

Facilitated transport of cobalt through bulk liquid membranes containing D2EHPA as carrier. Kinetic study of the influence of some operational variables

Gerardo León^{a*}, María Amelia Guzmán^b

^a*Departamento de Ingeniería Química y Ambiental, Universidad Politécnica de Cartagena, Paseo Alfonso XIII, no. 44, 30203 Cartagena, Spain*

Tel. +34 868 07 1002; Fax +34 968 32 55 55; email: gerardo.leon@upct.es

^b*Dirección Territorial de Comercio y Delegación del ICEX, Murcia, Spain*

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ABSTRACT

The presence of heavy metals in aqueous solutions beyond certain limits creates serious threat to the environment due to their non-degradability and toxicity. So the search for techniques to remove those pollutants is of increasing interest. Liquid membranes have shown great potential in this way, especially in cases where pollutant concentrations are relatively low and other techniques cannot be applied efficiently. A kinetic study of the influence of some operational variables (organic phase volume, emulsifier concentration in the membrane phase and stirring rate) on the transport of cobalt (II) through bulk liquid membrane containing di(2-ethylhexyl) phosphoric acid (D2EHPA), as mobile carrier, in kerosene and protons, as counter ions, in the product phase (H_2SO_4), is carried out in this paper. The transport kinetic was analysed by means of a kinetic model involving two consecutive irreversible first order reactions. The rate constants of the extraction and stripping reactions were determined for all the experimental conditions studied. Maximum transport fluxes of cobalt (II) through the bulk liquid membrane were also calculated.

Keywords: Membrane processes; Bulk liquid membranes; Cobalt; D2EHPA; Kinetics

* Corresponding author.