

Process Mineralogy '12



Tuesday November 6th

1630-1800 **Pre-registration and wine reception**
Accompanying guests welcome

Wednesday November 7th

- 07.30 Registration desk opens
Light breakfast of filled croissants, tea, coffee and fruit juice
- 08.30 Opening Remarks and presentation of MEI Award
B.A. Wills (MEI, UK) and M. Becker (University of Cape Town, South Africa)
- 08.50 *Technical Session 1*
Chairmen: R. Schouwstra (Anglo Research, South Africa) and P. Lamberg (Luleå University of Technology, Sweden)
- 08.50 **Keynote Lecture: Ore characterization, process mineralogy and lab automation - a roadmap for future mining**
W. Baum (FLSmidth Salt Lake City, Inc., USA)
- 09.30 **The process mineralogy of waste**
C.P. Brough, R.I. Warrender, R.J. Howell and A. Barnes (SRK Consulting, UK)
- 09.50 **Mineralogical effects on the dense medium separation of low grade nickel ores**
K. Pillay, M. Becker, A. Mainza (University of Cape Town, South Africa) and D. Chetty (Mintek, South Africa)
- 10.10 Coffee
- 10.50 **Gangue-reagent interactions during acid leaching of uranium**
B.J. Youlton (SGS, South Africa) and J.A. Kinnaird (University of the Witwatersrand, South Africa)
- 11.10 **A preliminary rheological classification of phyllosilicate (clay) group minerals**
B. Ndlovu, S. Farrokhpay, D. Bradshaw (JKMRC, Australia), M. Becker, D. Deglon (University of Cape Town, South Africa) and E. Forbes (CSIRO Process Science and Engineering, Australia)
- 11.30 **Mineralogical influences on copper, moly and gold flowsheets – lessons learned**
D.G. Meadows (FLSmidth, USA)
- 11.50 **Behaviour of arsenic during processing of refractory gold**
D. Paktunc (CANMET and University of Ottawa, Canada) and G. Poirier (CANMET and Canadian Museum of Nature, Canada)
- 12.10 **Representing and interpreting the liberation spectrum in a processing context**
E.M. Wightman and C.L. Evans (JKMRC, Australia)

- 12.30 **The influence of quantitative mineralogy on flowsheet development at the Ivanplats (Ltd) Kamao Project**
N.O. Lotter, J.F. Oliveira and A.L. Hannaford (Xstrata Process Support, Canada)
- 12.50 Lunch
- 14.00 *Technical Session 2*
Chairmen: N.O. Lotter (Xstrata Process Support, Canada) and E. Hill (Carl Zeiss Microscopy Ltd, UK)
- 14.00 **Mineralogical characterization of spinel group oxides in platinum slags**
B. Bezuidenhout and L. Andrews (Anglo American Technical Solutions – Research, South Africa)
- 14.20 **Characterisation of losses to slag cleaning furnace slag during platinum smelting**
M. Safi (Anglo American Technical Solutions – Research, South Africa)
- 14.40 **Mineralogy and recovery of copper from smelter slag of the O’Okiep copper district, South Africa**
A. Rozendaal and R. Horn (University of Stellenbosch, South Africa)
- 15.00 **Investigation of the effect of mineralogy as rate-limiting factors in large particle leaching**
Y. Ghorbani, M. Becker, J. Petersen, A.N. Mainza and J.-P. Franzidis (University of Cape Town, South Africa)
- 15.20 **Automated coal analysis of fine coal particles**
S. Bramdeo, S. Dhlamini and Y. Scharneck (Anglo American Technical Solutions - Research, South Africa)
- 15.40 Coffee
- 16.10 **How sulphides influence whiteness in micronized calcium carbonate slurry for the paper industry**
I. Bunkholt and R.A. Kleiv (Norwegian University of Science & Technology, Norway)
- 16.30 **The ore characterisation of different hematitic iron ores**
I. Tonžetić, S. Bramdeo and M. Duncan (Anglo American Technical Solutions - Research, South Africa)
- 16.50 **Occurrence of iron in industrial granitic pegmatite**
K.H. Hestnes (Sibelco Nordic AS and Norwegian University of Science & Technology, Norway), K. Aasly, B.E. Sørensen (Norwegian University of Science & Technology, Norway) and R. Sandøy (Sibelco Nordic AS, Norway)

Thursday November 8th

- 08.15 Light breakfast of filled croissants, tea, coffee and fruit juice
- 09.00 *Technical Session 3*
Chairmen: M. Becker (University of Cape Town, South Africa) and J. Hunt (University of Tasmania, Australia)
- 09.00 **Keynote Lecture: The continued development of X-Ray CT as an effective tool in process mineralogy**
J.D. Miller and C.L. Lin (University of Utah, USA)
- 09.40 **The application of X-ray computed tomography to the characterisation of pyrometallurgical products – a case study**
A.A. Corfield, D. Chetty, J. Mukadi and K. Bisaka (Mintek, South Africa)

