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17th International Biohydrometallurgy Symposium

2-5 September 2007, Frankfurt am Main
and Excursion 6-7 September 2007



DECHEMA e.V.

INVITATION

The International Biohydrometallurgy Symposium 2007 is the 17th event in this series. The first symposium took place in Wolfenbüttel, Germany, in the year 1978. In recent years attention has focused increasingly on the role that microorganisms play in the treatment of minerals, metals, coal, oil, waste materials and also in related environmental issues. Today, besides new technologies for the production of raw materials and valuable substances, the main tasks are focused on the remediation of former mining sites and environmental protection connected with the different kinds of mining and the mining industries. Increasing contributions to the field from disciplines like genetics, biochemistry, electrochemistry, microbiology, hydrometallurgy, chemistry, geology and process engineering have affected the rapid development as well as pressure from legislation of the European Union and of national governments.

The International Biohydrometallurgy Symposium IBS2007 will be held at the well-equipped DECHEMA premises in Frankfurt am Main, Germany. The Symposium will provide a forum to present the latest scientific and technological advances in this area, and an opportunity for biotechnologists, practitioners and environmentalists to meet and discuss challenging future trends in the field.

Furthermore, the symposium will be held in Germany for the second time! Due to the geographic location we expect to have a large number of participants from the new EU member states and developing countries. The latter often encounter a wide range of problems related to post-mining remediation. Consequently it is a unique opportunity to demonstrate the manifold remediation techniques in ore mining, uranium mining as well as coal and lignite mining, which have been put into use in Germany as a result of former mining activities. Therefore, the meeting will be an opportunity for scientists and engineers from all over the world to study biohydrometallurgical applications, to learn how to implement them as well as to find and/or facilitate new ways of collaboration.

COMMITTEES

INTERNATIONAL SCIENTIFIC COMMITTEE

Ricardo Amils	Universidad Autonoma de Madrid/E
Antonio Ballester-Perez	Universidad Complutense de Madrid/E
Violaine Bonnefoy	C.N.R.S, Marseille/F
Corale Brierley	Brierley Consultancy L.L.C., Colorado Springs, CO/USA
James Brierley	Brierley Consultancy L.L.C., Colorado Springs, CO/USA
Virginia Ciminelli	Universidade Federal de Minas Gerais/BR
Edgardo Donati	University of La Plata/RA
Henry Ehrlich	Rensselaer Polytechnic Institute, Troy, NY/USA
Peter Franzmann	CSIRO Land and Water, Floreat, WA/AUS
Oswaldo Garcia	Sao Paulo State University/BR
Stoyan Groudev	University of Engineering Geocology, Sofia/BG
Eric Guibal	Ecole de Mines Alés/F
Kevin Hallberg	University of Wales, Bangor/UK
Sue Harrison	University of Cape Town, Rondebosch/ZA
David Holmes	Andres Bello University, Santiago/RCH
Carlos Jerez	University of Chile, Santiago/RCH
Barrie Johnson	University of Wales, Bangor/GB
Dominique Morin	BRGM, Orléans/F
K.A. Natarajan	Indian Institute of Science, Bangalore/IND
Paul Norris	University of Warwick, Coventry/GB
Jochen Petersen	University of Cape Town/ZA
Tony Pinches	Mintek, Randburg/ZA
Chris du Plessis	Bilton Process Research, Kensington/ZA
Jaakko Puhakka	Tampere University of Technology/FIN
Douglas Rawlings	University of Stellenbosch, Matieland/ZA
Rosa Elva Rivera Santillan	Universidad Nacional Autonoma de México/MEX
Giovanni Rossi	University of Cagliari/I
Wolfgang Sand	University of Duisburg-Essen/D
Axel Schippers	BGR Hanover/D
Tsuyoshi Sugio	Okayama University/J
Monica Teixeira	Federal University of Ouro Preto/BR
Marios Tsezos	National Technical University of Athens/GR
Olli Tuovinen	Ohio State University, Columbus, OH/USA
Tomas Vargas	Universidad de Chile, Santiago/RCH
Helen Watling	CSIRO Minerals, Bentley, WA/AUS
Sabine Willscher	Technical University of Dresden/D

COMMITTEES**ORGANIZING COMMITTEE**

Klaus Bosecker	Hanover/D
Wolfram Fürbeth	DECHEMA e.V., Frankfurt/D
Franz Glombitza	G.E.O.S. Freiberg Ingenieurgesellschaft mbH, Tuttendorf/D
Wolfgang Sand	University of Duisburg-Essen/D
Axel Schippers	BGR Hanover/D
Helmut Tributsch	Hahn-Meitner-Institute Berlin GmbH/D
Sabine Willscher	Technical University of Dresden/D

