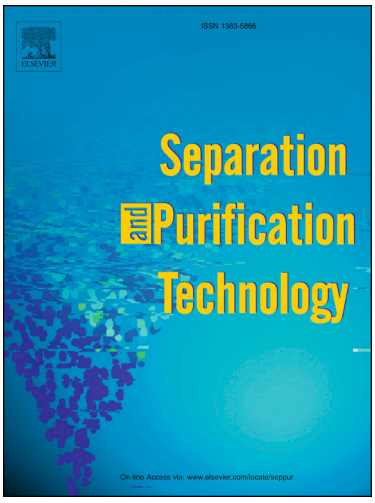

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Abstract

Electrocoagulation was used for uranium removal from Pyhäsalmi, Finland mine water. The effect of the electrode type, current density and reaction time was investigated and the removal efficiency, isotherms and kinetic data were calculated. Finally, the process was optimized with the response surface methodology (RSM) and statistically significant factors, which have an effect on the removal efficiency identified. Isotherm studies illustrated that iron–stainless steel and aluminum–stainless steel anode/cathode combinations are obeying Langmuir and Temkin isotherms, respectively. Kinetic studies showed that the iron–stainless steel and aluminum–stainless steel anode/cathode combinations are obeying first order kinetics.

The interactions between current density and reaction time on the uranium removal were statistically significant for both, the aluminum–stainless steel and iron–stainless steel anode/cathode combinations. Current density was shown to be a significant parameter for iron–stainless steel and aluminum–stainless steel anode/cathode combinations. However, the reaction time was only a significant parameter in the quadratic model for the aluminum–stainless steel combination.