

CMP流程处理高放废液后的锕系镧系的分离研究

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摘要 研究了以HDEHP为萃取剂、DTPA为络合剂,在0.2—0.5mol/l HNO₃酸度下实现An(III)、Ln(III)分离的工艺条件。结果表明,Am(III)、Gd(III)和Eu(III)的分配比和HDEHP浓度的平方成正比,和酸度的3次方成反比。随温度的升高和料液中金属离子起始浓度的增大而降低。Am(III)、Gd(III)和Eu(III)的萃取反应热依次为-7.1×10⁻³J·mol⁻¹,-9.2×10⁻³J·mol⁻¹和-1.9×10⁻³J·mol⁻¹。采用1.0 mol/l HDEHP-煤油为萃取剂,pH3.2-3.6,0.15 mol/l DTPA-2 mol/l 乳酸为反萃剂,用模拟料液进行串级实验。Am(III)近100%被回收,和Am(III)共存于水相的Ln(III)少于3%。根据实验结果提出了概念流程。

关键词 [锕系元素](#) [镧系元素](#) [萃取分离](#) [HDEHP](#) [DTPA](#)

分类号

STUDY ON THE SEPARATION OF ACTINIDES AND LANTHANIDES RECOVERED FROM HIGH-LEVEL LIQUID WASTE (HLW) BY CMP PROCESS

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Abstract The work investigates the technique conditions for the separation of An(III) and Ln(III) within the acidity range of 0.2--0.5 mol/l HNO₃. The effects of varying HDEHP, DTPA, H⁺ and initial metal ion concentrations, and temperature are studied. The results show that the distribution ratio of Am(III), Gd(III) and Eu(III) are proportional to the second power of HDEHP concentration, and in-versely proportional to the third power of H⁺ concentration, respectively. The extraction enthalpies of Am(III), Gd(III) and Eu(III) are -7.1×10⁻³ J·mol⁻¹, -9.2×10⁻³ J·mol⁻¹ and -1.9×10⁻³ J·mol⁻¹ in turn. 1.0 mol/l HDEHP--kerosen is used for coextraction of An(III) and Ln(III), and a lac-tic acid--DTPA mixture solution is used for selective stripping of An(III). Counter--current cascade ex-periments are performed. Nearly 100% An(III) is recovered, less than 3% Ln(III) remains with An(III). A conceptual flowsheet for the separation is suggested.

Key words [Actinides](#) [Lanthanides](#) [Seperation](#) [HDEHP](#) [DTPA](#)

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