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Among items appearing in this issue:

Electrospun Fibres of Semiconducting Magnus' Green Salt Derivatives

Semiconducting Magnus' salt derivatives were processed into fibres by electrospinning from organic solvents. Margherita Fontana, Walter Caseri and Professor Paul Smith (ETH Zürich, Switzerland) describe the supramolecular structure of the fibres, consisting of a backbone of platinum atoms in linear arrays. X-ray diffraction patterns indicate that the platinum arrays are oriented parallel to the axis of the fibres. Consistent with this, the fibres show anisotropic optical and electrical properties. The electrical conductivities observed along the fibre axis exceed the values for the bulk compounds by 2–3 orders of magnitude, comparable to observations in oriented semiconducting organic polymers. Mass-produced "plastic electronics" are a potential application for fibres of Magnus' salt derivatives.

New Methodology in the Crystallographic Properties of Platinum

John W. Arblaster (Coleshill Laboratories, West Midlands, U.K.) gives new equations to represent the lattice parameter thermal expansion of platinum from 293.15 K to the melting point at 2041.3 K. This treatment is designed to replace a combination of dilatometric equations and corrections for thermal vacancy effects.

The Minting of Platinum Roubles (Part IV)

Professor Thilo Rehren (Institute of Archaeology, University College London, U.K.) presents a paper in a series of articles on Russian platinum roubles, with a summary of recent research into the manufacturing history and materials characterisation of these coins. Various instrumental methods have been used to determine physical, chemical and magnetic properties of the coins, and to reveal their complex internal structure. The results are not only significant for the identification of roubles minted at different times, but offer insight into the large-scale refining and processing of platinum metal during those periods.

Merensky's Discoveries of Platinum in the Bushveld Complex

The earliest report of the occurrence of platinum in rocks from the Bushveld Complex, South Africa, is thought to be that of William Bettel in 1906. In the centenary year of that report, Professor Grant Cawthorn (School of Geosciences, University of the Witwatersrand, South Africa) revisits the biography of Dr Hans Merensky by Olga Lehmann, "Look Beyond the Wind". He proposes that the renewal of interest by Dr Merensky in 1924, which ultimately led to the discovery of the platinum-rich Merensky Reef, resulted from Dr Merensky's geological astuteness in recognising newly panned platinum as having a different grain size from that in chromite layers, indicating a different source rock. This had important consequences for the world platinum industry.

A Promising New Source of Platinum Group Elements

Currently, there is interest in exploring geological environments other than the layered mafic-ultramafic intrusions that provide the bulk of platinum metals. The background to a project in Brazil that has found promising concentrations of the platinum group elements (PGEs) in phoscorite-carbonatite pipe (PCP) complexes is described by Juarez Fontana (Polytechnic School of University of São Paulo, Brazil). Geochemical and mineralogical research to determine their potential as ore deposits is under way. This paper explores the connection between PGE-bearing dunite-pyroxenite pipes in the Urals and the Bushveld Complex, and PCP complexes in Brazil and South Africa.

Thermophysical Properties of Liquid Palladium

Claus Cagran and Gernot Pottlacher (Institut für Experimentalphysik, Technische Universität Graz, Austria) performed fast-pulse heating experiments (duration 60 μ s) on pure palladium. Thermophysical properties, including enthalpy, isobaric heat capacity, electrical resistivity, thermal conductivity and thermal diffusivity, are derived as a function of temperature in the range 1828 to 2900 K. Since temperature measurement is combined with simultaneous emissivity measurements at wavelength 684.5 nm, there is no ambiguity in the temperature-dependent data. Results are compared with literature values where available.

Launch of the Low Carbon and Fuel Cell Knowledge Transfer Network

On the 25th May, 2006, Fuel Cell Today (www.fuelcelltoday.com) along with partner bodies, announced the launch of the Low Carbon and Fuel Cell Knowledge Transfer Network (LCFC-KTN, www.low-carbon-ktn.org.uk).

The PGM Market

Details of supply and demand of the platinum group metals during the calendar year 2005 are summarised from "Platinum 2006", published in May 2006 by Johnson Matthey.

Literature and Patent Search

The issue includes abstracts from a selection of recent scientific and patent literature.

Dealing with Permanent Catalyst Poisons

In the "Final Analysis" item, John Dunleavy (Johnson Matthey PCT, U.K.) discusses the adverse effects of heavy metal contamination of hydrocarbon feedstocks on the activity of pgm catalysts. Metals such as mercury act as irreversible permanent poisons which cannot be adequately removed. It is therefore essential to reduce Hg contamination in the feed to below 5 ppb before it reaches the catalyst. This may be achieved using surface adsorption on non-regenerable metal sulfide pellets in fixed-bed reactors at ambient temperature.

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