

Flotation '17



Provisional programme- subject to change
Changes will be highlighted and alerted at [#Flotation17](#)

Sunday November 12th

17.00-18.30 Registration and wine reception, with hot and cold canapés (accompanying persons welcome)

Monday November 13th

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

08.00 Fundamentals Symposium Opening Remarks
B.A. Wills (MEI, UK)

08.20 *Technical Session 1*
Chairmen: P.R. Brito-Parada (Imperial College, UK) and B. Newcombe (OptFroth Solutions Pty Ltd, Australia)

08.20 **Keynote Lecture: Developing a flotation model from first principles**
R.-H. Yoon (Virginia Tech, USA)

08.50 **Modelling of flotation processes by density functional hydrodynamics**
N. Evseev and O. Dinariev (Schlumberger Moscow Research, Russia)

09.10 **Predicting flotation behaviour – the interaction between stability and performance**
S.J. Neethling and P.R. Brito-Parada (Imperial College, UK)

09.30 **A novel method for the measurement of flotation recovery by means of 4D particle tracking velocimetry**
A.-E. Sommer, M. Nikpay (Helmholtz-Zentrum Dresden-Rossendorf, Germany), S. Heitkam and K. Eckert (Technical University Dresden, Germany)

09.50 **Water quality effects on bubble-particle attachment of sulphide minerals**
L. October, K. Corin, M. Manono, J. Wiese (University of Cape Town, South Africa) and N. Schreithofer (Aalto University, Finland)

10.10 Coffee, exhibition and poster viewing

10.50 **Nano-entities for surface modification of minerals. Implications for flotation**
B.I. Pålsson, T. Karlkvist and A.P. Mathew (Luleå University of Technology, Sweden)

11.10 **Kernel functions to flotation bubble size distributions**
Z. Javor (Université de Lorraine, France), N. Schreithofer and K. Heiskanen (Aalto University, Finland)

11.30 **Measurement of bubble size distribution in flotation froths**
E. Tshibwabwa, C. Bhondayi and M. Moys (University of the Witwatersrand, South Africa)

11.50 **Measurement of foam flow using Ultrasound Doppler Velocimetry**
S. Heitkam, R. Nauber, L. Büttner, J. Czarske (Technical University Dresden, Germany) and K. Eckert (Helmholtz-Zentrum Dresden-Rossendorf, Germany)

- 12.10 **The heat of immersion as an indicator of mineral surface wettability**
J. Taguta, B. McFadzean and C.T. O'Connor (University of Cape Town, South Africa)
- 12.30 **Flotation study of a fine grained carbonaceous sedimentary apatite ore – challenges in process mineralogy and impact of hydrodynamics**
 D.H. Hoang (Hanoi University of Mining and Geology, Vietnam), H. Schubert (Technische Universität Bergakademie Freiberg, Germany), N. Kupka and M. Rudolph (Helmholtz Institute Freiberg for Resource Technology, Germany)
- 12.50 Lunch
- 14.00 *Technical Session 2*
 Chairmen: B.I. Pålsson, (Luleå University of Technology, Sweden) and P. Kowalczyk (Norwegian University of Science & Technology, Norway)
- 14.00 **Flotation cell hydrodynamics and design modifications investigated with Positron Emission Particle Tracking**
 P.R. Brito-Parada, K. Hadler, J.J. Cilliers (Imperial College, UK), A. Norori-McCormac (University College London, UK) and K. Cole (University of Cape Town, South Africa)
- 14.20 **Bubble size control in flotation column – numerical or imaging method**
L.O. Filippov (Université de Lorraine, France and National University of Science and Technology MISIS, Russia) and Z. Javor (Université de Lorraine, France)
- 14.40 **Study on gas dispersion characteristics in a column flotation using electrical resistance tomography coupled with pressure transducers**
 B. Vadlakonda and N. Mangadoddy (Indian Institute of Technology, India)
- 15.00 **Tank design modifications for the improved performance of froth flotation equipment**
A.J. Morrison, P. Brito-Parada, and J. Cilliers (Imperial College, UK)
- 15.20 Coffee
- 16.00 **Effect of pyrite type on the electrochemistry of chalcopyrite/pyrite interactions**
E. Forbes, M. Vepsäläinen and L. Smith (CSIRO Mineral Resources, Australia)
- 16.20 **Role of redox potential in flotation of galena**
M. Tadie (Stellenbosch University, South Africa), J.G. Wiese, K.C. Corin, C.T. O'Connor (University of Cape Town, South Africa)
- 16.40 **Characterizing mineral wettabilities on a microscale by colloidal probe atomic force microscopy**
 B. Babel and M. Rudolph (Helmholtz Institute Freiberg for Resource Technology, Germany)
- 17.00 Happy Hour, Vineyard Gardens
 Accompanying guests welcome

