Platinum Metals Review October 2006 e

www.platinummetalsreview.com and www.ingentaconnect.com

Among items appearing in this issue:

High-Temperature Mechanical Properties of Pure Iridium
R. Weiland and Professor D. F. Lupton (W. C. Heraeus GmbH, Hanau, Germany), Professor B. Fischer, Professor J. Merker and C. Scheckenbach (University of Applied Sciences Jena, Germany) and J. Witte (SCHOTT Glas, Mainz, Germany) provide data on the high-temperature deformation behaviour of pure iridium. Material properties such as stress-rupture strength, high-temperature tensile strength and creep behaviour are determined in the temperature range 1650ºC to 2300ºC. Results show that fracture behaviour is controlled by two different fracture mechanisms depending on test conditions, in particular applied load and test temperature. The existence of the different fracture modes is confirmed by SEM examination. Anomalies in the creep curves and the results of high-temperature tensile tests indicate that dynamic recrystallisation plays an important role in the high-temperature deformation behaviour of pure iridium.

Work on Rhodium and Iridium from Rhodium Bicentenary Competition Winner
Professor Robert H. Crabtree (Yale University, U.S.A.) describes work extending the catalytic chemistry of rhodium and iridium, with particular emphasis on the great versatility of rhodium. He addresses topics such as the design of chelating *N*-heterocyclic carbene ligands, and the cyclisation of alkynes using rhodium and iridium phosphine compounds as reagents or catalysts. The work was carried out by Ph.D. students sponsored through the Rhodium Bicentenary Competition prize awarded by Johnson Matthey.

Platinum Group Metals at the Forefront of Automotive Pollution Control
The Seventh International Congress on Catalysis and Automotive Pollution Control (CAPoC7) was held from 30th August to 1st September 2006 in Brussels, Belgium. Jillian Bailie, Peter Hinde and Valérie Houel (Johnson Matthey Technology Centre, U.K.) review the event, which was attended by 300 participants from academia and industry. The programme of high-quality presentations demonstrated that the platinum group metals remain at the forefront of many aspects of automotive catalysis.

Morphology Changes in the Platinised Platinum Interface
Super-dry dimethylformamide containing tetraalkylammonium salts (TAAX) causes platinised platinum layers to exhibit a reversible charging process at quite negative potentials (more negative than –2.2 V *vs.* saturated calomel electrode (SCE)), as described in this article by Emeritus Professor Jacques Simonet (Université de Rennes 1, France). A huge change of morphology of the original platinised layer occurs after cathodic charge and oxidation by air of samples removed from the cell. Repeated reduction/oxidation stages lead to progressive transformation of the original amorphous platinised layer, with a noticeable swelling of the original layer. The peculiar reactivity of platinum in the presence of bulky tetraalkylammonium salts is the precondition for a new kind of platinum interface.

Towards a Greater Understanding of Catalysis
Stan E. Golunski (Johnson Matthey Technology Centre, U.K.) attended the annual conference of the Royal Society of Chemistry Surface Reactivity and Catalysis Group (SURCAT 2006), from 25th to 27th July 2006. He reports that the precious metals, particularly platinum, palladium, rhodium and gold, were the centre of attention in the wide range of catalytic materials discussed. The tools available for the study of catalysis have increased since the first SURCAT meeting in 1973, leading towards a greater understanding of the relationship between the active site and its surface environment.

Effects of Atmosphere on Platinum-Based Thermocouples
Roy Rushforth (Charles Booth Ltd, Birmingham, U.K.) expands on a series of articles on platinum-based thermocouples by Roger Wilkinson in this Journal. In this article, Rushforth demonstrates that the prevailing atmosphere in which the thermocouple is operating, and the potential for contamination, can have a profound effect on its life and accuracy.

Fundamentals and Development of Fuel Cells
“Principles of Fuel Cells”, by Professor Xianguo Li, is reviewed by Professor Tom R. Ralph (Johnson Matthey Fuel Cells, Swindon, U.K.). The book covers both the fundamental aspects of thermodynamics and electrochemical processes in the fuel cell, and the development of the six major fuel cell types. Aimed at senior-level undergraduate and first year graduate students, the chapters on fundamentals provide a solid basis for tackling fuel cell technology at a higher level. Overall, the book succeeds in its main aim of educating students in the relevant challenges.

Platinum Group Metals in Electrochemical Energy Storage and Conversion
Sarah C. Ball (Johnson Matthey Technology Centre, U.K.) reports on the 10th Ulm Electrochemical Talks (UECT), held on the 27th and 28th June 2006 in Ulm, Germany. This selective review concentrates on the fuel cell aspects of the talks, which covered trends in the development of batteries, supercapacitors and fuel cells. New platinum group metal-based alloy catalysts described at the Talks show marked increases in stability and activity over platinum-only materials for fuel cell applications.

Susan V. Ashton: A Tribute on her Retirement as Editor
Mike Steel, former Market Research & Planning Director of Johnson Matthey's Precious Metal Products, presents a tribute highlighting the achievements of Susan Ashton, who retired as Editor of Platinum Metals Review in May 2006.

Patent and Literature Selection and Yearly Indexes
The issue also contains a selection of abstracts based on recently published patent and scientific literature. The Name and Subject Indexes for 2006 are also included.

Contact
To receive E-mail alerts about the new issues of Platinum Metals Review please register at the website: http://www.platinummetalsreview.com/. You may also request back issues, change your E-mail address, join our People and Organisation Directories or contact the Editor or the Editorial Office by emailing us on: jmpmr@matthey.com.