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neptunium extraction behavior in the plutonium purification process

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In order to control Np path-way in plutonium purification process, the extraction behavior of Np(IV) and Np(V) were investigated with experiment and numerical simulation.

19%-42% Np can be extracted into organic phase in the co-extraction unit while using 1-3mol/L nitric acid as scrubbing reagent, if Np(V) was added into feed solution, because of the oxidation of Np(V) to Np(VI) prompted by nitrous acid. Most of Np(V) is not oxidated timely at short residence time if using centrifugal contactor and leads Np goes into raffinate. On the contrary, above 90% Np can be extracted into organic phase if Np(IV) was added into the feed solution. At this time, however Np(IV) is accumulated obviously at scrubbing stage when the nitric acid concentration of scrubbing reagent is 1.5mol/L.

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