Tuesday November 14th

- 07.45 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice
- 08.40 *Technical Session 3*
 Chairmen: M. Rudolph (Helmholtz Institute Freiberg for Resource Technology, Germany)
- 08.40 **Consideration of the pulp/froth interface in the compartment model of flotation**
 R. LaDouceur, C. Young (Montana Tech, USA) and P. Amelunxen (Aminpro, Peru)
- 09.00 **The adsorption behaviour of surfactants on solid-liquid interfaces in saline water**
Z. Chang, X. Chen and Y. Peng (University of Queensland, Australia)
- 09.20 **Flotation collector: new understanding, new development**
Guangyi Liu, Jun Liu, Xianglin Yang and Hong Zhong (Central South University, China)
- 09.40 **Performance characterisation of new frothers for sulphide mineral flotation**
D. Chipfunhu (BASF Australia Ltd, Australia), G. Bournival, S. Ata (University of New South Wales, Australia) and S. Dickie (BASF New Zealand Ltd, New Zealand)
- 10.00 **Mitigation negative effects of thiosulfate on flotation performance of a Cu-Pb-Zn sulfide ore**
 Y. Öztürk, Ö. Bıçak, E. Özdemir and Z Ekmekçi (Hacettepe University, Turkey)
- 10.20 Coffee

- 11.00 **A review of phosphoric acid esters for the flotation of oxidised copper minerals**
L. Mahlangu and F. Pinto (Clariant Southern Africa Pty Ltd, South Africa)
- 11.20 **Study on the effect of a mixture of hydrogen peroxide and ferrous sulfate on the floatability of chalcopyrite and molybdenite**
G.P.W. Suyantara, T. Hirajima, H. Miki and K. Sasaki (Kyushu University, Japan)
- 11.40 **The multiple flotation of quartz using environmental-friendly hexyl amine cellulose nanocrystals**
R. Hartmann and M. Illikainen (University of Oulu, Finland)
- 12.00 **Secondary collectors in direct flotation of apatite**
M. Svensson, H. Nordberg and N.S. Schwarzmayr (Akzo Nobel Surface Chemistry AB, Sweden)
- 12.20 **The promoting effect of cationic surfactant on low-rank coal flotation with oil collector: A molecular dynamics simulation study**
Yangchao Xia and Xiahui Gui (China University of Mining and Technology, China)
- 12.40 **Temperature-responsive polymers as tuneable collectors/depressants in flotation: a review**
W.S. Ng, L.A. Connal, G.V. Franks (University of Melbourne, Australia) and E. Forbes (CSIRO Mineral Resources, Australia)
- 13.00 Lunch
- 14.00 *Technical Session 4*
Chairman: E. Forbes (CSIRO Mineral Resources, Australia)
- 14.00 **Selective depression of pyrite using biopolymers in the flotation of copper sulphide minerals**
Y. Mu, Y. Peng (University of Queensland, Australia) and R.A. Lauten (Pionera, Norway)
- 14.20 **Effects of mono- and divalent cations in seawater flotation**
L. Pan and R.-H. Yoon (Virginia Tech, USA)
- 14.40 **Modelling effects of dissolved ions in process water on flotation performance**
O. Bicak, Y. Ozturk, E. Ozdemir and Z. Ekmekci (Hacettepe University, Turkey)
- 15.00 **On the mechanism of the flotation of soluble and semi-soluble salts**
F.K. Crundwell, B.D.H. Knights and N. du Preez (CM Solutions (Pty) Ltd, South Africa)
- 15.20 **Complete characterization of quartz flotation kinetics of a compact itabirite**
S.G.C. Nobre, T.F.M. Brasil Duque and C.L. Schneider (CETEM, Brazil)
- 15.40 **An investigation into copper upgrade using Reflux Flotation**
J.E. Dickinson and K.P. Galvin (University of Newcastle, Australia)
- 16.00 Coffee
- 17.45 Coaches leave for conference dinner at Lagoon Beach

