

538d Lab-Scale Demonstration of the Urex+1 Process Using Spent Nuclear Fuel

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The Advanced Fuel Cycle Initiative (AFCI), funded by the Department of Energy's Office of Nuclear Energy, is developing advanced technologies to allow for the safe and economical disposal of waste from nuclear reactors; thus assuring a stable energy supply for the future. An important element of this initiative is the separation of key radionuclides followed by either superior waste-disposal forms and/or transmutation of long-lived isotopes. To that end, the AFCI is developing advanced fuel reprocessing systems that separate key radionuclides from spent fuel. One of these systems is the UREX+1 process. The UREX+1 process is a series of four solvent-extraction flowsheets and one ion exchange process that perform the following operations: (1) recovery of U and Tc (UREX), (2) recovery of Cs and Sr (CCD-PEG), and (3) group recovery of Pu, Np, minor actinides and lanthanides Am and Cm (TRUEX), (4) and separation of actinides from lanthanides (TALSPEAK). This paper discusses the results of the FY2005 demonstration of the UREX, TRUEX, and TALSPEAK processes using spent nuclear fuel, as well as future development needs and plans.