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Among items appearing in this issue:

Asymmetric Hydrogenation Using Rhodium Catalysts with Phosphoramidites

Asymmetric hydrogenation controlled by phosphoramidites and using a rhodium catalyst is described by David J. Ager (DSM, Raleigh, NC, U.S.A.) and André H. M. de Vries and Johannes G. de Vries (DSM Research, Geleen, The Netherlands). The phosphoramidites, in particular those derived from BINOL (MonoPhos family of ligands) are very useful, with a Rh catalyst, for the asymmetric hydrogenation of unsaturated carbon-carbon bonds. High-throughput techniques can be used to synthesise the MonoPhos ligands and then to screen them to identify a promising candidate for a specific transformation. Suitable mixtures of ligands can also be found by high-throughput methods.

Metathesis Reactions Using Ruthenium Allenylidene Complexes

The reactions of ruthenium allenylidene complexes in metathesis catalysis are reviewed by Ileana Dragutan and Valerian Dragutan (Institute of Organic Chemistry, Bucharest, Romania). These complexes are described as a promising class of metathesis pre-catalysts. This type of ruthenium complex, readily accessible from commercial reagents, induces good to excellent metathesis catalytic activity and selectivity, and shows great tolerance towards many organic functional groups. These features permit the synthesis of a wide range of heterocyclic and carbocyclic compounds via RCM and enyne metathesis, and the production of specialty polymers by acyclic diene metathesis and ROMP.

Reducing the Emissions of the Greenhouse Gas Nitrous Oxide

To reduce the production/emission of the green house gas N_2O as a waste product from nitric acid plants, the Norwegian nitrogen fertiliser manufacturer, Yara International ASA, has developed a N_2O abatement catalyst. When the de- N_2O catalyst is placed under the rhodium-platinum gauze pack and the catchment gauzes in a nitric acid plant it cuts the N_2O output by 80% or more. Trine Kopperud (Yara International) describes how the catalyst will be aimed at 'clean development mechanism' (CDM) and 'joint implementation' (JI) countries, as defined by the Kyoto Protocol.

The Effects of Sulfur on PGM Catalysts Used in Hydrocarbon Processes

Precious metal catalysts are crucial to the operation and economics of many hydrocarbon processing applications, but sulfur species, such as H_2S , RSH and RSSR, are poisons for all catalytic processes that use reduced metals as the primary active phase. John Dunleavy (Oil & Gas Section, Johnson Matthey PCT, U.K.) describes how to overcome the problems caused by S poisoning, and some positive uses to which catalyst poisoning with S can be applied.

Catalytic Combustion over PGM Catalysts

Reza Torbati (Johnson Matthey Technology Centre, U.K.) attended the 6th International Workshop on Catalytic Combustion on the Isle of Ischia, Italy, in September 2005. Catalytic combustion is now a benchmark technique for the abatement of volatile organic compound (VOC) emissions. He reports that other areas of great potential for fuel-rich catalytic combustion include fuel cells, and aftertreatment and cold start-up technologies for automotive applications. Catalytic combustion based on platinum, palladium and rhodium catalysts can produce heat and energy at much lower temperature, with lowered pollutant emission. The excellent emission control achievable is an incentive to commercialise this technology.

High-Temperature Mechanical Properties of Rhodium Intermetallics

Yoshihiro Terada (Department of Metallurgy and Ceramics Science, Tokyo Institute of Technology, Japan) and Kenji Ohkubo, Seiji Miura and Tetsuo Mohri (Graduate School of Engineering, Hokkaido University, Japan) measured the thermal conductivity and thermal expansion of $L1_2$ intermetallic compounds Rh_3X ($X = Ti, Zr, Hf, V, Nb, Ta$) between 300 and 1100 K. Values for the thermal conductivities of Rh_3X range over 32 to $103 \text{ W m}^{-1} \text{ K}^{-1}$ at 300 K. The thermal conductivity of Rh_3X is greater if X belongs to Group 5 rather than to Group 4 in the Periodic Table. The coefficient of thermal expansion (CTE) values of Rh_3X increase slightly with increasing temperature, and concentrate around $10 \times 10^{-6} \text{ K}^{-1}$ at 800 K. CTE values of Rh_3X decrease if X is lower in the Periodic Table. Rh_3Nb and Rh_3Ta have higher thermal conductivities and smaller CTE values, and are most suitable for ultra-high temperature structural applications.

Ruthenium Catalysts

“Ruthenium in Organic Synthesis”, edited by S.-I. Murahashi, is reviewed by Laura Ashfield (Johnson Matthey Technology Centre, U.K.). The writers are a range of experts on ruthenium chemistry. Each chapter gives a thorough account of a particular area of ruthenium-catalysed reactions.

Precious Metals Electrodeposition

“Electrodeposition of the Precious Metals: Osmium, Iridium, Rhodium, Rhenium, Ruthenium”, by T. Jones, is reviewed by Alan Boardman (Johnson Matthey Technology Centre, U.K.). This revised edition contains data on fused salt plating, electropolishing and stripping of precious metals, and the emerging area of electroless platinum deposition.

Discoverers of Palladium Isotopes

John W. Arblaster (Coleshill Laboratories, West Midlands, England) gives the fourth in a series of reviews of circumstances surrounding the discoveries of the isotopes of the six platinum group elements. Platinum, iridium and osmium isotopes have already been covered. His current review looks at the discovery and the discoverers of the thirty-four isotopes of palladium.

Auction of Platinotype Creates a New Record

Mike Ware (Buxton, U.K.) describes the platinotype photograph (multiple gum bichromate over platinum) by Edward Steichen (1879–1973) that was recently sold at auction in New York. The platinotype, of a pond in Mamaroneck, is entitled: “The Pond – Moonlight” (1904), New York. The sale set a new world record price for photographs.

Commemorating Smithson Tennant

Smithson Tennant, the discoverer of osmium and iridium, was commemorated in 2005 by the placing of a plaque on his birthplace in Selby, Yorkshire, U.K. His birthplace is now a pub. Professor W. P. Griffith (Department of Chemistry, Imperial College, London) describes the background to this pleasing tribute.

Patent and Literature Selection

The issue also contains a selection of abstracts based on recently published patent and scientific literature.

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