Determination of transport Number:
طرق تعيين اعداد النقل

1-Hittorfs Method

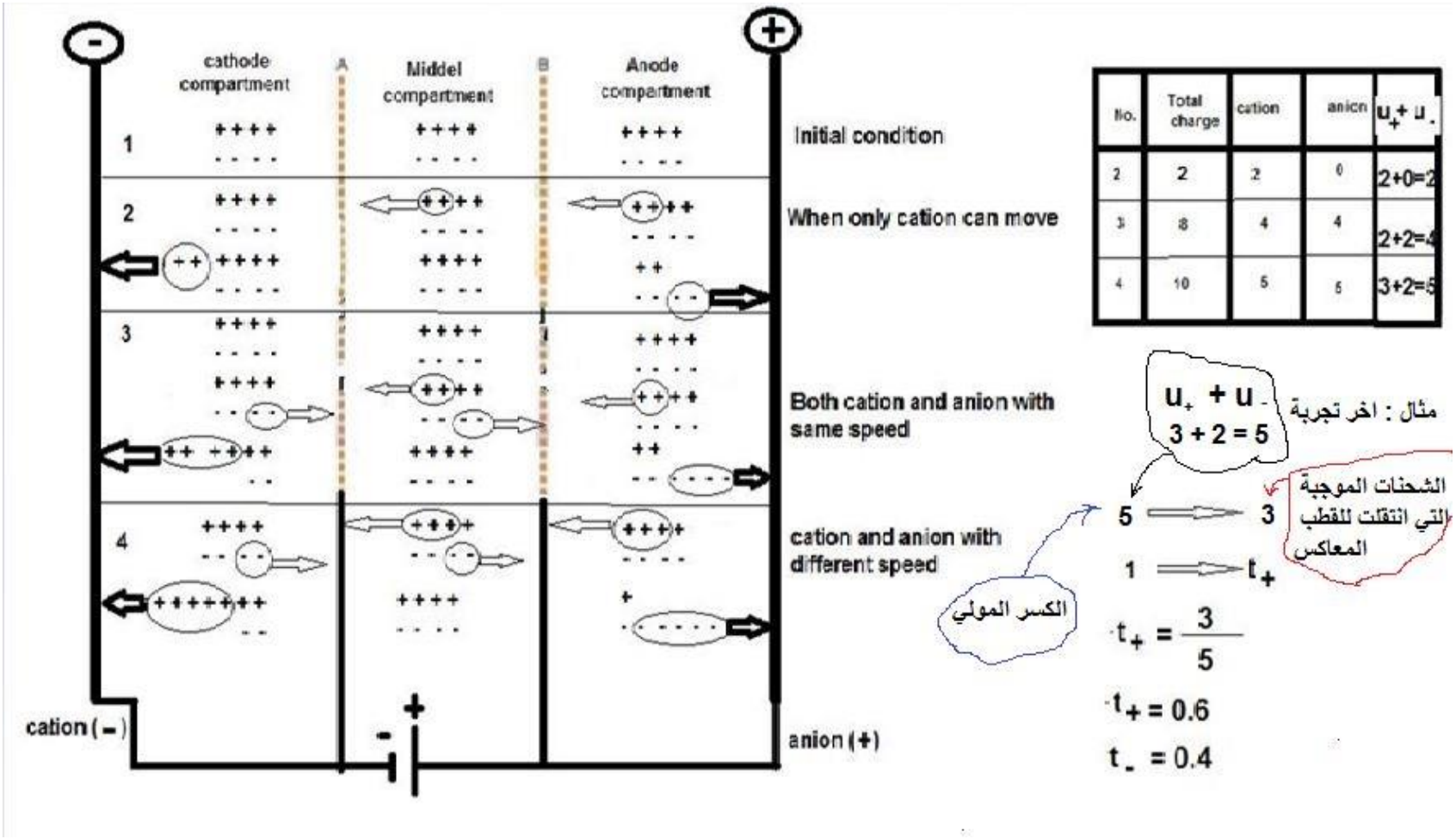
2-Moving boundary method

طريقة الحد الفاصل المتحرك

3-Measurement of Electromotive force

قياس القوه الدافعه الكهربائية

Mechanism of ionic Transport



The limiting law of Debye – Huckel

is related to the average interaction of the cation and anion with their respective ionic surroundings

$$\log\gamma_{\pm} = -A\,|z_+ z_-|\,\sqrt{\mu}$$

$$= -0.519\,|z_+ z_-|\,\sqrt{\mu}$$

where :

