Modelling Reactions with Chiral Ruthenium Catalysts
Sam French (Johnson Matthey Technology Centre, Sonning Common, U.K.) presents findings from a collaborative research project looking at ruthenium-based asymmetric hydrogenation catalysts. Selectivity is a key success factor in the chiral catalyst technologies market, and understanding the fundamental processes that occur when a reagent interacts with a homogeneous single-site catalyst is therefore critical to the rational design of new catalysts. [(*S*)-XylBINAP-RuH_2-(*S,S*)-DPEN], first developed by Noyori, is studied as the parent or prototype model of a series of efficient hydrogenation catalysts. In a 'first' for Platinum Metals Review, a simulation of the approach of a ketone reactant molecule to the chiral ruthenium catalyst is illustrated by an animation.

Platinum-Gold Alloy Microstructure
Supported platinum-gold catalysts are often superior to those containing platinum alone for low-temperature selective oxidations. Geoffrey C. Bond (Emeritus Professor, Brunel University, U.K.) discusses the platinum-gold phase diagram, which shows a wide miscibility gap due to limited mutual solubility of the components. However, small particles (< 3 nm) form homogeneous alloys because all atoms retain their atomic electronic structure, and rehybridisation due to band formation does not take place.

Platinum Group Metals Refining Technology
Professor Jianmin Yu (Kunming University of Science and Technology, China) presents a synopsis of his new book: "The Separation and Refining Technologies of Precious Metals", (published in Chinese). The book provides data on the refining technologies of platinum group metals (pgms), gold and silver in China and abroad.

Ruthenium Plays a Key Role in Metathesis Chemistry
The NATO Advanced Study Institute on New Frontiers in Metathesis Chemistry: From Nanostructure Design to Sustainable Technologies for Synthesis of Advanced Materials took place in Antalya, Turkey, from 4th to 16th September 2006. Ileana Dragutan and Valerian Dragutan (Institute of Organic Chemistry, Romanian Academy) review the event, which showed pgms, especially ruthenium, playing a key role in olefin metathesis.

Metal-Catalysed Cascade Reactions Using Palladium and Ruthenium
Professor Ron Grigg (MIDAS Centre, University of Leeds, U.K.) reviews the book: "Metal Catalyzed Cascade Reactions", edited by T. J. J. Müller. It is written by experts in the relevant areas and is heavily weighted towards palladium(0)-catalysed processes. Ruthenium-catalysed metathesis and the cobalt-catalysed Paulson-Khand process are also covered.

Strengthening Platinum Jewellery Alloys
Chumani Mshumi and Professor Candy Lang (Centre for Materials Engineering, University of Cape Town, South Africa) carried out microsample tensile testing of platinum-5 wt.% copper alloy. Their results show that low-temperature heat treatment of previously cold-worked specimens gives an increase in yield strength and tensile strength, with a maximum in strength occurring after heat treatment at 300ºC. Ductility is unchanged.

Industrial Processes Catalysed by Palladium
A one day meeting on the Successful Scale-Up of Catalytic Processes was organised by the Applied Catalysis Group of the Royal Society of Chemistry on the 5th October 2006, hosted by Davy Process Technology Ltd, in Stockton-on-Tees, U.K. Chris Mitchell (Huntsman Polyurethanes, Everberg, Belgium) presents a review including the optimisation of three palladium-catalysed processes, as well as discussion of the approach to catalytic processes scale-up used by different companies.

Iridium and Platinum in Organic Light Emitting Devices
J. A. Gareth Williams (Department of Chemistry, University of Durham, U.K.) reviews the book: "Organic Light-Emitting Devices: Synthesis, Properties and Applications", edited by K. Müllen and U. Scherf. It brings together contributions from leading research groups in the field, to give a coherent account of the fundamental principles behind the science of OLEDs and of the materials required for their fabrication. Iridium- and platinum-based electrophosphorescent dopants are included.

Platinum Group Metal Perovskites as Catalyst Materials
Thomas Screen (Reaxa Ltd, Manchester, U.K.) reviews the use of pgm perovskites as a relatively new catalyst material, having high activity, versatility and stable structure. Combined with a low pgm content, they can offer advantages over conventional catalysts. He reviews some of the typical applications and preparation methods of pgm perovskites, with particular focus on their use in autocatalysts and for organic synthesis.

Data Storage Materials Using Platinum
Dave M. Newman and M. Lesley Wears (School of Engineering, Computer Science & Mathematics, University of Exeter, U.K.) review two chapters featuring platinum in the development of magnetic data storage materials from the book: "Combinatorial and High-Throughput Discovery and Optimization of Catalysts and Materials", edited by R. A. Potyrailo and W. F. Maier. The book covers a wide range of topics and this is the first of a series of chapter reviews in Platinum Metals Review.

Abstracts and New Patents
A selection of abstracts from the scientific and patent literature is presented.

Final Analysis: Casting Platinum Jewellery – A Challenging Process
Neill Swan (Johnson Matthey Precious Metals Marketing, Royston, U.K.) discusses some measures that jewellery manufacturers and designers can take to improve their cast platinum pieces, and reduce the time and effort spent finishing them. Platinum-cobalt and platinum-ruthenium alloys both provide relatively hard castings. Porosity can be reduced through the design or sprueing method, and much can be done to improve the 'as-cast' structure on the surface by burnishing.

Contact
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