ORGANIZED BY

DECHEMA e.V.
Society for Chemical Engineering
and Biotechnology
Frankfurt am Main/D

PROGRAMME AT A GLANCE

Tuesday, 4 Sept 2007	
Environmental Problems	
	<i>Chairs: F. Glombitza, B. Dold</i>
8:30	KEYNOTE LECTURE B. Dold
9:10	L. Moreno
9:30	K. Gruiz
9:50	J. Huisman
10:10	A. Storch
10:30	Coffee Break with Poster Presentation
(Bio)-Remediation	
	<i>Chairs: B. Dold, F. Glombitza</i>
11:00	L. Diels
11:20	R. Mariner
11:40	V. Preuss
12:00	M.F.M. Bijmans
12:20	A. Schöner
12:40	D.M. Zapata
13:00	Lunch
Interfacial Processes	
	<i>Chairs: S. Willscher, A. Bergel</i>
14:00	KEYNOTE LECTURE A. Bergel
14:40	J. Pinka
15:00	K.A.Natarajan
15:20	L.M. Ruiz
15:40	Coffee Break with Poster Presentation
	<i>Chairs: A. Bergel, S. Willscher</i>
16:10	KEYNOTE LECTURE M. Hagen
16:50	K. Etzel
17:10	T. Vargas
17:30	POSTER SESSION
19.30	End of the 2 nd day

Wednesday, 5 Sept 2007	
Molecular- and Microbiology I	
	<i>Chairs: D.E. Rawlings, D.B. Johnson</i>
8:30	KEYNOTE LECTURE C. Jerez
9:10	D.B. Johnson
9:30	R. Hawkes
9:50	R. Amils
10:10	P. Sar
10:30	Coffee Break with Poster Presentation
Molecular- and Microbiology II	
	<i>Chairs: D.B. Johnson, D.E. Rawlings</i>
11:00	D.E. Rawlings
11:20	S.R. Dave
11:40	V. Bonnefoy
12:00	S.T.L. Harrison
12:20	P.R. Norris
12:40	P. Galleguillos
13:00	Lunch
Molecular- and Microbiology III	
	<i>Chairs: M. Tsezos, C. Jerez</i>
14:00	D.S. Holmes
14:20	T.M. Taha
14:40	J. Petersen
15:00	C. Castelle
15:20	Coffee Break with Poster Presentation
Biosorption and -accumulation	
	<i>Chairs: C. Jerez, M. Tsezos</i>
15:40	KEYNOTE LECTURE M. Tsezos
16:20	A. Ballester
16:40	N. Creamer
17:00	Closing remarks
19.30	CONFERENCE DINNER
23:30	End of the 3 rd day

PROGRAMME**Sunday, 2 September 2007**

16:00 **Registration open**

17:30 **WELCOME**

W. Sand, University of Duisburg-Essen/D

W. Fürbeth, DECHEMA e.V., Frankfurt/D

17:40 **HONORARY LECTURE**

Biohydrometallurgy – this microbiologist's perspective

J. Brierley, Brierley Consultancy LLC, Colorado Springs, CO/USA

18:40

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Welcome Reception

20:30

PROGRAMME

Monday, 3 September 2007

8:15 **OPENING**

W. Sand, University of Duisburg-Essen/D

F. Glombitza, G.E.O.S. Freiberg Ingenieurgesellschaft mbh,
Tuttendorf/D

8:30 **INTRODUCTION****Bioleaching Technology and Biobeneficiation I**

Chairs: W. Sand / D.H.R. Morin

8:40 **KEYNOTE LECTURE**

Status and challenges of the bioleaching technologies

D.H.R. Morin, BRGM, Orleans/F

9:20 **Optimization of ROM sulphide leaching at Anglo American Chile los bronces division**

S. Saldivar, G. Zarate, Anglo American Chile, Santiago/RCH

9:40 **Development of biotechnology on flotation tailing reprocessing in copper-concentrating factory in almalyk mining and metallurgical complex**

M. Sagdieva, K.S. Sanakulov, S.I Borminskiy, O.P.Vasilyonok,
Institute of Microbiology of Academy of Sciences of Uzbekistan,
Tashkent/UZB

10:00 **Talvivaara black schist bioheapleaching demonstration plant**

M. Riekkola-Vanhanen, Talvivaara Mining Company Ltd.,
Sotkamo/FIN

10:20 **Comparison of bioleaching effect of mesophilic (35°) and termophilic bacteria (45°) on the Tizapa tailings**