- 10.00 **3D Analysis of solidified nickel converter matte phases: direct observations via TEM and FIB-SEM tomography**
E.L. Thyse, G. Akdogan (University of Stellenbosch, South Africa), E.J. Olivier, J.H. O'Connell, J.H. Neethling (Nelson Mandela Metropolitan University, South Africa) and J.J. Eksteen (Curtin University, Australia)
- 10.20 Coffee, poster and exhibition viewing
- 11.30 **Overcoming the contrast, resolution and sampling volume challenges in X-ray tomography systems for mineral processing applications**
S.H. Lau, M. Feser, S. Candell and T. Case (Xradia Inc, USA)
- 11.50 **Characterisation of mixed oxide-sulphide copper ore by microfocus X-ray computed tomography for heap leaching applications**
D. Phillpotts, W. Clark and D. Chetty (Mintek, South Africa)
- 12.10 **A comparison between 2D and 3D particle and grain size measurements**
Ying Gu, Deming Wang (JKMRC, Australia) and R. Schouwstra (Anglo Research, South Africa)
- 12.30 Lunch
- 14.00 *Technical Session 4*
Chairmen: J.P.R. de Villiers (University of Pretoria, South Africa) and D. Chetty (Mintek, South Africa)
- 14.00 **Cleaner and more efficient coal utilisation driven by automated quantification of included and excluded minerals**
E. Hill and C. Gohil (Carl Zeiss Microscopy Ltd, UK)
- 14.20 **Advanced mineral classification using automated feature analysis and spectrum imaging with 6th generation XFlash silicon drift detectors**
T. Salge, J. Berlin, S. Scheller (Bruker Nano GmbH, Germany), M. Patzschke (Vale S/A, Brazil) and R. Neumann (CETEM, Brazil)
- 14.40 **Automated mineral liberation analysis using INCAMineral**
J. Liipo (Outotec Oy, Finland), C. Lang, S. Burgess (Oxford Instruments Nanoanalysis, UK), H. Otterstrom, H. Person (Ottab Technologies, Sweden) and P. Lamberg (Luleå University of Technology, Sweden)
- 15.00 **Estimating the error in measurements of mineral grain size distribution**
C.L. Evans and T.J. Napier-Munn (JKMRC, Australia)
- 15.20 Coffee
- 16.00 **Ball milling control with an eye on ore**
S. Leroy, A. Kottgen, E. Pirard (University of Liege, Belgium) and B. de Haas (Magotteaux, Belgium)
- 16.20 **Automated textural analysis of the Kansanshi Copper ore**
L. Pérez-Barnuevo, R. Castroviejo (Universidad Politécnica de Madrid, Spain) and E. Pirard (Université de Liège, Belgium)
- 16.40 **Classification of hematite types in iron ores through circularly polarized light microscopy and image analysis**
O.F.M. Gomes and A.V. Fontes (CETEM, Brazil)
- 18.30 Coaches depart for conference dinner at Gold Restaurant, Green Point

Friday November 9th

- 08.15 Light breakfast of filled croissants, tea, coffee and fruit juice
- 09.00 *Technical Session 5*
Chairmen: H. Horsch (Hazen Research Inc., USA) and E.M. Wightman (JKMRC, Australia)
- 09.00 **Implementing a geometallurgy program for Cripple Creek and Victor Gold Mine**
S. Leichliter (AngloGold Ashanti, USA)
- 09.20 **Mineralogical analysis in geometallurgical hydrometallurgy**
N.M Chapman, R.L Meakin, L.L. Kuhar, A.J. McFarlane, N.L Turner, D.J Robinson, R.A.H. Martin and P. Merrigan (CSIRO Minerals Down Under Flagship, Australia)
- 09.40 **Taking liberation information into a geometallurgical model – case study Malmberget, Northern Sweden**
P. Lamberg and C. Lund (Luleå University of Technology, Sweden)
- 10.00 **A quantitative methodology for integrating geometallurgy and mineral resource management: the Namakwa Sands case study**
C. Philander and A. Rozendaal (University of Stellenbosch, South Africa)
- 10.20 Coffee
- 11.00 **Detailed characterisation of the Sb-mineralogy in a geometallurgical context at the Rockliden ore deposit, northern Sweden**
F. Minz, P. Lamberg, C. Wanhainen (Luleå University of Technology, Sweden) and N.-J. Bolin (Boliden AB, Sweden)
- 11.20 **Development of liberation/recovery domains: examples from the Prominent Hill IOCG deposit, Australia**
J. Hunt, R. Berry (University of Tasmania, Australia), D.J. Bradshaw (JKMRC, Australia) and B. Triffett (Oz Minerals, Australia)
- 11.40 **Geological variations in the Merensky Reef at Bafokeng Rasimone Platinum Mine and its influence on flotation performance**
A.J.B. Smith, K.S.Viljoen (University of Johannesburg, South Africa), R. Schouwstra, J. Roberts, C. Schalkwyk (Anglo American Technical Solutions, South Africa) and J. Gutzmer (Helmholtz Institute Freiberg for Resource Technology, Germany)
- 12.00 **Mineralogical and metallurgical characterization of highly weathered to fresh metamorphosed banded iron formations**
S.J. Theron, J.M. Richards, A. Walliser and G. Naude (Exxaro - Metallurgy Research and Development, South Africa)
- 12.20 **Process mineralogical studies in the beneficiation of rare earth element ores**
D. Chetty, W. Clark, M. Kotze, N. Sehlotho and C. Bushell (Mintek, South Africa)
- 12.40 **Rare earth element deportment studies utilizing QEMSCAN technology**
D.M. Smythe, L.L. Coetzee, G.J. Martin and B.J. Youlton (SGS, South Africa)
- 13.00 Lunch
- 14.00 *Technical Session 6*
Chairman: M. Becker (University of Cape Town, South Africa)
- 14.00 **Case studies using X-Ray Diffraction methods for process optimization in the minerals industry**
S. Verryn (PANalytical (Pty) Ltd, South Africa), U. König (PANalytical B.V., The Netherlands) and L. Gobbo (PANalytical, Brazil)

