

Flotation '09, Cape Town, South Africa, November 9-12, 2009

Sponsored by:



Sunday November 8th

16.00-19.30 Registration and Wine Reception

Monday November 9th

07.30 Registration Desk Opens

Symposium on Fundamentals: Physics and Chemistry

- 08.50 Opening Remarks
J. Wills (MEI, UK) and D.J. Bradshaw (JKMRC, Australia)
- 09.10 **Keynote Lecture: Chemical interactions occurring in the flotation process - a review**
C.T. O'Connor (University of Cape Town, South Africa)
- 09.40 *Technical Session 1F*
Chairmen: N. Shackelton (Anglo Research, South Africa) and D. Beattie (Ian Wark Research Institute, Australia)
- 09.40 **Impact of talc on pulp and froth properties in F150 and 1-pentanol frother systems**
H. Kuan and J.A. Finch (McGill University, Canada)
- 10.00 **Adsorption of tailored carboxymethyl cellulose polymers on talc and chalcopyrite: correlation between coverage, wettability, and flotation**
A. Mierczynska-Vasilev and D.A. Beattie (Ian Wark Research Institute, Australia)
- 10.20 Coffee
- 11.00 **The effect of increased frother dosage on froth stability at high depressant dosages**
J.G. Wiese, P.J. Harris (University of Cape Town, South Africa) and D.J. Bradshaw (JKMRC, Australia)
- 11.20 **A study on the effect that fresh and aged solid and/or liquid xanthates (SIBX and PAX) has on the recovery of zinc and lead from sulphide ore by flotation**
E. Muzenda, M. Lekgwati, M. Belaid, F. Ntuli and J. Kabuba (University of Johannesburg, South Africa)
- 11.40 **Spectroelectrochemical investigation of hydroxamate reagents on metals and copper oxide minerals**
G. Hope, R. Woods, G. Parker (Griffith University, Australia), A. Buckley (University of New South Wales, Australia) and J. McLean (Axis House, Australia)
- 12.00 **Poly (N-Isopropylacrylamide) (PNIPAM) as a flotation collector: effect of temperature and molecular weight**
E. Burdukova, G.V. Franks (University of Melbourne, Australia), H. Li (Alberta Research Council, Canada) and D. J. Bradshaw (JKMRC, Australia)
- 12.20 **The formulation and use of mixed collectors in sulphide flotation**
N.O. Lotter (Xstrata Process Support, Canada) and D.J. Bradshaw (JKMRC, Australia)
- 12.40 Lunch
- 14.00 *Technical Session 2F*
Chairman: L. Burdukova (University of Melbourne, Australia) and K. Heiskanen (Helsinki University of Technology, Finland)
- 14.00 **Optimization and conversion of flotation reagents towards sustainable chemicals solutions**
R. Capanema, L. Hoffmann and A. Gorke (Cytec Industries Inc., USA)

- 14.20 **Investigation on alternative depressants for iron ore flotation**
H.D.G. Turrer (Samarco Mineração SA, Brazil) and A.E.C. Peres (University of Minas Gerais, Brazil)
- 14.40 **Evidence for surface cleaning of sulphide minerals by attritioning in stirred mills**
X. Ye, S. Gredelj and S.R. Grano (Ian Wark Research Institute, Australia)
- 15.00 **A systems approach for optimum flotation results - benefits of HPGR**
H. von Michaelis (Randol International Ltd, USA)
- 15.20 **The effect on grinding environment on flotation of sulphide poor PGE ores**
T. Maksimainen, S. Luukkanen, P. Mörsky and R. Kalapudas (Geological Survey of Finland, Finland)
- 15.40 **Effect of fundamental properties of eucalyptus oils on foamability and bubble size in coal flotation**
P.T. Botman, P.N. Holtham and E. Wightman (JKMRC, Australia)
- 16.00 Coffee

