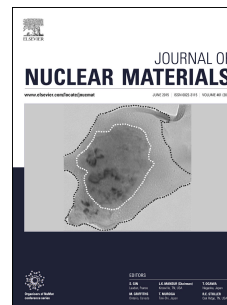


# Accepted Manuscript

A study on recovery of uranium in the anode basket residues delivered from the pyrochemical process of used nuclear fuel

H.C. Eun, T.J. Kim, J.H. Jang, G.Y. Kim, S.B. Park, D.S. Yoon, S.H. Kim, S.W. Paek, S.J. Lee



PII: S0022-3115(17)31767-1

DOI: [10.1016/j.jnucmat.2018.01.022](https://doi.org/10.1016/j.jnucmat.2018.01.022)

Reference: NUMA 50730

To appear in: *Journal of Nuclear Materials*

Received Date: 12 December 2017

Revised Date: 27 December 2017

Accepted Date: 12 January 2018

Please cite this article as: H.C. Eun, T.J. Kim, J.H. Jang, G.Y. Kim, S.B. Park, D.S. Yoon, S.H. Kim, S.W. Paek, S.J. Lee, A study on recovery of uranium in the anode basket residues delivered from the pyrochemical process of used nuclear fuel, *Journal of Nuclear Materials* (2018), doi: 10.1016/j.jnucmat.2018.01.022.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 **A study on recovery of uranium in the anode basket residues delivered**  
2 **from the pyrochemical process of used nuclear fuel**

3 **H.C. Eun<sup>\*</sup>, T.J. Kim, J.H. Jang, G.Y. Kim, S.B. Park, D.S. Yoon, S.H. Kim,**  
4 **S.W. Paek, S.J. Lee**

5 *Pyroprocessing Division, Korea Atomic Energy Research Institute, Daedeok-daero*  
6 *989-111, Yuseong-gu, Daejeon, 34057, Republic of Korea*

7  
8 **Abstract**

9 In this study, the chlorination of uranium oxide ( $\text{UO}_2$ ) using ammonium chloride  
10 and zirconium as chemical agents was conducted to recover the uranium in the anode  
11 basket residues from the pyrochemical process of used nuclear fuel. The chlorination of  
12  $\text{UO}_2$  was predicted using thermodynamic equilibrium calculations. The experimental  
13 conditions for the chlorination were determined using a chlorination test with cerium  
14 oxide ( $\text{CeO}_2$ ). In the chlorination test, it was confirmed that  $\text{UO}_2$  was chlorinated into  
15  $\text{UCl}_3$  at 320 °C, some  $\text{UO}_2$  remained without changes in the chemical form, and  $\text{ZrO}_2$ ,  
16  $\text{Zr}_2\text{O}$ , and  $\text{ZrCl}_2$  were generated as byproducts.

17  
18 **Key words:** recovery of uranium, anode basket residue, pyrochemical process,  
19 chlorination,  $\text{UO}_2$

20  

---

<sup>\*</sup>Corresponding author, Tel.: +42 868 2712, Fax.: +42 868 2329, E-mail address: ehc2004@kaeri.re.kr (H.C. Eun).

Download English Version:

<https://daneshyari.com/en/article/7963379>

Download Persian Version:

<https://daneshyari.com/article/7963379>

[Daneshyari.com](https://daneshyari.com)