

Process Mineralogy '18



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Sunday November 18th

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

Monday November 19th

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

08.45 Opening Remarks
J. Wills (MEI, UK) and M. Becker (University of Cape Town, South Africa)

09.00 *Technical Session 1*
Chairmen: G. Yorath (University of Cape Town, South Africa) and M.I. Pownceby, (CSIRO Mineral Resources, Australia)

09.00 **Keynote Lecture: When scientists and engineers talk – lessons from the oil industry and applications to mining**
A.R. Butcher (Geological Survey of Finland, Finland)

09.30 **The new generation of EDS Detectors; implications for automated mineralogy**
M. Hiscock (Oxford Instruments NanoAnalysis, UK)

09.50 **The robustness of the GLCM and XCT method for the quantification of 3D mineral texture**
M. Voigt (University of Cape Town, and Council for Geoscience, South Africa), J. Miller (University of Stellenbosch, South Africa), M. Becker, A. Mainza and D. Bradshaw (University of Cape Town, South Africa)

10.10 Coffee, exhibition and poster viewing

11.00 **Application of refined protocols for XCT scanning of high density ore samples**
L. Bam (Stellenbosch University and Necsa, South Africa), M. Becker (University of Cape Town, South Africa) and J. Miller (Stellenbosch University, South Africa)

11.20 **Simulated breakage of meso-scale textures, a reality check**
E.M. Wightman, C.L. Evans and C. He (JKMRC, Australia)

11.40 **Effect of the geological texture at meso and micro-scale on grinding performance**
E.Díaz, G. Pamparana, L. Voisin, W. Kracht and P. Martínez (University of Chile, Chile)

12.00 **Automated environmental mineralogy; using image processing tools to maximise the efficient analysis of liberation across multiple size fractions**
C. Brough, J. Strongman, J. Fletcher, C. Garner (Petrolab Ltd, UK), A. Parbhakar-Fox (University of Tasmania, Australia), A. Barnes (Geochemic Ltd, UK), R. Bowell and R. Griffiths (SRK Consulting, UK)

12.20 **Cathodoluminescence and reflected light correlative microscopy for iron ore characterization**
O.F.M. Gomes, R. Neumann (CETEM and Federal University of Rio de Janeiro, Brazil) and F.S.G. Vasques (CETEM, Brazil)

12.40 Lunch

14.00 *Technical Session 2*
Chairmen: P.W.S.K. Botha (Hippo Geoscience, Australia) and D. Chetty (Mintek, South Africa)

14.00 **Augmenting automated mineralogy phase classification and chemical quantification through raw data analytics**
P.W.S.K. Botha (Hippo Geoscience, Australia) and H. Horsch (Hazen Research, USA)

- 14.20 **Advancements in Micro-XRF technology supporting Automated Mineralogy**
S. Scheller, R. Tagle (Bruker Nano GmbH, Germany), Gerda Gloy (Bruker Pty Ltd, Australia) and A. Menzies (Universidad Católica del Norte, Chile)
- 14.40 **Nanomin – a new SEM-EDS technique for automated mineral classification**
M. Owen and G. Howell (ThermoFisher Scientific, USA)
- 15.00 **Development of a geometallurgical framework for process simulation coupled with automated mineralogy data**
I.B. Fernandes, M.A. Reuter and J. Gutzmer (Helmholtz Institute Freiberg for Resource Technology, Germany)
- 15.20 Coffee
- 16.00 **Establishing early-stage geometallurgical domains for the Swartberg polymetallic sulphide deposit**
H.J.J. Gordon (University of Stellenbosch, South Africa), J.A. Miller (Black Mountain Complex Pty, Ltd, South Africa) and M. Becker (University of Cape Town, South Africa)
- 16.20 **Geometallurgical characterisation of non-ferrous historical slag in Tasmania: determining reprocessing options**
 S. Gilmour, A. Parbhakar-Fox, P. Olin and N. Fox (University of Tasmania, Australia)
- 16.40 **Epithermal Au-mineralisation and Mn distribution at El Peñón: spatial relationships and geometallurgical processing**
A. Menzies, M. Barraxa (Universidad Católica del Norte, Chile), J. Ordenes (Minera Meridian Ltda-Yamana Gold Inc, Chile), S. Scheller and R. Tagle (Bruker Nano GmbH, Germany)
- 17.00- Sundowner in Vineyard Gardens
 18.00 Accompanying guests welcome

