



Uranium-thorium and rare earth separation by using cation exchange resin with electron deposition

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Uranium, thorium and rare earth elements (REE) were separated in nitric acid by using ion exchange column-resin combined electron deposition. Feed was prepared from uranium, thorium and REE in 80 ppb concentrations. Dowex-50 cation exchange resins (x2, x4 and x8) were used for uranium, thorium and REE separation. Three nitric acid concentrations (1 M, 2 M, and 3 M) were used to elute uranium isotope, while thorium was eluted by 6 M, 7 M, and 8 M of nitric acid. High corrosion-resistance metals were used to be as electrode for improving resin-separation such as aluminum (Al), silver (Ag), stainless-steel (SS) and tungsten (W). The optimum condition for resin-separation was selected then electron deposition was compared for select the high selectivity for each elements. In this study, uranium, thorium and REE concentration were quantitatively determined by inductively coupled plasma – mass spectrometry (ICP-MS).

Keywords: Uranium; Cation exchange resin; Electron deposition