

# Process Mineralogy '17



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## Sunday March 19th

16.30-18.00 Registration and wine reception, with hot and cold canapés (accompanying guests welcome)

## Monday March 20th

07.30 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice

08.50 **Opening Remarks**  
B.A. Wills (MEI, UK)

09.00 *Technical Session 1*  
Chairmen: G. Yorath (University of Cape Town, South Africa) and E.-P. Heikkinen (University of Oulu, Finland)

09.00 **Keynote Lecture: Process mineralogy: an essential booster of the circular economy**  
E. Pirard (University of Liege, Belgium)

09.40 **The business value of best practice process mineralogy**  
N.O. Lotter (Flowsheets Metallurgical Consulting Inc., Canada), W. Baum (Ore & Plant Mineralogy LLC, USA), S. Reeves (Starkey & Associates Inc., Canada), C. Arrue (Rio Tinto Ltd, Chile) and D.J. Bradshaw (University of Cape Town, South Africa)

10.00 **Process mineralogy: the key to unlocking the provision of minerals and metals to a sustainable world**  
M. Becker, J.L. Broadhurst and D. Bradshaw (University of Cape Town, South Africa)

10.20 Coffee, poster and exhibition viewing

11.20 **Sampling – a key tool in modern process mineralogy**  
N.O. Lotter (Flowsheets Metallurgical Consulting Inc., Canada) and C.L. Evans (University of Queensland, Australia)

11.40 **Evaluation of sampling systems in iron ore concentrating and pelletizing processes - quantification of total sampling error (TSE) vs. apparent process variation**  
K. Engström and K.H. Esbensen (LKAB, Sweden)

12.00 **On-line monitoring of spodumene flotation with novel time-resolved Raman Spectroscopy**  
P. Tanskanen (University of Oulu, Finland), P. Lamberg, O. Sirén (Keliber Ltd, Finland), J. Takalo and L. Kurki (Timegate Instruments Ltd., Finland)

12.20 **Microanalytical techniques for characterising critical metal deportment in mine materials**  
N. Fox, A. Parbhakar-Fox (University of Tasmania, Australia) and A. Somers (Sci Aps Inc., USA)

12.40 Lunch

14.00 *Technical Session 2*  
Chairmen: D. Chetty (Mintek, South Africa) and J.D. Miller (University of Utah, USA)

14.00 **Advancements in automated mineralogy incorporating Micro-XRF technology**  
A. Menzies, M. Barazza (Universidad Católica del Norte, Chile), S. Scheller, R. Tagle (Bruker Nano GmbH, Germany), G. Gloy (Bruker Pty Ltd, Australia)

- 14.20 **Micro-XRF: a new automated mineralogical analysis paradigm**  
I. Tonžetić (Sci-Ba Laboratories, South Africa)
- 14.40 **New tools for process monitoring – PLSR on XRD data**  
U. König (PANalytical B.V., The Netherlands)
- 15.00 **Applications of advanced analytical and mass spectrometry techniques to the characterisation of micaceous lithium bearing ores**  
M.G. Aylmore, K. Merigot, Z. Quadir, W. Rickard, D. Saxey, D. Fougereuse, S. Reddy, N. Evans, B. McDonald, B.I.A. McInnes (Curtin University, Australia), E. Catovic and P. Spitalny (Lithium Australia, Australia)
- 15.20 **Environmental impact of mine exploitation: An early predictive methodology based on ore mineralogy and contaminant speciation**  
A. Chopard, M. Benzaazoua, H. Bouzahzah (UQAT, Canada), B. Plante and P. Marion (Université de Lorraine, France)
- 15.40 **Improved mine-waste characterisation through blended testwork**  
A. Parbhakar-Fox, N. Fox (University of Tasmania, Australia), R. Hill, T. Ferguson and B. Maynard (Grange Resources, Australia)
- 16.00 Happy Hour, Vineyard Gardens  
Accompanying guests welcome

