

# Table of Contents

## Preface

### Rare Earths Production and Marketing Opportunities

P.G. Falconnet 1

### Rare Earth Resources

T.M. Mahadevan 13

### Monazite, the Basic Raw Material for Rare Earths Beneficiation from Beach Sands

V.S. Bashir 33

### Processing of Monazite at the Rare Earths Division, Udyogamandal

N.S. Narayanan, S. Thulasidoss, T.V. Ramachandran, T.V. Swaminathan and K.R. Prasad 45

### Development of a Photochemical Route for Upgrading Europium from Aqueous Lanthanide Mixtures

L.V. Shastri, J.P. Mittal, N.P.K. Krishnan and T.K.S. Murthy 57

### Electrowinning of High Purity Individual Rare Earth Metals - A Review

P.N. Mohan Das, A.D. Damodaran and M. Subhash 61

### Extractive Metallurgy of Rare Earths - Developmental Work at the Bhabha Atomic Research Centre

O.K. Mehra, S. Singh, J.C. Sehra, T.S. Krishnan, D.K. Bose and C.K. Gupta 73

### Rare Earths in Magnesium Alloys

K. Suseelan Nair and M.C. Mittal 89

### Some Aspects of the Decomposition of Isopropanol over Rare Earth Oxides

K. Bhattacharya, P. Ramakrishnan, J.S. Gill and U.R. Marwah 105

### Mixed Rare Earth Oxides and Their Catalytic Applications

N. Gunasekaran 117

### Rare Earths in New Materials

Y.R. Mahajan and P. Rama Rao 125

### Hi-Tech Applications of Rare Earths

R. Omachi 147

### Rare Earths in Laser Technology

S.S. Singh 155

### Preparation of Neodymium Iron Boron Alloy for Permanent Magnet

P. Pramanik and M. Aquil Akhtar 173

### High Energy PrCo<sub>5</sub> Permanent Magnets

W. Wallace, R.S. Craig, H.O. Gupta, H. Shoichi, A. Pedziwiatr, E. Oswald and E. Schwab 177

### R&D Activities on High Energy Samarium - Cobalt Permanent Magnets at Defence Metallurgical Research Laboratory (DMRL), Hyderabad

V. Chandrasekaran, T.S.R.K. Sastry, B. Nageswara Rao and G. Venkateswarlu 187

### Development of Nd-Fe-B Permanent Magnets and Their Property Evaluation by Gamma Ray Resonance Fluorescence

R. Kamal and M. Rani 203

### Investigation of the Utility of Commercial Grade Indian Mischmetal for the Fabrication of Permanent Magnets

E.M.T. Velu, M. Uma Devi and K.P. Gupta 213

### Rare Earth Substituted Garnet Films for Magnetic Bubble Memory Applications

C.M. Srivastava and B.U. Maheshwar Rao 227

### Industrial Applications of Rare Earths in Japan

Y. Kudo 243

### Use of Rare Earths in Paints and Pigments

G.C. Desai 259

### The Use of Rare Earths in Cinema ARC Carbons

D.C. Bagchi 265

### Rare Earth Intermetallics for Hydrogen Storage

P. Suryanarayana, K.B. Bhatt and A. Singh 269

### Preparation and Luminescence Study of Y<sub>2</sub>O<sub>2</sub>S: Eu Phosphors

R. Jagannathan, R.P. Rao, K. Venkatesan and K.I. Vasu 277

