

## Electrolytic extraction of palladium from nitric acid and simulated high-level liquid waste

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### ABSTRACT

Electrochemical behavior of palladium (II) nitrate in nitric acid medium and simulated high-level liquid waste has been investigated to explore the feasibility of recovering this potentially useful fission product from high-level liquid waste. The cyclic voltammogram of palladium (II) in nitric acid medium at stainless steel electrode consists of a cathodic wave occurring at an onset of  $-0.4$  V (vs. Pd) due to the irreversible reduction of palladium (II) to metallic palladium at 298 K. The recovery of palladium was quantitative at nitric acid concentrations ranging from 1 to 4 M, however, the recovery from simulated high-level liquid waste (SHLLW) solution was only 30% due to the interferences of various ions present in SHLLW. The faradic efficiency of electrolysis lowered with increase in nitric acid concentration and only silver was found to get co-deposited to the extent of 5% along with palladium from SHLLW solution.

*Keywords:* Palladium; Fission product; Nuclear waste; Voltammetry; Electrodeposition

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