Wednesday November 15th

- 07.00 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice
- 08.05 Welcome to the Applications Symposium
J. Wills (MEI, UK)
- 08.10 *Technical Session 5*
Chairmen: P. Amelunxen (Aminpro, Peru) and K. Heiskanen (Aalto University, Finland)
- 08.10 **Keynote Lecture: Existing opportunities for increasing metallurgical and energy efficiencies in concentrators**
N.W. Johnson (Mineralis Consulting Pty Ltd and Adjunct Professor, University of Queensland, Australia)
- 08.40 **Forecasting flotation plant results – how precise is that?**
D.A. Bulled and C.A. Sosa-Blanco (SGS, Canada)
- 09.00 **How metal accounting can improve the efficiency of plant trials**
L. Lachance, S. Garipey and M. Cousineau (Algosys, Canada)
- 09.20 **Development and application of a geometallurgical framework**
V. Ross (University of the Witwatersrand, South Africa)
- 09.40 **Characterization of the industrial flotation process based on size-liberation relationships**
P. Vallejos, J. Yianatos, L. Vinnett and L. Bergh (Federico Santa Maria Technical University, Chile)

- 10.00 **Modeling recoveries per size liberation classes using the particle surface area**
N.A. Santos (UFMG, Brazil)
- 10.20 Coffee, poster and exhibition viewing
- 11.10 **Chemistry rules: the Prominent Hill experience**
C.J. Greet, M. Myllynen (Magotteaux Australia Pty Ltd, Australia) and T. Li (OZ Minerals, Australia)
- 11.30 **A study of the effect of grinding environment on the flotation of two copper sulphide ores**
J.Y. Liu, Han Long (Beijing General Research Institute of Mining and Metallurgy, China), K.C. Corin and C.T. O'Connor (University of Cape Town, South Africa)
- 11.50 **Downstream flotation changes that occur when hydrocyclones are replaced by multi-stack screens in a ball milling circuit**
J.J. Frausto, G.R. Ballantyne, K. Runge and M.S. Powell (Julius Kruttschnitt Mineral Research Centre, Australia)
- 12.10 **The effect of rotor speed on the flash flotation performance of Au and Cu in an industrial concentrator**
B. Newcombe (OptFroth Solutions Pty Ltd, Australia), B. Akerstrom and E. Jaques (Cadia Valley Operations, Australia)
- 12.30 **Evaluation of the FLSmidth nextSTEP™ installation at a South American concentrator**
B. Dabrowski, D. Lelinski, K. St. John, D. Stevens, M. Walker and A. Weber (FLSmidth, USA)
- 12.50 Lunch
- 14.00 *Technical Session 6*
Chairmen: C.T. O'Connor, University of Cape Town, South Africa and L.O. Filippov (Université de Lorraine, France)
- 14.00 **Metallurgical Performance of the 660 m³ SuperCell™ equipped with the nextSTEP™ rotor and stator**
B. Dabrowski, D. Lelinski, K. St. John, D. Stevens, M. Walker and A. Weber (FLSmidth, USA)
- 14.20 **Hydrodynamic and metallurgical performance of large TankCell® flotation cell in comparison to smaller cells**
T. Mattsson, R. Grau, A. Rinne (Outotec, Finland) and T. Maksimianen (Boliden Kevitsa Mine, Finland)
- 14.40 **Coarse chalcopyrite recovery in a universal flotation machine**
G.J. Jameson (University of Newcastle, Australia)
- 15.00 **Improving coarse particle flotation using Hydrofloat technology**
J.N. Kohmuench, M.J. Mankosa, H. Thanasekaran and A. Hobert (Eriez Flotation Div., USA)
- 15.20 Coffee
- 16.00 **Analysis of the impeller flow number in industrial Wemco mechanical flotation cells**
T.C Souza Pinto, A.S Braga, L.S Leal Filho (Instituto Tecnológico Vale/ITV, Brazil) and D.A. Deglon (University of Cape Town, South Africa)
- 16.20 **Getting the best out of your bubbles with good cleaner circuit design using the Jameson Cell**
V. Lawson (Glencore Technology, Australia)
- 16.40 **Improving the representation of hot flotation testing through the application of a novel, double batch flotation machine**
F.L Bernardis and J.M Wallenius (CP Kelco Oy, Finland)
- 17.00 **Improved flotation of fine PGMs with a high shear cavitation device**
V. Ross, K. Pillay, M. Dlame (Mintek, South Africa) and A. Singh (Gold Ore, South Africa)
- 17.20 **Improving fine flotation using the StackCell**
M.J. Mankosa, J.N. Kohmuench, L. Christodoulou and E.S. Yan (Eriez Flotation Div., USA)
- 17.40 **Research on the influence of impeller pumping performances and gas accumulation effect on fluid dynamics of air forced and pulp induced flotation cell**
Z. Ming, S. Zhengcang, S. Shuaixing, H. Zhibin and H. Dengfeng (Beijing General Research Institute of Mining and Metallurgy, China)
- 18.00 Happy Hour, Vineyard Gardens
Accompanying guests welcome

