

# Table of Contents

## Waste Processing and Recycling in Mineral and Metallurgical Industries – VI

Foreword .....	v
Acknowledgement .....	vi
Biography – Laxman (Lucky) M. Amaratunga .....	ix

### METAL RECYCLING

Recent Trends in Rare Metals Recycling in Japan .....	3
<i>S. Owada</i>	
Overview of Waste Processing and Recycling of Nonferrous Metals in Metallurgical Industries in China .....	15
<i>X. Guo</i>	
Review of Lead Recycling Technology.....	27
<i>R. David Prengaman, A.H. Mirza and Timothy W. Ellis</i>	
Selective Recovery of Gold from E-wastes by Using Cellulosic Wastes .....	41
<i>K. Inoue, B. Pangen, M. Abe, H. Kawakita, K. Ohto, B.B. Adhikari and S. Alam</i>	
Precious Metals Leaching from Electronic Wastes .....	51
<i>N. Naseri Joda and F. Rashchi</i>	
Recovery of Precious Metals by Means of Adsorption Using Persimmon Tannin Gels.....	59
<i>M. Gurung, K. Inoue, B.B. Adhikari, K. Ohto, H. Kawakita and S. Alam</i>	
Physical Separation Process for Recovering Tantalum Capacitors from Electronic Devices Mounted on Printed Circuit Boards.....	69
<i>T. Oki</i>	
Copper and Tantalum Recovery from Printed Circuit Board.....	79
<i>T. Fujita, H. Ono, G. Dodbiba, K. Okaya, S. Matsuo, J. Sadaki and S. Murakam</i>	
Lead Recovery from Waste CRT Glass by Hydrofluoric Acid and Electrochemical Treatments .....	91
<i>E. Shibata, M. Itoh and T. Nakamura</i>	
Vanadium and Molybdenum Recovery from Industrial Wastes Using Cybber Ion Exchange Resins .....	99
<i>D. Kipper, V. Korovin, A. Olifirenko, Yu. Shestak and A. Tikhonov</i>	
Vanadium Recovery from LD Converter Slag by Means of Heterotrophic Bacteria.....	107
<i>S.M.J. Mirazimi and F. Rashchi</i>	
Dezincing Galvanized Coated Steel Scrap Using Sulfuric Acid.....	115
<i>L.C.S. Solimani, M.M.C. Lima and M.A. Quintela</i>	
Volatilization Behavior of Valuable Metals in Electronic Substrate Waste by Chlorination Volatilization .....	127
<i>A. Shibayama, A. Hosoi, K. Hiruta, Y. Takasaki, W. Tongamp, T. Kato and K. Sugawara</i>	

The Characteristics of Electrolytic Refining of Tin Soldering Scrap in Hydrochloric Acid Solutions.....	137
<i>G. Rimaszeki, T. Kulcsar and T. Kekesi</i>	

### METALLURGICAL SLAG AND DUST

Recycling Polymeric Materials for Slag /Carbon Interactions in EAF Steelmaking .....	149
<i>V. Sahajwalla, M. Zaharia, S. Kongkarat, J. Dankwah, R. Khanna and N. Saha-Chaudhury, P. O’Kane, C. Skidmore, J. Dicker and D. Knights</i>	
Stabilization of Chromium-Based Slags with FeS <sub>2</sub> and FeSO <sub>4</sub> .....	163
<i>G. Díaz-Sandi, A. Pineda-Rivera, C. Martínez-Morales, A. Romero-Serrano, B. Zeifert and H. Martínez-Gutiérrez</i>	
Recovery of Iron from Waste Slag of Pyrite Processing Using Reduction-roasting Magnetic Separation Method.....	173
<i>G.F. Zhang, Q.R. Yang, Y.D. Yang, P. Wu and A. McLean</i>	
Valorisation of Thermal Residues by Intensified Mineral Carbonation .....	185
<i>R.M. Santos, D. Ling, M. Guo, B. Blanpain and T. Van Gerven</i>	
Pyrometallurgical Treatment of Flue Dust from Copper Smelters for Stabilization of Va Elements and Cu Recovery .....	197
<i>R. Parra, E. Balladares, I. Wilkomirsky, F. Parada, I. Saavedra, J.A. Carrasco and R. Parada</i>	
A Mathematical Model for Carbothermic Reduction of Dust–carbon Composite Agglomerates.....	211
<i>Y. Kuwauchi and M. Barati</i>	

