

Research on the Platinum Elements

Geo-Platinum 87

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Recent advances on the occurrence, genesis, geochemistry, mineralogy and the analysis of the platinum group elements were reported at a symposium held in April 1987 at the Open University, Milton Keynes, England, and the proceedings have recently been published. A total of 44 papers were presented by 89 authors from more than 12 countries, demonstrating an international interest in the subject.

The symposium was introduced by two invited lectures, the first, by C. J. Morrissey of Riofinex North Ltd., gave an insight into the aims and objectives of exploration for new resources, while C. R. N. Clark of Johnson Matthey considered uses of, and the future market trends for platinum and the platinum group metals.

At first sight the exploitation of platinum in the Western World is so dominated by production from Southern Africa that there may appear to be little impetus for exploration. The projected increase in market requirements in the next decade can more easily be met by expansion of existing production than by opening new mines. Technical and commercial considerations, however, are not the only criteria that govern the availability of primary commodities, hence the perceived need for alternative sources of platinum and for additional supplies of palladium and rhodium. The exploration activities described show a trend away from the conventional wisdom that major new platinum metals finds are most likely to be contained within massive intrusions of the Bushveld type. Alternative host rocks such as ophiolites, and deposits much younger than the early Proterozoic Era, are described in mineralogical analyses. This discussion does not extend to rocks of sedimentary origin of which, so far, very few commercially exploitable examples are known. This may be a promising field for future exploration.

Information on a majority of the actual and potential platinum producing countries is included. In addition to the Eastern Block, other countries with scientifically significant deposits which are not discussed include Australia, Colombia, Ethiopia and Cyprus.

More than three-quarters of the papers presented dealt with some aspect of emplacement mechanisms. Magma differentiation processes and hydrothermal emplacement were discussed. Both are sometimes considered to be important in the same deposit. The thermodynamic treatment of platinum group elements in hydrothermal fluids was considered by B. W. Mountain and S. A. Wood of McGill University, Montreal, and by I.R. Plimer and P. A. Williams of Newcastle University, New South Wales, and University College, Cardiff, respectively, their papers covering the conditions relevant to both the whole rock and the surface environments. Their approach offers the possibility that the magma and hydrothermal mechanisms may eventually be seen to involve the same chemistry operating in different regimes of pressure, temperature and host rock.

The papers on platinum group metals analysis show that the traditional fire assay preconcentration methods based on sulphide collection are still preferred. Inductively Coupled Plasma Mass Spectrometry is described for the analysis of sulphide collections. This instrument has superior detection limits, particularly for high atomic number elements, compared to Optical Emission Plasma Spectrometry.

The current prediction of 30 per cent growth in platinum consumption within 10 years is based on the requirements of the present major users. An unexpected upsurge in Third World demand could significantly alter this prediction, and further emphasise the importance of this symposium.

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