

Biohydrometallurgy '14



Sunday 8th June

16.30-18.00 Registration, wine and cheese reception. Accompanying partners welcome

Monday 9th June

- 08.00 Registration opens
- 09.00 **Introduction to Cornwall and to Biohydromet '14**
B.A. Wills (MEI, UK) and C. Bryan (University of Exeter, UK)
- 09.20 *Technical Session 1*
Chairmen: M. Gericke (Mintek, South Africa) and R. Huddy (University of Cape Town, South Africa)
- 09.20 **Keynote Lecture: Biomining in reverse gear: using bacteria to extract metals from oxidized ores**
B. Johnson (Bangor University, UK)
- 09.50 **Characteristics of novel acidophilic bacteria with potential for remediating metal-rich mine waters**
R.M. Jones and D.B. Johnson (Bangor University, UK)
- 10.10 **Salt-tolerant bioleaching microbes for mining operations where fresh water is scarce**
S.M. Rea, N.J. McSweeney, A.H. Kaksonen (CSIRO Land and Water, Australia) and B. Degens (Dept. of Water, Australia)
- 10.30 Coffee
- 11.10 **Bacterial community changes with depth and metal geochemistry in spent ore gold heap leach**
C. Hwang, Lisa Kirk (Montana State University, USA), and M. Fields (National Center for Genome Resources, USA)
- 11.30 **The abandoned Rammelsberg mine: A potential source of novel microbial miners?**
S. Hedrich, M. Blöthe and A. Schippers
Federal Institute for Geosciences and Natural Resources, Germany
- 11.50 ***Sulfobacillus thermosulfidooxidans* strain Cutipay enhances chalcopyrite bioleaching under moderate thermophilic conditions in the presence of chloride ion**
R.A. Bobadilla-Fazzini and P. Parada (BioSigma S.A., Chile)
- 12.10 **Bioleaching of silicate minerals by soil bacterium *Bacillus mucilaginosus* under Fe-limited conditions: investigation of microbe-mineral interactions by fluorescence microscopy and sol-gel technology**
Y. Farber and R. Armon (Israel Institute of Technology, Israel)
- 12.30 **Study of biodiversity of chemolithotrophic bacteria and assessment of their activity in bioleaching processes**
A.K. Vardanyan, S.K. Stepanyan, L.S. Markosyani, N.S. Vardanyan (NAS of Armenia, Institute of Microbiology, Armenia), W. Sand, M. Vera and R. Zhang (University of Duisburg-Essen, Germany)
- 12.50 Lunch

- 14.00 *Technical Session 2*
Chairman: S. Hedrich (Federal Institute for Geosciences and Natural Resources, Germany)
- 14.00 **Effect of thiocyanate on BIOX® organisms: inhibition and adaptation**
R.P van Hille, E. Dawson, C. Edward and S.T L Harrison (University of Cape Town, South Africa)
- 14.20 **Investigating the effect of acid stress on selected mesophilic bioleaching micro-organisms**
E. Ngoma and S.T.L. Harrison (University of Cape Town, South Africa)
- 14.40 **SEM and EDS observations of carrollite bioleaching with mixed culture of acidophilic bacteria**
G. Nkulu, E. Mwena (GECAMINS Sarl, DR Congo), S. Gaydardzhiev and P. Compere (University of Liege, Belgium)
- 15.00 **Thermophilic mineral-microbe interfacial environments explored: insight into the building blocks of the *Metallosphaera hakonensis* biofilm**
C.-J. Africa, R. Huddy, R.P. van Hille, S.T.L. Harrison (University of Cape Town, South Africa), A.J. Wikiel, W. Sand (Universität Duisburg-Essen, Germany) and T.R. Neu (Helmoltz Centre for Environmental Research- UFZ, Germany)
- 15.20 **Three new methods to quantify biomass and activity of microbial leaching cultures**
F. Giebner, S. Kaschabek, S. Schopf and M. Schlömann (TU Bergakademie Freiberg, Germany)
- 15.40 Coffee
- 16.30 Optional Guided Coast Path Walk, ending with a beer at the Chain Locker Pub, Old Falmouth. Accompanying partners welcome

