

Determination of Transport Numbers by Moving Boundary

Group 12 :

Nurul Safitry (06121010003)

Yoli Resmita (06121010009)

Ina Ayu Nengtyas (06121010013)

Melantina Oktriyanti (06121010023)

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The determination of the number of transport by Hittorf method based on the addition of solution concentration around the electrode, then the moving boundary method based on the movement of ions when a potential difference is applied. The movement of these ions at the boundary of two different electrolyte solutions can be directly observed. The tools used for the same purposes Hittorf manner, except the cells can be seen in the following figure.

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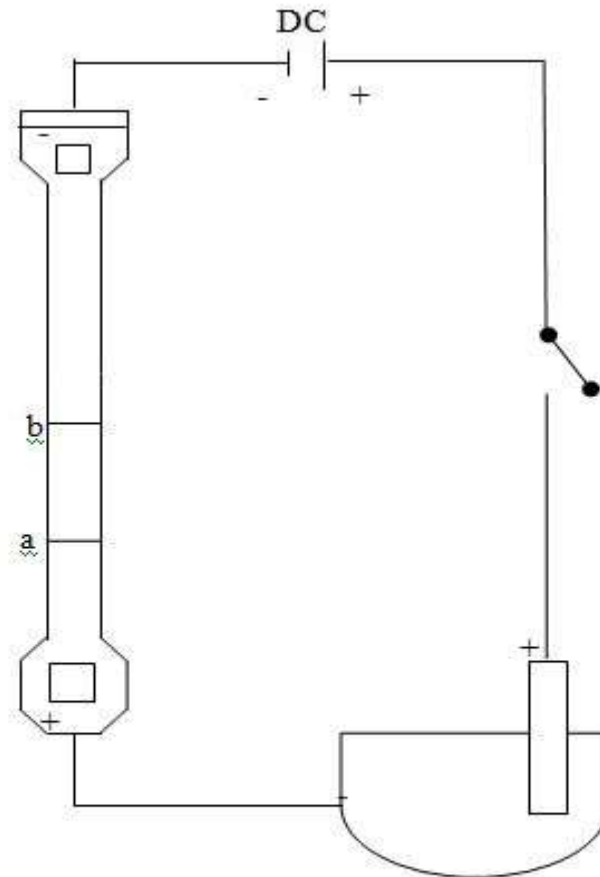


Figure 2.5 . Electrolysis cells for determination of numbers transport by moving boundary

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Electrolytes were studied as a tool is inserted into the upper layer, while the bottom layer is a solution of a salt with the same anion and cation should have a smaller mobility of the electrolyte cations studied. For example if the KCl solution to be studied, used as a top layer and bottom layer can use CaCl_2 solution. Mobility Cd^{2+} is smaller than K^+ .

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When current is passed anion, Cl^- moves down to the anode, while K^+ and Cd^{2+} to move up to the cathode. When K^+ ions ride was replaced by Cd^{2+} , because it is the border between the two solutions is also moving up. By knowing the volume of the moving boundary was crossed to a number of electricity that is passed into the cell can be calculated transport number of K^+ .

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For example, the volume is bypassed border movement from a to b . The amount of electricity that flowed when the movement to move from A to B in the amount of Q (to be determined from Coulometer):

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If the concentration of KCl solution is C , then the concentration of K^+ also C . Means K^+ moves from A to B is equal to $V \times C$. By knowing the number of moles of K^+ are moved can be calculated amount of cargo carried off, Q_+ . Thus it can be determined :

$$t_+ = \frac{Q_+}{Q}$$

Thank's fou your
attention

