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DHDECMP从强放废液中分离和回收锕系-镧系元素的研究

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摘要 文章在单级萃取实验的基础上,以串级萃取的实验方法,用30%DHDECMP-DEB从模拟动力堆核燃料后处理1AW强放废液中,进行了分离和回收锕系-镧系元素的工艺研究。串级实验是在共萃取槽R-A;分离槽R-B;反萃取槽R-C三个槽进行的。经过共萃取槽后,从强放废液中提取了全部α-放射性核素;经过分离槽后,使Pu,Am,Gd等三价锕系-镧系元素与U,Np分离;经过反萃取槽后,回收了Np和U。

关键词 锕系 镧系 DHDECMP 萃取分离 高放废液

分类号

SEPARATION OF ACTINIDES AND LANTHANIDES FROM NUCLEAR POWER REACTOR FUEL REPROCESSING WASTE BY BIDENTATE ORGANOPHOSPHOROUS EXTRACTANT

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Abstract A multistage countercurrent extraction process is developed for the removaland recovery of actinides and lanthanides by 30(V)% bidentate organophospho-rous extractant DHDECMP in diethyl benzene from 3 mol/1 nitric acid solutionof simulated nuclear power reactor fuel reprocessing waste. In the R-A extractioncycle (6 extraction stages and 2 scrub stages), the recovery efficiency for U, Np,Pu, Am and Gd is 99.95%, 99.40%, 99.95%, 99.99% and 99.70% respectively,and the decontamination factor for fission product elements is DF_(Zr)>3.6×10~3,DF_(Nb)>3.7×10~3, DF_(Ru)=6.8, DF_(C?)>3.9×10~3 and DF_(Sr)>2.8×10~3 respectively.In the R-B cycle (6 stripping stages) for the stripping of Pu, Am and Gd fromorganic phase, the stripping efficiency for Pu, Am and Gd is 96.58%,>99.65%and>99.70% respectively. Finally, in the R-C cycle (6 stripping stages) for thestripping of Np and U, the stripping efficiency for Np is 99.95% whereas thatfor U is 98.02%.

Key words Bidentate organophosphorous extractant DHDECMP U Np Pu Am Gd Reprocessing waste

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