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Formation of semi-permeable polyamide skin layers on the surface of supported liquid membranes

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Abstract

The instability of supported liquid membranes has been a major impediment to practical applications. To address this shortcoming, we have developed a method to form semi-permeable polyamide skin layers in situ on supported liquid membranes containing an anion-exchange extractant (trioctylamine) and a neutral extractant (tributyl phosphate). These skin layers encapsulate large extractant molecules within the membranes but allow the transport of small species across the membranes. A liquid–liquid interfacial polymerization reaction was employed to form the polyamide skin layers utilizing monomers that are compatible with the extractants. SEM examination of the membranes shows the polyamide skin layer to be about 1 μ m thick with pore sizes below resolution. Membranes with polyamide skin layers showed a typical flux of 1 $\times 10^{-4}$ mol/s m^2 of Cr(VI), about half that exhibited by similar membranes without skin

layers.



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Keywords

Liquid membranes; Stability; Skin; Membrane preparation and structure

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