



Parametric studies on the removal of nickel using emulsion liquid membrane

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ABSTRACT

Removal of Nickel(II) ions from aqueous solution was investigated in this study using emulsion liquid membrane under a wide range of operating conditions. ELM solution was prepared in an emulsification reactor at a high emulsification rotating speed of 3000 rpm by mixing toluene (organic solvent), D2EHPA (carrier/extractant), span 80 (surfactant) and sulfuric acid (stripping phase). Effects of operating parameters, namely pH of the internal phase, external phase, initial concentration of nickel, surfactant concentration, carrier concentration and type of organic solvent on metal removal efficiency were studied. A maximum removal efficiency of 98% was obtained for 10 ppm of initial concentration of nickel(II) in the external feed phase. The removal efficiency decreased with increase in metal concentration. The optimal pH of the stripping and external phases were determined as 1 and 11 respectively with the maximum removal efficiency achieved greater than 95%. The optimal carrier concentration was found to be 2% (v/v), while the 6% (v/v) surfactant concentration yielded optimal results. Among the various solvents tested, toluene was found to be the suitable one.

Keywords: Metal; Liquid membrane; Extraction; Surfactant

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