Tuesday 10th June

- 09.00 *Technical Session 3*
Chairmen: A.H. Kaksonen (CSIRO, Australia) and P. Norris (University of Exeter, UK)
- 09.00 **Keynote Lecture: Integrating biohydrometallurgy in contemporary mine production**
C.L. Brierley (Brierley Consultancy LLC, USA)
- 09.30 **The significance of copper speciation during the abiotic and microbial dissolution of chalcopyrite**
C. Falagan, B.M. Grail and D.B. Johnson (Bangor University, UK)
- 09.50 **Effect of physicochemical conditions on the growth and activity of *Acidithiobacillus ferrooxidans* on low grade whole chalcopyrite ore**
E. Govender, S.T.L. Harrison (University of Cape Town, South Africa) and C.G. Bryan (University of Exeter, UK)
- 10.10 **EcoMetals - innovative eco-efficient biohydrometallurgy process for the recovery of strategic and rare metals: primary and secondary resources**
S. Kutschke et al. (Helmholtz-Institute Freiberg, Germany)
- 10.30 Coffee
- 11.10 **Optimisation of bio-oxidation processes for gold recovery**
S.H. Ahoranta, G. Zou, A.-M. Lakaniemi and J.A. Puhakka (Tampere University of Technology, Finland)
- 11.30 **Bioleaching of a complex mixed sulphide ore as a remedy for chalcopyrite disease**
L.M. McTaminey, R.D. Pascoe (Camborne School of Mines, UK) and C.G. Bryan (University of Exeter, UK)
- 11.50 **Heterotrophic bioleaching of copper ores**
S. Kostudis, S. Kutschke and K. Pollmann (Helmholtz Institute Freiberg, Germany)

- 12.10 **Copper bioleaching by alkaliphilic bacteria isolated from a local fly ash landfill site**
T. Ramanathan and Yen-Peng Ting (National University of Singapore, Singapore)
- 12.30 **Elevated CO₂ and N₂ on microbial community change during column bioleaching of pyrite-type chalcocite ore**
B. Chen, B. Wu, X. Liu, W. Jiankang (General Research Institute for Nonferrous Metals, China)
- 12.50 Lunch
- 14.00 *Technical session 4*
Chairman: S. Gaydardzhiev (University of Liege, Belgium)
- 14.00 **The influence of anoxic conditions on mineral sulfide ore bioleaching**
P.R. Norris, O. Gould and T. Ogden (University of Exeter, UK)
- 14.20 **The use of oxygen-enriched atmosphere instead of air in bioleaching operations**
A.-G. Guezennec, Y. Ménard, P. d'Hugues (BRGM, France), F. Savreux (Milton Roy Mixing, France), S. Naanaa and M. Delclaud (Air Liquide, France)
- 14.40 **Bioleaching of nickel-cobalt-arsenic containing flotation by-products of the talc industry**
M. Gericke, C. Pawlik (Mintek, South Africa), D.W. Dew (Dewality Consultants Ltd, UK), P. van Aswegen (P Met. Consulting, South Africa), S.C.C. Barnett (Consultant, UK) and T. Mikkola (Mondo Minerals B.V., Finland)
- 15.00 **The effect of different media-compositions on sphalerite bioleaching**
N. Gelhaar, S. Schopf and M. Schlömann (TU Bergakademie Freiberg, Germany)
- 15.20 Coffee
- 16.15 Coaches depart for Eden Project

Wednesday June 11th

- 09.20 *Technical Session 5*
Chairmen: J. Brierley (Brierley Consultancy USA) and S.M. Rea (CSIRO, Australia)
- 09.20 **Industry delivery of BIOMIN's BIOX[®] and ASTER[™] Processing Technologies**
J. van Niekerk, C. van Buuren and W. Olivier (BIOMIN South Africa (Pty) Ltd, South Africa)
- 09.40 **Biooxidation of Alaskan refractory gold ore concentrates**
N. Okibe, M. Tanaka, K. Sasaki, T. Hirajima (Kyushu University, Japan) and M. Sawada (Sumitomo Metal Mining, Japan)
- 10.00 **Possibilities for Co(III) dissolution from oxide ore through simultaneous bioleaching of pyrite**
L. Zeka (University of Lubumbashi, DR Congo), F. Lambert, J. Frenay and S. Gaydardzhiev (University of Liege, Belgium)
- 10.20 **Impact of organic carbon on the leachability of vanadium, manganese iron and molybdenum from shale residues**
V. Sjöberg and S. Karlsson (Örebro University, Sweden)
- 10.40 Coffee
- 11.20 **Co-processing of sulfidic mining wastes and metal-rich post-consumer wastes by biohydrometallurgy**
A.-G. Guezennec, K. Bru, J. Jacob and P. d'Hugues (BRGM, France)
- 11.40 **The effect of pre-treatment and parameters for bioleaching of printed circuit boards**
J. Mäkinen (VTT – Technical Research Centre of Finland, Finland)