Thursday November 16th

- 07.00 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice
- 08.00 *Technical Session 7*
Chairmen: S. Ata (University of New South Wales, Australia)
- 08.00 **Application of the hydrophobic hydrophilic separation (HHS) process for the recovery of fine particles**
B. Li, K. Huang, N. Gupta, G. Luttrell and R.-H. Yoon (Virginia Tech, USA)
- 08.20 **Experience coating bubbles with solvent in a downcomer**
S.H. Kuan, Y. Tan and J.A. Finch (McGill University, Canada)
- 08.40 **Grade analyser success factors: What is good enough for process control?**
B. Whitehead (Northam Platinum, South Africa), A. Russell (Mintek, South Africa) and K. Keet (Blue Cube Systems, South Africa)
- 09.00 **Implementation and optimisation of the SGS MET expert control system at MCM copper flotation plant**
R. Peacock, O. Bouh (First Quantum, Mauritania Copper Mine, Mauritania), M. Westcott and F. van der Walt (SGS Mineral Services, South Africa)
- 09.20 **Equipment health indicator to improve analyser availability**
J. Timperi, K. Aberkrom (Outotec, Finland), H. Miettunen and J. Larkomaa (Dragon Mining, Finland)
- 09.40 **Convolutional neural networks for feature extraction in froth flotation sensing**
Z.C. Horn, L. Auret, J.T. McCoy, B. Herbst (Stellenbosch University, South Africa) and C. Aldrich (Curtin University, Australia)
- 10.00 Coffee
- 10.40 **Phenomenological models of entrainment and froth recovery for laboratory flotation kinetics tests**
P. Amelunxen, R. Amelunxen (Aminpro, Peru), R. LaDouceur and C. Young (Montana Tech, USA)
- 11.00 **Improving grade control efficiency with rapid on-line elemental analysis**
I. Kejonen, O. Haavisto, J. Martikainen and V. Suontaka (Outotec Oy, Finland)
- 11.20 **The benefit of improved individual cell performance metrics for supervisory control in froth flotation**
A Müller (Anglo American Platinum, South Africa), R.P Brown, A.L Haasbroek and C.W. Stein (Stone Three Mining, South Africa)
- 11.40 **The use of automated sample transport and analytical methods to monitor and control flotation plant performance**
P. Hofmeyr, B. de Jong, B. Hohenstein and A. van der Westhuizen (Innovative Metallurgical Products (IMP), South Africa)
- 12.00 **Improving flotation recovery of oxide copper minerals**
T. Bhambhani, D.R. Nagaraj and O. Yavuzkan (Cytec Solvay Group, USA)
- 12.20 **Designing modified starches for depressing carbonaceous gangue during copper flotation**
B.L. Fletcher, M. Gidley, P. Halley, P. Luckman, Y. Peng and R. Truss (University of Queensland, Australia)
- 12.40 Lunch
- 14.00 *Technical Session 8*
Chairmen: K. Waters and J.A. Finch (McGill University, Canada)
- 14.00 **Dynamic froth stability of copper flotation tailings**
I. Mackay, P.R. Brito-Parada, J.J. Cilliers (Imperial College, UK), E. Mendez, I. Molina and A.R. Videla (Pontificia Universidad Católica de Chile, Chile)
- 14.20 **New reagent formulations for selective flotation of scheelite from a skarn ore with complex calcium minerals gangue**
I.V.Filippova, L.O. Filippov and Y.Foucaud (Université de Lorraine, France)
- 14.40 **Upgrading nickel in laterite ores by flotation**
S. Farrokhpay, D. Fornasiero and L. Filippov (Université de Lorraine, France)
- 15.00 **Development of fatty acid modifier for beneficiation of the igneous apatite ores of Kovdor deposit**
R. Kamkin, P. Alexandrov (OOO BASK, Russia), A. Michailovski (BASF SE, Germany) and P. Mikkola (BASF Oy, Finland)
- 15.20 Coffee
- 16.00 **Experimental design to optimize BASF's collector performance in the apatite froth flotation**
D.M. Neto, G. Budenberg and J. Davo (BASF SA, Brazil)
- 16.20 **Water quality impact on flotation: impacts and control of residual xanthates**
I. Muzinda and N. Schreithofer (Aalto University, Finland)

