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Y. Freijanes, V.M. Barragán, S. Muñoz



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**Chronopotentiometric study of a Nafion membrane in presence of glucose**

Y. Freijanes<sup>a</sup>, V. M. Barragán<sup>a,\*</sup>, S. Muñoz<sup>b</sup>

<sup>a</sup>Department of Applied Physics Faculty of Physics, University Complutense of Madrid, 28040 Madrid, Spain.

<sup>b</sup>Department of Applied Physics III Faculty of Physics, University Complutense of Madrid, 28040 Madrid, Spain.

\*Corresponding author. Fax: +34913945191; e-mail: vmabarra@ucm.es

**ABSTRACT**

Chronopotentiometric and swelling experiments have been conducted to characterize the behavior of a Nafion membrane in NaCl and KCl aqueous solutions without and with glucose. A mixture solution with similar composition to the cerebrospinal fluid and blood plasma has also been studied. From the chronopotentiograms, current-voltage curves have been obtained, and the values of the limiting current density, diffusion boundary layer thickness, difference between counter-ion transport number in membrane and free solution, and transition times have been determined for the investigated membrane systems. The obtained results indicate that the presence of glucose affects the ion transport through the membrane depending on the electrolyte and glucose concentrations. At low electrolyte concentration, experimental transition times are found to be smaller in presence of glucose, which has been related to an effective membrane area reduction in presence of glucose. The membrane system corresponding to the mixture solution shows a behavior similar to the single high concentration NaCl membrane system, indicating that the observed behavior is mainly associated to the Na<sup>+</sup> ions transport in higher proportion. In this case, the glucose presence does not affect significantly the investigated properties of the membrane, which is interesting for its utilization in a glucose fuel cell.

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