1/2

where, C = Concentration of solution in equivalent/litre
i.e. Normality (N).

Similarly,

$$\Lambda_m = \frac{R \times 1000}{C}$$

where, C = Concentration of solution in mole/litre.
i.e. Molarity (M).

$$\text{Normality (N)} = \text{Molarity (M)} \times \text{acidity or Basicity}$$

Problems :-

① 0.5 Normal solution of a salt placed between two Pt-electrode, 20 cm apart and of a area of cross-section is 4.0 cm^2 has a resistance of 25 ohms. Calculate the equivalent conductance of the solution.

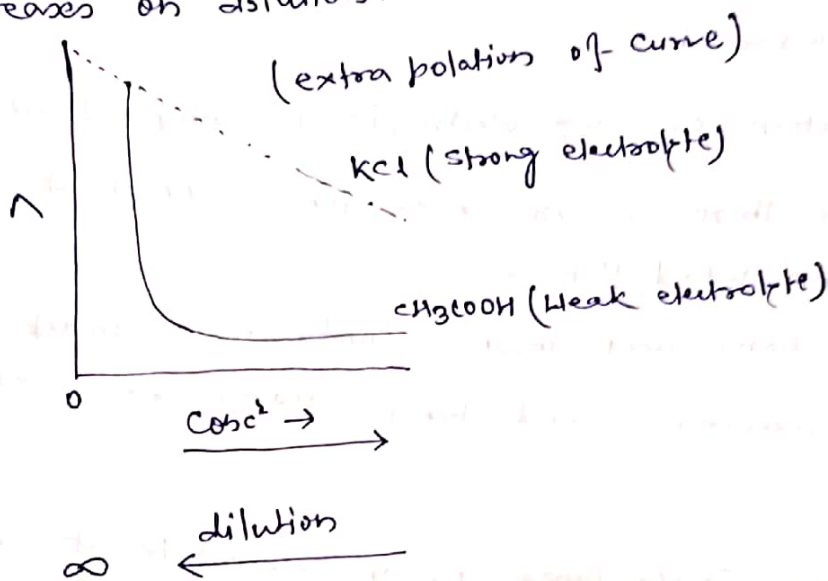
Ans:- ($\Lambda = 400 \text{ ohm}^{-1} \text{ cm}^2$)

Dr. A.K. Gupta.
Chemistry (L.S. College)

Effect of dilution on Conductance :-

When the electrolytic salt is diluted, ionisation increases and the no. of ions increases. So, equivalent conductance and molar conductance increases.

On dilution through no. of ions increases no. of ions per unit volume decreases. So, specific conductance decreases on dilution.



For strong electrolyte Λ_{∞} or Λ_0 can be obtained through extrapolation of curve but this is not possible in case of weak electrolyte.

Degree of Ionisation :-

The fraction of the electrolyte which ionised from one mole of an electrolyte is called degree of ionisation.

It is denoted by α

Where,
$$\alpha = \frac{\Lambda_c}{\Lambda_{\infty}}$$

Where,

Λ_c = Equivalent Conductance of 'C' concentration.

Λ_∞ = Equivalent Conductance of ∞ dilution.

This is approximately true for weak electrolytes but not in strong electrolytes.