

عنوان مقاله:

Application of response surface methodology for thorium(IV) removal using Amberlite IR-120 and IRA-400 : Ion exchange equilibrium and kinetics

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نویسندگان:

Ehsan Zamani Souderjani - *Department of Chemical Engineering, Collage of Engineering, University of Tehran, Tehran, Iran*

Ali Reza Keshtkar - *Nuclear Fuel Cycle School, Nuclear Science and Technology Research Institute, Tehran, Iran*

Mohammad Ali Mousavian - *Department of Chemical Engineering, Collage of Engineering, University of Tehran, Tehran, Iran*

خلاصه مقاله:

In this work, thorium(IV) removal from aqueous solutions was investigated in batch systems of cationic and anionic resins of Amberlite IR-120 and IRA-400. In this way, the effects of pH, initial Th(IV) concentration and the amount of adsorbent were investigated. A Central composite design (CCD) under response surface methodology (RSM) was employed to determine the optimized condition. The results showed that the maximum removal efficiency of Th(IV) onto IR-120 and IRA-400 either discretely or in combination, albeit with equal mass fraction, was determined as follows: 98.09% , 65.70% and 72.19% at pH=3.23, 6 and 4.07, initial Th(IV) concentration of 78.2,30 and 55.4 mg.L-1 and 2.08, 2.5 and 2.2 g.L-1 of resin, respectively. The kinetic and equilibrium data were accurately described by the pseudo-second order and Langmuir models. The results showed that IR-120 is a suitable adsorbent for thorium removal from aqueous solutions

کلمات کلیدی:

Th(IV) removal, Response surface methodology (RSM), Central composite design, Ion exchange resin

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