

# International Solvent Extraction Conference – ISEC 2008

## REFINING AND PROCESSING OF PGMs AND GOLD AT THE 18th ISEC

Reviewed by David J. Robinson

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Following the successful 2005 conference in Beijing (Solvent Extraction for Sustainable Development (1)), the 18th International Solvent Extraction Conference (ISEC 2008), Solvent Extraction: Fundamentals to Industrial Applications, was held in Tucson, Arizona, U.S.A., between 15th and 19th September 2008 (2). The programme emphasised the development from fundamentals to industrial applications of solvent extraction. Session topics were:

- Hydrometallurgy and Metals Extraction
- Process Chemistry and Engineering
- Nuclear Applications
- Analytical and Preparative Chemistry
- Biotechnology, Pharmaceuticals, Life-Science Products and Organic Products
- Fundamentals
- Novel Reagents, Materials and Techniques

The conference followed a traditional format with five excellent plenary lectures from experts in the various fields, five parallel oral programmes, two poster sessions and two panel discussion sessions specifically considering 'Uranium Processing' and 'New Reagents and Their Design'. Full conference proceedings have been published (3).

The interesting and potentially exploitable aspects of the chemistry of the platinum group metals (pgms) in solvent extraction-based refining circuits continue to be of significant interest (4–10). Comments on selected oral and poster presentations most relevant to the furthering of fundamental chemistry, refining and processing of both the pgms and gold are given here under the titles of the sessions in which they appeared (with the relevant page numbers of the aforementioned proceedings given in brackets).

### Hydrometallurgy and Metals Extraction

Several systems have been proposed for the replacement of cyanide as a lixiviant for gold and silver, and a thermodynamic model has been developed by G. T. Lapidus *et al.* (Universidad Autónoma Metropolitana-Iztapalapa, Mexico) (pp. 299–304) for the precious metal complexes extracted from an ammonium copper thiosulfate solution. Similarly, the use of thiourea as an alternative to cyanide for the recovery of gold and silver has several advantages, including improved kinetics and lower toxicity of the reagents. Z. Gamino-Arroyo *et al.* (École Centrale Paris, France) (pp. 293–298) presented a mechanistic study of the extraction of precious metals from a di(2-ethylhexyl)di thiophosphoric acid solution system. A study of the influence of residual gold on the solvent extraction-based recovery of cyanide from more traditional industrial cyanidation liquors was presented by M. B. Mansur *et al.* (Universidade Federal de Minas Gerais, Brazil) (pp. 311–316).

As part of the capacity expansion project within the Anglo Platinum Precious Metals Refinery in South Africa, S. F. Woollam (Anglo Research, South Africa) and R. A. Grant (Johnson Matthey Technology Centre (JMTFC), U.K.) (pp. 281–286) observed a significant increase in the rate of acid-catalysed degradation of the hydroxyoxime LIX 841 in the palladium solvent extraction circuit when the reagent concentration was increased. However, a reduction in strip acid concentration was found to alleviate this problem sufficiently, while leaving phase disengagement and overall strip circuit efficiency at acceptable levels. A number of reagents have been reported previously as

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