Tuesday November 10th

- 09.00 *Technical Session 3F*
Chairmen: G. Hope (Griffith University, Australia) and N.O. Lotter (Xstrata Process Support, Canada)
- 09.00 **The effect of using different comminution devices on the flotation recovery of sphalerite**
N.A. Palm, N.J. Shackleton, V. Malysiak (Anglo Research, South Africa) and C.T. O'Connor (University of Cape Town, South Africa)
- 09.20 **Understanding Gamsberg- a geometallurgical study of a large stratiform zinc deposit**
R.P. Schouwstra, D.V. de Vaux, P. Hey, V. Malysiak, N.J. Shackleton and S. Bramdeo (Anglo Research, South Africa)
- 09.40 **An investigation into the nature of methanol treatment on the increased flotation response of ZnS**
M.E. Holuszko (University of British Columbia, Australia), M.A. Hampton, A.V. Nguyen (University of Queensland, Australia), J.P. Franzidis (University of Cape Town, South Africa) and E.V. Manlapig (JKMRC, Australia)
- 10.00 **The mineralogy of pyrrhotite from selected nickel ore deposits and its effect on flotation performance**
M. Becker (University of Cape Town, South Africa), J. de Villiers (University of Pretoria, South Africa) and D.J. Bradshaw (JKMRC, Australia)
- 10.20 Coffee
- 11.00 **Synchrotron XPS and ToF SIMS studies of solution exposed chalcopyrite and heterogeneous chalcopyrite with pyrite**
R.G. Acres, S.L. Harmer and D.A. Beattie (Ian Wark Research Institute, Australia)
- 11.20 **Modelling bubble-particle interaction with dynamic surface tension**
G. Wierink and K. Heiskanen (Helsinki University of Technology, Finland)
- 11.40 **The effects of hydrophobicity and orientation of cubic particles on the stability of thin films**
G. Morris, S.J. Neethling and J.J. Cilliers (Imperial College, UK)
- 12.00 **Estimation of flotation rate distribution in the collection zone of industrial cells**
J. Yianatos, L. Bergh, L. Vinnett, F. Contreras (Santa Maria University, Chile) and F. Díaz (Chilean Commission of Nuclear Energy, Chile)
- 12.20 **Flotation bank air addition and distribution for optimal performance**
C. Smith, K. Hadler and J.J. Cilliers (Imperial College, UK)
- 12.40 Lunch
- 14.00 *Technical Session 4F*
Chairman: D.J. Bradshaw (JKMRC, Australia)
- 14.00 **Understanding and using gas dispersion measurements**
C.O. Gomez and J.A. Finch (McGill University, Canada)
- 14.20 **Combining positron tracking and image analysis to interpret particle motion in froths**
K. Cole, K. Waters, S.J. Neethling and J.J. Cilliers (Imperial College, UK)
- 14.40 **The impact of the froth zone on metallurgical performance in a 3m³ RCS flotation cell**
R.V. Crosbie, K.C. Runge and J.K. McMaster (Metso Minerals Process Technology, Australia)

- 15.00 **3D Drainage of liquid in froths for modelling flotation cells**
P.R. Brito-Parada, C.C. Pain, S.J. Neethling and J.J. Cilliers (Imperial College, UK)
- 15.20 **New selective flotation reagent “ChemAdd FLOT” for non-ferrous metals**
N. Magdalinovic (Chematek, Italy)
- 15.40 Coffee
- 18.30 Coach departs for Conference Dinner at Spier Wine Estate, Stellenbosch

