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Optimization of Cu(II) removal/recovery by bulk liquid membranes containing benzoylacetone as mobile carrier

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ABSTRACT

The effective treatment of wastewater containing heavy metal ions has grown into an important research area in the last decades due to both environmental and economic point of view. In this paper we study the removal/recovery of Cu(II) by bulk liquid membranes, through a facilitated counter transport mechanism, using benzoylacetone as carrier and hydrochloric acid as striping agent (protons as counter-ions). The influence of different experimental conditions (carrier concentration in the membrane, stripping agent concentration in the product phase, stirring rate and membrane phase volume) on transport parameters (flux and permeability through feed/membrane and membrane/product interfaces) and on the percentages of Cu(II) removed from feed phase, recovered in the product phase and accumulated in the membrane phase, are analyzed in order to optimize the conditions of the removal/recovery process. Cu(II) recovery increases with the increase in carrier concentration in the membrane phase, in stripping agent (counter-ion) concentration in the product phase and in stirring rate in the three phases, and decreases with the increase in the volume of that membrane phase.

Keywords: Copper; Removal/recovery; Bulk liquid membranes; Benzoylacetone; Facilitated counter transport

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