- 14.20 **How quantitative is quantitative XRD? (or who put the "Q" in QXRD??)**
D.A. Steele, JKTech Pty Ltd, Australia)
- 14.40 **Analysis of iron ore – a combined XRD, XRF and MLA study**
K. Knorr (Bruker AXS GmbH, Germany) and M. Bornefeld (ThyssenKrupp Polysius AG, Germany)
- 15.00 **The tools of process mineralogy: XRD, QSEM and Optical Microscopy and the interpretation of their results**
J.P.R. de Villiers (University of Pretoria, South Africa)
- 15.20 **Refinement of the isomorphous substitutions in goethite and hematite by the Rietveld method, and relevance to bauxite characterisation and processing**
R. Neumann (CETEM, Brazil) and Â.N. Avelar (Vale SA, Brazil)
- 15.40 **Conference Summary and Invitation to Process Mineralogy '14**
M. Becker (University of Cape Town, South Africa) and A.J. Wills (MEI, UK)
- 16.00 **Coffee and wine**
Accompanying guests welcome

Posters

Monitoring of mineral process systems by use of textural feature analysis

M. Munnik, G.T. Jemwa (University of Stellenbosch, South Africa) and C. Aldrich (Curtin University, Australia)

Department of platinum group elements, Cu and Ni in the rougher flotation circuit at the Two Rivers Platinum Mine, Mpumalanga, South Africa

D.H. Rose and K.S. Viljoen (University of Johannesburg, South Africa)

Geometallurgical characterization of Merensky Reef at Lonmin's Marikana Operation, Bushveld Complex, South Africa

T.Dzvinamurungu, K.S. Viljoen and M.W. Knoper (University of Johannesburg, South Africa)

Department of gold, U and Th at Rand Uranium gold mine, South Africa

L. Mngoma, K.S. Viljoen and H. Rajesh (University of Johannesburg, South Africa)

Gold deportment analysis in Pogo gold mine utilising MLA

Y. Aoki and D. Ochi (Sumitomo Metal Mining, Japan)

Quantitative estimation of mineralogical composition of ore from Udokan copper sand-stone deposit (Trans Baikal region, Russia) using X-ray diffraction

E. Belogub, P. Khvorov, E. Palenova and K. Novoselov (Baikal Mining Company, Russia)

Distribution and textures of REE-minerals quantified for the world class Riviera polymetallic deposit, South Africa

M. Santana and A. Rozendaal (University of Stellenbosch, South Africa)

The use of computed tomography in the characterization of coal and associated coke and char reductants

G. Naude, S.J. Theron and G. Coetzer (Exxaro - Metallurgy Research and Development, South Africa)

New automated mineralogy solution for process mineralogical analyses

J. Klíma, D. Motl and V. Králová (TESCAN, a.s., Czech Republic)

Evolution of acid rock drainage: insights from integrated mineralogical and textural evaluations during kinetic testing of waste rock

A. Parbhakar-Fox, B. Lottermoser (University of Tasmania, Australia) and D.J. Bradshaw (JKMRC, Australia)

Development of an effective and practical alteration index for predicting metallurgical responses of Cu porphyries

B. Yildirim, D. Bradshaw, M.S. Powell and A. Clark (JKMRC, Australia)

Use of mineralogy to interpret laboratory-scale static acid rock drainage (ARD) prediction tests: A gold case study

N. Dyantyi, M. Becker, J. Broadhurst, S. Harrison and J-P Franzidis (University of Cape Town, South Africa)