- 16.40 **Analysis of water quality variation in the tailings stream of a flotation cell operating at a coal preparation plant**
M. Yoshida, G. Bournival, N. Lambert and S. Ata (University of New South Wales, Australia)
- 17.00 Conference summary
J.A. Finch (McGill University, Canada)
- 17.15 Closing Remarks and Invitation to Flotation '19
A.J. Wills (MEI, UK)
- 17.20 Coffee and Farewell wine function, Vineyard Gardens
Accompanying guests welcome

Posters

Fundamentals Symposium

(Displayed 13th-14th November)

Selective flotation of scheelite from calcite using Pb-BHA complexes as collector and Al-Na₂SiO₃ polymer as depressant

Zhao Wei, Wei Sun, Haisheng Han, Yuehua Hu and Ruolin Wang (Central South University, China)

A laboratory-scale froth flotation tank for the design and optimisation of mechanical and operational improvements

A.J. Morrison, P. Brito-Parada, and J. Cilliers (Imperial College, UK)

The effect of surface coverage and particle size on the behaviour of rising bubbles

P. Wang, J.J. Cilliers, S.J. Neethling and P.R. Brito-Parada (Imperial College, UK)

Evaluation of an attachment-detachment kinetic model for the effect of energy input on the flotation rate constant

M. Safari, M. Harris and D. Deglon (University of Cape Town, South Africa)

The smaller the valuables, the poorer the recovery – Is that always true?

E. Schach, T. Leistner and M. Rudolph (Helmholtz Institute Freiberg for Resource Technology, Germany)

Fundamental aspects from Bayovar phosphate ore concentration

R.O. Balduino (Vale Fertilizantes S.A, Brazil), E.R. Peçanha, M.B.M. Monte (CETEM, Brazil) and L.S.L. Filho (University of São Paulo, Brazil)

Investigation of the interaction mechanism of depressants in the reverse cationic flotation of complex iron ores

L.O. Filippov, I.V. Filippova (Université de Lorraine, France), C.H. Veloso de Melo and A. Correa de Araujo (ArcelorMittal Global R&D, France)

Intensification of the flotation process with electrochemistry potentiograms for copper ores

T.N. Alexandrova, K.M. Arustamyan, S.A. Romanenko, St.Petersburg Mining Institute, Russia) and A.M Arustamyan (AO “GiproRIVS”, Russia) and A.V Alexandrov (Saint-Petersburg State University of Industrial Technologies and Design, Russia)

Development of alternative additive of NaHS for selective flotation of chalcopyrite and molybdenite

T. Hirajima, H. Miki, Y. Muta, G.P.W. Suyantara and K. Sasaki (Kyushu University, Japan)

Froth liquid transport in a two-dimensional flotation cell

J. Yianatos, P. Vallejos C. Matamoros (Federico Santa Maria Technical University, Chile) and F. Díaz (Nuclear Trace and Engineering Ltd., Chile)

Use of a modified water glass in the flotation of molybdenite in seawater

F. Roman, A. Ramirez, L. Gutiérrez (University of Concepcion, Chile) and J.S. Laskowski (University of British Columbia, Canada)

The influence of the conditioning environment of oxidized pyrite and hematite on their hydrophobicity

T.F.M. Brasil Duque, M.B.M. Monte (CETEM, Brazil) and A.J.B. Dutra (Federal University of Rio de Janeiro, Brazil)

CFD modelling of column flotation hydrodynamics – validation against ERT data

B. Vadlakonda and N. Mangadoddy (Indian Institute of Technology, India)

The effect of change in process water chemistry on the behaviour of mixtures of thiol collectors during the flotation of a Pt bearing ore from the Merensky reef