- 12.00 **Fundamental aspects of hematite flotation using the bacterial strain *Rhodococcus ruber* as a bioagent**
L.Y. Lopez, A.G. Merma, M.L. Torem and G.H. Pino (Pontifical Catholic University of Rio de Janeiro, Brazil)
- 12.20 **Flotation of copper-loaded bovine serum albumin-coated bubbles**
A.M. Nazari, K.E. Waters (McGill University, Canada) and P.W. Cox (University of Birmingham, UK)
- 12.40 Lunch
- 14.00 *Technical Session 6*
Chairman: C. Bryan (University of Exeter, UK)
- 14.00 **Biotreatment of As-containing acid mine drainage using sulfate reducing granules in upflow anaerobic sludge blanket (UASB) reactor**
E. Sahinkaya, Y. Toker (Istanbul Medeniyet University, Turkey), A. Yurtsever, H. Elcik, M. Cakmaci (Yildiz Technical University, Turkey) and A.H. Kaksonen (CSIRO Land and Water, Australia)
- 14.20 **Nitrification of arsenic-containing mining waters**
S. Papiro, G. Zou and J.A. Puhakka (Tampere University of Technology, Finland)
- 14.40 **Sorption of arsenic onto biogenic iron precipitates from mining waters**
S.H. Ahoranta, M.E. Nissilä and J.A. Puhakka (Tampere University of Technology, Finland)
- 15.00 Closing Remarks and panel discussion
P. d'Hugues (BRGM, France) and S.T. Harrison (University of Cape Town, South Africa)
- 15.55 Invitation to Biohydromet '16
A.J. Wills (MEI, UK)
- 16.00 Coffee

POSTERS

Kinetic studies applied to the metal biosorption in AMD treatment

F.P.C. Silvas, V. Tavares de Moraes, D.C.R. Espinosa, J.A.S. Tenório (Polytechnic School of São Paulo University, Brazil) and M.L. Torem (Pontifical Catholic University of Rio de Janeiro, Brazil)

Uranium retention at low pH by fungal metabolites

A. Grandin, V. Sjöberg, S. Karlsson (Örebro University, Sweden) and A. Ogar (Jagiellonian University, Sweden)

Ni and V tolerant microorganisms and their potential application in the treatment of spent catalysts

M. Gómez-Ramírez, L.G. Martínez and N.G. Rojas (Centro de Investigación en Ciencia Aplicada y Tecnología Avanzada del IPN (Mexico))

Engineered strains enhance gold biorecovery from electronic scrap

G. Natarajan Song Buck Tay, Wen Shan Yew and Yen-Peng Ting (National University of Singapore, Singapore)

Start-up and adjustment of a two-stage bioremediation process treating real acid mine drainage

R.J. Barros, G. Vitor, T.C. Palma and M.C. Costa (Universidade do Algarve, Portugal)

Resolution of sulfur-oxidation and carbon metabolism pathways of *Metallosphaera cuprina* Ar-4 via comparative proteomics

Cheng-Ying Jiang, Li-Jun Liu, Xu Guo, Xiao-Yan You, Shuang-Jiang Liu (Chinese Academy of Sciences, China) and A. Poetsch (Ruhr University Bochum, Germany)

Recovery of indium from sphalerite ore and flotation tailings by bioleaching and subsequent precipitation processes

M. Martin and S. Reichel (G.E.O.S. Ingenieurgesellschaft, Germany)

Overcome organic solvent inhibition from acidophilic microorganisms in PLS by addition of isolated heterotrophic degraders

I. Vyrides, E. Xenofontos and C. Varotsis (Cyprus University of Technology, Cyprus)

Effect on iron dispose and copper extraction from inoculation of native bacterial consortiums on column leaching test

F. Vera, C. Cárdenas and V. López (Arturo Prat University, Chile)

Utilisation of thermophilic species in secondary reactors to reduce cyanide consumption in the BIOX® process

R.P. van Hille, S.T.L. Harrison (University of Cape Town, South Africa), C. van Buuren (Biomim South Africa (Pty) Ltd, South Africa), J. Irons and C. Fourie (Barberton Mines Ltd, South Africa)

A bioleaching research on the chalcopyrite ore in a copper mine in Pakistan

Biao Wu, Minglin Wu, Wenjuan Li, Jing Bai, Bowei Chen and Jiankang Wen (General Research Institute for Nonferrous Metals, China)