

# Spotlight

## ISEC '96 by K.C. Sole\*

The International Solvent Extraction Conference takes place every three years, under the auspices of the International Solvent Extraction Committee. ISEC '96 held in Melbourne, Australia, in March 1996, was attended by delegates from 34 countries. South Africa was well represented, with delegates from Amplats, De Beers, Mintek, Western Platinum Refinery, and independent consultant Phillip Lloyd (who represents South Africa on the International Committee).

The theme of this year's conference was 'Value Adding through Solvent Extraction'.

Five plenary lectures were presented. Dr E. Blass of Germany gave the opening presentation entitled 'Solvent extraction—a historical review', which traced evidence for the use of solvent extraction (SX) from the time of the ancient Egyptians, through the Middle Ages and Renaissance, to the Industrial Revolution.

The lecture by Gordon Ritcey (Canada), 'Solvent extraction processing plants—problems, assessments, solutions', provided an interesting look at several practical aspects of SX technology, highlighting the factors that should be considered in the design and operation of a plant, but that are often overlooked or ignored.

Henry Freiser (USA) received the 1996 Carl Hanson Award for Solvent Extraction, and delivered a paper entitled 'New tools for old questions in solvent extraction', a presentation that drew largely on his personal experiences of five decades. He paid particular attention to the use of the automated Teflon-membrane extraction system (ATMES) and Fourier Transform infrared attenuated total reflectance spectroscopy (FTIR-ATR) for the elucidation of interfacial phenomena, and the use of centrifugal partition chromatography (CPC), which his research group has pioneered in recent years.

David Stuckley (UK) gave an interesting discussion of 'Solvent extraction in biotechnology'. The final plenary lecture, 'Liquid-liquid extraction equipment: progress and problems', was a challenging and provocative paper delivered by Mike Slater (UK).

The remainder of the conference comprised 113 oral and 164 poster presentations, ranging from fundamental studies through to equipment design and plant experience. Base- and rare-earth metal extractions and hydrometallurgical applications dominated the conference, although analytical, biotechnological, nuclear-fuel, and petrochemical applications also received attention. Papers on supercritical extraction and membrane technologies drew considerable interest; although there is much active research, practical applications of these technologies have yet to be realized.

Several new extractant systems for the recovery of base metals were discussed. Zeneca reported on the performance of their latest developmental zinc extractant, DS5869, in laboratory and miniplant testwork. This extractant shows

high selectivity for zinc over iron in sulphate media. There is growing interest worldwide in the application of SX to zinc systems, and it seems likely that commercial operations employing one of the new zinc-specific reagents will be seen in the not-too-distant future.

In the area of cobalt SX, Queensland Nickel Inc. (Australia) recently completed extensive pilot-plant testwork on an alternative process for the recovery of high-purity cobalt from their impure cobalt sulphide slurry. The process appears rather cumbersome, but can easily be integrated with existing plant without changes in the nickel-production flowsheet. The full-scale plant is currently under construction.

Several European partners are collaborating on the development of a new selective extractant for iron from sulphate media, based on aminomethylenephosphonic-acid functionality. Although work is in the early stages, the results are promising, and the reagents appear to have significant advantages over traditional extractants such as di(2-ethylhexyl) phosphoric acid.

Somewhat surprisingly, little was reported on the SX of nickel. This may be because much of the research is being kept confidential at present since this is an area ripe for new developments.

A substantial number of papers<sup>†</sup>, originating particularly in the Far East, dealt with various aspects of the separation of lanthanides. Cytec publicized details of Cyanex 571, a reagent recently commercialized for the SX of lanthanides.

The overall impression gained from the technical presentations was that SX is maturing as a technology, and that development, rather than innovation, is occurring at present. SX has become widely accepted as a viable separation technology for applications in many areas. As more operating plants are brought on-line worldwide in the next few years, the next conference (Barcelona, 1999) may reflect more applied studies.

Following a dynamic bid by Phillip Lloyd for South Africa to host the next conference, supported by a video presentation and endorsements from various South African scientific and engineering societies (including The South African Institute of Mining and Metallurgy), South Africa was elected to host ISEC 2002, beating bids from China, the USA, Canada, and Austria. The new-found respectability of this country in the international scientific community, and the emerging importance of SX in the African subcontinent, also favoured the decision to hold the next conference here. ♦

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† Copies of the Proceedings of ISEC '96, entitled Value Adding through Solvent Extraction (two volumes), edited by D.C. Shallcross, R. Paimin, and L.M. Prvcić, are available from The University of Melbourne, Department of Chemical Engineering, Parkville, Victoria 3052, Australia (ISBN 0 7325 1250 6).