Tuesday November 20th

- 08.45 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice
- 09.30 *Technical Session 3*
 Chairmen: E. Whiteman (XPS Expert Process Solution, Canada) and A.R. Butcher (Geological Survey of Finland)
- 09.30 **Quantitative measurement of the effect of operating conditions on non-surface mineral grain leaching from crushed and agglomerated low grade chalcopyrite ore**
M. Ghadiri, S.T.L. Harrison and M.A. Fagan-Endres (University of Cape Town, South Africa)
- 09.50 **Investigation of mineral deportment in a copper ore from Botswana**
P. Nenguba, L.K. Moatlhodi, G. Gaogane and G. Danha (Botswana International University of Science and Technology, Botswana)
- 10.10 **Mineralogical characterisation and leaching characteristics of ilmenite concentrates**
M.M. Ramakokovhu, R.K.K Mbaya (Tshwane University of Technology, South Africa) and P.A Olubambi (University of Johannesburg, South Africa)
- 10.30 Coffee
- 11.20 **The role of manganese ore reduction morphology development in setting reduction mechanisms**
T. Coetsee (University of Pretoria, South Africa)
- 11.40 **Characterisation of phosphorus and other impurities in goethite - possible P incorporation mechanisms**
M.I. Pownceby, S. Hapugoda, J. Manuel, N. Webster and C. MacRae (CSIRO Mineral Resources, Australia)
- 12.00 **The optimisation of iron oxide discrimination on a QEMSCAN – current best practise**
I. Tonžetić (University of Pretoria, South Africa)
- 12.20 **The interaction of ore mineralogy and ferric oxidants on leaching of sphalerite**
 G. Aphane, P. Olubambi and S. Lephuthing (University of Johannesburg, South Africa)
- 12.40 Lunch
- 14.00 *Technical Session 4*
 Chairmen: R. Neumann (CETEM, Brazil)
- 14.00 **From the mineralogy to the processing of a complex tungsten skarn ore deposit (Tabuaço, Portugal)**
 Y. Foucaud, I. Filippova, L. Filippov (Université de Lorraine, France) and Q. Dehaine (Camborne School of Mines, UK)
- 14.20 **The impact of mineralogy on platinum group element recovery from oxidised ores of the Middle Group chromitite, western Bushveld Complex**
D. Chetty, J. Mogoru, C. Carelse, M. Pebane, C. Bergmann and K. Selepe (Mintek, South Africa)

- 14.40 **Monthly monitoring of metallurgical performance at the Kidd Concentrator using QEMSCAN and the link to Ag recovery to Cu concentrate**
E. Whiteman, M. Kelvin (XPS Expert Process Solutions, Canada) and S. Carlo (Glencore Kidd Operations, Canada)
- 15.00 **Application of Raman spectroscopy to the flotation process of fluorite**
B. Lewandowski (University of Duisburg-Essen and Niederrhein University of Applied Sciences, Germany), Mathias Ulbricht (University of Duisburg-Essen, Germany), B.B. Said and G. Krekel (Niederrhein University of Applied Sciences, Germany)
- 15.20 **Process monitoring during aluminium production using X-ray diffraction in combination with statistical methods**
U. König and N. Norberg (Malvern Panalytical B.V., The Netherlands)
- 15.40 Coffee
- 18.00 Coaches leave for conference dinner at Kirstenbosch Botanical Gardens

