



## Optimization of nickel removal using liquid–liquid extraction and response surface methodology

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### ABSTRACT

The nickel extraction efficiency by means of liquid–liquid extraction (LLE) method was studied using response surface methodology; six parameters were identified as influential factors on nickel removal efficiency as the response. However, on screening experiments, only two factors were selected: pH and di-(2-ethylhexyl) phosphoric acid (D2EHPA) concentration. Face-centered composite design (FCCD) was applied in order to determine the optimum conditions for nickel removal by LLE. The results of FCCD showed that a second-order model described the relationship between the factors and nickel removal properly. Results showed that the optimum conditions are pH 1.1 and D2EHPA concentration 0.2 M, where 95.57% of nickel removal was achieved.

*Keywords:* Response surface methodology; Liquid–liquid extraction; Di-(2-ethylhexyl) phosphoric acid (D2EHPA); Face-centered composite design

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