Desalination and Water Treatment
www.deswater.com

doi: 10.5004/dwt.2021.27146

225 (2021) 422–429
June

Recovery of nickel ions by supported liquid membrane (SLM) using D2EHPA as carrier

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Received 16 March 2020; Accepted 29 January 2021

ABSTRACT

This research is dealing with the liquid–liquid extraction and the facilitated transport through a supported liquid membrane (SLM) system of nickel ions. Di(2-ethylhexyl) phosphoric acid (D2EHPA) was used as a carrier dissolved in chloroform. The effect of critical parameters such as the amount of D2EHPA (in membrane), the initial concentration of nickel as well as feed phase pH which affect the transport of nickel(II) through the SLM system, were investigated. Experimental results revealed that Ni(II) flux across the membrane tends to increase with the concentration of these metal ions. The optimum conditions for Ni(II) transport are: feed phase pH of 5, stripping phase of 0, 5 M HNO_3, and 30% D2EHPA (v/v). At optimal conditions, the transport of Ni(II) was achieved with an efficiency of about 60% within 24 h and 100% within 3 h for initial nickel concentration of 2.5 and 0.25 mM, respectively. A concluding aging test was carried out to check the stability of the membrane and the evolution of the percentage of nickel transported in the function of time.

Keywords: Nickel; Extraction; Supported liquid membrane; D2EHPA; Transport

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