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A chronopotentiometric study of polymeric ion-exchange membranes in alcohol-water media

Tuesday, 1 June 2021 10:00 (1 hour)

Chronopotentiometry is a powerful technique to investigate transport phenomena in charged porous mediumelectrolyte interfaces, especially those associated with ion transport in the overlimiting regime. It allows to determine the transition time, which is an important characteristic of transient ion transport. Under certain conditions, the Sand equation can be applied to analyse fouling effects, the inhomogeneity of the surface or to determine ion transport numbers in polymeric ion-exchange membranes. Even ion-exchange membranes based on chemically homogeneous polymers can exhibit microheterogeneities disturbing the ion transfer. The surface heterogeneity of the membranes used in many electrochemical systems is an important issue and it has been actively studied, but usually aqueous electrolyte systems have been studied.

In this work we apply chronopotentiometry for studying polymeric ion-exchange membranes in alcohol-water media. A non-reinforced homogenous membrane, Nafion 117, and two reinforced homogeneous membranes, Neosepta CMX and AMX, have been investigated in LiCl 0.005 M electrolyte solutions with 2M alcohol-water solution as solvent. Methanol and ethanol were used as alcohols. Limiting current values were determined from voltage-current curves. The transition times were obtained as a function of the density current and the agreement with the Sand theory has been analysed.

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Time Block Preference

Time Block A (09:00-12:00 CET)

References

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