XXV International Mineral Processing Congress – IMPC 2010
"Smarter Processing for the Future"
Brisbane, Australia
6 – 10 September 2010
## CONTENTS

### Plenary Addresses

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interfacial Chemistry in Flotation of Diasporic Bauxite</td>
<td>Y Hu, W Sun and W Liu</td>
<td>3</td>
</tr>
<tr>
<td>Real-Time Simulation in Process Engineering – Dream or Reality?</td>
<td>J Li</td>
<td>19</td>
</tr>
<tr>
<td>Recent Metallurgical Developments and their Impact on Minerals Project Execution</td>
<td>Z Meka and G Lane</td>
<td>21</td>
</tr>
</tbody>
</table>

### Keynote Addresses

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Recycling and Frugal Water Use</td>
<td>R Dunne</td>
<td>45</td>
</tr>
<tr>
<td>Concentration of Igneous Phosphate Ores via Froth Flotation – Challenges and Developments</td>
<td>I Leal Filho, M Martins and D Horta</td>
<td>63</td>
</tr>
<tr>
<td>Characterisation, Analysis and Simulation of Multiphase Particulate Systems Using High Resolution X-Ray Micro Tomography (HRXMT)</td>
<td>J Miller</td>
<td>77</td>
</tr>
<tr>
<td>Chemical Aspects of Sustainable Mineral Processing and a Framework for Research and Technology Transfer</td>
<td>D Nagaraj</td>
<td>91</td>
</tr>
<tr>
<td>Nanoscience in Aqueous Processing</td>
<td>K Osseo-Asare</td>
<td>101</td>
</tr>
<tr>
<td>The Importance of Mineral Processing Technology for Establishing a Sustainable Society with an Environmentally-Sound Material Cycle</td>
<td>S Owada</td>
<td>111</td>
</tr>
<tr>
<td>The Elephant in the Mill</td>
<td>J Pease</td>
<td>123</td>
</tr>
<tr>
<td>Maximising Value Add from Collaborative Research</td>
<td>N Plint</td>
<td>133</td>
</tr>
<tr>
<td>Automated Mineralogical Techniques – A Drive Towards Plant Optimisation</td>
<td>R Sehouwstra</td>
<td>135</td>
</tr>
<tr>
<td>Challenges on the Front End Activities of the Uranium Fuel Cycle – Areva’s Approach</td>
<td>A Serond</td>
<td>137</td>
</tr>
<tr>
<td>Technology Based Innovation – The Next Decade</td>
<td>R Shaw</td>
<td>139</td>
</tr>
<tr>
<td>Project Sustainability Assessment – Matching Method to Enterprise Size</td>
<td>D Shields</td>
<td>141</td>
</tr>
<tr>
<td>Digital Simulation of Particulate Processes</td>
<td>R Williams and X Jia</td>
<td>143</td>
</tr>
<tr>
<td>Enhance Fine Particle Flotation by Hydrodynamic Cavitation</td>
<td>Z Xu and J Masiyah</td>
<td>159</td>
</tr>
</tbody>
</table>
Agglomeration

Adsorption Behaviours of Humic Substances onto Iron Ore Particle Surface

Possibilities and Working of the Specific Agglomeration of Fibrous Materials and Residues

Agglomeration for Copper Heap Leaching

Agglomeration Drum Selection and Design

Comparison of Grinding and Liberation Processes for Stalky Biomass Materials as a Prerequisite for Production of Energy Pellets with High Calorific Value

Improving Pelletisation of Pyrite Cinder by High Pressure Roller Grinding

Study on Iron Ore Sintering with High Proportion of Specularite Concentrates

Aqueous Processing

Kinetic Study on the Leaching of Vanadium from LD Converter Slag Using Sulfuric Acid

Rheological Behaviour of Clay-Rich Gangue Mineral Dispersions During Hydrometallurgical Treatment

Stripping of Fe (III) from D2EHPA Using Different Reagents

Recovery of Precious Metals from Chloride Solution by Magnetite

Purification of Nickel and Cobalt from Heap Leaching Effluents Using Ion Exchange Resins

Separation of Nickel and Cobalt from Manganese, Magnesium and Calcium by Synergistic Solvent Extraction - From Batch Tests to Pilot Plant Operation

High Pressure Sulfuric Acid/Oxygen Leaching of Platinum Group Metals Bearing Ni-Cu Mattes

G Han, Y Zhang, Y Huang, G Li and T Jiang

S Hildebrandt, P Ay, H-J Gussoius, C Glaser and C Stollberg

K A Lewandowski, T C Eisele and S Komar Kawatra

G Miller

S Narra, C Glaser, H-J Gussoius, C Stollberg and P Ay

W Yu, D Zhu, Q Li and J Fan

Y Zhang, T Jiang, G Li and X Fan

M Aarabi, F Rashchi, E Vahidi and N Mostoufi

J Addai-Mensah

M Akhlaghi, F Rashchi and E Vahidi

R Aiorro, N Hiroyoshi, M Ito and M Tsunekawa

T Berni, F Mendes and A Pereira


C Dorfling, G Akdogan, S Bradshaw and J Eksteen
Aqueous Processing continued

Development of the Boleo Process Flow Sheet and the Direct Solvent Extraction (DSX) Circuit for Cobalt and Zinc Recovery  
D Dreisinger, C Cheng, W Zhang and Y Pronolo  
309

Thermodynamics of Non-Cyanide Gold Solvents  
A Gudkov, I Zhuchkov and G Mineev  
319

Application of Agitated Leaching for Iron Removal from Silica Using Sulfuric and Hydrochloric Acid  
H Haghi, A Ghadyani and M Faramarzi  
325

Modelling of Synergistic Effect of Cyanex 302 and D2EHPA in Zinc Solvent Extraction  
T Hosseini, M Daneshpayeh, N Mostoufi and F Rashchi  
335

Pilot-Plant Testing of Ammoniacal-Cyanidation for Gold Recovery from Copper Gold-Bearing Ore  
O Khmelnitskaya, G Voloshnikov and V Lodelsichkov  
345

Treatment of Gold-Bearing Oxide High-Clayish Ores  
A Koblov, A Raschenko and S Gudkov  
351

Beneficiation of Iron Ore – Washing with Surface-Active Agent  
S Mahiuddin and P Sengupta  
359

An Investigation on the Effect of Chrysotile Particle Shape and Anisotropic Properites on the Rheology of Chrysotile Suspensions  
B Ndlovu, E Burdulova, M Becker, D Deglon, J-P Franzidis and J Laskowski  
367

Demonstration of Solid-Liquid Separations Using Recycled Supernatant that Contains Temperature-Responsive Polymer  
J-P O'Shea, G Qiao and G Franks  
377

Removal of As(III) and As(V) in Aqueous Solution  
J Shibata and N Murayama  
389

Additional Attractive Force Between Alumina Particles Due to Low Solubility of Dicarboxylic Acids  
E-J Teh, Y-K Leong, Y Liu, V Craig, R Walsh, S Howard and T Becker  
395

Effect of Anionic Surfactant on Silica Particle Attachment at the Oil-Water Interface  
C Vashisht, C Whitby, D Fornasiero and J Ralston  
407

Process Options for Difficult Arid-Region Nickel Laterites  
H Watling, G Das, A Elliot, J Li, R McDonald and D Robinson  
417

Bioprocessing

Biosorption of Cr(VI), Pb(II) and Zn(II) from Aqueous Solutions by Immobilised Phanerochaete chrysosporium Biomass in a Fixed-Bed Column  
H Amirafshar and R Marandi  
431
### Bioprocessing continued

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioleaching of Weathered Saprolite – Heavy Metal Adaptation Mechanisms of Aspergillus foetidus</td>
<td>W Ge, M Saidan and M Valix</td>
<td>447</td>
</tr>
<tr>
<td>Development of Cost-Efficient Environmentally Sound Technology for Enhanced Gold Recovery from Rebellious Gold-Containing Raw Materials</td>
<td>B Kenzhaliev and A Berkinaeva</td>
<td>455</td>
</tr>
<tr>
<td>Bio-Oxidation of Arsenic and Stibium Bearing Gold Ores</td>
<td>Q Li, T Jiang, G-Z Qiu, Y-B Yan and G-H Li</td>
<td>463</td>
</tr>
<tr>
<td>Pyrite Bioleaching and Slag Neutralisation – Two Treatments in a Single Process for Recovering Valuable Metals from Both Materials</td>
<td>D Morin, P Spolaore, P d’Hugues, A Teczan and Ö Mafa</td>
<td>469</td>
</tr>
<tr>
<td>Column Bioleaching of a Low-Grade Nickel-Bearing Sulfide Ore</td>
<td>W Qin, X Ji and S Zhen</td>
<td>479</td>
</tr>
<tr>
<td>Several Approaches to Enhance the Bioleaching of Enargite</td>
<td>K Sasaki, K Takatsugi and T Hirajima</td>
<td>487</td>
</tr>
<tr>
<td>Bioremediation of Acid Mine Water Using Fly Ash and <em>Desulfitomaculum nigrificans</em></td>
<td>S Subramaniam, E Chockalingam and J Braun</td>
<td>499</td>
</tr>
<tr>
<td>Bacterial Leaching of Complex Polymetallic Sulfide Ore</td>
<td>J Wang, W Qin, J Chen, C Yang, S Zhen, T Zhuang, S Nai, Y Zhang, L Li, X Fu and G Qiu</td>
<td>513</td>
</tr>
<tr>
<td>Electrochemical Behaviour of Massive Chalcopyrite Bioleached Electrodes in Presence of <em>Acidithiobacillus ferrooxidans</em> and <em>Acidithiobacillus caldus</em></td>
<td>J Wang, W Qin, S Zhen, T Zhuang, Y Zhang, K Liu, F Jiao, L Ren, C Shao, P Ren and G Qiu</td>
<td>521</td>
</tr>
<tr>
<td>Kinetic Dependence of Refractory Gold Sulfide Biooxidation Using Different Microorganism Association</td>
<td>P Zaulochny, G Sedefnikova, E Savari, D Kim and T Pivovalova</td>
<td>527</td>
</tr>
<tr>
<td>Extraction and Characterisation of Extracellular Polymeric Substances from the Mineral Surface During Bioleaching of Chalcopyrite Concentrate</td>
<td>W Zeng, G Qiu and M Chen</td>
<td>537</td>
</tr>
</tbody>
</table>

