

Removal of Lead by emulsion organophosphorus liquid membrane. Response surface modeling

N.E. Belkhouche¹, N. Benyahia¹

¹Department of Chemistry, Faculty of Sciences, Laboratory of Separation and Purification Technologies (LTSP),
University of Abou-Bekr Belkaid, Tlemcen, 13000, Algeria

Keywords: Emulsion liquid membrane, Lead, D2EHPA, RSM

Presenting author email: nbelkhouche@yahoo.fr

Abstract

We consider a new approach in the study of lead extraction by di(2-ethylhexyl)phosphoric acid (D2EHPA) as an organophosphorus carrier (Malik et al, 2012). A comparative study on the optimization of process parameters of an emulsion organophosphorus liquid membrane (EOgLM) by experimental work and response surface methodology (RSM), according to a Box–Behnken design (BBD), was carried out (Jiao et al, 2013). Emulsion stability was achieved by the TritonX-100 as biodegradable surfactant in a dichloromethane membrane. The transport of Pb(II) ions from the acidic nitrate medium was evaluated from yield of extraction as analytical response, and the optimum conditions were initially determined by optimizing one parameter at the time. The extraction of Pb(II) was found to be total. The comparison between the values, experimentally optimized and those RSM optimized, was accomplished by optimizing the following parameters: D2EHPA/TritonX-100 ratio, initial feed phase concentration and concentration of internal phase. The comparison showed that all the values were in good agreement and all interactions of the chosen variables are significant.

References

- Malik, M.A., Hashim, M.A., Nabi F., Extraction of metal ions by ELM separation technology, *J. Disper. Sci. Technol.* 33 (3) (2012) 346–356
- Jiao, H., Peng, W., Zhao, J., Xu, C., Extraction performance of bisphenol A from aqueous solutions by emulsion liquid membrane using response surface methodology, *Desalination* 313 (2013) 36–43