## Tuesday March 21st

- 08.20 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice
- 09.00 *Technical Session 3*  
Chairmen: M. Aylmore (Curtin University, Australia) and K. Tungpalan (University of the Philippines, Philippines)
- 09.00 **Keynote Lecture: Reflections on the benefits and tasks ahead for geometallurgy – from metallurgist to junior miner at Pasinex Resources**  
S. Williams (Pasinex Resources Ltd, Canada)
- 09.40 **Mineralogical domains by XRD multivariate statistical analysis and SEM image analysis of the nickel sulfide deposit, Fazenda Sta. Rita, Brazil**  
R. Contessotto, J.L. Antoniassi and H. Kahn (University of Sao Paulo, Brazil)
- 10.00 **Process mineralogical preliminary approach for geometallurgical concept implementation in a Norwegian industrial mineral case-study**  
C.A. Mena Silva and K. Aasly (Norwegian University of Science and Technology, Norway)
- 10.20 Coffee
- 11.00 **Automated mineralogy applied to exotic Cu deposits in northern Chile**  
A. Menzies, M. Barazza (Universidad Católica del Norte, Chile), S. Scheller, R. Tagle (Bruker Nano GmbH, Germany) and G. Gloy (Bruker Pty Ltd, Australia)
- 11.20 **Importance of mineralogy in copper selective flotation at Chelopech concentrator**  
D. Naumov, H. Bouzahzah, S. Gaydardzhiev (University of Liege, Belgium) and L. Stamenov (Dundee Precious Metals, Bulgaria)
- 11.40 **Influence of mineralogy on spiral performance of tungsten ore**  
Y. Ghorbani, P. Hegarty, R. Fitzpatrick, G. Rollinson (Camborne School of Mines, UK) and P. Hingston (Wolf Minerals Ltd, UK)
- 12.00 **Mineral characterization as a tool in the implementation of geometallurgy into industrial mineral mining**  
A.M. Lang, K. Aasly and S.L. Ellefmo (Norwegian University of Science and Technology, Norway)
- 12.20 **Valuation of uncertainty in geometallurgical process optimisation**  
K.G. van den Boogaart and R.T. Delgado (Helmholtz Institute Freiberg for Resource Technology, Germany)
- 12.40 Lunch
- 14.00 *Technical Session 4*  
Chairman: H.J. Glass (Camborne School of Mines, UK)
- 14.00 **Modelling of combined processing parameters for tailing material based on Mineral Liberation Analysis (MLA) data**  
P. Büttner, I. Osbahr, R. Zimmermann, G. Unger, L. Satge, J. Gutzmer (Helmholtz Institute Freiberg for Resource Technology, Germany) and T. Leißner (TU Bergakademie Freiberg, Germany)

- 14.20 **Applied mineralogy at Kansanshi mine- proof of the concept of on-site routine process mineralogy for continuous improvement of plant operations**  
M. Kalichini, E.M. Paul, A. Prinsloo (First Quantum Minerals, Zambia) and W.R. Goodall (MinAssist Pty Ltd, Australia)
- 14.40 **High speed automated mineralogy**  
M. Hiscock (Oxford Instruments NanoAnalysis, UK)
- 15.00 **Towards the development of an integrated modelling framework using mineralogy**  
S. Ntlhabane, M. Becker, E. Charikinya, R. Schouwstra and D. Bradshaw (University of Cape Town, South Africa)
- 15.20 **Optimising automated mineralogy for operational mine site applications**  
J. Strongman (iMin Solutions Ltd, UK), C. Brough, J. Fletcher, R. Garside (Petrolab Ltd, UK), A. Prinsloo (FQML Kansanshi Mining plc, Zambia) and B. Tordoff (Zeiss Natural Resources Lab, UK)
- 15.40 Coffee
- 17.30 Coaches leave for conference dinner at Lagoon Beach Hotel

### Wednesday March 22<sup>nd</sup>

- 08.00 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice
- 09.00 *Technical Session 5*  
 Chairmen: H. Kahn (University of Sao Paulo, Brazil) and K. Aasly (Norwegian University of Science and Technology, Norway)
- 09.00 **Keynote Lecture: X-Ray Tomography for mineral processing technology–particle characterization from mine to mill**  
J.D. Miller (University of Utah, USA)
- 09.40 **X-ray Computed Tomography: challenges in iron ore analysis for process mineralogy**  
L. Bam, J.A. Miller (Stellenbosch University, South Africa), I. Basson (Tect Geological Consulting, South Africa) and M. Becker (University of Cape Town, South Africa)
- 10.00 **2D-3D liberation comparisons in HCT testwork for the Hannukainen IOCG deposit, Finland**  
C. Brough, J. Strongman, J. Fletcher (Petrolab Ltd, UK), S. Graham (Zeiss Natural Resources Lab, UK), A. Barnes (Geochemic Ltd, UK), R. Bowell, R. Warrender (SRK Consulting, UK) and L. Ward (University of Leicester, UK)
- 10.20 Coffee
- 11.00 **The role of vein-type mineralisation in mineral liberation**  
K. Tungpalan (University of the Philippines, Philippines), E. Wightman and E. Manlapig (JKMRC, Australia)
- 11.20 **Automated classification of drill cores textures for geometallurgy**  
P.-H. Koch, C. Lund, V. Lishchuk, P. Lamberg and J. Rosenkranz (Luleå University of Technology, Sweden)
- 11.40 **An overview of the modelling liberation of scheelite and the determination of the parameters function equation**  
S.A. Hamid, E. Guasch, H. Anticoi, J. Oliva, P. Alfonso and T. Escobet (Universitat Politècnica de Catalunya Barcelona Tech, Spain)
- 12.00 **Mineralogical study to determine agglomeration free heat treatment conditions for spodumene concentrate**  
 O. Peltosaari, S. Strand, P. Tanskanen, E.-P. Heikkinen (University of Oulu, Finland), O. Sirén and P. Lamberg (Keliber Ltd, Finland)
- 12.20 **The effect of phyllosilicates in the processing of Great Dyke PGE ores**  
T. Dzingai, M. Becker, B. McFadzean (University of Cape Town, South Africa) and M. Tadie (University of Stellenbosch, South Africa)
- 12.40 Lunch
- 14.00 *Technical Session 6*  
 Chairman: M. Becker (University of Cape Town, South Africa)
- 14.00 **Grade and product quality control by micro-CT scanning of the Namakwa Sands Ti-Zr placer deposit West Coast, South Africa: an orientation study**  
 A Rozendaal, S.G. Le Roux, A. du Plessis (University of Stellenbosch, South Africa) and C. Philander (Tronox Namakwa Sands, South Africa)
- 14.20 **Calculating the deportment of a fine-grained and compositionally complex Sn skarn with a modified approach for automated mineralogy**  
M. Kern, R. Möckel, J. Krause, J. Teichmann and J. Gutzmer (Helmholtz Institute Freiberg for Resource Technology, Germany)

