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Studies on the transport of chromium(III) through a supported liquid membrane containing D2EHPA as carrier

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ABSTRACT

The facilitated transport of chromium(III) through a flat-sheet supported liquid membrane (FSSLM) containing di(2-ethylhexyl) phosphoric acid (D2EHPA) as ionophore is studied. A buffered Cr(III) solution was used as a source phase, whereas HCl solution was used as a receiving phase. The incidence of several parameters such as feed phase pH, carrier concentration, polymeric support nature and diluent chemical nature on the transport efficiency has been investigated. Overall experiments, a feed pH decrease has been observed due probably to proton permeation. Therefore, pH was manually maintained during the run at the initial value by adding NaOH concentrated solution to the feed phase. After 48 h transport, a trivalent chromium transport efficiency of almost 67% has been obtained through a D2EHPA-2-octanol based SLM when source pH was maintained constant around 4.5. Under the optimum experimental conditions an initial flux value of 4×10^{-6} mol.m^{-2}.s^{-1} has been estimated. Transport of hexavalent chromium across the D2EHPA based FSSLM was also examined, and a very slight amount not exceeding 5% was transported.

Keywords: Chromium(III); D2EHPA; Facilitated transport; Flat-sheet supported liquid membrane (FSSLM); Transport efficiency

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