$\gamma_{\pm}$: Mean activity coefficient متوسط معامل الفعالية

$$\mu = \frac{1}{2} \sum_i c_i z_i$$

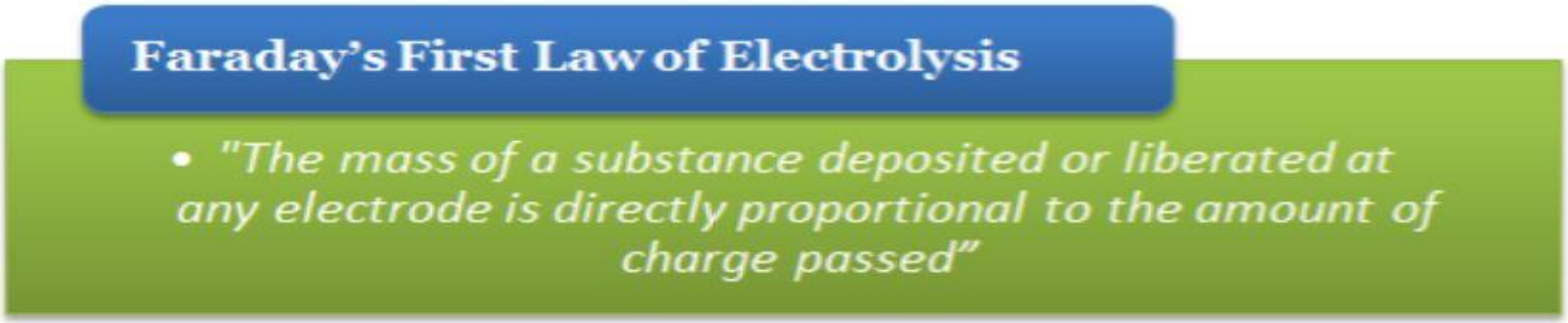
μ Ionic Strength القوة الايونية

C : Concentration , z شحنه الايون
The valancy if each ion present

Example : Calculate the mean activity coefficicent for K_2SO_4 0.2M).Assuming Deby Huckel limiting law to apply?

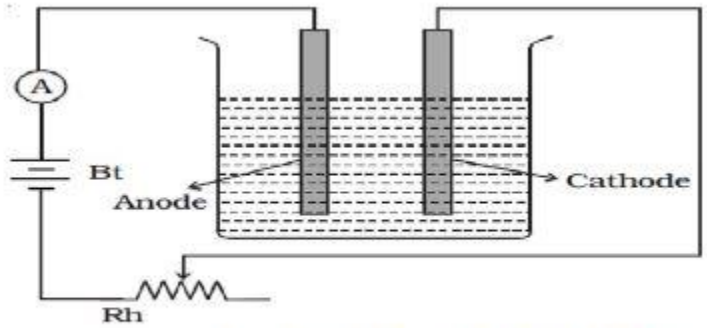
Faraday's laws of electrolysis, in Chemistry

first described by the English scientist Michael Faraday in 1833.



قانون فراداي الاول ينص على : كمية المادة المترسبة او المتحرره تتناسب طرديا مع كمية الكهربائية الماره في المحلول

