

## Extraction and electrolytic reduction of palladium in DBSO/ionic liquid

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As part of a research to recover platinum group metals from spent nuclear fuel using ionic liquid, the extraction and electrolytic reduction of palladium was studied using dibutyl sulfoxide (DBSO) as an extractant in the ionic liquid. 1-Butyl-3-methylimidazolium bis(trifluoromethyl-sulfonyl) imide (bmimTf<sub>2</sub>N) was used for the extraction of palladium from a nitric acid medium, followed by direct electrodeposition from the organic phase. The extraction of Pd(II) increased with a decrease in the concentration of nitric acid, and the extraction mechanism of palladium into bmimTf<sub>2</sub>N can be represented by a cation exchange reaction. Electrodeposition experiments of Pd ions extracted from 0.5 M nitric acid using 1 M DBSO/bmimTf<sub>2</sub>N were carried out at -1.0 V potential. The current response for the potentiostatic electrolysis was stable throughout, and black and dense particles of Pd were deposited on the glassy carbon electrode. The results indicate that ionic liquid bmimTf<sub>2</sub>N can perform both as a diluent for the extractant DBSO and as an electrolytic medium for deposition of palladium. Extraction of Pd followed by direct electrodeposition from the organic phase is feasible.