### Comminution and Physical Separation

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geological Parameters Controlling the Improvement of Manufactured Sand Using Vertical Shaft Impact Crushers Instead of Cone Crushers</td>
<td>U Åkesson and B Tjell</td>
<td>547</td>
</tr>
<tr>
<td>Title</td>
<td>Authors</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Cyclone Process for Heavy Metals Decontamination of Sediments</td>
<td>G Alfano, M Surracco and P Valera</td>
<td>555</td>
</tr>
<tr>
<td>Application of the Anaconda Simplified Work Index for Multiple Test</td>
<td>V K Alves and C L Schneider</td>
<td>565</td>
</tr>
<tr>
<td>Sizes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maghemite – A Source of Heavy Medium for Coal Washeries</td>
<td>A Arol, G Ozbayoglu, S Anaç and M Bülut</td>
<td>571</td>
</tr>
<tr>
<td>Separation of Minerals Using Electrical Fields</td>
<td>G Ballantyne and P Holtham</td>
<td>575</td>
</tr>
<tr>
<td>Energy Savings and Technology Comparison Using Small Grinding Media</td>
<td>M Brissette</td>
<td>581</td>
</tr>
<tr>
<td>Distribution of Settling Velocity of Irregular Particles and its</td>
<td>M Brozek and A Surowiak</td>
<td>591</td>
</tr>
<tr>
<td>Effect on Jig Separation Efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recovery of Fine Gold Particles from Philippine Gold Deposits by</td>
<td>B Buenaventura and H Mendoza</td>
<td>601</td>
</tr>
<tr>
<td>Enhanced Gravity Concentration and Flotation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigation on Multicomponent Semi-Autogenous Grinding</td>
<td>M Bueno, F Shi, T Kojić and M Powell</td>
<td>611</td>
</tr>
<tr>
<td>An Innovative Process for Comprehensive Utilisation of Clay-Vanadium</td>
<td>X Chen, J Yang, Y Mao, X Liao, H Liu and W Xiong</td>
<td>619</td>
</tr>
<tr>
<td>Ores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding and Flowing Investigation on Dry Stirred Ball Milling in</td>
<td>B Csöke, Á Rácz and G Múcs</td>
<td>629</td>
</tr>
<tr>
<td>Order to Determine the Influence of Grinding Aids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characterisation and Processing of Electronic Waste for the Recovery</td>
<td>A Das, S Chatterjee and S Mehrotra</td>
<td>637</td>
</tr>
<tr>
<td>of Metal Values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separation of Iron Particles from Banded Haematite Quartzite (BHQ)</td>
<td>B Das, B Mishra, S Prakash, P Reddy, R Sakhivel and S Das</td>
<td>649</td>
</tr>
<tr>
<td>Ore by Selective Magnetic Coating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Operation of the LAROX PF-50 Pressure Filter at ‘Ellatzite-Med’</td>
<td>K Dedelyanov, V Mehendzhiiiski, I Kanchev and T Voutov</td>
<td>661</td>
</tr>
<tr>
<td>Flotation Plant, Bulgaria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development and Validation of Ore Characterisation Test and its Use</td>
<td>H Delboni Jr, A Chiaregati and M Bergerman</td>
<td>667</td>
</tr>
<tr>
<td>in Variability Campaigns of Comminution Circuits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with NaHS</td>
<td>S C Dominy, A H Gray and T J Doffern</td>
<td>683</td>
</tr>
<tr>
<td>Development of Underground Gold Processing Plants</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Comminution and Physical Separation continued

Laboratory-Scale Magnetohydrostatic Separator for High Resolution Density Analysis of Plastic and Other Wastes J Faitli, S Nagy, G Antal, B Csőke and P Lukács 697

Beneficiation of Nickel Lateritic Ore from Montes Claros de Goiás, Brazil B Foggiaetto, B Tomaselli, H Delboni Jr and D David 707

CrusherMapper™ – A New Tool for Crusher Condition Monitoring J Franke 717

Fine Gravity Separation in the Reflux Classifier, Exploiting a High Shear Rate, Laminar Flow Mechanism K Galvin, K Walton and J Zhou 729

Evaluation of Grinding Medium Wear in Stirred Mills M Gao, D Obeng and F Burgess 739

Python Underground Processing Plant Critical Design S Gray 747

Study on Basic Theory of the Grain Settlement in Fluidised Bed X-H Gui, J-T Liu, Y-F Li, Y-J Cao, C Liu and G-S Li 757

Reduction of Iron Content from Silica by Gravitational Processes H Haghi, M Noaparast, A Shabani, M Farrokhrouz, A Ghadyani, A Ghorbani, M Shevринi and M Tayebi 767

Effects of DA as a Grinding Aid on Selective Grinding of Low-Grade Bauxite Y Han, Y Zhu, Z Wang and Y Tian 781

Enhancement of Energy Efficiency in Fine Grinding of Copper Sulfide Minerals Using a Pilot-Scale Stirred Media Mill – IsaMill M He, R Morrison and K Barns 791

Comparing Energy Efficiency of Multi-Pass High Pressure Grinding Roll (HPGR) Circuits M Hilden and S Suthers 801

Two Variable Real-Time Algorithm for Cone Crusher Control E Hulthén and C Evertsson 813

Upgrading of Indonesia’s Bauxite by Washing Method H Husaini and S Cahyono 821

Particle Mechanics and the Design of Cyclone Tribochargers P Ireland and G Jameson 833

Advanced Jig Separation of Shredded Plastics M Ito, M Akatsuka, E Ishida, K Hori, N Hiroyoshi and M Tsumekawa 843

Circulating Air Classification of Manufactured Sand R Johansson and C Evertsson 851

Smarter Gravity Separation Using the Kelsey Centrifugal Jig T Jones and A Foster 859

The Autogenous Fine Grinding Kelsey Axial Displacement (KAD) Mill J Kelly, A Foster, C Kelsey and T Tomicki 871
Comminution and Physical Separation continued

Test Work on High Throughput Diamond Tracer Recovery from Alluvial Recovery Tailings with a Containerised Optical Sorter Under Real Production Conditions

C Kleine and H Wotruba

Development of New Comminution Testing Methodologies for Geometallurgical Mapping of Ore Hardness and Throughput

T Kojovic, S Michaux and S Walters

Validation of the JKMRC Rotary Breakage Tester (JKRBT) Ore Breakage Characterisation Device

T Kojovic, F Shi, S Larbi-Bram and E Manlapig

Simulation and Analysis of Media Behaviour in the Tower Mill by Discrete Element Method for Estimating the Power Draw and Spatial Distribution of Grinding Process

M Kouklan and S Nitta

Experimental Study of Ore Characterisation Methods for AG/SAG Mills

S Larbi-Bram, F Shi and T Kojovic

Validation and Simulation of Optimised Compressive Crushing

E Lee, P Svedensten and C Evertsson

Study on Reasonable Mineral Processing Flow Sheet of Yunfu Low-Grade Pyrite Ores

H-W Li, Z Hu, H Zhang and H-X Wu

A Simulation Study on Two-Stage Grinding with High-Pressure Roller Mills

J Liu and K Luo

Separating Particles by Horizontal Deflection in a Paramagnetic Fluid

S Liu, Y Chen, N Miles, R Hill and L Eaves

The Small Pebble Process for Reducing Ball and Power Consumption in Secondary Grinding

B Loveday

Study on Ball Mill Grinding of a Cassiterite-Polymetallic Sulfide Ore

S Ma, W Mo, G Wang, X Su, J Yang and Z Shi

The Effect of Grinding Aids on Laboratory Grinding of a Cassiterite-Polymetallic Sulfide Ore

S Ma, J Yang, W Mo, G Wang, X Su and C Yuan

Triboelectric Charge and Separation Characteristics of Industrial Minerals

H Manouchehri

Silica-Kaolin Sand Wet Sizing

M Marinov, A Vacek, I Nishkov and I Grigorova

Approximation of Surface Area of Fines in Blast Induced Fragmentation

S Michaux and N Djordjevic

Importance of Strain to Fragment Strength in Blasting Induced Pre-Conditioning

S Michaux and R Hocking
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of Grindability Tests Based on Direct Measurement of</td>
<td>G Muesi and B Csőke</td>
<td>1047</td>
</tr>
<tr>
<td>Energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triboelectric Separation – Beneficiation of Coal</td>
<td>K Nicholson, P Ireland, E Wanless and G Jameson</td>
<td>1057</td>
</tr>
<tr>
<td>Investigation of the Classification Operation in a Coal Pulverising</td>
<td>C Özer, W Whiten, F Shi and T Dixon</td>
<td>1065</td>
</tr>
<tr>
<td>Vertical Spindle Mill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Effect of Using Different Commination Procedures on the Flotation</td>
<td>N Palm, N Shackleton, V Malysiak and C O'Connor</td>
<td>1077</td>
</tr>
<tr>
<td>of Platinum Group Minerals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trends in Test Filtration to Respond to Decreasing Sample Size</td>
<td>J Palmer, D Safonov, A Häkkinen, B Ekberg and A Kraslawski</td>
<td>1085</td>
</tr>
<tr>
<td>New Developments in Spirals and Spiral Plant Operations</td>
<td>M Palmer and C Vadeikis</td>
<td>1099</td>
</tr>
<tr>
<td>Analysis of Electrostatic Separation for Rutil Cleaning Duty Using a</td>
<td>R Pax and H Hutcheson</td>
<td>1109</td>
</tr>
<tr>
<td>Plate Electrode Assisted High Tension Roll Separator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eco-Efficient Gravity Separation Solutions in India</td>
<td>C Pena</td>
<td>1123</td>
</tr>
<tr>
<td>Building the Unified Commination Model</td>
<td>M Powell and N Weerasekara</td>
<td>1133</td>
</tr>
<tr>
<td>Study on Preparation and Gel Performance of High Purity Montmorillonite</td>
<td>J Qiu, X Lu, G Wang and L Sun</td>
<td>1143</td>
</tr>
<tr>
<td>Study on Desulfurisation and Deashing for Medium-High Sulfur Coal</td>
<td>Y Qiu, L Sun, Q Zhang and Z Liu</td>
<td>1149</td>
</tr>
<tr>
<td>Using Shaking Table</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haematite Recovery from a Tailings Stream</td>
<td>K Quast and B Quast</td>
<td>1155</td>
</tr>
<tr>
<td>Efficacy of Enhanced Gravity Separator in Processing Indian Iron Ore Slime</td>
<td>R Rath, S Mohanty, M Mohanta, R Singh and K Bhattacharyya</td>
<td>1165</td>
</tr>
<tr>
<td>A Robust Chemically Enhanced Electrostatic Separation Technology</td>
<td>S Ravishankar, H Kolla and R Raitani</td>
<td>1171</td>
</tr>
<tr>
<td>Near-Infrared Spectroscopy (NIRS) Sorting in the Upgrading and</td>
<td>M Robben, M Buxton, W Dalmijn, H Wotruba and D Balthasar</td>
<td>1179</td>
</tr>
<tr>
<td>Processing of Skorpion Non–Sulfide Zinc Ore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding Mill Operation and Maintenance – Central to Asset Management</td>
<td>J Russell</td>
<td>1187</td>
</tr>
<tr>
<td>TowerMill – Advantages in Wet Grinding Applications</td>
<td>J Sachweh</td>
<td>1197</td>
</tr>
</tbody>
</table>
Comminution and Physical Separation continued

Rutile Beach Sand from Hard Rock

K Sandvik, P Norrby and T Malvik 1207

A Loss of Strength of Gold Sulfide Concentrate Before Grinding and Cyanidation Using Magnetic Impulse Treatment

G Sedelnikova, E Koshe, P Ananev and S Goncharov 1217

Iron Ore – Mineral Processing Overview

J Sherrell and M Nevens 1227

Development of Process for Beneficiation of Low-Grade Iron Ore Samples from Orissa, India

R Singh, R Rath, B Nayak and K Bhattacharyya 1235

Use of Impact Crushing for the Enrichment of Low-Grade Colemanite Concentrates

A Sirkeci, A Gil, G Bidut, M Savaš and F Burat 1243

Effects of High Pressure Grinding Rolls on Platinum-Bearing Ores and the Flotation Response as Compared to the Conventional Ball Mill

N Solomon, A Mainza, M Becker, J Petersen, V Ross and J-P Franzidis 1249

SAG Mill Grinding Design Versus Geometallurgy – Getting it Right for Competent Ores

J Starkey and P Scinto 1265

Crushing Plant Process Optimisation

P Swedensten 1273

The Research on Application of New Technologies in High Gradient Magnetic Separator with Horizontal Magnetic Line

Y Tang, J Zhang and J Wernham 1281

A Mechanistic Model of Batch Grinding in Ball Mills

L Tavares and R Carvalho 1287

Comparative Studies on Balls Versus Spheroidal Tetrahedrons Working Media to Ore Grinding in an Industrial Drum Mill

L Tzotzorkov, T Penchev, P Bodurov and L Kuzev 1299

Flow Sheet Development of Three Geographically Distinct Chromium-Bearing Ores

C Vadeikis, M Germain and E Raffaillac 1309

High Pressure Grinding Rolls Scale-Up and Experiences

F van der Meer 1319

Implementation of an Energy Efficient Dry Grinding Technology into an Anglo-American Zinc Beneficiation Process

W van Drunick, C Gerold and N Palm 1333

The Physical Basis of Non-Random Breakage in an Iron-Oxide Ore Hosted Copper Gold Ore

T Vizcarra, E Wightman, N Johnson and E Manlapig 1343

Study on Mineral Processing Technology for a Refractory Iron Ore

Z Wang, F Yu and L Zhao 1351

Exploring the Breakage Environment in Mills with Discrete Element Methods

N Weerasekara and M Powell 1357

Grinding and Beneficiation Characteristics of a Low-Grade Haematite Ore

D Wei, S Gao, W Liu, Z Guan, B Cui, C Han and P Fang 1367
Comminution and Physical Separation continued

Fragmentation Characteristics of Iron Ores from Anshan, China
D Wei, C Han, W Liu, S Gao and Z Guan

Implementation of Fine-Screening in Preparation of KGHM PM SA
Sandstone-Carbonate Copper Ore for Flotation
A Wieniowski, B Skorupska, Z Smieszek, P Brodzik and A Konieczny

Development of a New Dry Density Separator for Fine-Grained Materials
H Wotrubac, L Weitkaemper and M Steinberg

Study on Dynamic Characteristics of Inertia Cone Crusher and Its Application
X Xia and B Chen

A New Technology of Applying SLon-2500 Magnetic Separator to Recover Iron Concentrate from Abandoned Tails
D Xiong

Spreadsheet Based Modelling of Liner Wear Impact on Charge Motion in Tumbling Mills
M Yahyaei and S Banisi

Reason Analysis of Impurity Containing and Technology Discussion of Quality Improvement for Low-Quality Iron Concentrate
L Yu, G Qiu, H Wang and Y Tang

Fine Coal Evaluation by Gravity Methods
E Yüce, A Güney, G Önal, O Kangal, O Kökkaç, M Özer and M Özdingiş

Research and Application of Vertical Screw Stirred Mill
G Zhang, X Zhao, Z Li, S Xiao and L Huang

Study on Mineral Processing for a Cassiterite Ore in Southwest China
H Zhang, X-Y Qiu, X Tong, Z Hu, H-W Li and Z-Q Chen

Triboelectrostatic Producing Ultra-Clean Coal
X-X Zhang, D-Y Duan, B Tian, J-S Wang, F Deng and S Zhang

Extractive Metallurgy

Recovery of Rhenium from Mineral Raw Materials of Kazakhstan
Z Abisheva, A Zagorodnyaya and N Bekturganov

Pressure Oxidation of Sulfide Gold-Bearing Concentrates with Double Refractoriness
A Bogorodsky, Y Emelianov, S Balikov and N Kopylova

Comparison of Industrial Cyanide Destruction Processes
P Breuer, C Sutcliffe and R Meakin
Extractive Metallurgy continued

Roasting of a Copper Sulfide Concentrate

E Brocchi, R de Souza, A Brandão, C Queiróz and J de Campos

The Application of Roasting Pretreatment for Antimonial Refractory Gold and Silver Ores

O Celep, I Alp and H Deveci

A Study of Extracting Vanadium from Stone Coal Using Cyclic Oxidation

T Chen, Y Zhang, T Liu and J Huang

Carbothermal Reduction of Ilmenite Concentrates and Synthetic Rutile in Different Gas Atmospheres

M Dewan, G Zhang and O Ostrovski

The Dynamics and Thermodynamics of Absorbing Lithium of Ion Sieve Preparing Polymetallic Nodules

L Feng, X Jiang, S Wang, Y Fan, K Jiang, H Wang and L Zhao

Research on Reduction-Magnetic Separation of Bayan Obo Ore

P Gao, Y Han, Y-J Li and H-F Wu

Study on Selective Reduction and Magnetic Separation of Low-Grade Nickel Laterite Ore to Produce High Nickel Concentrate

Q Li, Y Cui, D Zhu, J Zhu, J Pan, H Zhang and G Zheng

Kinetic Behaviour of Solid/Solid Separation of Ultrafine Particles in Aqueous Suspension

H Mendoza

Effect of Activated Carbon on the Leaching of Cobalt-Rich Ferromanganese Crust in Sulfuric Acid

H Nakazawa, W Hareyama and T Okura

The Development of a Non-Roasting Technology for Polymetallic Gold and Silver-Bearing Sulfide Concentrates Treatment

Y Nikolaev and S Rybkin

Carbothermal Reduction and Nitridation of Ilmenite Concentrates and Chlorination of the Reduced Samples

S Rezan, A Adipuri, G Zhang and O Ostrovski

Recovery Process of Carbon Dioxide with Metal Oxides and Metal Hydroxides

J Shibata and N Murayama

Removal of Arsenic in Enargite from Copper Ores by Flotation and Leaching in NaHS Media

A Shibayama, W Tongamp, K Haga and Y Takasaki

Characterisation of Manganese Ores

B Sørensen, S Gaal, E Ringdalen, M Tangstad and O Ostrovski

Recovery of Vanadium from Stone Coal Through an Environmentally Friendly Acid Leaching Technology

X Tong, F Rao, X Luo and G Ye
Extractive Metallurgy continued

Roles of Mineral Impurities and Sulfur in the Leaching Behaviour of Pre-Reduced Ilmenite Ores
M Valix, C Chen, W Eu and W Cheung 1633

Thermal Processing of Petroleum Fly Ash for Vanadium Recovery
Y Xiao, H Jalkanen, Y Yang, C Mambote and R Boom 1643

Upgrading of Superfine Low-Grade Haematite Ores by Reverse Floatation Direct Reduction Low Intensity Magnetic Separation Process
Y Xiao, D Zhu, T Chun, B Chen and J Pan 1653

Microfluidic Solvent Extraction for Mineral Processing of Copper Leach Solutions
J Zhou, C Priest, R Sedev, J Ralston, A Aota, K Mawatari and T Kitamori 1661

Upgrading and Removing Phosphorus from Low-Grade and High Phosphorus Containing Iron Ores
D Zhu, Y Xiao, T Chun, B Chen and J Pan 1667

Preparation of MgO Nano-Particles with Magnesite
Y Zhu, Y Han, X Wang 1677

Flotation

Au-Ag Recovery from Complex Ore by Flotation
N Acarkan, G Önal, G Bulut and A Gül 1687

Recovery Efficiency Study on Ilesha Placer Gold Ore by Flotation Using Locally-Sourced Frothers and Collectors
J Ajayi and S Awe 1695

An Integrated Study of Bubble-Particle Attachment Mechanisms
B Albijanic, M Hampton, P Nguyen, O Ozdemir, D Bradshaw and A Nguyen 1703

An Investigation into the Flotation Behaviour of Pyrrhotite Present in the Merensky Orebody
S Allison and C O'Connor 1711

Temperature Sensitive Polymers as Efficient and Selective Flotation Collectors
E Burdukova, D Bradshaw and G Frank 1721

Cyclonic Separation Effect of Metallic Ores in Cyclonic-Static Micro-Bubble Flotation Column
Y-J Cao, Z-L Ma, X-B Li, J-T Liu, Y-T Wang and H-J Zhang 1731

Treatment of the Siirt-Madenköy Ores by Flotation
A Ceylan and G Bulut 1737

The Effect of High Power Nanosecond Electromagnetic Pulses on Selectivity of Pyrite from Arsenopyrite
V Chanturiya, I Filippova, L Filippov and M Ryazantseva 1743

Study on Flotation Experiment of Complex Copper-Lead-Zinc Polymetallic Sulfide Ore in High Altitude Area and its Industrial Application
D Chen, J Yang, G Li and H Zeng 1753
Flotation continued

Research on the Differential Flotation of Iso-Floatable Lead-Zinc Sulfide Ore  
J Chen and C Sun  1763

Behaviour of Bubble Clusters in a Turbulent Flow  
Z Chen, S Ata and G Jameson  1773

Effects of Hydrated Mg\textsuperscript{2+} on KCl Flotation  
F Cheng, H Zhang, Y Jiao, C Li and C Zhu  1783

Study on New Tungsten Beneficiation Technological Flow Sheet of Shizhuyuan Polymetallie Mine  
X Cheng, Z Wang, X Li and Y Shang  1793

Processing of Hard-to-Treat Copper Ore and Flotation Middlings Using Chemical Treatment  
T Chmielewski, A Luszczkiewicz and A Konieczny  1799

The Effect of Ionic Strength of Plant Water on Valuable Mineral and Gangue Recovery in a Platinum Bearing Ore from the Merensky Reef  
K Corin, A Reddy, I Mityen, J Wiese and P Harris  1807

Inhibition of Bubble Coalescence by Salts and Sugars  
V Craig and C Henry  1815

A Modelling Approach Using a Back-Calculated Induction Time to Predict Recoveries in Flotation  
A Danoucaras, S Vianna and A Nguyen  1827

Enhancing the Flotability of Gold-Bearing Ores by a Mixture of Collectors  
N Dementyeva  1837

Adhesion of Escherichia coli onto Oxide Minerals – Extended DLVO Theory and Flotation Behaviour  
M Farahat, T Hirajima, K Sasaki and K Doi  1841

Application of Agricultural Residues from Pyrolysis in Flotation of Black Coal  
P Fecko, V Kriz, J Vales, M Kusmierzova and A Kasparkova  1853

Study on Separation Technology for Copper-Molybdenum Collective Concentrate  
A-S Peng, T-B Yue, L Lv and L-H Fang  1863

Reverse Cationic Flotation of Iron Ores – Floatability of Amphiboles at Depression of Iron Oxides by Starch  
I Filippov, I Filippova and V Severov  1869

Optimisation of the Performance of Flotation Circuits Using a Genetic Algorithm Oriented by Process-Based Rules  
P Ghobadi, M Yahyaei and S Banisi  1879

Detachment of Particles from Bubbles in a Stirred Cell  
S Goel and G Jameson  1891

The Effect of Non-Toxic Depressants in Chalcopyrite Flotation  
A Gül, E Baran and F Burat  1899

Beneficiation Studies of Dolomitic Rock Phosphate in Pursuit of Zero Waste Technology – A Case Study  
C S Gundewar and A Majumdar  1905
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration of Phosphate Ore by Flotation With/Without Desliming</td>
<td>O Güven, G Bulut, O Kangal, N Durmaz and F Arslan</td>
<td>1911</td>
</tr>
<tr>
<td>Flotation Performance Improvement by Air Recovery Optimisation on</td>
<td>K Hadler, C Smith and J Cilliers</td>
<td>1917</td>
</tr>
<tr>
<td>Roughers and Scavengers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanism of Modified Sodium Silicate on Fluorite Ore Flotation</td>
<td>Y-X Han, Z Lu, W-Z Yin, Y Li and Q Li</td>
<td>1925</td>
</tr>
<tr>
<td>Flotation of Phosphate Gangue from Magnetite Fines – Non-Ionic</td>
<td>K Hanumantha Rao, R Divari, S Lu, A Vilinska and P Somasundaran</td>
<td>1933</td>
</tr>
<tr>
<td>Surfactant as Atrac Collector Modifier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effect of Grinding Media on the Flotation of Sulfide Minerals</td>
<td>F He, L Song and C Sun</td>
<td>1945</td>
</tr>
<tr>
<td>A Process for the Flotation of Chrysocolla</td>
<td>R Herrera-Urbina, J Laskowski and D Fuerstenau</td>
<td>1959</td>
</tr>
<tr>
<td>Methods for Improving the Flotation Recovery of the Coarse Fraction</td>
<td>M Holuszko, E Wightman and E Manlapig</td>
<td>1971</td>
</tr>
<tr>
<td>of a Nickel Ore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spectroelectrochemical Investigation of Hydroxamate Reagents on</td>
<td>G Hope, R Woods, G Parker, A Buckley and J McLean</td>
<td>1981</td>
</tr>
<tr>
<td>Copper Oxide Minerals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plant-Based Trials of Monitoring of Coal Flotation Systems Using</td>
<td>S Hu and B Firth</td>
<td>1991</td>
</tr>
<tr>
<td>Electrical Impedance Spectrum Technique</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effect of Hardwater on Selective Flocculation of Diaspore-Bauxite</td>
<td>Y Hu, W Liu, W Sun and Y Liu</td>
<td>2003</td>
</tr>
<tr>
<td>Study on the Reasonable Mineral Processing Technology of a Cu-Mo Ore</td>
<td>Z Hu, F-X Ye, H-W Li, H Zhang, Z-Q Chen and Q-L He</td>
<td>2011</td>
</tr>
<tr>
<td>Fast Adsorption Phenomena at Air/Liquid Interfaces</td>
<td>Z Jávor, N Schreithofer and K Heiskanen</td>
<td>2015</td>
</tr>
<tr>
<td>Carrier Micro Encapsulation (CME) for Suppressing Pyrite Floatability</td>
<td>R Jha, J Satur, N Hiroyoshi, M Ito and M Tsunekawa</td>
<td>2025</td>
</tr>
<tr>
<td>and Oxidation in Coal Preparation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Metallurgical Development of an Enargite-Bearing Deposit</td>
<td>R Kappes and J Gathje</td>
<td>2035</td>
</tr>
<tr>
<td>Contact Angle Measurements on Lignite Surface</td>
<td>S Koca, Y Bektas and H Koca</td>
<td>2049</td>
</tr>
<tr>
<td>Experimental Validation of a Flotation Cell Model</td>
<td>P Koh and L. Smith</td>
<td>2055</td>
</tr>
</tbody>
</table>
Flotation continued

Advances in Coarse Particle Recovery – Fluidised-Bed Flotation

J Kohmuench, M Mankosa, E Yan, H Wyslouzil, L Christodoulou and G Luttrell 2065

A Study on Main and Interaction Effects of Operating Variables of Column Flotation

M Kor and S Karimi 2077

Influence of Frothers on Bubble Shape and Velocity Close to the Generation Point

W Kracht and J Finch 2087

Development of Technology for Complex Uranium Ores Processing on the Flotation Process Basis

A Kurkov and V Skatalov 2097

Role of Bubbles in the Action of Flotation Agents

J Laskowski 2107

An Investigation of Cobalt Recovery on a Complex Oxidation Mine with High Per Cent of Mud

C Li and S Zhou 2115

Sulfidisation Promotion Effect of Ammonium Sulfate on the Flotation of Copper Oxide Ores

D Liu, J Fang, S Wen, W Zhang, Y Chen, X Zhang, L Sun and X Zhou 2121

Investigation of the Effect of N-Substituents on Performance of Thioureas as Special Collectors for Copper Sulfides by ab Initio Calculations

G Liu, H Zhong, Z Xu, Y Lu, L Xia and T Dai 2129

A Study on Process Mineralogy and Mineral Processing of Complex Carbon-Bearing Cu-Pb-Co-Ni Multi-Metal Sulfide Ore by Bulk Flotation

S Lu 2139

Adsorption of Starch on Kaolinite Surfaces

X Ma, W Bruckard and D McCallum 2147

Electrochemistry Measurement, Using Chena Analyser, to Investigate Selective Separation of Pentlandite and Pyrrhotite

H Manouchehri, V Lawson and A Taylor 2153

Investigation on Sheelite Floatability by Particle Size Fraction

Z Markovic and D Milanovic 2165

Improving Pentlandite Selectivity Over Pyrrhotite Using Reagents

M Mbonambi, M Becker, J-P Fratzidis, M Bryson and D Bradshaw 2169

The Effect of Molecular Weight on the Adsorption and Efficacy of Polysaccharide Depressants

B McFadzean, P Dicks, G Groenmeyer, P Harris and C O’Connor 2177

Bubble Load Measurements in Flotation – A Critical Review of Current Practice

G Montes-Atenas and D Bradshaw 2187
Flotation continued

Peculiarities of Quartz Distribution in Zinc Flotation Products and their Influence to Mineral Processing

I Nishkov, I Grigorova, N Valkanov, R Bodurov and M Damianov

Effect of Hydrophobicity and Frother Concentration on Bubble-Particle Interactions in Turbulent Flow

B Omelka, N Schreithofer and K Heiskanen

Upgrading of MgO in Dolomite Ore by Froth Flotation

K Ono, A Kariwada, G Dobibba, J Sasaki and T Fujita

A New Cell for Electrochemically Aided Flotation

V Panayotov and M Panayotova

Valuable Components Recovery from Lead-Zinc Metallurgical Slag

M Panayotova and V Panayotov

Flotation Research on Cassiterite of Tailings

W Qin, L Ren and M He

Electro-Flotation Research on Fine Cassiterite

W Qin, L Ren and W Sun

Study on Rational Process Flow Sheet for Beneficiating Low-Grade Cu, Mo, Bi, S, W Polymetallic Ore

X Y Qiu, Z Hu, H-W Li, Z-Q Chen, H Zhang, J-W Yao and Z-A Xu

Adsorption Isotherm Measurement of Sodium Oleate on Haematite Using Differential Thermal Analysis

K Quast

Retreating Cu-Mo Rougher Tailing by Flotation for Concentration of Copper and Molybdenum

J Rabatho, W Tongamp, A Shibayama, J Kato and Y Takasaki

Development of a Froth Dropback Measurement Device

R Rahman, S Ata and G Jameson

Effect of pH and Chain Length on the Flotation Separation of Fluorite from its Synthetic Mixtures with Calcite and Dolomite with Imino-Bis-Methylene Phosphonic Acid

B Rai, T Rao, J Mielczarski, J Cases and Pradip

Effectiveness of Lead as an Alternative to Copper Activation in Gold Bearing Iron Sulfide Flotation

V Ramsell and G Subasinghe

An Evaluation of Froth Recovery Measurement Techniques

K Runge, R Crobie, T Rivett and J McMaster

Frother-Depressant Interactions in Two and Three Phase Systems

N Schreithofer, J Wiese, B McFadzean, P Harris, K Heiskanen and C O’Connor
Floatation continued

Flotation Circuit Optimisation – Towards More Sustainable Practice  
S Schwarz and E Wightman  

Promoters for Soap Flotation of Phosphate Minerals  
D Sekhar, K Srinivas, G Prabhulingaiah, Y Dassin and A Alftinah  

An Application of Depressant BK510 in Separation of Molybdenite and Bismuth by Flotation  
Y Shang, Z Wang and X Cheng  

Wetting Characteristics of Mineral Surfaces – Contact Angle Measurements through Molecular Dynamics Simulations  
S Singh, Pradip and B Rai  

Predicting Water Recovery from Flotation Cells  
C Smith and J Cilliers  

Recovery of Pentlandite and Chalcopyrite from Tailings by Bi-Cyclone Powerful Flotation Column  
Y Song, W Li, W Qu, Y Cheng and S Liu  

Influence of Grinding Media on the Flotation of Carbonate Using Sodium Oleate as Collector  
Z Song, C Sun and S Lu  

The Mineralogical Researches of Gold Ores and Technological Products at Operating Factory in Olympiada Mine (Russia)  
V Soumen, S Savushkina, J Stragis, J Akhmetvaloeva and G Krizomazova  

Effect of Matching Relationship Between Bubble Size and Particle Size on Kaolinite Flotation  
W Sun, P Chen, Y Li, Y Hu and H J Huang  

Study on the Recovery of Zinc Minerals from the Tailing of a Lead and Zinc Mineral Processing Plant  
Y Sun, J Liu, S Wang and F Dong  

Study on the Mineral Processing Technology of Low-Grade Refractory Lead-Zinc Oxide Ores Containing Argillaceous and Carbonated Gangue in Yunnan  
X Tan, F He, W Wu, M Wei and C Sun  

Assessment of the Consistency Between Different Laboratory Froth Stability Measurements  
D Tang, E Wightman, J-P Franzidis and G Montes-Atenas  

The Harmonious Design on the Beneficiability for the Pt-Pd Ores Containing High MgO Gangue in Yunnan  
M Tang and W Zhang  

Slime Flotation Using Ethoxylated Surfactants in Solutions of the Electrolytes  
S Titkov, E Konoplev, N Panteleeva and T Garkova  

Research and Tests on Improving the Technology of Enrichment of the Copper-Molybdenum Ore  
N Tyushkova and L Marusanova  

Possibilities for Flotation Acoustics Monitoring – A Review  
C Vanegas and P Holtham
Flotation continued

The Rate Variable Batch Test (RVBT) – A Research Method of Characterising Ore Floatability

On the Role of Dixanthogen in Froth Flotation

Study on Mechanism of Sphalerite Flotation in the Presence of Main Metal Ions by Molecular Mechanics

Correlation of Air Recovery with Thin Film and Froth Stability in Flotation

Flotation of Composite Synthetic Particles

Study on Beneficiation Technology of a Refractory Fluorite Ore in North China

Study on the Effects and Mechanics of Na₂SO₃ to Chalcopyrite and Galena

The Effects of Collector and Grinding Environment on the Flotation Selectivity of Rosh Pinah Pb/Zn Ore

Improvement of Phosphate Ore Flotation Performance Through Sized Flotation

The Significance of Internal Recycle in Froth Flotation

The Direct and Indirect Effects of the Reagent Suite on Froth Stability in Laboratory Scale Batch Flotation Tests

Generation and Attachment of Submicron Size Bubbles to Colloidal Solids

Effect of Spacer Chain Length on the Flotation of Kaolinite and Quartz by Using Gemini Surfactants as Collector

Certain Molybdenum Resources in Indonesia Mineralogical and Processing Study

Study on Mineral Processing of Refractory Copper-Nickel Ore

Experiment of Improving the Quality and Decreasing the Impurity of Titanium Concentrate in Panzhihua Mine in China

The detachment of Coarse, Composite Particles from Bubbles

R Varadi, K Runge and J-P Franzidis

V Vugdergauz and S Konratiev

F Wang and S Luo

I Wang, X Qu and A Nguyen

W Wang and D Fornasiero

Z Wang and Q Xiao

M Wei and C Sun

Y Wei and R Sandenbergh

Y Wei, S Wang, X Li and R Sandenbergh

S D D Welsby, S M S M Yianna and J-P Franzidis

J Wiese, P Harris and D Bradshaw

C Wu, K Nesset, Z Xu and J Masliyah

L Xia, H Zhong and G Liu

Q Xiao, Z Wang and H Deng

W Q Xiao, Z M Wang and X C Cheng

K Xiong, S Wen, J Peng and H Shen

D Xu, W Wang, I Ametov, D Fornasiero and S Grano
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flotation continued</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process Study on Some Ag-Cu-Pb-Zn Polymetallic Ore in South China</td>
<td>X Xu, L Wang, C Luo, X He and X Zhou</td>
<td>2611</td>
</tr>
<tr>
<td>A Novel Diagnosis and Evaluation Procedure for Flotation Plants</td>
<td>J Yianatos, L Bergh, F Contreras and F Diaz</td>
<td>2617</td>
</tr>
<tr>
<td>Study on Flotation of the Low-Grade Magnesite Ore</td>
<td>W-Z Yin, Q Li and Y Ma</td>
<td>2631</td>
</tr>
<tr>
<td>The Purification of Low-Grade Quartz Ore by Flotation and its Mechanism</td>
<td>W-Z Yin, Y-Z Ding and Y-X Han</td>
<td>2639</td>
</tr>
<tr>
<td>Research on Universal Depressant of Talc and Serpentine</td>
<td>C Yu, X Wu, Z Wang, D Li and D Zhang</td>
<td>2645</td>
</tr>
<tr>
<td>Technical Challenges in the Flotation of Molybdenite from Porphyry Copper Ores</td>
<td>M Zanin, S Grano and I Ametov</td>
<td>2651</td>
</tr>
<tr>
<td>The Study of Jamesonite Flotation Behaviour</td>
<td>Q Zhang, B Deng, B-Q Yang and J-G Liu</td>
<td>2663</td>
</tr>
<tr>
<td>Study on Pure Mineral Flotation Tests of Low-Grade Phosphate Ore in Zhijin, Guizhou Province, China</td>
<td>Q Zhang, Z Long, S Mao, Y Feng, F He, W Zhao, W Zhang, K Chen, Q Wu, S Yang, Y Chen, R Zhang and T Xie</td>
<td>2671</td>
</tr>
<tr>
<td>An Ammonia Leaching-Solvent Extraction-Electrowinning-Flotation Process for Copper Oxidised Ore Treatment</td>
<td>W Zhang, J Fang, D Liu and Y Li</td>
<td>2677</td>
</tr>
<tr>
<td>Study on the New Flow Sheet and Wastewater Recycling for Xiaoliuguo Copper-Bearing Low-Grade Scheelite Ore</td>
<td>Z Zhang, P Zhang, S Zhang, Y Wei, X Wang and Z Zhou</td>
<td>2689</td>
</tr>
<tr>
<td>Flotation of Smithsonite by Using Siloxane Cationic Surfactants as Collectors</td>
<td>H Zhong, L Xia, H Wang and Q Liu</td>
<td>2697</td>
</tr>
<tr>
<td>Study of Bauxite Separation by Using Flotation Column</td>
<td>C-C Zhou, J-T Liu, X-B Li, Y-T Wang, L Feng, X-R Zhao and M-Q Zhang</td>
<td>2705</td>
</tr>
<tr>
<td>The New Technology of Enrichment of a Fine Low-Grade Tungsten from Complex Multi-Metallic Ore</td>
<td>X Zhou, X Li, L Deng, W Huang, T Guan and A Zhai</td>
<td>2711</td>
</tr>
<tr>
<td>The Performance of Benzyl Arsonic Acid as a Collector in the Flotation of Wolframite and Cassiterite Slime</td>
<td>J Zhu and Y Zhu</td>
<td>2719</td>
</tr>
<tr>
<td>Autogenous-Carrier Effect and Gangue Influence in Fine Particle Flotation of Ilmenite/Titanaugite System</td>
<td>Y Zhu, Q Feng, G Zhang, Y Lu and L Ou</td>
<td>2731</td>
</tr>
</tbody>
</table>
Health, Safety and Environment

Satellite Image Based Strategies to Evaluate the Impact of Dismissed Mine Site – An Application to the Mae Moh Coal Mine Area in the Lampang Province, Thailand

Choosing an Effective Dust Suppressant

The Role of Mineral Processing in the Development of Cement with Low Carbon Emissions

Mineral Characterisation and In Situ Analysis

The Mineralogy and Reactivity of Pyrrhotite from Selected Nickel Ore Deposits and its Effect on Flotation Performance

The Use of Automated Mineralogy to Interpret the Batch Flotation Performance of Merensky Reef Ore

Surface Chemistry of Iron Ore Throughout a Processing Plant

Phosphorus Phase Analysis of Medium-Low-Grade Rare-Earths-Bearing Phosphate Ores

Advances in Optical Image Analysis and Textural Classification of Iron Ore Fines

Selective Recovery of Platinum from Cobalt-Rich Crust

Using Positron Emission Particle Tracking (PEPT) to Investigate Industrial Systems

Determination of Flotation Kinetics of Coal Grain Types in a Pilot Scale Jameson Cell using Coal Grain Analysis Method

Techniques Used and Problems Encountered in Normal and Reverse Circulation Drilling at the Mt Roseby Project, Cloncurry, North West Queensland

The Effect of Bulk Iron Concentration on the Copper Activation of Sphalerite at pH 9
Mineral Characterisation and In Situ Analysis continued

Research on the Thermodynamics of Siderite Roast Decomposition and the Experiment of Magnetic Roasting-Separation

D Huang, Y-F Guo, G You, T Jiang, H-G Dong, X-W Ma and Y-N Lu

Using Mineral Maps to Rank Potential Processing Behaviour

J Hunt, R Berry and S Walters

Geometallurgical Study of Copper Oxide Mineralisation Hosted in Gravels of Different Physical Quality

O Jerez, M Pinheiro, S Helle, U Keim and M Avendaño

The Effect of Mineral Liberation on the Floatabilities of Pyrite, Arsenopyrite and Arsenian Pyrite for Carlin Trend Ores

R Kappes, D Brosnahan and J Gathje

Characteristics Analysis of a Bastnaesite Rare Earth Mineral for Recovery of Cerium

J-A Kim, G Dobibb, T Fujita and N Fujii

How Particles Stick to Bubbles — The Influence of pH and Hydrophobicity in Flotation

M Krasowska, D Fornasiero and J Ralston

How to Evaluate Crushed Rocks for Concrete Production

B Lagerblad, H-E Gram and M Westerholm

Adsorption of Alkylammoniums in the Interlayer of Montmorillonite and its Effect on the Viscosity of Organo-Montmorillonite Gels

X Lu, Y Liu and J Qiu

New Bio-Adsorber with Activated Carbon and Nano Tube Carbon for Separation of Nickel and Cadmium

M Mehervan, H Ghafortan and F Malekian

Determination of Porosity and its Influence on Specific Surface

T Niedoba and B Pesko

Significance of Ion Interactions in Flotation in Saline and Brine Solutions

O Ozdemir, A Nguyen, J Miller, H Du and M Celik

Ultrasonic Extinction for High Resolution Particle Size and Concentration Analysis

A Pankiewitz, C Behrens, J Geng and A Smith

Dynamics of Three Phase Contact Line Motion in Liquid-Liquid-Solid Systems — Impact of Surface Roughness

M Ramiasa, R Fetzer and J Ralston

A New Online Detection Method for Arsenic Minerals in Process Streams

B Schwitter, D Bennett and D Miljak

Similarities and Dissimilarities in Florida Phosphate Ore Types — Surface and Bulk Property Analysis of the Flotation Feed, Concentrate and Tails

P Somasundaran, P Patra, I Chernyshova, S Ponnurangam, P S Purohit and H El-Shall

Mineral Changes that Occur During Coal Gasification

F Waanders and J Bunt
**Mineral Characterisation and In Situ Analysis continued**

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study on Influence that Styrene-Phosphoric has on the Surface Property of Rutile Minerals</td>
<td>T-B Yue, D-Z Wei, A-S Feng and W-Y Zhou</td>
<td>3033</td>
</tr>
<tr>
<td>Study on the Interaction Mechanism of Flotation Reagents and Rare-Earths-Bearing Phosphate Ore</td>
<td>W Zhao, W Zhang, K Chen, Q Wu, C Linhu, Z Xu, Z Long, Q Zhang, S Mao, C Tang, W Ma, Y Tian and F He</td>
<td>3041</td>
</tr>
</tbody>
</table>

**Minerals Industry Education**

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Beginnings of Mineral Processing Research in Canada – A Short Account</td>
<td>F Habashi</td>
<td>3051</td>
</tr>
<tr>
<td>Exerting the Advantages of National Key Discipline, Outstanding the Training of Engineering Capability, Cultivating Talent to be with Innovation Ability</td>
<td>Y-Q He, Y-M Zhao, J-T Liu, J-X Xie, Y-J Tao, C-L Duan and B-F Wen</td>
<td>3063</td>
</tr>
<tr>
<td>Earnest Advocacy – A Key to Sustainable Minerals Industry Education – A Philippine Experience</td>
<td>M Ignacio</td>
<td>3069</td>
</tr>
<tr>
<td>Mineral Processing Engineering Education in China – Bringing up the Engineering Diathesis and Design Competence of the College Students</td>
<td>Y Kuang, Y Zhao, J Liu, Y He and Y-J Tao</td>
<td>3077</td>
</tr>
<tr>
<td>Mineral Processing Education in China</td>
<td>X-X Zhang, Y-M Zhao, J-T Liu, J-X Xie, J-S Wang and H-S Li</td>
<td>3095</td>
</tr>
</tbody>
</table>

**Modelling and Process Simulation**

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using Dynamic Simulation Throughout a Process Plant’s Life Cycle</td>
<td>H Askew and M Patel</td>
<td>3101</td>
</tr>
<tr>
<td>Diagnostic Monitoring of Concentrator Circuits with Random Forest Models</td>
<td>L Auret and C Aldrich</td>
<td>3111</td>
</tr>
<tr>
<td>Real-Time Integration of Mining and Metallurgical Information for Efficient Use of Energy and Water</td>
<td>O Baseur and A Soudek</td>
<td>3123</td>
</tr>
<tr>
<td>Comparison of Discretised Population Balance (DPB) and Finite Element Method (FEM) Methodologies for Modelling Batch Gibbsite Precipitation</td>
<td>A Bekker, T Li and I Livk</td>
<td>3133</td>
</tr>
<tr>
<td>Process Simulation and Plant Design of a Mineral Selective Magnetising Flash Roasting Plant Using Neutrons</td>
<td>A Boehm, M Boehm and A Kogelbauer</td>
<td>3141</td>
</tr>
<tr>
<td>Modelling and Simulation to Design a Flotation Circuit for Gold Concentration</td>
<td>S Brochet, M-V Durance, P Botané and A Cailleau</td>
<td>3151</td>
</tr>
<tr>
<td>Title</td>
<td>Authors</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>The Influence of Particle Shape in Rock Fracture</td>
<td>R Chandramohan, P Holtham and M Powell</td>
<td>3163</td>
</tr>
<tr>
<td>Effect of Lattice Impurities on Electronic Properties and Surface</td>
<td>Y Chen, J Chen, Z Wei, X Mu, J Chen and D Zhou</td>
<td>3173</td>
</tr>
<tr>
<td>Adsorption of Sphalerite – A Density-Functional Theory Study</td>
<td>J Fernandez, M Sinnott, P Cleary and R Morrison</td>
<td>3187</td>
</tr>
<tr>
<td>Using DEM to Model Industrial Banana Screens</td>
<td>F Göktepe</td>
<td>3199</td>
</tr>
<tr>
<td>Continuous pH and Pulp Potential Measurements During Complex Sulfide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ore Flotation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media Type Effect on Grinding Efficiency</td>
<td>L Guzmán and D García</td>
<td>3207</td>
</tr>
<tr>
<td>Techno-Economic Evaluation of a New Early Removal Process to Treat</td>
<td>N Haque, T Norgate and W Bruckard</td>
<td>3217</td>
</tr>
<tr>
<td>High-Arsenic Copper Ores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advances in Thickener Feedwell Design via Computational Fluid</td>
<td>A R Heath and R A Triglavcanin</td>
<td>3229</td>
</tr>
<tr>
<td>Dynamics Modelling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimisation of the Advanced Automation System at Inmet Mining's</td>
<td>J Huuskonen and J Moilanen</td>
<td>3237</td>
</tr>
<tr>
<td>Pyhäisalmi Mine, Finland</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discrete Element Method – Computational Fluid Dynamics Modelling</td>
<td>C Jayasundara, R Yang, B Guo, A Yu and J Rubenstein</td>
<td>3247</td>
</tr>
<tr>
<td>of Flow Behaviour in a Stirred Mill – Effect of Operation Conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimating Particle Size Fraction Proportions – A Multiscale Approach</td>
<td>G Jemwa and C Aldrich</td>
<td>3257</td>
</tr>
<tr>
<td>Using Multiple Kernel Learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review on Some Research Methods of Mineral Crystal Chemistry and</td>
<td>S Lu, Z Song and C Sun</td>
<td>3269</td>
</tr>
<tr>
<td>Computer Simulation on Flotation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modelling of Magnetic Carrier Separation Process Using Computational</td>
<td>S Mohanty, B Das and B Mishra</td>
<td>3277</td>
</tr>
<tr>
<td>Fluid Dynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimating Breakage of Fine Ore Particles by Media in a Small Ball</td>
<td>R Morrison and P Cleary</td>
<td>3287</td>
</tr>
<tr>
<td>Mill Using DEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Towards Improved Hydrocyclone Models – Contributions from Computational</td>
<td>M Narasimha, M Brennan, A Mainza and P Holtham</td>
<td>3299</td>
</tr>
<tr>
<td>Fluid Dynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modelling Channel Scale Flow in Heap Leaching Using Smooth Particle</td>
<td>S Neethling</td>
<td>3313</td>
</tr>
<tr>
<td>Hydrodynamics (SPH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application of Kriging in Approximations of Grained Materials</td>
<td>T Niedoba</td>
<td>3321</td>
</tr>
<tr>
<td>Characteristics Distribution Functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upgrading of a Flow Sheet Selection PC Algorithm for Refractory</td>
<td>D Nikolaev and Y Nikolaev</td>
<td>3327</td>
</tr>
<tr>
<td>Concentrates Treatment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Modelling and Process Simulation continued

Application of Discrete Element Method for Simulating Feeding Conditions and Size Reduction in Cone Crushers

J Quist and C Evertsson

3337


Y Rao

3349

Dynamic Simulation of an Alumina Refinery

B Reynolds

3363

Flow Sheet Simulation of Municipal Waste Treatment Processes

J Rosenkranz and H Kuyuneu

3373

Modelling and Optimisation of Direct Reduction of Iron Ore by Coal in a Rotary Kiln

V Runkana, P Natekar, V Bandila, G Pothal and A Chatterjee

3383

On Kinetic Coupling in Meso-Scale Phenomena in Mineral Froth Flotation

G Wierink and K Heiskanen

3395

Predicting Flotation Response from Liberation Information

E Wightman, C Evans, D Bradshaw and E Manlapig

3403

Performance of Outotec FloatForce® Flotation Mechanism – A Study in Both Computational Fluid Dynamics and Industrial Scale Measurement

J Xia, A Rinne, H Myllykangas and S Grönstrand

3411

Study on Oil Agglomeration Flotation for Deinking

C Yu and L Zhang

3419

Plant Design and New Equipment

Tried, Tested and Proven – 300 m³ Flotation Cells in Operation

R Coleman and A Dixon

3429

Innovative and Resource-Preserving Washing Processes for Primary and Secondary Raw Materials

P Grotjohann and H Müller

3441

Particle Size Measurement of TiO₂ Nanoparticles in Non-Aqueous Solvent by Interactive Force Apparatus Under an Electric Field

A Otsuki, G Dodibiba and T Fujita

3451

Mining Systems and Technology – Synchronous Electric Drives for Grinding Mills

M Floc and D Peters

3459

Research of 200 m³ Self-Suction Flotation Machine

Z Shen, J Liu, S Lu, S Shi and D Chen

3473

Research on the Design and Processing Characteristics of 320 m³ Air-Forced Mechanical Flotation Cell

Z Shen, S Lu, L Yang and G Dong

3481

Acoustic Emission Monitoring of Froth Flotation

S Spencer, R Bruniges, V Sharp, A Catanzano, G Roberts, W Bruckard and K Davey

3489
Sustainability and Energy Utilisation

Coal Preparation Research at Turkish Coal Enterprises (TKI)  
S Anac, M Bulut, Ö Gülsoy and L Ergin  
3503

Economic Sustainable Power for Mineral Processing  
J Claflin, R Leonard, D Rogers and H Petersen  
3509

Efficiency, Economics, Energy and Emissions – Emerging Criteria for Commination Circuit Decision Making  
M Daniel, G Lane and E McLean  
3523

Energy Dissipation in Long-Distance Slurry Pipelines  
R H Derammelaere and J M Martinson  
3533

Ecological Fuel from High-Sulfur-Content Coal  
P Fecko, J Vales, B Tora, A Kasparkova, J Kusy and I Janakova  
3547

Claiming the Green Revolution – Protecting Investment in Green Mineral Processing  
M Hedges and M Lloyd  
3555

Recycling and Recovering Fine Particles from Auto Shredding Residue (ASR/SR) to Conserve Raw Materials and Protect Environment  
H Manouchehri  
3563

Improving the Sustainability of Primary Metal Production – The Need for a Life Cycle Approach  
T Norgate and S Jahanshahi  
3575

Creating Value and Improving Environmental Performance by the Recovery of Valuable Products from Tailings from the Athabasca Oil Sands in Alberta, Canada  
J Oxenford, K Moran and S Nelson  
3585

Evaluation of Commination Circuit Design for Sustainability Using EconoMies™  
Z Pokrywiec, R O'Halloran and C Jones  
3597

Commercialisation of Ni Heap Leaching at Murrin Murrin Operations  
D Readett and J Fox  
3611

Identifying Opportunities to Reduce the Consumption of Energy Across Mineral Processing Plants  
D Sterling  
3617

An Integrated Geology-Mine-Plant and Eco-Efficiency Simulator for Anglo Platinum’s Evaluation and Operational Improvement Initiatives  
M Ziemska, A Bye, N Plint, M Cole and A Tordoir  
3629

Transformational Technologies

The Research on Refined Gold Bullions Surface Upgrading  
S Balikov  
3641

Real Time and In Situ Measurement of Elemental Composition Using Lasers  
D Death, P Yarozcheyy and S Spencer  
3651

Innovative Technology for Optimised Thickening Sedimentation  
C Loan and I Arbuthnot  
3663

Pipe Flow Stability of Concentrated Coal-Water Suspensions in the Presence of an Electric Field  
P Rozakeas  
3675
Transformational Technologies continued

Effective Dry Density Beneficiation of Coal
L Weitkaemper and H Wotruba 3687

Waste Management

Electroosmotic Dewatering and Consolidation of Mineral Waste Tailings
J Addai-Mensah 3697

Bioleaching of E-Wastes
B Brown, M Saidan and M Valix 3707

Kinetics of Reclamation of E-Waste by a Bioleaching Route
J Bucknell, M Saidan and M Valix 3713

Adsorption Effect on Multi-Heavy Metal Ions in Wastewater by Water-
Washing Waste Saccharomyces cerevisiae
S-J Dai, D-Z Wei, D-Q Zhou and L Bai 3719

Validation and Application of Filtration Theory to Plate and Frame
Pressure Filtration – From Laboratory to Full Scale
R de Kretser, P Scales and H Saha 3727

Beneficiation of Coal Fines from Tailing Ponds of Tunçbilek Washing
Plant
A Erdem, Z Olgun, A Gulmez, O Altun, A Gümüş, B Oteyoka and S Koca 3737

Recycling of Sludge from the Production of Manganese
S Gaal, M Tangstad, B Ravary and E Ringdal 3743

Copper Extraction from Scrap Cables by Biotechnological Means
S Gaydardzhiev, D Bastin and P Bareel 3751

Experiments on High Efficiency Separation of Mixed Plastic Wastes by
Vortex-Tube Separator
I Gombkötő, B Csőke and P Lukács 3759

Cheloopec Mining EAD and Best Available Techniques for Management
of Waste Rock in Mining Activities
K Gradëva-Vasileva and I Stambolieva 3767

In Situ Bioremediation of a Heavily Polluted Alkaline Soil in a Uranium
Deposit
S Groudev, I Spasova, M Nicolova and P Georgiev 3777

Combined Flow Sheet for Treatment and Recycling of Municipal Solid
Waste (MSW) with Complex Morphological Composition
L Kuzev and N Hristov 3787

Integrated Utilisation of Desulphurisation and Skimming Slag
L Li, Y Han, L M Bai, L Wang and X Liu 3795

Iron Concentrate Synthesised from Waste Ferrous Sulfate Produced in
Titanium White Preparation
D Liu, S Wen and H Shen 3801

Coagulation-Neutralisation Technology to Treat Wastewater from Lead-
Zinc Concentrator
S Liu, Y Cao and F Gao 3807
Waste Management continued

Size Separation Pretreatment and Alumina Recovery from Bayer Red Mud
W Liu, X Zhu, X Zhang and J Yang

Old Copper Flotation Tailings Waste Reprocessing
Z Markovic, N Vusovic and D Milanovic

Lead Removal from Contaminated Soils with Chelating Agents
M Niinae and K Nishigaki

Recovery of Tantalum Capacitors from Waste Printed Circuit Boards Using a Pneumatic Separator
T Oki, Y Naito, T Kamiya, K Kawakita and T Shiratori

Copper Recovery from Printed Circuit Board by Carbonisation
H Ono, G Dodibba and T Fujita

Investigation on Comprehensive Utilisation of Nickel Slag from JNMC
J Pan, G Zheng, D Zhu and Y Cui

Performance of Dry Separation Processes in Cenospheres Recovery from Coal Fly Ash
H Petrus, T Hirajima, Y Oosako, M Nonaka, K Sasaki and T Ando

Biosorption of Cadmium from Aqueous Solutions by Coconut Shell Powder in a Fixed Bed Column
G Pino and M Torem

Physical/Chemical Treatment of Mercury-Contaminated Wastes from Former Chlorine-Alkali Electrolysis Plants – Application of Flotation Technologies in Soil Washing Plants
R Richter and H Flachberger

Management of Mining Wastes in European Union and Developments in Turkey
S Safak and I Karsan

An Integrated Solid Waste Management Method for Western Macedonia, Greece
S Savvidis and I Kapageridis

Pressing-Drill Method – A Representative Method for Taking Analysis Samples from Recycled Materials
S Schade-Dannenwitz, J Poersechke and S Döring

Paste Thickening of Tailings at the Clermont Coal Preparation Plant
N September and R Kirkwood

Lean Iron Ore Beneficiation in India
K Sharma, T Das, K Lahiri and R Boral

Study on Treatment of Wastewater Containing Heavy Metal Ions Using Modified Oceanic Cobalt-Rich Crusts
X Tan, F Wang, X Zhou and C Sun

Pilot-Scale Study of Deep Cone Thickener for Phosphatic Clay Dewatering
D Tao, G Chen, B Porekh and R Honaker
Waste Management continued

Selective Removal of Arsenic from Acid Mine Drainage Containing Ferrous Ion Using Sulfide Precipitation Method

Thickener Modelling – Incorporating Shear Effects
S Usher, R Spehar, A Kiviti-Manor and P Scales

The Acid Leaching Process for the Synthesis of Zeolitic Material from Paper Sludge Ash
T Wajima

Analysis of Procedures and Drivers for Industrial Waste Management
M Wierink, M Pajunen and K Heiskanen

Bioleaching Metals from Waste Printed Circuit Boards and the Shapes of Microorganisms
Z Xu, T Yang, L Yang and Y Li

Characterisation of Computer Printed Circuit Boards for Hazardous Properties and Beneficiation Studies
E Yazıcı, H Deveci, I Alp, A Akçıl and R Yazıcı

Removal of Thiocyanate from Solutions by Precipitation
E Yazıcı, R Üçüncü and H Deveci

Water Recycling and Frugal Water Use

Clinoptilolite as a Low-Cost Solution to Remove Heavy Metals from Water in Mining and Mineral Processing Industry
K Athanasiadis and C Hertle

Frothing in Seawater Flotation Systems
S Castro, I Venegas, A Landero and J Laskowski

Application of Natural Zeolite for the Removal of Diethylenetriamine (DETA) and DETA-Metal Complexes from Flotation Process Water
J Dong and M Xu

Mechanism Responsible for Flocculation in Poly (N-Isopropylacrylamide) Temperature Responsive Dewatering – Attractive Interaction Forces Induced by Surface Hydrophobicity
G Franks, E Burdukova, H Li, N Ishida and J-P O'Shea

Removal of Dilute Toxic Anions in Wastewater Using Aluminum Hydroxides Co-Precipitation Method
D Haraoguchi, Y Oda, C Tokoro and S Owada

Recycling of Process Water in Sulfides Processing and Flotation Selectivity
F Ikumapayi, B Johansson and K Hanumantha Rao

Water Balancing in Mineral Processing – Issues and Opportunities
L Laehance, F Flament and S Gariepy
Water Recycling and Frugal Water Use continued

Study on a Novel Polymer/Bentonite Compound Adsorbent for Removal of Cu(II) from Aqueous Solution

Water Savings and Coal Product Compromise

The Rehabilitation of Acid Mine Effluents and Toxic Heavy Metal Pollution, Emanating from Gold Mines in South Africa

Remediation of Mine Seepage at Batu Hijau

Author Index