

Book Reviews

THE PHYSICAL SEPARATION AND RECOVERY OF METALS FROM WASTES

By T.J. Veasey, R.J. Wilson and D.M. Squires
Gordon and Breach Science Publishers, 1993, 201 pp, hardcover US\$70.00

The book *The Physical Separation and Recovery of Metals from Wastes* is the introductory volume in a series "Process engineering for the chemical, metals and minerals industries". In five chapters the authors discuss unit operations in secondary metal processing, the processing of fragmented metal wastes, of granulated metal wastes and the processing of urban waste.

The Chapter One offers an introduction into the secondary metals processing, definition of terms used in recycling and analysis of potentials for recovery of resources. Chapter Two describes various techniques of separation and sorting based on assorted physical properties, namely size, density, electrical conductivity, magnetic properties and electronic sorting methods. Chapter Three covers scrap treatment particularly from the view of scrap quality, automobile composition and shredding and outlines the non-magnetic processing.

Chapter Four is devoted to the processing of granulated metal wastes, with the main emphasis on metal reclamation, waste tire and battery processing and cryogenic and high-temperature treatment. In the final chapter the processing of urban waste is discussed.

Although the authors did not indicate the anticipated readership it is apparent that the book will be of benefit for generalists rather than specialists. A more inquisitive reader will miss fundamental analyses of separation techniques and equipment and their comparison (e.g. efficiency, cost, maintenance requirements, level of introduction into industry, track record etc). In line with the authors' empirical and somewhat shallow approach, no theory of these techniques is outlined and literature on the subject is incompletely researched. Coverage of some unit operations is too superficial, with obsolete and unrepresentative references (e.g. magnetic and electrostatic separation). For instance, the most recent reference to separation in magnetic fluids is from 1981 although considerable progress has been achieved in recent years and literature on the subject is ample.

The apparent haste in which the book was prepared is demonstrated by inconsistent usage of units of physical quantities: imperial units are often used, frequently mixed with metric units, a practice unacceptable even in a journal publication. Readability and scannability of the book is limited by the use of an

unsuitable font of the word-processor-generated text, by long paragraphs and insufficient separation of subsections. On the other hand, numerous excellent diagrams (there are 104 of them) enhance the value of information provided.

In summary, the main value of the book is that it succeeds in bringing together information from numerous highly fragmented fields and disciplines. The description of the available equipment and techniques will be of particular benefit to administrators, while more technically-minded readers might find the book a useful starting point for a deeper and more comprehensive study of recycling methods.

J. Svoboda
De Beers Diamond Research Laboratory
Johannesburg, South Africa

INTERNATIONAL STRATEGIC MINERALS INVENTORY SUMMARY
REPORT: RARE EARTH OXIDES

W.D. Jackson and G. Christiansen, US Geological Survey Circular 930-N, Denver, Colorado, USA, 1993. 68 pp.

This report on major sources of strategic raw materials was prepared by the respective agencies of Australia, Canada, Germany, South Africa, UK and USA. Part I of the report gives a general review of rare earth oxides. Topics include applications, mineralogy, geology, major rare earth minerals, supply and consumption, mining and beneficiation, metallurgy and refining. Several maps are provided which identify operating mines, deposit types, processing plants and their owners.

Part II provides information on rare earth site names, location, host rock, geological age, local environment, principal mineral assemblages and average grade of mineral at each site.

The report is of value for those companies in business if recovering, importing and exporting rare earth oxides.