

Studies on the recovery of Th(IV) ions from nitric acid solutions using amino- magnetic glycidyl methacrylate resins and application to granite leach liquors

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Polymeric matrices composed of glycidyl methacrylate/divinylbenzene and glycidyl methacrylate/N,N'-methylenebis (acrylamide) were prepared concurrently in the presence of dispersed fine magnetite particles. The obtained products were allowed to react with tetraethylenepentamine to produce two amino-magnetic resins named RI and RII. The adsorption of Th(IV) ions on RI and RII from nitric acid solutions was studied using batch and column experiments. At pH 3.7, maximum adsorption capacity values of 0.86 and 0.97 mmol g⁻¹ of Th(IV) ions were obtained for RI and RII, respectively. At S/L ratio = 1, removal efficiency values of 86 and 99% from an initial concentration of 0.54 mmol L⁻¹ were achieved for Th(IV) ions using RI and RII respectively. At all S/L ratios, the more hydrophilic resin RII showed better removal efficiency compared to RI. Adsorption experiments were carried out on three granite ore samples to recover Th(IV) ions using the two new resins obtained. The results indicated good recovery percentage and selectivity of the resins towards Th(IV) ions compared to other associated elements. The resins loaded with Th(IV) ions were effectively regenerated using 0.1 M HNO₃.