

SOLVENT EXTRACTION SEPARATION OF TRIVALENT LANTHANIDES WITH CALIX[n]ARENE AND β -DIKETONE (DBM and HTTA).M.C.F.C. Felinto¹ and M.S.I. Souza¹*¹Instituto de Pesquisas Energéticas e Nucleares Travessa R 400 Cidade Universitária, São Paulo SP. CEP 05508-970. Brazil*

Lanthanide elements possess very unique and superior physical and chemistry properties that are suited to the creation of advanced materials components for high technological devices. Mutual separation among adjacent lanthanide ions is a most difficult problem in the separation metal ions due to the similar chemistry properties. On another hand, among the [1_n] metacyclophanes, calixarenes are attractive ligands for solvent extraction, mainly due to the possibilities to introduce various ionophilic groups in a certain geometry arrangement with the molecule, to pre-organize the conformation, to balance the hydrophobic and ionophilic characters. This work studied the behavior of acetatecalix[n]arene (n = 4, 6) associated with two β -diketones (dibenzoylmethane-DBM and thenoyltrifluoroacetone-HTTA) in the extraction of trivalent lanthanide ions (Pr, Nd, Eu and Er). It was investigated the influence of pH, Ln metal concentration, and kinetic of extraction. The results shown that the acetatecalix[n]arene is a powerful extractant to the Ln with percents of extraction approximately 100%, in nitric acid solutions with lanthanide concentration near to $5.0 \cdot 10^{-4}$ M. The selectivity parameters $D_{Ln1}^{3+} / D_{Ln2}^{3+}$ for calixarenes systems are in some cases high, especially when these ratios are between light and heavy element series as for example Pr³⁺/Eu³⁺ couple where these ratios is 5.7 (in 3M HNO₃ for tetraacetatecalix[4]arene system) and approximately 5.0 for hexaacetatecalix[6]arene in all range of HNO₃. The addition of β -diketones (DBM and HTTA) enhances the efficiency of process in approximately 30% although a decreasing in the selectivity coefficient have been observed. The replacement of hydroxyl groups by acetate groups also enhances the percent of extraction.

[FAPESP and CNPq for financial support].