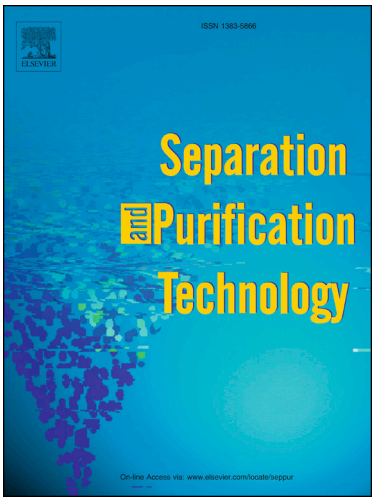

Process for recovery of uranium from low grade SDU of phosphoric acid/ D2EHPA-TBP plant origin using DHOA/*n*-dodecane solvent

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Process for recovery of uranium from low grade SDU of phosphoric acid/D2EHPA-TBP plant origin using DHOA/*n*-dodecane solvent

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Abstract

A process is described for separation and recovery of uranium from low grade sodium diuranate (SDU) obtained from processing of phosphatic uranium with D2EHPA-TBP solvent. SDU containing impurities of rare earths mostly heavier fraction (Y, Dy, Er, Yb) and Fe, Al, Cr, Mn, Ca etc. was dissolved in nitric acid and contacted with *N*,*N*-dihexyl octanamide (DHOA) / *n*-dodecane solvent for selective separation of uranium from rest of the impurities. The average separation factor of uranium with respect to the heavy rare earths and base metals was obtained was 30 and 1000 respectively. Effect of different experimental parameters like aqueous nitric acid concentration, DHOA concentration, uranium concentration, phase ratio of extraction, scrubbing and stripping was optimized to obtain high purity uranium product solution. The extraction of uranium by DHOA follows solvation mechanism, at low uranium loading the combining ratio of U to DHOA determined by slope analysis method suggests complex formation as $[UO_2(NO_3)_2.2DHOA]$. A 8-stage counter current extraction of 70 g/L uranium feed solution obtained on dissolving SDU in 3M HNO_3 with 1 M DHOA/*n*-dodecane solvent at O/A =1 and scrubbing with 80 g/L pure uranium solution in 3 M HNO_3 at O/A = 4:1 was found appropriate to obtain uranium of purity above 99.9%.

Keywords: DHOA, uranium, rare earths, SDU, phosphoric acid, selective separation

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