**Dr.Manoj Kumar**

**Associate professor**

**Department of Chemistry**

**Raja Singh College,Siwan**

**Transport number**

The fraction of the total current carried by an on is called its transport number or transference number or Hittorf number.

Greater the amount of current it will carry with it and hence greater will be its transport number.

If Ua and Uc are the speeds of the anion and the cation respectively.

Then current carried by the anion $∝$ Ua =k.Ua

current carried by the cation $∝$ Uc =k.Uc

since current is carried by ion .

Total current carried = k.Ua + k.Uc

 = k(Ua + Uc)

Tranport number of anion

 na= $\frac{kUa}{k(Ua + Uc)}$

na = $\frac{Ua}{(Ua + Uc)}$

similarly,

Tranport number of cation

nc = $\frac{Uc}{(Ua + Uc)}$

**Hittorf’s method**

**determination of transport number of AgNO3 solution:**

Suppose , weight of the anodic solution taken out = w1g

Weight of AgNO3 found to be present =w2g

Weight of water present = (w1 – w2)g

Thus (w1 – w2)g of water contain w2 g of AgNO3 after electrolysis.

w2 g of AgNO3 = $\frac{w2}{170}geq of AgNO$3 = $\frac{w2}{170}geq of AgNO$3 = x g eq

Hence we can say that after electrolysis (w1 – w2) g of water contain x g eq of Ag .

Before electrolysis,

Suppose w3 g solution contain w4 g of AgNO3

Weight of water present = (w3-w4) g

Thus,

 (w3-w4) g of water contains w4 g of AgNO3 before electrolysis.

(w1-w2) g of water contains

 = $\frac{w4}{W3-W4}×(W1-W2) g $ of AgNO3

 = $\frac{w4}{W3-W4}×\frac{(W1-W2)}{170}$ g eq of AgNO3

 = $\frac{w4}{W3-W4}×\frac{(W1-W2)}{170}$ g eq of Ag

When the electrodes are not attacted,x$<$y

Fall in the concentration of the anodic compartment

 = (y-x) g eq. of Ag

Sppose the weight of silver desited in the silver voltameter

= w g = $\frac{w}{108}$ g eq of Ag = z g eq

Transport number of Ag+ ion (nAg+)

= $\frac{y-z}{z}$

Transport number of NO3- ion (nNO3-) = 1- nAg+