### BY-PRODUCTS PROCESSING AND UTILIZATION

High-effective Process for the Preparation of $\alpha$ -Al <sub>2</sub> O <sub>3</sub> Using Secondary Aluminum Dross as Raw Material .....	225
<i>X-Y. Guo, F. Li and Q-H. Tian</i>	
Pretreatment of Silver Separated Residue by Alkaline Smelting at Low Temperature.....	237
<i>Q-H. Tian, L-Z. Cheng and X-Y. Guo</i>	
Possibilities for the Improvement of Secondary Zinc Oxide Quality .....	247
<i>S. Steinlechner, G. Schneeberger and J. Antrekowitsch</i>	
Removal of Elemental Sulfur from Hydrometallurgical Waste Derived from Massive Sulfide Concentrates .....	259
<i>J.E. Halfyard, K. Hawboldt and C. Bottaro</i>	
A Computer Simulation off an Agitation Mill Abrasion Process for Waste Printed Circuit Boards .....	269
<i>C. Tokoro, Y. Tsunazawa, K. Torigoe and S. Owada</i>	
Effect of Blending HDPE with Coke on the Reduction Behaviour of a Manganese Oxide .....	281
<i>A. Blagus and V. Sahajwalla</i>	
Waste Processing and Recycling: Some Case Studies.....	293
<i>V.I. Lakshmanan, R. Sridhar and R. Roy</i>	

### REMEDIATION

An Integrated Approach for Heavy Metal Remediation Using Sorbents Synthesized from Waste Residues.....	303
<i>Y.W. Chiang, K. Ghyselbrecht, R.M. Santos, B. Meesschaert, J. Martens, V. Cappuyns, T. Van Gerven and R. Swennen</i>	

The Behaviour of As(III) and As(V) during the Precipitation of Alunite at 98°C .....315  
*A. Sunyer and J.E. Dutrizac*

Factors Affecting the Start-up, Operation and Decline of a Laboratory based Passive Treatment .....337  
System for Selenium and Sulfate Removal  
*P. Mirjafari, L. Moger, R. Martel and Susan A. Baldwin*

Effect of Thiocyanate Loading and Temperature on Thiocyanate Degradation by a Mixed  
Microbial Population .....349  
*A.W. van Zyl, S.T.L. Harrison and R.P. van Hille*

### **CHARACTERIZATION**

The Application of Advanced Characterization Techniques to Industrial Waste Removal Procedures .....363  
*N. Geoffroy, S. Poulin and G.P. Demopoulos*

Characterisation of Sulphide Oxidation In A Passive Acid Rock Drainage (ARD) Treatment  
System ..... 375  
*N. Mooruth and R.P. Van Hille*

Characterization and Reduction of Filter Dusts in the Liquid Phase .....387  
*G. Schneeberger, S. Steinlechner and J. Antrekowitsch*

Distributions of Minor Metals in E-waste .....399  
*T. Yumoto and T. Shiratori*

### **EFFLUENTS AND WASTEWATER TREATMENT**

Sulphide Precipitation and Ion Exchange Technologies for Cost Effective Removal of Selected  
Metals in Wastewater .....413  
*A. Consigny and D. Kratochvil*

Offsetting Effluent Treatment Costs by Metal Recovery from Effluent Streams .....423  
*J.P Wyethe, D.A. Auerswald and N.M. Vegter*

### **ENERGY AND ENVIRONMENT**

Effect of Electricity Mix and Ore Grade on the Carbon Footprint of Chilean Cathodic Copper .....439  
*C.A. Zaror, M. Vega, C. Peña and M. Bustamante*

Author Index.....447