K. Matibidi (Vaal University of Technology, South Africa), M.S. Manono, I.O. Otunniyi, K.C. Corin and J.G Wiese (University of Cape Town, South Africa)

Attachment of non-spherical particles to the fluidic surface: experiment and direct numerical simulations

G. Lecrivain (Helmholtz-Zentrum Dresden-Rossendorf, Germany and Kyoto University, Japan), K. Eckert, U. Hampel (Helmholtz-Zentrum Dresden-Rossendorf, Germany and Technische Universität Dresden, Germany), R. Yamamoto and T. Taniguchi (Kyoto University, Japan)

Design and construction of flotation collector with canola oil and non-ionic surfactants and create effective combination to reduce phosphorus from iron ore

M. Seyedmomen and B. Soltanzadeh (Islamic Azad University, Iran)

Role of ultrasonic treatment on the contacting behavior of bubble/oil-coated-bubble/oil-droplet on glass surfaces of various hydrophobicities

Yuran Chen, Wencheng Xia, Guangxi Ma, Yuqiang Mao (China University of Mining and Technology, China)

Flotation of copper sulphide tailings using hydroxypropyl-methyl cellulose as frother

T. Nuorivaara and R. Serna-Guerrero (Aalto University, Finland)

Mechanism and performance of acidified water glass in scheelite flotation against calcite

N. Kupka, B. Babel and M. Rudolph (Helmholtz Institute Freiberg for Resource Technology, Germany)

The scale-up behaviour of the froth stability measurement

S. Geldenhuys and B. McFadzean (University of Cape Town, South Africa)

Froth stability of steady state flotation at the bench scale

I. Mackay, J.J. Cilliers and P.R. Brito-Parada (Imperial College, UK)

Anisotropic surface reactivity of fluorite: a consideration of surface broken bonds

Zhiyong Gao, Ruiying Fan, Wei Sun and Yuehua Hu (Central South University, China)

Kinetics of froth flotation of naturally hydrophobic solids with different shapes

S. Szczerkowska (Wroclaw University of Science and Technology, Poland), A. Wiertel, J. Zawala (Polish Academy of Sciences, Poland), E. Larsen and P.B. Kowalczyk (Norwegian University of Science and Technology, Norway)

Prediction and experimental verification of a novel cationic surfactant: tributyltetradecyl-phosphonium chloride for iron ore flotation

Pan Chen, Chenyang Zhang, Yuehua Hu, Wei Sun, Jihua Zhai, Tong Yue (Central South University, China) and Dongbo Zhao (Nanjing University, China)

Insights into the activation mechanism of calcium ions on the sericite surface: a combined experimental and computational study

Yuehua Hu, Jianyong He, Chenhu Zhang, Chenyang Zhang, Wei Sun (Central South University, China), Dongbo Zhao, Pan Chen, Haisheng Han, Zhiyong Gao, Runqing Liu and Li Wang (Nanjing University, China)

Effect of dispersants in flotation of molybdenite in the presence of kaolinite in seawater

E. Rebolledo, A. Ramirez, L. Gutiérrez (University of Concepcion, Chile) and J.S. Laskowski (University of British Columbia, Canada)

The importance of exposed mineral grain textures of particles on their flotation response

C.F. Vos, C.L. Evans, E.M. Wightman (JKMRC, Australia), R. Kappes (Newmont Ltd, USA) and D.J. Bradshaw (University of Cape Town, South Africa)

Applications Symposium

Displayed 15th-16th November)

A novel scheme of tungsten minerals: flotation by Pb-BHA complexes for preconcentration and gravity separation for cleaning process

Haisheng Han, Yuehua Hu, Wei Sun, Runqing Liu, Tong Yue, Xiangsong Meng, Yanzhe Guo, Zhiyong Gao, Pan Chen (Central South University, China), Xiaodong Li, Chonggao Cao, Weisheng Huang, Jie Liu, Jiawen Xie and Yulin Chen (Hu Nan Shizhuyuan Non-ferrous Metal Limited Liability Corporation, China)

Flotation of REE-minerals from fluorite by pH-shift

R.G. Merker (MMP, Germany), H. Morgenroth (UVR GmbH, Germany) and D.L. Smith (Commerce Resources Corp., Canada)

Cassiterite and sulfide flotation with a skarn type ore from Hammerlein Deposit, Germany

