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The January 2006 issue of Platinum Metals Review starts volume 50, and celebrates the 50th year of continuous publication for our journal. Among items appearing in this issue:

Ruthenium Polyaminocarboxylates as Metallopharmaceuticals

Ruthenium polyaminocarboxylate (Ru-pac) complexes have potential use in biological applications and as metallodrugs. Ru-pac bind to certain biomolecules, have stable and accessible oxidation states, and can undergo fast ligand exchange. Ru-pac complexes can mimic enzymatic hydrocarbon oxidation by cytochrome P-450. This is important for developing Ru-pac-based agents to cleave DNA and artificial nuclease in DNA foot-printing experiments. Debabrata Chatterjee and Anannya Mitra (Central Mechanical Engineering Research Institute, India) and Professor G. S. De (University of Burdwan, India) describe mechanisms of these complexes and possible uses, such as DNA modification, NO scavenging and carrying, and protease inhibition.

New Mechanical Properties Data for Platinum Jewellery Alloys

There is scant data on the mechanical properties of the jewellery alloys Pt-5 wt.% Cu and Pt-5 wt.% Ru. Professor Candy Lang and Kamili Jackson (University of Cape Town, South Africa) present new micrographs and values of hardness, strength and elongation after different workings, and compare them to the available literature values. It is suggested that the data can serve as a basis for comparison in further research on the alloys.

The 10th International Platinum Symposium

Oulu, Finland, was the location in August 2005 for the 10th International Platinum Symposium. Professors Grant Cawthorn and Tony Naldrett (University of the Witwatersrand, South Africa) report on presentations covering discoveries and evaluations of mineralised areas, descriptions of host rocks (usually layered igneous intrusions), characterisations of different platinum-group mineral assemblages, and ideas on the processes that induce platinum mineralisation. Reporting of exploration programmes to stock exchanges has changed, and much more quantitative information is now available about developments in the platinum group elements.

Unusually High Iridium Permeability

Iridium crucibles used in extracting gold and silver from zinc refining residues were noticed to have an anomalously high permeability to gold. This was investigated by examining gold diffusion into single crystals of iridium annealed at 1300–2000 K, under ultrahigh (UHV) and technical grade (TGV) vacuums. On annealing in TGV, interstitial impurities formed vacancy-impurity complexes (VICs) which dissociated to give large concentrations of 'extrinsic' vacancies. Professor S. M. Klotsman, S. A. Matveev, G. N. Tatarinova, A. N. Timofeev (Institute of Metal Physics, Ekaterinburg, Russian Federation) and A. V. Yermakov and V. K. Rudenko (Ekaterinburg Non-Ferrous Metals Processing Plant JSC, Russian Federation) concluded that the high gold diffusion in iridium in TGV was due to the 'extrinsic' vacancies. Alloying iridium with hafnium or thorium will avoid this.

Platinum's Catalytic Activity on Encapsulation

Results of work on a platinum catalyst completely encapsulated by ceria is reported by David Thompsett (Johnson Matthey Technology Centre, U.K.) and Professor S. C. E. Tsang (University of Reading, U.K.). The activity of the catalyst was good and selectivity was excellent for the water gas shift reaction. This is the first report of such activity for a completely encapsulated catalyst.

Osmium – The Patent Landscape

Dedicated software designed to create 'landscapes' of patent activity is applied to patents on osmium over a 25 year time period. Richard Seymour (Johnson Matthey Technology Centre,

U.K.) demonstrates how the software can display the range of patented technologies, and identify 'hot spots' in current patent activity or areas where particular companies are currently active.

Metathesis Researchers Win the Nobel Prize

The 2005 Nobel Prize in Chemistry was awarded to Y. Chauvin (Institute Français du Pétrole, France), Professor R. H. Grubbs (Caltech, U.S.A.) and Professor R. R. Schrock (MIT, U.S.A.) for the development of the metathesis reaction in organic synthesis. Professor A. T. Balaban (Texas A&M University, U.S.A.) and Valerian and Ileana Dragutan (Institute of Organic Chemistry, Romanian Academy) review the literature and present a pocket history of these reactions, many of which rely on ruthenium catalysis.

The Ninth Grove Fuel Cell Symposium

The latest in this series of prestigious fuel cell Symposia, held in London from 4–6 October, 2005, is reviewed by Donald S. Cameron (The Interact Consultancy, U.K.). Manufacturers of fuel cells, components and associated equipment are emerging, and many of their products were exhibited at the Symposium. Small fuel cells of up to 5 kW are now in use as standby generators for residential CHP applications and consumer electronics. Costs must be substantially reduced for widespread transport applications to emerge – even for buses, but for stationary applications, increasing manufacturing capacity is likely to reduce costs considerably.

7th European Congress on Catalysis

The EUROPACAT-VII Congress that took place in Sophia, Bulgaria, from 28 August to 1 September, 2005, is reviewed by Stephen Poulston, Andrew Smith and Thomas Ilkenhans (Johnson Matthey Technology Centre, U.K.). The Congress was entitled 'A Key to a Richer and Cleaner Society', which demonstrates a major preoccupation of current research. Platinum group metals featured in several of the eleven different symposia.

“Supported Metals in Catalysis”

Volume 5 in the 'Catalytic Science Series' is reviewed by Neil R. McGuire (Johnson Matthey Catalysts, U.K.). The book discusses developments in the characterisation and application of supported metals in heterogeneous catalysis, with in-depth topics, such as the catalytic activation of C1 compounds, naphtha reforming, hydrogen production and the synthesis of fine chemicals. Catalytic abatement of pollutants from flame combustion of fossil fuels for transport applications is introduced.

Final Analysis: Recommendations for Catalyst Users

John Dunleavy (Johnson Matthey PCT, U.K.) writes that catalysts are crucial for the operation of many processes, and are a major contributor to the overall economics. Precious metal-based catalysts, such as platinum or platinum-rhenium alloys, are extensively used in chemical applications and refining. The technical services a customer should expect from the catalyst supplier include regular evaluation of process data and laboratory analyses of spent catalyst to assess performance and response to operating conditions, and an assessment of the remaining service life of the catalyst.

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