Wednesday November 11th

Symposium on Applications and Plant Practice

- 09.00 Opening Remarks
J.-P. Franzidis (University of Cape Town, South Africa)
- 09.10 **Keynote Lecture: New directions in flotation machine design**
G.J. Jameson (University of Newcastle, Australia)
- 09.40 *Technical Session 1A*
Chairmen: D. Lelinski (FLSmidth Minerals, USA) and R. Grau (Outotec Research Oy, Finland)
- 09.40 **Improving energy efficiency of flotation machines**
A. Rinne, A. Peltola and H. Myllykangas (Outotec, Finland)
- 10.00 **A novel scale-up method for mechanical flotation cells**
P. Morales, F. Coddou, H. Elgueta, J. Ortíz (Codelco-Chile, Chile), J. Yianatos and F. Contreras (Santa Maria University, Chile)
- 10.20 Coffee
- 11.00 **Metallurgical evaluation of the SuperCell™ - world's largest flotation machine**
M. Dunn (Rio Tinto, USA), D. Lelinski, A. Weber, B. Dabrowski, and F. Traczyk (FLSmidth Minerals, USA)
- 11.20 **On hydrodynamic set-up of the TankCell-300**
S. Grönstrand, A. Yañez (Outotec Chile Ltda., Chile), P. Morales, H. Elgnet et al (Codelco Chile, Chile)
- 11.40 **Simple theoretical models for predicting froth recovery and entrainment in flotation**
S.J. Neethling and J.J. Cilliers (Imperial College, UK)
- 12.00 **Pilot plant testing and the successful commercial installation of Imhoflot G-Cell pneumatic flotation for molybdenum concentrate cleaning at Los Pelambres in Chile**
S.S. Pino, A.S. Baquedano (Ingenieria de Minerales S.A., Chile), R. Imhof and M. Battersby (Maelgwyn Mineral Services Ltd, UK)
- 12.20 **Using a multi-phase particle tracking approach to characterise the flotation response of particles at different grind sizes**
E. Wightman and C. Evans (JKMRC, Australia)
- 12.40 Lunch
- 14.00 *Technical Session 2A*
Chairmen: S. Schwarz (JKTech, Australia) and J.A. Finch (McGill University, Canada)
- 14.00 **Metallurgical performances of the sulphidization route and the direct alkyl hydroxamates flotation of mixed carbonated copper-gold ores of the Kansanshi deposit**
F.X. Paquot, A. Mukutuma, A. Delaney (First Quantum Minerals Ltd, Zambia) and D. Bastin (University of Liege, Belgium)
- 14.20 **Sequential flotation operating strategy to maximise gold recovery at Telfer**
X. Zheng, F. Burns, A. Crawford, P. Manton, P. Griffin (Newcrest Telfer Gold Mine, Australia)
- 14.40 **A potential application of collectorless flotation in a sequential flotation circuit at Telfer**
X. Zheng, P. Manton (Newcrest Telfer Gold Mine, Australia)
- 15.00 **Preliminary variable survey and simulation model on flotation of low sulphide PGE ores**
J. Ruuska, J. Kiuttu, L. Yliniemi (University of Oulu, Finland) and T. Maksimainen (Geological Survey of Finland, Finland)
- 15.20 Coffee
- 16.00 **Characterising the effect of mineralogy on the flotation behaviour of three ore types from the Merensky Reef at Northam**
C.P. Brough (Cardiff University, UK), M. Becker (University of Cape Town, South Africa) and D.J. Bradshaw (JKMRC, Australia)
- 16.20 **On-line grade measurement for automatic chrome content control in UG2 flotation**
V.W. du Plessis, F. du Plessis (Blue Cube Systems (Pty) Ltd, South Africa), D. Minnaar and D. Smit (Northam Platinum Limited, South Africa)
- 16.40 **Bench, pilot and plant scale factors which influence Cr₂O₃ entrainment in UG2 flotation**
M.P. Hay (Eurus Mineral Consultants, South Africa) and R. Roy (Barrick Platinum, South Africa)

Thursday November 12th

- 09.00 *Technical Session 3A*
Chairmen: G. Heyes (CSIRO Minerals, Australia) and K. Hadler (Imperial College, UK)
- 09.00 **Barrick's "Unlock the Value" program: An innovative approach to R&D**
B.K Gorain (Barrick Gold Corporation, Canada)
- 09.20 **Element to mineral conversion and mineral balance in a complex nickel sulphide flotation circuit**
P. Lamberg (Outotec Research Oy, Finland) and S. Vianna (JKMRC, Australia)
- 09.40 **Implication of the froth characteristics on the performance of a Pb-Zn flotation plant**
G.K. Ganguly, J. Mishra and Amit (Bateman Engineering India Pvt. Ltd, India)
- 10.00 **Lead and zinc circuit changes at Lisheen Mine, Ireland**
A. Prinsloo (Lisheen Mine, Ireland)
- 10.20 Coffee
- 11.00 **Converting the Two Rivers concentrator to inert grinding media: A plant case study on UG2 ore**
C.J. Greet (Magotteaux Australia Pty Limited, Australia)
- 11.20 **Iron ore slimes flotation**
L. Rocha, R.Z.L. Cançado and A.E.C. Peres (Federal University of Minas Gerais, Brazil)
- 11.40 **Performance evaluation of a copper flotation plant by employing process mineralogy**
İ.B. Çelik and N.M. Can (Hacettepe University, Turkey)
- 12.00 **Optimizing flotation with online XRD mineralogical analysis**
O. Maldonado (SAX Chile, Chile)
- 12.20 **Effects of water chemistry on flotation performance of a sulphide ore**
O. Bicak, Z. Ekmekçi, M. Can and Y. Ozturk (Hacettepe University, Turkey)
- 12.40 Lunch
- 14.00 *Technical Session 4A*
Chairman: J.-P. Franzidis (University of Cape Town, South Africa)
- 14.00 **Recovery vs mass pull: the link with froth stability**
K. Hadler, C.D. Smith and J.J. Cilliers (Imperial College, UK)
- 14.20 **Control of flotation and acquisition of the key control variables**
L. Blahous and T. Marx (ABB, Switzerland)
- 14.40 **Flotation flow control with pinch valves**
J. Häkkinen (Larox Flowsys Oy, Finland)
- 15.00 **Predicting collapse of the solid content in a column flotation cell using tomographic imaging technique**
A. Lehikoinen et al (Numcore Tld, Finland) and T. Maksimainen (Geological Survey of Finland, Finland)
- 15.20 **Gibbsite concentration from bauxite tailings via froth flotation**
A.Pinto Chaves (Universidade de São Paulo, Brazil), R.K. Gancev (Multigeo Engenharia de Minas, Brazil), C.P. Massola (Instituto de Pesquisas Tecnológicas do Estado de São Paulo, Brazil) and C.F. Andrade (Companhia Brasileira de Alumínio, Brazil)
- 15.40 Coffee/Wine

