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The recovery and the separation of metal ions from galvanic wastewaters

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ABSTRACT

This paper investigates a method for the recovery and the separation of metal ions from two galvanic wastewater types using two different polymer inclusion membranes (PIMs). The main aim of this work was to present results of the transport of metal ions from acidic and alkaline galvanic wastewaters. Membranes with acetylacetone and di(2-ethylhexyl)phosphoric acid were used for removal of metal ions from alkaline and acidic wastewaters, respectively. Additionally, the obtained PIMs were characterized by attenuated total reflectance Fourier transform infrared Spectroscopy and scanning electron microscopy. A characterization of membrane structures was presented along with its impact on the efficiency of the process of transporting metal ions. The obtained results showed that both studied membranes efficiently separated the investigated metals from their mixture. The highest recovery factors were obtained for iron(III) (97.01%) and nickel(II) (68.09%) ions.

Keywords: Galvanic wastewater; Polymer inclusion membrane; PIM; Metal ion separation; Metal recovery

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