R. Rivera-Santillan, V. Becerril-Reyes, Univerddad Nacional
Autonoma de Mexico/MEX

10:40 COFFEE BREAK WITH POSTER PRESENTATION

Bioleaching Technology and Biobeneficiation II

Chairs: D.H.R. Morin / W. Sand

11:10 **Application potential of biohydrometallurgy in the Iranian mining industry**

M. Ranjbar, M. Schaffie, Shahid Bahonar University of Kerman/IR

11:30 **Overview of bioshale project main results for a sustainable way of exploiting black shale ores using biotechnology**

P. d'Hugues, BRGM, Orléans/F

11:50 **Removal of organically bound sulfur from oil shale by iron(III)-ion generated-regenerated from pyrite by the action of *Acidithiobacillus ferrooxidans***

V. Beskoski, J. Milic, Institute of Chemistry, Technology and
Metallurgy, Belgrade/YU; B. Mandic, M. Takic, M. Vrvic,
University of Belgrade/YU

12:10 **A qualitative study of galvanic actions during the bioleaching of mixed nickel sulphides**

V.A. Leão, Núcleo de Valorização de Materiais Minerais,
Ouro Preto, MG/BR

PROGRAMME

Monday, 3 September 2007

- 12:30 **Effects of monovalent cations on the formation of jarosites in *Acidithiobacillus ferrooxidans* cultures**
J.P. Gramp, J.M. Bigham, O.H. Tuovinen, Ohio State University, Columbus/USA
- 12:50 **Novel approach in bioleaching? The use of HCN-forming bacteria to mobilize metals as water soluble cyanide complexes**
H. Brandl, S. Lehmann, M.A. Faramarzi, University of Zurich/CH
- 13:10 Lunch

Bioleaching Technology and Biobeneficiation III

Chairs: A. Schippers / S.N. Groudev

- 14:10 **KEYNOTE LECTURE**
Bioremediation of acid mine drainage in a uranium deposit
S. Groudev, P. Georgiev, I. Spasova, M. Nicolova, University of Mining and Geology, Sofia/BG
- 14:50 **High-rate fluidized-bed ferric sulfate generation for hydrometallurgical applications**
J. Puhakka, P.H.-M. Kinnunen, T. van der Meer, B. Özkaya, E. Sahinkaya, A.H. Kaksonen, P. Nurmi, Tampere University of Technology/FIN
- 15:10 **Development of a tank bioleaching process for the treatment of complex Cu-polymetallic concentrates**
M. Gericke, H.H. Muller, P.J. van Staden, A. Pinches, Mintek, Randburg/ZA
- 15:30 COFFEE BREAK WITH POSTER PRESENTATION
- Chairs: S.N. Groudev / A. Schippers*
- 16:00 **Continuous bioleaching of a cobaltiferous pyrite in stirred reactors: population dynamics and EPS production vs. bioleaching performances**
P. D'Hugues, C. Joulian, P. Spolaore, C. Michel, F. Garrido, D. Morin, BRGM, Orléans/F
- 16:20 **Thermophilic bioleaching of a complex multimetal black shale ore**
J. Langwaldt, Geological Survey of Finland, Outokumpu/FIN
- 16:40 **Characterisation of factors in the bacterial leaching of nickel laterites using statistical design of experiments**
G.S. Simate, S. Ndlovu, University of the Witwatersrand, Johannesburg/ZA
- 17:00 **Modeling the auto-thermal performance of a thermophilic chalcopyrite bioleaching heap employing mixed mesophilic and thermophilic microbes**
J. Vilcaez, K. Suto, C. Inoue, Tohoku University, Sendai/J
- 17:20 **POSTER PARTY**
- 20:00 End of the 1st day

PROGRAMME

Tuesday, 4 September 2007

Environmental Problems

Chairs: F. Glombitza / B. Dold

- 8:30 **KEYNOTE LECTURE**
Biogeochemical processes in marine shore mine tailings deposit and their remediation
B. Dold, University of Lausanne/CH
- 9:10 **Modeling of contaminant release from mining waste deposits**
L. Moreno, Royal Institute of Technology, Stockholm/S
- 9:30 **Environmental toxicity testing in the risk assessment of a metal contaminated abandoned mining site in Hungary**
K. Gruiz, E. Vaszita, Z. Siki, Budapest University of Technology and Economics/H
- 9:50 **Application of sulfate reduction to biologically convert anglesite to galena**
J. Huisman, A. Wolthoorn, S. Kuitert, H. Dijkman, Paques B.V., Balk/NL
- 10:10 **First evidence of active sulphate reduction in a lignite mine dump site at low pH values – the Plessa site**
A. Storch, TU Bergakademie Freiberg/D; K. Tröger, Helmholtz Centre for Environmental Research, Halle/D; N. