

PROCEEDINGS OF THE 59TH ANNUAL CONFERENCE OF METALLURGISTS (COM 2020)

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Damian Connelly, METS Engineering Group

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Lele Niu and Guilin Wang, University of Science and Technology Beijing

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Michael P. Sudbury, Michael P Sudbury Consulting

Bryn Harris, NMR360 Inc.

Anne Herbst and Hendrik Schubert, University of Rostock

Carlos Paulo, Trent University

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Mohammad Sedighy, Hatch Ltd., Mahdi Raoofat, Tugliq Energy, Mark Mitchell, Hatch Ltd.

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Lee Barker, Sparton Resources Inc.

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Laurent Birry, Rio Tinto Aluminium

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Ryan Monteith and Erin Legault, SGS Canada Inc.

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Matthias Schelter, Intilion GmbH

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Georgiana Moldoveanu and Vladimiro G. Papangelakis, University of Toronto

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Noel Devaere and Vladimiro Papangelakis, University of Toronto

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Damian Connelly, METS Engineering Group

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Massoud Aghamirian, Syed Saad Ali, Irina Bylina, and Mykolas Gladkovas, SGS Canada Inc.

Yves Rougerie, Vision Lithium

Gary Pearse, Equapolar Resource Consultants Inc.

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Massoud Aghamirian, Syed Saad Ali, Jing Liu, and Chris Gunning, SGS Canada Inc.

Pierre Pelletier, Consultant, Claude Dufresne, Niobay Metals Inc.

Charlotte Gibson, Vale Canada

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Sample Maziar E. Sauber, Antonio Di Feo, and Tesfaye Negeri, CanmetMINING, Natural Resources Canada

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*Kerstin M. Forsberg and Michael Svärd, KTH Royal Institute of Technology
Reza Younesi, Uppsala University*

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Anton Andersson and Lena Sundqvist Ökvist, Luleå University of Technology

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George P. Demopoulos and Fuqiang Guo, McGill University

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Mitchell Zak, Vladimiro G. Papangelakis, and D. Grant Allen, University of Toronto

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Gisele Azimi, Ka Ho Chan, Monu Malik, and John Anawati, University of Toronto

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*David Dreisinger, University of British Columbia
Niels Verbaan and Mike Johnson, SGS Canada
Greg Andrews, Search Minerals*

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The First Vanadium Carlin Vanadium Project Metallurgical Process Development

David Dreisinger, University of British Columbia, Jodi Esplin, First Vanadium

Mike Johnson, SGS Canada, Gary Kordosky and Michael Mracek, First Vanadium

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Alind Chandra, Joshua Werner, and Rick Honaker, University of Kentucky

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Jeff Adams, Jacqueline Fossenier, and Jack Shannon, Hatch Ltd.

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Gisele Azimi and John Anawati, University of Toronto

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A New Approach to Solubilize REE Values: Acid Soaking Water Leaching (ASWL) Process

Chen Xia, Wesley Griffith, Ceferino Soriano, and Eden Barry, CANMET Mining

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A Study on the Behavior of Light and Heavy REEs in Fe and Al Removal Process of Rare Earth PLS

Farzaneh Sadri and Ahmad Ghahreman, Queen's University

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Joshua Werner, University of Kentucky

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Lyn Jones, M.Plan International

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Rick Honaker and Alind Chandra, University of Kentucky

Wencai Zhang, Virginia Tech

Joshua Werner and Xinbo Yang, University of Kentucky

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Liuyin L. Xia, Saskatchewan Research Council

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Tyler McCallum, Troy Bednarski, and Boban Jakovljevic, Solvay

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Lukas Hoerber and Stefan Steinlechner, Montanuniversität Leoben / Chair of Nonferrous Metallurgy

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Stefan Steinlechner, Montanuniversität Leoben / Chair of Nonferrous Metallurgy

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Yemi Oyediran, Nok Associates Limited

Peter Cashin and Pierre Guay, Imperial Mining Group Ltd.

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Niels Verbaan, Jing Liu, Mike Johnson, Massoud Aghamirian, and Tassos

Grammatikopoulos, SGS Canada Inc.

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Ron Molnar, MetNetH2O

Craig Brown, Chemionex Inc.

Andrew Robinson and Ross Lewis, Standard Lithium Ltd.

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Markus Koponen and Tuomas Van der Meer, Outotec (Finland) Oyj

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Carlos A. Morais and Michelle L. Sa, CDTN/CNEN

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Jeffrey Donald, DeepGreen Metals Inc.

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Cesare J. Ferron, HydroProc Consultants

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Process Technology Overview of the Current Estonian Production of Both Tantalum and Niobium Oxides and Metals at NPM Silmet

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Process Technology Overview for the Canadian Recycling of Gallium and Indium from Electronic Scrap and Its Conversion into High Purity Metals

Michael Robart, Brandon Taylor, and Edgar Peek, Neo Rare Metals - Neo Performance Materials

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Jonathan Chen, Vaikuntam Lakshmanan, Ramamritham Sridhar, Robert Delaat, and Md. Abdul Halim, Process Research Ortech

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Corby Anderson and Dylan Everly, Colorado School of Mines

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Kang Sun, Christel Bemelmans, and Nick Hazen, Hazen Research, Inc.

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Julien Zollinger, Institut Jean Lamour

Jacob R. Kennedy, University of Manchester

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Recent Developments in the Production, Application and Research of Titanium in Germany

Carsten Siemers, TU Braunschweig / Institut fuer Werkstoffe

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A Taxonomy of Low-voltage Perfluorocarbon Emissions in Primary Aluminium Production Cells

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*Usman Niaz, McGill University
Roderick Guthrie and Mihaiela Isac, McGill Metals Processing Center*

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The Effect of Single and Double Impingement Types of Metal Delivery Systems Used in Horizontal Single Belt Casting for the Processing of Thin Strips of AA6111 Aluminum Alloy

*Usman Niaz, McGill University
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Sohail M. Mohammed, Daolun Chen, Dejiang Li, and Xiaoqin Zeng, Ryerson University

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*Goroh Itoh, and Akira Kurumada, Ibaraki University
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Application of Inoculation Methods for Grain Refinement of Wire-Arc Additive Manufactured Ti-6Al-4V

*Jacob R. Kennedy and Alec Davis, University of Manchester
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Ed Pickering, University of Manchester
Stewart Williams, Cranfield University
Phil Prangnell, University of Manchester*

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Effect of Alloying Elements and Heat Treatments on Electrical and Mechanical Properties of Al Alloy Produced by Conventional Casting Process

Asiful H. Seikh, King Saud University, Muneer Baig, Prince Sultan University, Ateekh Rahaman, King Saud University, Jabair A. Mohammed

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*Ali Merati, NRC / ARC
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Alan A. Luo, Ohio State University

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*Julien Zollinger, Félix Royer, and Bernard Rouat, Institut Jean Lamour
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*Mohammad H. Ghoncheh, Marine Additive Manufacturing Centre of Excellence Mehdi Sanjari, CanmetMATERIALS
Babak Shalchi-Amirkhiz, Natural Resources Canada
Mohsen Mohammadi, Marine Additive Manufacturing Centre of Excellence*

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The Influence of Post-Build Microstructure on the Performance of Additively Manufactured 17-4 Stainless Steel

Mark R. Stoudt, Richard Ricker, Carelyn E. Campbell, and Maureen Williams, National Institute of Standards and Technology (NIST)

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Shengze Yin and Vahid Fallah, Queen's University

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*Stefan Heugenhauer, Sumanth Shankar, and André B. Phillion, McMaster University
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Daniela Diaz, Hani Henein, and Abdoul-Aziz Bogno, University of Alberta

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Jonas Valloton and Abdoul-Aziz Bogno, University of Alberta

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Effect of Bi on the Rapid Solidification Microstructure and Properties of Hypoeutectic Al-Si

Marcelino Dias and Abdoul-Aziz Bogno, University of Alberta

Jose Eduardo Spinelli, Federal University of Sao Carlos

Amauri Garcia, UniCamp

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Activating Monolayer Mott2 for Hydrogen Evolution by Introducing 2H/1T' Phase Boundaries

Yiqing Chen and Jun Song, McGill University

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Xiaohan Bie and Jun Song, McGill University

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Baihua Ren and Jun Song, McGill University

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Stability Improvement of Low-Cost Perovskite Solar Cells Processed in Ambient Condition by Incorporation of Inorganic Materials

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Jun Fan, City University of Hong Kong

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Crystallographic Texture during Laser Additive Manufacturing of Stainless Steel

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Scale-Phobic Rare Earth Oxide Ceramics

Gisele Azimi and Runqian Zhang, University of Toronto

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Tracking the Microstructural Development in the Selective Laser Melting of Ti-185 with In-Situ Alloying

Farheen F. Ahmed, McMaster University

Samuel Clark and Peter D. Lee, University College London

Hatem S. Zurob and André B. Phillion, McMaster University

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Microstructures and Mechanical Properties of Fiber Laser Welded Ti-6Al-4V and CP-Ti Dissimilar Joints

Alireza Abdollahi, Ahmed Shaheer Ahnaf Huda, and Abu Syed Kabir, Carleton University

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Initial Boron Uptake and Kinetics of Transient Liquid Phase Bonding in Nickel-Based Superalloys

Eric D. Moreau and Stephen Corbin, Dalhousie University

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Effect of Stress Relief Annealing on the Microstructure and Mechanical Properties of Linear Friction Welded Ti-6Al-4V

Sidharth Rajan, Carleton University

Priti Wanjara and Javad Gholipour, National Research Council (NRC), Canada

Abu Syed Kabir, Carleton University

Paper 816842

Impact of Extended Heat Treatments on Additively Manufactured Ti-6Al-4V

Peter Walker, Abu Syed Kabir, and Mostafa El Sayed, Carleton University

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Joining of Additive Manufactured Aluminium Alloys by Friction Stir Processing

Ming-Jen J. Tan, Nanyang Technological University

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Evaluation of Zener-Hollomon Parameter in an Ultrasonic Spot Welded Al5182 Alloy

Soumya S. Dash, Sohail M. Mohammed, and Daolun Chen, Ryerson University

Xianquan Jiang, Southwest University

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The Study of the Performance of Additive Manufacturing and Powder Metallurgy Titanium Alloys in Drilling Process

Junhui Ma, Javad Mohammadi, Olufisayo A. Gali, and A R. Riahi, University of Windsor

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Supersolidus Liquid Phase Sintering and Grain Growth Activation of a Metal Injection Molded Nickel-Base Superalloy

Addison J. Rayner, Dalhousie University

Stephen Corbin, Dalhousie University

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In-situ X-Ray Characterization of Keyhole Dynamics in Laser-Based Additive Manufacturing of Aluminium Alloys

Yu Zou and Hongze Wang, University of Toronto

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Hot Tearing Susceptibility of Al-Fe-Ni Alloys

Abdallah Elsayed, Stephanie Kotiadis, Mehkansh Sharma, and Matthew Bolan, University of Guelph

Paper 819488

Microstructure Evolution and Mechanical Properties of a γ -TiAl/Ti₂AlNb Dual Alloy Produced by Laser Direct Metal Deposition

Yu Zou and Haoxiu Chen, University of Toronto

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Mechanical and Fatigue Behavior of Direct Metal Laser Sintered (DMLS) Inconel 718

Anil Saigal, Tufts University

Ramesh Singh and Sachin Alya, IIT Bombay

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Atom Probe Tomography and Electron Backscattered Diffraction Correlative Study of Grain Boundary Role in Liquid Metal Embrittlement

Mohammad Hadi Razmpoosh, University of Waterloo

Brian Langelier and Hatem S. Zurob, McMaster University

Norman Zhou and Elliot Biro, University of Waterloo

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Role of Transient Softening at Fusion Zone in Failure Behavior of Resistance Spot Welds in Ultra-High Strength Hot-Stamped Steel

Alireza Mohamadizadeh, Elliot Biro, and Michael J. Worswick, University of Waterloo

Paper 820257

X-Ray Diffraction Analysis of Dynamic Transformation during High-Temperature Deformation of Niobium Steel

Clodualdo Aranas, University of New Brunswick

Samuel F. Rodrigues, Federal Institute of Maranhao

Fulvio Siciliano, Dynamic Systems Inc.

John Jonas, McGill University

Paper 820324

Materials Characterization of M789 Steel Produced by Means of Laser Powder Bed Fusion

Clodualdo Aranas, Robert Palad, and Kanwal Chadha, University of New Brunswick

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Paper 821213

Formation of Strain Induced Ferrite and its Retransformation above the Ae_3 under Plate Rolling Conditions

Samuel F. Rodrigues, Federal Institute of Maranhao

Fulvio Siciliano, Dynamic Systems Inc.

Clodualdo Aranas, University of New Brunswick

Eden S. Silva and Gedeon S. Reis, Federal Institute of Maranhao

John Jonas, McGill University

Paper 821263

An Investigation of the Effects of Welding Parameters on the Properties of Thin-Wall Pieces of Al-Si Alloy Made Using GMAW-Based Wire Arc Additive Manufacturing

Tan Pham and Mehdi Gharagozloo, École de technologie supérieure

Paper 821662

Is Cold Spray Additive Manufacturing?

Stephen Yue, McGill University

Phuong Vo, National Research Council Canada

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Paper 828982

Hybrid Investment Casting

Abdoul-Aziz Bogno, Mubashir Chand Tamboli, Ahmed Qureshi, and Hani Henein, University of Alberta

Paper 836927

How Additive Manufacturing Changes Material Properties

Hadi Mozaffari-Jovein, Dennis Pedo, Emre Özel, Mo Li, and Tobias Poleske, Furtwangen University

Paper 836991

Influence of Additive Manufacturing and Subsequent Treatments on the Corrosion Behaviour of Different Titanium Alloys

Dennis Pedo, Mo Li, Tobias Poleske, and Hadi Mozaffari-Jovein, Furtwangen University

MATERIALS: Corrosion & Degradation

Paper 814111

Corrosion Protection with Thermal Sprayed Zinc Duplex Coatings

Martin Gagne, ZELIXIR Inc.

Paper 815743

Topographic and Crystallographic Analyses of Hydrogen-Related Fracture Surfaces in Notched Tempered Martensitic Steel

Muhammad Zakuan and Kenichi Takai, Sophia University

Kensuke Iwanaga, Tsukasa Okamura, and Norio Tanaka, Neturen Co., Ltd

Paper 816577

Quantitative Evaluation of Strain-Induced Lattice Defects Enhanced by Hydrogen in Pure Iron

Kenichi Takai and Yuri Sugiyama, Sophia University

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Mass Transfer of Oxygen in Powder Coatings in Wet Diffusion Systems

Hossein Zargar and Edouard Asselin, University of British Columbia

Dennis Wong and Catherine Lam, ShawCor Ltd.

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Microbiologically Influenced Corrosion (MIC) in an Operating Gold Mine

Muan Wei, ICE Dragon Corrosion Inc.

Noelia Díaz, Barrick

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Finite Element Analysis (FEA) Study of Microstructural Influences on Hydrogen Embrittlement (HE) of High Strength Martensitic Steels

Tuhin Das, Rohan Chakrabarty, and Jun Song, McGill University

Salim V. Brahim, IBECA Technologies Corp.

Stephen Yue, McGill University

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Effect of Surface Treatment on Corrosion Control of Fe-Cr and Fe-Cr-Ni Alloys in Hydrothermal Liquefaction Processing of Biomass

Joey Kish, McMaster University

Yimin Zeng, Natural Resources Canada - CanmetMATERIALS

Elliott K. Asare, McMaster University

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Comparison of the Corrosion of Wrought and Electron Beam Melted Ti-6Al-4V for Biomedical Applications

Mohammadali Shahsavari and Edouard Asselin, University of British Columbia

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Amin Imani and Edouard Asselin, University of British Columbia

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Rust Never Sleeps: Uncovering the Hidden Business Risks from Physical Asset Degradation

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Ferric Leaching of Pyrrhotite Tailings under Controlled pH And ORP Using Different Ferrous Oxidizers

Dazhi Ren, Georgiana Moldoveanu, Radhakrishnan Mahadevan, Elizabeth A. Edwards, and Vladimiro G. Papangelakis, University of Toronto

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Plant-Wide Economic Model Predictive Control Application in Mineral Processing

Alex Thivierge, Jocelyn Bouchard, and André Desbiens, Université Laval

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Developing a Phenomenological Dynamic Model for Particle Flow in Wet Low-Intensity Magnetic Separation

Juan Sebastian Guiral-Vega, Université Laval - COREM

Jocelyn Bouchard and Éric Poulin, Université Laval

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Terry C. Cheng, CanmetMINING, Natural Resources Canada

Michael B. Parsons, Geological Survey of Canada, Natural Resources Canada

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Turning Waste to Value: Selective Recovery of Rare Earth Elements from Coal Fly Ash with Ion Exchange Technologies

Mehdi Mostajeran, Jean-Michel Bondy, and Rory Cameron, Natural Resources Canada - CanmetMINING

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Exploring the Potential Benefits of Considering Mineral Liberation Explicitly in Process Control

Edgar Manuel M. Pérez García, Jocelyn Bouchard, and Éric Poulin, Université Laval

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Erin R. Bobicki, Darryel Boucher, and John H. Forster, University of Toronto

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Accelerated Carbonation of Natural Canadian Silicates (Kimberlite and Wollastonite) for CO₂ Sequestration

Rafael M. Santos, Ye Eun Chai, Salma Chalouati, Cibi Chakravarthy, and Hugo Fantucci, University of Guelph

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An Analytical Tool to Assess the Carbonation Potential of Mineral Deposits and Mining Wastes

*Carlos Paulo, Ian Power, and Amanda Stubbs, Trent University
Nina Zeyen and Sioban A. Wilson, University of Alberta*

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Functionalized Biopolymer for Enhanced Metal Recovery in Froth Flotation Processes

*Laura Benavides, Integrity Mining and Industrial
Cameron Bruin, Base Met Labs*

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A Comparison of Two Circuit Applications for Implementation of Coarse Particle Flotation

*Eric B. Wasmund, Eriez Flotation Division
Rafael Regino, Cozamin site, Capstone Mining Corporation
Oscar Lopez, Eriez Flotation Division
Hank Wong, Fluor Canada Ltd
Kathy Adams, Paterson and Cooke
Drew Hobert, Eriez Flotation Division*

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Model Predictive Control – A Digital Transformation Initiative at Vale Long Harbour Processing Plant

*Kevin S. Brooks, BluESP
Michael Roy, Lindani Ntombela, Ryan Peterson, and Trevor Batstone, Vale
Paul Yanchus, Hatch Ltd.*

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Investigation of Ferrous Bio-Oxidation Kinetics in a Batch Bioreactor

*Heping Shen, Vladimiro G. Papangelakis, Mingqing Yang, Georgiana Moldoveanu,
Elizabeth A. Edwards, and Radhakrishnan Mahadevan, University of Toronto*

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Application of Switchable Biopolymers to Mitigate Clay Minerals in Mineral Processing

Erin R. Bobicki and Nahid Molaei, University of Toronto

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Recovery of Battery Metals (Ni and Co) from Pyrrhotite Tailings

*Rory Cameron, Natural Resources Canada - CanmetMINING
Yves Thibault and Rolando Lastra, Natural Resources Canada
Jean-Michel Bondy, Natural Resources Canada - CanmetMINING
Doug Gould, Self*

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Control Strategies with Environmental Benefits for Mineral Processing Operations

Carole Prévost and Marc Tardif, BBA Inc.

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Biodegradation of Diethylenetriamine and Metal-Diethylenetriamine Chelates

Erin R. Bobicki and Erin Furnell, University of Toronto

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Process Analytics and Machine Learning to Predict Arc Loss in an Electric Arc Furnace

*Lee D. Rippon, Bhushan Gopaluni, and Ibrahim Yousef, University of British Columbia
Behrooz Hosseini, Jean-Francois Beaulieu, and Carole Prévost, BBA
Sirish Shah, University of Alberta*

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Selective Heat Ore Treatment: Shaking up the Economics of Mineral Recovery

*Tracy Holmes, Jenike & Johanson Ltd.
Chris Dodds, University of Nottingham
David Craig, Jenike & Johanson Inc.
Andrew Batchelor and Sam Kingman, University of Nottingham
Erin Legault, SGS Canada Inc.
Mark Whetton, Teledyne e2v*

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Mineral Process Dust Management, a Medium Range LiDAR for Fugitive Emissions Quantification

*Jonathan Bernier, Rio Tinto
Martin Allard, Institut National d'Optique*

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Niobium Ore Carbonate Minerals Flotation without Desliming

*Elves Matiolo, Hudson Couto, and Amanda Freitas, Centro de Tecnologia Mineral (CETEM/MCTIC)
Joselito Silva and Andreia Camelo, Niobras - CMOC International
Stephanie Sá, Centro de Tecnologia Mineral (CETEM/MCTIC)*

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Development and Application of Lime-Free Flotation Separation of Pb-Zn-S in Mining Plants

*Yun Chen, Hunan Institute of Engineering
Ping Xiang, Hu'nan Huaqi Resources and Environment Science and Technology Development Co, Ltd.
Dongsheng He, Wuhan Institute of Technology*

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High Definition Sorting System Based on New XRT, Visible Light and IR Detection Technologies

Jacek Kolacz, Comex

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Numerical Modelling of Non-Newtonian High Density Slurries in Thickeners

*Guilherme A. Lindner, University of British Columbia
David N. Minson, MTP - MinTecProcess C & M Ltd.
Sanja Miskovic, University of British Columbia*

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Practical Considerations in the Design of an Experimental Set-Up for Laboratory-Scale Investigation of Slag Freeze-Linings

Pieter J. Bezuidenhout, Mintek

Joalet D. Steenkamp, Mintek / University of the Witwatersrand

Quinn G. Reynolds, Mintek

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The Role of Chromite in the Refractory Products

Dean Gregurek, Jürgen Schmidl, and Alfred Spanring, RHI Magnesita

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Cr Oxidation in Ferrochrome Smelter Dusts from Pilot-Scale DC Arc Furnace

Eleanor J. Berryman and Dogan Paktunc, CanmetMINING, Natural Resources Canada

David Kingston, National Research Council Canada

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Magnetic Fields in DC and AC Furnaces

Isobel McDougall and Piet Jonker, Tenova South Africa (Pty) Ltd

Bennie Henning, Bennie Henning Consulting

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The Recovery of Ferrochrome from Chromite and Stainless Steel Production Wastes Using DC Plasma Smelting

Tim Johnson, Tetronics International

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Chromite Ore Pellet Sticking and Fouling

Marc Duchesne and Nicole Bond, Natural Resources Canada

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Ferrochrome Production from Ontario's Ring of Fire Chromite

Michael McCaffrey, Hatch Ltd.

Stephen Flewelling, Mark Baker, Ryan Weston, and Michael Desilets, Noront Resources Ltd.

Matthew Cramer, Hatch Ltd.

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Effects of the Reducing Atmosphere of the Calcination Stage on the Sulfur Department in Ferronickel Production via RK-EF Process

Sahand Sarbishei and Leili Tafaghodi Khajavi, University of British Columbia

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Responsible Chromite Mining in Ontario's Ring of Fire

Ryan Weston and Mark Baker, Noront Resources Ltd.

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Pilot Plant Smelting of Canadian and South African Chromite in a DC Furnace

Isabel J. Geldenhuys, Mintek

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Chromium Markets and Outlook for the 2020s

Nils R. Backeberg, Roskill Information Services

Paper 825768

Reduction of Synthetic Chromite with Methane

Vincent Y. Canaguier and Leiv Kolbeinsen, Norwegian University of Science and Technology

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Removal of Hexavalent Chromium by Means of Adsorption onto Chitosan and Chitosan/B-Cyclodextrin Beads from Cr-Contaminated Waters

Georgios Kolliopoulos, Université Laval

Tryfon Kekes and Constantina Tzia, National Technical University of Athens

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Overfeeding in DC FeCr Smelting & Lessons Learned from the Aluminium Industry

Harmen Oterdoom and Johan Zietsman, University of Pretoria

Paper 826533

Phase Transitions and Microstructural Changes during Oxidation and Reduction of a Weathered Ilmenite Concentrate

Hossein Salehi, Norwegian University of Science and Technology

Stian Seim, TiZir Titanium and Iron

Leiv Kolbeinsen and Jafar Safarian, Norwegian University of Science and Technology

Paper 827086

New Technology Development in Pyrometallurgy - A Framework for Reliable and Sustained Progress

Johan H. Zietsman, Heine Weitz, and Nicole Sweeten, Ex Mente Technologies

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Leveraging Process Mineralogy for Integrated Management of Chromite Processing

Alessandro Navarra, McGill University

Felipe Peña, Universidad Católica del Norte

Tassos Grammatikopoulos, SGS Canada Inc.

Alain Kabemba

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90 MW 3 Electrode Furnace with an Electrically Islanded Power Plant Utilizing SPLC, SVC for Electrical Efficiency and Stable Operation in Shielded Arc and Immersed Arc Modes

Mohammad Sedighy and Yan Elksnis, Hatch Ltd.

Denis Shevchenko, Pronico S.A.

Dong Shen, Hatch Ltd.

Alexander Sherstobitov and Denis Pershin, Pronico S.A.

Paper 819148

Extraction of Copper from Copper-Cobalt Alloy by Molten Magnesium

Dawei Yu, Chunxi Zhang, Xueyi Guo, and Qinghua Tian, Central South University

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Uncovering and Managing Hidden Catastrophic Business Risks from Asset Corrosion in Mining

Zoe L. Coull, ICE Dragon Corrosion Inc.

Paper 819765

Market Challenges for Using Rare Earths to Treat Waste Streams

Mason R. Haneline, Neo Chemicals & Oxides

Paper 819890

Recent Advancements in Refractory Management Technology for Furnace Campaign Life Extension

Mitchell Henstock, Afshin Sadri, Winnie Ying, Blair Climenhaga, Joshua Barnard, and Maria Tibbo, Hatch Ltd.

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Metal processing R&D at CanmetENERGY-Ottawa

Marc Duchesne and Robin Hughes, Natural Resources Canada

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Laboratory and Pilot Scale Study for Mercury (I) Chloride Oxidation to Mercury (II) Chloride Using Sodium Hypochlorite Dissociation in an Acidic Medium

Francois X. Cardin and Charles Desroches, CEZinc

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Application of a Refractory Corrosion Model (RCM) –Simulation and Validation of the Model

Christoph Pichler, Christoph Wagner, and Daniel Kreuzer, RHI Magnesita

Christoph Sagadin and Stefan Luidold, Christian Doppler Laboratory for Extractive Metallurgy of Technological Metals

Paper 825892

The Effect of Aging on Refractory Thickness Calculations for Process Vessels and Furnaces

*Afshin Sadri, Winnie Ying, Mitchell Henstock, and Blair Climenhaga, Hatch Ltd.
Julia Allard, McGill University*

Paper 826223

McNulty 4.0: Towards a Predictive Parametric Approach

Harmen Oterdoom, University of Pretoria

Paper 826964

A Semi-Quantitative Catastrophic Risk Likelihood Prioritization Framework for the Metallurgical Industry

*Stefan Hlouschko and Matthew Cramer, Hatch Ltd.
Martin Pergler, Balanced Risk Strategies Ltd.*

Paper 828414

Catastrophic Risk Management of Tailings Storage Facilities

Karl H. Pearce, Johan DuToit, Aravind Raman, Carmen Bracho, Rafael Davila, Dan McEvoy, Winnie Chan, and Daniel Molina, Hatch Ltd.