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Dynamic Test of New Extraction System –TODGA in Meta-Nitrobenzotrifluoride

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Tetraoctyldiamide of diglycolic acid –(TODGA) is actively studied as promising extractant for actinide separation. Extraction properties of TODGA in various diluents were studied. It was shown, that maximal metal concentration in the organic phase can be achieved when meta-nitrobenzotrifluoride (F-3) was used as a diluents.

Actinide and lanthanide extraction from HLW by 0.2 M TODGA in F-3 was tested in dynamic test. Simulated HLW –PUREX process raffinate with high concentration of lanthanides was used as a feed solution. Extraction mock-up has worked more 110 hours, about 5,5L of feed solution was used, solvent had more two cycles. High efficiency of actinide (americium, thorium, uranium) and lanthanides extraction (more 99,9%) was demonstrated. Zirconium and molybdenum partly remained in raffinate. The distribution of components between the stages of flowsheets was studied on the base of stage sampling. Lanthanide extraction is in the raw: La < Ce < Nd < Gd < Sm < Eu < Y. Extraction of americium is very close to such lanthanides as Nd and Gd. These trends are in good accordance with literature data for TODGA –dodecane solvent.

The loss of TODGA with raffinate is about 10 mg/L. It's noted that Tc has not been full stripped from solvent. TODGA –metanitrobenzotrifluoride is very promising solvent for HLW processing

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