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Separation of Neptunium (IV) from Actinides by Solid Phase Extraction Using a Resin Containing Aliquat 336

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HIGHLIGHTS

- A novel solid phase extraction resin containing Chromosorb W and Aliquat 336 was prepared
- Batch uptake studies were carried out using Np, Pu and U radiotracers
- Column mode operations were done to obtain breakthrough profiles
- Np was selectively separated from a mixture of Np, U and Pu with decontamination factor (with respect to Pu) of 300

SUMMARY

An extraction chromatographic resin material containing Aliquat 336 as the liquid anion exchanger extractant and Chromosorb W as the solid support was prepared and tested for the uptake of UO_2^{2+}, Np^{4+}, Pu^{4+}, and Pu^{3+} from nitric acid feed solutions. The resin beads were characterized by thermogravimetry / differential thermogravimetry (TG/DTG) and scanning electron microscopy (SEM) surface morphology analysis. The uptake trend for the metal ions from 3 M HNO_3 was found to be $Pu^{4+} >> Np^{4+} >> UO_2^{2+} \sim Pu^{3+}$ which clearly followed the trend