

# Notices

## CONFERENCE ON COMPUTERS IN ENGINEERING

The above Conference, which is being organized by the Electrical and Electronics Board of the Institution of Engineers, Australia, is to be held in Sydney on 16th and 17th May, 1974. It is being planned in conjunction with the Sixth Australian Computer Conference and will be held during the week immediately preceding the latter.

Papers are invited on the use of computers in all fields of engineering, with particular reference to engineering design. In all these fields it is desired to cover batch computing, on-line computing, and the use of small desk computers.

Enquiries should be directed to The Secretary, Conference on Computers in Engineering, The Institution of Engineers, Australia, 157 Gloucester Street, Sydney, N.S.W., 2000, Australia.

## NIM REPORTS

The following reports are available free of charge from the National Institute for Metallurgy, Private Bag 7, Auckland Park, Johannesburg.

### Report No. 1495

*A method for the determination of elemental sulphur on the surface of sulphide minerals.*

A gas-chromatographic method for the estimation of the amount of free sulphur in an organic solvent solution containing both free and combined sulphur has been developed. The application of this method to the determination of sulphur extracted from a mineral surface by carbon disulphide is described. The sensitivity of the method is equivalent to approximately 10 per cent of a monolayer of sulphur on a sample having an area of 0,1 m<sup>2</sup>.

### Report No. 1500

*The chromatographic separation and determination of noble metals in matte-leach residues.*

The determination of the noble metals in the residues resulting from the industrial leaching of copper-nickel mattes is described. The

procedure involves the separation of gold by reversed-phase chromatography on a column of TBP-treated Porasil C, the separation of base metals by cation exchange, and the separation of the individual non-volatile platinum-group metals by partition chromatography on a cellulose column. After the separations, platinum and palladium are determined gravimetrically, and gold, rhodium, and iridium are determined by atomic-absorption spectrophotometry.

### Report No. 1505

*The production of the refractory aluminium silicates, with special reference to South Africa.*

The search for improved refractory materials to withstand the high temperatures encountered in many industries has led to an increased demand for the refractory aluminium silicates—kyanite, sillimanite, and andalusite. All three of these minerals have the property of forming the artificial mineral mullite, which is the basis of many refractories and ceramic materials. The production of the natural refractory aluminium silicates during 1971 is estimated at about 300 000 tonnes, in spite of increased production of 'synthetic' mullite.

In South Africa, reserves of sillimanite appear to be rather limited, but the reserves of andalusite, especially in the eastern Transvaal, are very large and easily worked. There is a definite possibility that kyanite production will be developed in Natal.

Although sillimanite and andalusite are at present being produced on a considerable scale in South Africa, with a total production of 81 882 short tons during 1971, the production of these minerals does not appear to be keeping pace with the general World demand, and South Africa may be losing overseas markets to certain new producers, particularly in France and Malawi. The relatively small scale of individual mining operations in South Africa and, as a result, poor marketing practice are largely responsible for this state of affairs.

Certain positive steps are suggested to increase the exports of South African andalusite, and of

kyanite if further investigation proves the exploitation of the deposits in Natal to be economically feasible.

### Report No. 1517

*Computer-controlled flotation plants in Canada and Finland.*

This report contains information gained during visits to three flotation plants in Canada and one in Finland where on-line digital computers are used in plant control. Details of the methods used in the sampling and analysis of the slurry streams are given, and five distinct control strategies are described.

### Report No. 1526

*Heat of solution as a control of aqueous-ammonia concentration.*

A process-control loop for the preparation of aqueous ammonia solutions has been devised and tested. The control is based on the relation between the heat evolved as ammonia gas dissolves in water and the concentration of the resulting solution. Thus, the difference in temperature of a water stream before and after the addition of ammonia gas is employed to control the rate of addition of the gas.

Satisfactory control has been demonstrated with ammonia gas of fluctuating temperature and pressure, both when the water flowrate was constant and the solution concentration was varied and when the flowrate was varied and the solution concentration constant.

The control loop is neater and therefore cheaper than the conventional method that employs flow ratio control of the gaseous ammonia and water streams.

### Report No. 1529

*South African costs of equipment for the metallurgical industry (197).*

The average costs of the equipment used for metallurgical processing are given in the form of graphs, which are based on costs prevailing at the beginning of December, 1972. Costs of materials of construction and an updated buyers' guide to firms that supply the equipment are also given.

To assist in the conversion from metric to imperial units, conversion graphs are provided.