- 14.40 **Mineralogical and geochemical study of REE from a carbonatite deposit**  
M. Edahbi, B. Plante, M. Benzaazoua (UQAT, Canada) and M. Pelletier (Ressources Géoméga, Canada)
- 15.00 **Mineralogical studies in developing a novel approach for the extraction of rare earth elements from ferruginised rare earth element ores**  
D. Chetty, W. Clark, K. Bisaka and I. Thobadi (Mintek, South Africa)
- 15.20 **Conference summary**  
M. Becker (University of Cape Town, South Africa)
- 15.40 **Invitation to Process Mineralogy '18**  
A.J. Wills (MEI, UK)
- 15.45 Farewell reception, Vineyard Gardens  
Accompanying guests welcome

## Posters

### **Characterisation of rare earth elements in ion adsorption clays**

C. Burcher-Jones, R. Ram, J. Petersen and M. Becker (University of Cape Town, South Africa)

### **Optical and electrical properties of alexandrite (BeAl<sub>2</sub>O<sub>4</sub>:Cr<sup>3+</sup>) mineral**

N.M. Trindade (São Paulo Federal Institute, University of São Paulo, Brazil, A.R. Blak, E.M. Yoshimura (University of São Paulo, Brazil), L.V.A. Scalvi and R.M.F. Scalvi (São Paulo State University, Brazil)

### **Developing a particle-based process model for a dry magnetic separator**

E. Charikinya, J. Robertson, A. Platts, M. Becker, D. Bradshaw (University of Cape Town, South Africa) and P. Lamberg (Luleå Technical University, Sweden)

### **An approach to mineral processing by liberation modelling of tantalum ore**

S.A. Hamid, H. Anticoi, E. Guasch, P. Alfonso, J. Oliva and T. Escobet (Universitat Politècnica de Catalunya Barcelona Tech, Spain)

### **Mineralogy and texture of the Storforshei iron formation, and their effect on mineral liberation and particle size distribution of the ground product**

M.K. Tøgersen, R.A. Kleiv and K. Aasly (Norwegian University of Science and Technology, Norway)

### **Industrial gamma-activation assay system for gold ore analysis**

A.D. Sokolov, V.V. Gostilo, V.L. Titov (Baltic Scientific Instruments, Latvia) and Y.N. Burmistenko (Applied Physics Instruments, Finland)

### **Prediction of contaminant leaching from a REE silicated deposit**

M. Edahbi, B. Plante, M. Benzaazoua (UQAT, Canada) and S. Doire (Matamec Explorations Inc., Canada)

### **Mineralogical control on the leaching properties of cobalt oxides from DR Congo**

L. Santoro, E. Pirard (Université de Liège, Belgium), S.T. Yav and A. Kanik (University of Lubumbashi, DR Congo)

### **Application of micro-CT scanning in the recovery of endo-skarn associated scheelite from the Riviera Deposit, South Africa**

A. Rozendaal, S.G. Le Roux and A. du Plessis (University of Stellenbosch, South Africa)

### **Characterisation of a low-grade nickel-bearing ore separated in the Falcon Concentrator**

C.K. Thubakgale, N.E. Jeli, P. Mendonidis (Vaal University of Technology, South Africa) and R.K.K. Mbaya (Tshwane University of Technology, South Africa)

### **Distribution of REE minerals in fluorite flotation at the Vergenoeg Mine, South Africa**

F.E. Minz, M. Kern, S. Birtel, J. Krause (Helmholtz Institute Freiberg for Resource Technology, Germany) T.W. Höfig and J. Gutzmer (Technical University Bergakademie Freiberg, Germany)

### **Mineralogical distribution of base metal sulfides in processing products generated from black shale-hosted Kupferschiefer-type ore**

A. Kamradt, S. Walther (Martin Luther University, Germany), J. Schaefer (UVR-FIA GmbH, Germany), S. Hedrich and A. Schippers (Federal Institute for Geosciences and Natural Resources, Germany)