Wednesday November 21st

- 09.15 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice
- 10.00 *Technical Session 5*
Chairmen: T. Coetsee (University of Pretoria, South Africa) and C. Marion (McGill University, Canada)
- 10.00 **Keynote Lecture: Common problems - and progress towards solutions - in the process mineralogy of rare earths**
F. Wall (Camborne School of Mines, UK)
- 10.30 **Integration of process mineralogy in critical element ore deposits**
T. Grammatikopoulos, C. Gunning, T. Hrstka and L. Dubazana (SGS Minerals, Canada)
- 10.50 Coffee
- 11.40 **A process mineralogical study of a rare earth element (REE) bearing ion-adsorption clay deposit**
M. Becker, C. Burcher-Jones, J. Petersen, R. Ram, S. Mkhize, P. Kooyman (University of Cape Town, South Africa), B. Etschmann, J. Brugger (Monash University, Australia) and D. Howard (Australian Synchrotron, Australia)
- 12.00 **Mineralogical characterization of some streams of the Volta Grande Mine (SE Brazil) Sn-Nb-Ta processing plant, aiming at the recovery of REE by-products**
F.E.A. Alves (CETEM, Brazil), C.S. Assumpção, P.E.M. Ferreira, A.F. Silva (AMG Mineração, Brazil), C.A. Ávila (Universidade Federal do Rio de Janeiro, Brazil) and R. Neumann (CETEM and Universidade Federal do Rio de Janeiro, Brazil)
- 12.20 **Mineralogical characterisation of lithium and Fe-Ti-V ore tailings**
R. Kallio, S. Luukkanen, M. Sinche-Gonzales (University of Oulu, Finland), P. Tanskanen (Keliber Oy, Finland) and J. Jylänki (Otanmäki Mine Oy, Finland)
- 12.40 Lunch
- 14.00 *Technical Session 6*
Chairman: M. Becker (University of Cape Town, South Africa)
- 14.00 **On-line monitoring of spodumene heat treatment process with time-gated Raman spectroscopy**
P. Tanskanen (University of Oulu, Finland), B. Heilala, L. Kurki, J. Savela (Timegate Instruments Ltd, Finland) and P. Lamberg (Keliber Ltd, Finland)
- 14.20 **Application of LA-ICP-MS to process mineralogy: Ga and Ge recovery at Kipushi Cu-Zn deposit**
M. Kelvin, E. Whiteman (XPS Expert Process Solution, Canada), J. Petrus (Laurentian University, Canada), M. Leybourne (Queen's University, Canada) and V. Nkuna (Ivanhoe Mines, Canada)
- 14.40 **Impacts of cation (Co, Cd, Fe) substitution on the geometallurgical response of sphalerite**
L. Babedi, M. Tadie and B.P. von der Heyden (Stellenbosch University, South Africa)
- 15.00 **Automated mineralogy: applications to secondary resource characterisation**
A.C. Guhl, B. Schulz and M. Bertau (Freiberg University of Mining and Technology, Germany)
- 15.20 Conference summary
M. Becker (University of Cape Town, South Africa)
- 15.35 Invitation to Process Mineralogy '20
A.J. Wills (MEI, UK)

15.40 Farewell wine and coffee in Vineyard Gardens
Accompanying guests welcome

POSTERS

Iron ore characterisation of the N4WS deposit (Carajás Mineral Province) by ^{57}Fe Mössbauer spectroscopy

V.M. Nogueira, P.F. Barbosa, J.A.H. Coaquira, A.M. Silva, C.L.B. Toledo, F.R. Almeida, M.A.R. Martinez (Universidade de Brasília, Brazil), and L.M. Assis (Vale S.A., Brazil)

Characterization of banded iron ore

C. Ramakgala and G. Danha (Botswana International University of Science and Technology, Botswana)

QEMSCAN analysis of HIVOL air filters to determine sources of dust particulates at the Sudbury INO smelter

M. Kelvin and L. Kormos (XPS Expert Process Solutions, Canada)

Beneficiation of a low-grade, goethite-rich iron ore using microwave-assisted magnetizing roasting

V. Nunna, S. Hapugoda and M.I. Pownceby (CSIRO Mineral Resources, Australia)

General study for characterization and structural property investigation on diorite rocks

G. Gaesengwe and G. Danha (Botswana International University of Science and Technology, Botswana)

Characterisation of a smelter slag from B.C.L plant in Botswana

T. Gabasiane, L. Moathodi, T. Gaogane and G. Danha (Botswana International University of Science and Technology, Botswana)

Characterization and beneficiation of pyrolyzed black mass: Increasing the recycling rate of spent lithium ion battery

A. Vanderbruggen and M. Rudolph (Helmholtz Institute Freiberg for Resource Technology, Germany)

Fe-sulfide liberation and association as a tool for acid rock drainage test result interpretation

O. Guseva, A.K.B. Opitz, J.L. Broadhurst, S.T.L. Harrison and Megan Becker (University of Cape Town, South Africa)