Faraday's first law



Verification of Faraday's first law

$m \propto Q$

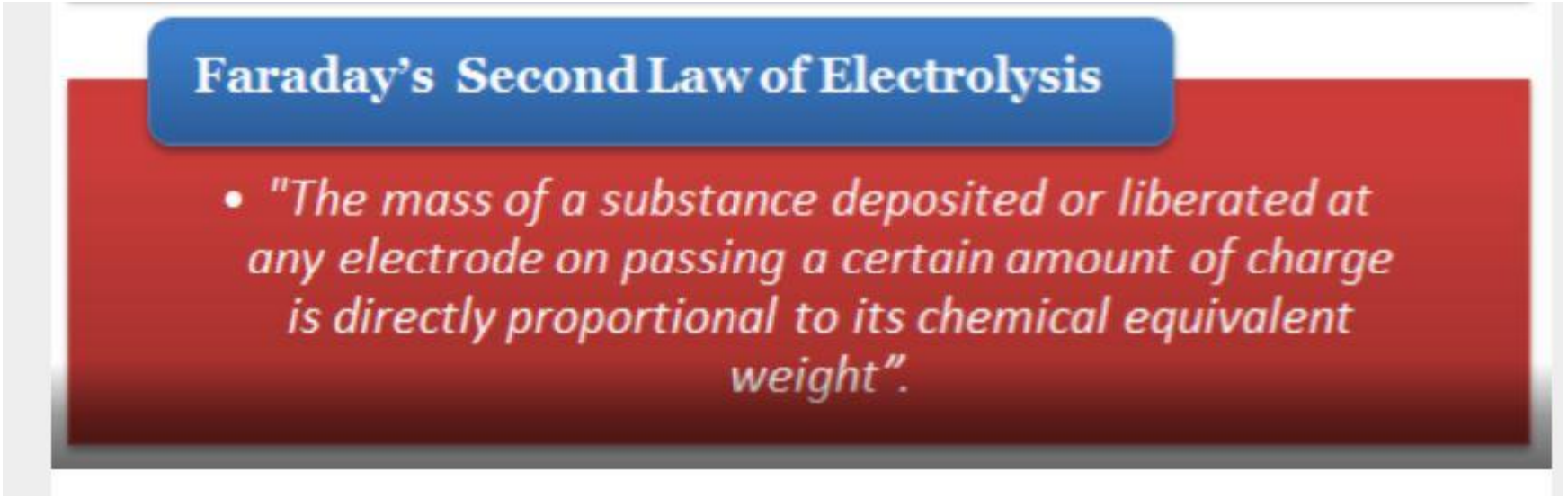
$m = Z \cdot Q$

Q : Quantity of electricity
m : mass of substance
Z :electro-chemical equivalent of the substance.

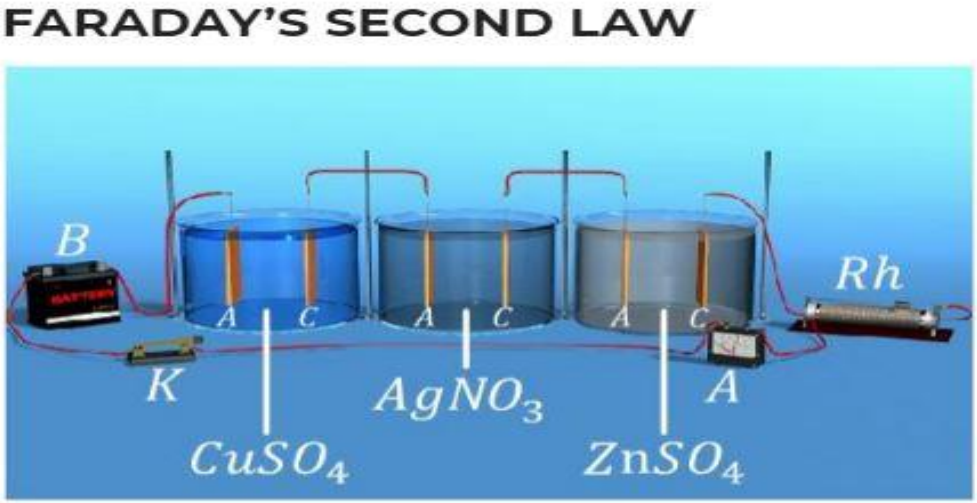
$Q = I \cdot t$
I : the intensity in amperes and
t : the time in seconds.

Faraday’s second law of electrolysis

كمية المادة المترسبة او المتحرره عند امرار نفس الكمية من الكهربائية تتناسب مع اوزانها المكافئة



Faraday's second law of electrolysis



$$\frac{M_1}{M_2} = \frac{E_1}{E_2}$$

M_1 and M_2 are the masses deposited or liberated

E_1 and E_2 are their chemical equivalents