



Dielectric properties of electrolyte solutions in polymeric nanofiltration membranes

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ABSTRACT

In this work a nanofiltration membrane immersed in an electrolyte solution has been studied using impedance spectroscopy. In this technique the membrane is in contact with the same concentration at both sides, therefore there is not any ion transport through the membrane and, thus, it is possible to obtain electric and dielectric properties that would help to model the nanofiltration process. Results allow obtaining the electrical properties of the whole system assumed as consisting in an equivalent electric circuit. Three relaxation times can be identified and modeled with the aim of understanding the behavior of the solution inside the pores as a function of concentration. The pore permittivity decreases with increasing concentration due to confinement effects, while the conductivity inside the pores increases rapidly for high concentrations due to the easy penetration of the ions into the pores.

Keywords: Impedance spectroscopy; Nanofiltration; Conductivity; Permittivity; Dielectric properties

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