

available with over 150,000 units (using 5.25 inch disks) having been sold worldwide; 50 per cent in U.S.A., 35 per cent in Japan and 15 per cent in Europe. It is expected that 3.5 inch disks will be introduced within the next year with over 200,000 units in use by 1992.

Magnetic disks and solid state memories may still be used for fast data processing in main-frame computers but magneto-optic storage is expected to replace the floppy and hard disks in personal computers and microcomputers by 2000. J.W.S.

The Platinum Market in 1990

The Platinum Yearbook 1991

BY B. H. NATHAN, Woodhead Publishing/Metal Bulletin, Cambridge, 1991, 153 pages, ISBN 1-85573-045-6, £95.00

The Platinum Yearbook sets out to provide a reference to events in the markets for platinum group metals during 1990. It contains a description of the evolution and operation of the metals markets, prefaced by a concise history of the platinum metals, from the earliest decorative applications of platinum to the isolation of the other five platinum group elements during the nineteenth century, and on to the growth of their major modern applications.

As the managing director of Ayrton Metals, one of the longest established platinum dealers in London, Brian Nathan is well qualified to review the features of the platinum markets of the world and to explain the basic practice of dealing in the platinum group metals. His account of how the markets work is comprehensible, and avoids entangling the reader in the deeper complexities of trading strategems.

Indeed, the principal value of the book lies in its description of the mechanics of the London and the New York markets, its clarification of some of the mystique which surrounds traders, their colloquialisms, and its discussion of the techniques of trading such as "stops", options,

charts and arbitrage, which do so much to influence the pattern of platinum metals prices in the short term.

Half of the book is devoted to an extensive review of monthly developments in the markets for the platinum metals, including the economic, political and fundamental supply and demand factors which were of influence during 1990. Access to key events and features described in the text is simplified by a comprehensive and well planned index, while the review is supported by records of the daily movements of platinum and palladium prices in London and New York. The provision of statistics to compare the trading activities in the New York and Tokyo futures markets might be of use in future editions.

As the first in what is intended to be an annual series, the Platinum Yearbook sets out an attractive stall of information. Junior dealers and commentators on the platinum group metals should therefore find it a helpful guide to dealing in the platinum group metals and a useful source for details of price changes during the year 1990. J.S.C.

Iridium Oxide Device for Coulombic Titrations

When determining the acidity or basicity of a solution by coulombic titrations, an actuator electrode is positioned close to the pH sensitive gate of an ion sensitive field effect transistor. The ISFET acts as the indicator electrode to establish the equivalence point in the titration. However, in this system, the operating potentials of the actuator electrode are such that any other redox couple in the solution, or any chloride ions present, will interfere.

Now, however, an all iridium oxide sensor-actuator system has been proposed by researchers at the University of Twente, The Netherlands, and tested for such titrations (W. Olthuis, J. C. Van Kerkhof, P. Bergveld,

M. Bos and W. E. Van Der Linden, *Sens. Actuators B*, 1991, 4, (1&2), 151-156). Since the reversible redox reaction at an iridium oxide electrode functions at a favourable potential, it is suitable for use as the actuator electrode, with a pH sensitive iridium oxide sensor determining the equivalence point. Such a system eliminates interference from any chloride ions present. The preparation of this system is reported to be easier than the preparation of conventional ISFET-based devices.

The authors go on to describe a new current-pulse method of producing iridium oxide where the growth parameters are independent of the pH of the growth solution.