

## RECOVERY OF PLATINUM AND PALLADIUM FROM CHLORIDE SOLUTIONS BY A THIODIGLYCOLAMIDE DERIVATIVE

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*The liquid-liquid extraction of platinum(IV) and palladium(II) from hydrochloric acid media was carried out using N,N'-dimethyl-N,N'-dicyclohexylthiodiglycolamide (DMDCHTDGA) in 1,2-dichloroethane (1,2-DCE). Pt(IV) is efficiently extracted from 5 M HCl onwards (%E ≥ 97%), whereas Pd(II) is quantitatively recovered from 1 to 8 M HCl solutions. Both Pt(IV) and Pd(II) can be successfully stripped from the loaded organic phases, the former with a 1 M HCl solution, the latter with 0.1 M thiourea in 1 M HCl. The maximum loading capacity of DMDCHTDGA for Pt(IV) could not be determined but it is high, since molar ratios extractant:Pt(IV) within 2 and 3 have been achieved. Data obtained from successive extraction-stripping cycles suggest a good stability profile of DMDCHTDGA towards Pt(IV) recovery. Attempts to replace 1,2-DCE by more environmentally-friendly diluents showed, in general, comparable %E for Pt(IV). The study of the influence of acidity, as well as chloride ion and DMDCHTDGA concentrations, allows a proposal for the composition of the Pt(IV) species formed upon extraction. Results obtained with binary metal ion solutions point out that Pt(IV) and Pd(II) can be efficiently separated from DMDCHTDGA loaded organic phases through sequential selective stripping.*

**Keywords:** platinum, palladium, thiodiglycolamide derivative, liquid-liquid extraction, hydrochloric acid

## INTRODUCTION

Platinum, palladium, and related rare metals are used in several leading technological applications, namely electronics, fuel cells, and catalysts (in automotive catalytic converters, oil refining, and fine chemistry processing).<sup>[1]</sup> Platinum-group metals (PGMs) are very valuable and considered critical raw materials<sup>[2]</sup> since they are scarce in the Earth's crust,

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