I. Bremerstein (UVR-FIA GmbH, Germany)

Deposition of trace elements in the flotation of copper ores

C. Plackowski and Y. Peng (University of Queensland, Australia)

An overview of the effect of clays on froth flotation

S. Farrokhpay (Université de Lorraine, France)

BASF selective metal collectors for enhanced sulphide flotation

A. Villanueva, A. Michailovski (BASF SE, Germany), P. Brito-Parada (Imperial College, UK) and E. Ozarslan (BASF Türk Kimya Sanayi ve Ticaret Ltd., Turkey)

The use of a factorial experimental design to optimize the flotation of fluorite ore

D. Tesh, H. Musiyarira and C. Magombedze (Namibia University of Technology, Namibia)

Beneficiation of siliceous carbonate phosphate ore

E. Ferreira, J.M. Silva, W. Silva, L. Gois, E. Fonseca, A. Avelar (Centro de Desenvolvimento Mineral/Vale, Brazil, M. Saito (Vale Fertilizantes S/A, Brazil) and L.A.F. Barros (Barros Consultoria e Engenharia Ltda. Brazil)

Minimizing the propagation of experimental errors in the estimate of flotation recovery of size-liberation classes using Savassi's method

N.A. Santos and R. Galery (UFMG, Brazil)

Evaluating flotation per size liberation classes

N.A. Santos and R. Galery (UFMG, Brazil)

The characterization of Polish copper ores using scanning electron microscopy techniques and image processing

K. Spunda, M. Kania and R. Kubik (Wroclaw Research Centre, Poland)

A novel scheme of tungsten minerals: flotation by Pb-BHA complexes for pre-enrichment and gravity separation for cleaning process

H. Han, Y. Hu, W. Sun, R. Liu, T. Yue, X. Meng, Y. Guo, Z. Gao, P. Chen (Central South University, China), W. Huang, J. Liu, J. Xie, Y. Chen and X. Li (Hu Nan Shizhuyuan Non-ferrous Metal Limited Liability Corporation, China)

Investigation of Cu-Mo separation method in flotation process

M. Yamane, E. Takida, S. Kuroiwa, Y. Imaizumi (Sumitomo Metal Mining Co., Ltd, Japan) and T. Hirajima (Kyushu University, Japan)

Effect of energy input on the Ni(II) ion flotation

F.S. Hoseinian, B. Rezai, E. Kowsari (Amirkabir University of Technology, Iran) and M. Safari (University of Cape Town, South Africa)

Flotation characteristics of a cassiterite bearing complex skarn ore from the Ore Mountains, Germany

M. Buchmann, A. Peuker (TU Bergakademie Freiberg, Germany), M. Kern, M. Rudolph, E. Schach and J. Astoveza (Helmholtz Institute Freiberg for Resource Technology, Germany)

Processing strategies for various fluorite ores

K.C. Teme (Mintek, South Africa)

Analysis of upgrading selectivity of copper and organic carbon in the copper ore flotation plant

A. Bakalarz, M. Duchnowska and A. Luszczkiewicz (Wroclaw University of Technology, Poland)

Performance of locally formulated collector from sesame oil for the flotation of Maru copper ore

M.N.S. Usaini, M.K. Abdullahi (Kaduna Polytechnic, Nigeria) and O.K. Abubakre (FUT, Nigeria)

Effects of angled impeller on flotation cell performance

F. Xuesai, S. Shuaixing, H. Zhibin and L. Shijie (Beijing General Research Institute of Mining and Metallurgy, China)

A new flotation simulation framework for incorporating particle attributes

C.F. Vos, C.L. Evans, E.M. Wightman (JKMRC, Australia), R. Kappes (Newmont Ltd, USA) and D.J. Bradshaw (University of Cape Town, South Africa)

Development of a flowsheet for selective Cu-Pb recovery at Rosh Pinah concentrator

Z. Sindane, N. Sehlotho (Mintek, South Africa) and L. Lintvelt (DRA, South Africa)

Techno-economic analysis of the improvement in the grade vs. recovery curves at Mogalakwena Concentrators

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The effect of saline water on the critical degree of coal surface oxidation for coal flotation

Z. Chang, X. Chen and Y. Peng (University of Queensland, Australia)

Selective flotation of fine-grained pentlandite

H. Kumar and S. Luukkanen (University of Oulu, Finland)

Innovation of froth velocity profile for rougher flotation optimization

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Flotation recovery of strategic metals from carbonaceous rocks

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