Posters

Symposium on Fundamentals: Physics and Chemistry

Investigation into the flotation response of a sulphide ore to depressant mixtures

K.C. Corin and P.J. Harris (University of Cape Town, South Africa)

Kaolinite microflotation and electrokinetic properties

O.M.S. Rodrigues; A.C. Araujo and A.E.C. Peres (Federal University of Minas Gerais, Brazil)

Research on the depression performance of azo dyes to sulfide minerals

Lan Li-hong et al (Guangxi University, China)

Estimation of bubble size produced in electroflotation

M.S.K.A. Sarkar, G.M. Evans and S.W. Donne (University of Newcastle, Australia)

Amphoteric collectors adsorption onto silicate-carbonate phosphate ore

M.S. Oliveira (Federal Institute of Minas Gerais, Brazil), C.A. Pereira (Federal University of Ouro Preto, Brazil) and A.E.C. Peres (Federal University of Minas Gerais, Brazil)

Froth touch samples viewed with scanning electron microscopy

K.E. Cole, G.D.M. Morris and J.J. Cilliers (Imperial College, UK)

The surface sulphidization of copper, zinc and lead oxide fine particles

Liu-Ming Wu and Zhong-Xi Sun (University of Jinan, China)

Estimation of the actual bubble surface area flux in flotation

J. Leiva, L. Vinnett, F. Contreras and J. Yianatos (Santa Maria University, Chile)

Investigation of the behaviour of platinum-group minerals and base metal sulphides during flotation of UG2 ore

T.B. Lekgetho, M. Tredoux (University of the Free State, South Africa) and D. Chetty (Mintek, South Africa)

Numerical modelling of non-Newtonian slurry in a mechanical flotation cell

C.W. Bakker, D.A. Deglon and C.J. Meyer (University of Cape Town, South Africa)

Symposium on Applications and Plant Practice

Process mineralogical investigations on the rare earth flotation tailings of Baiyunebo iron ore

Xianjun Lu and Jun Qiu (Shandong University of Science and Technology, China)

Research on the flotation of auriferous sulfide ore by using tertiary dodecyl mercaptan as collector in weak alkaline pulp

Chen Jianhua et al (Guangxi University, China)

An investigation into the effect of combinations of various reagents and pH regimes on the flotation of pyrrhotite

S. Dey (National Metallurgical Laboratory, India), S.Allison. J.-P. Franzidis, G. Yorath, P.J. Harris and C.T. O'Connor (University of Cape Town, South Africa)

Improvement of hematite dephosphorization by flotation in Chadon-Malu iron ore processing plants

H. Nematollahi, H.-R. Jenabi and A.-H. Rejaee (Asfalt Tous Co., Iran)

Flotation of Sukabumi galena ore by using Aerofloat 241

Husaini and S. Cahyono (Mineral and Coal Technology Research and Development Center, Indonesia)

An impedance study of the adsorption of CuSO₄ and SIBX on pyrrhotite samples of different provenances

Z. Ekmekçi, E.B. Tekes (Hacettepe University, Turkey), M. Becker (University of Cape Town, South Africa) and D.J. Bradshaw (JKMRC, Australia)

Kinetic considerations around coal flotation from preparation tailings

A.P. Chaves (Escola Politécnica da Universidade de São Paulo, Brazil) and A.S.R. Nieves (Carbones del Cerrejon, Brazil)

Flotation in the minerals industry - some observations and novel flotation technique for optimization of flotation circuits with forestalling "sanding-up"

J. Chandra, M.S. Negi (Hindustan Zinc Ltd, India) and J. Mishra (Bateman Engineering India Pvt. Ltd, India)

Effect of air distribution profile on selectivity at zinc cleaner circuit

A. Aslan and H. Boz (Çayeli Bakır İşletmeleri AŞ, Turkey)

Does the type of grinding media in the primary ball mill have an impact on overall metallurgical performance when treating UG2 ores: A pilot plant case study

C.J. Greet (Magotteaux Australia Pty Limited, Australia)

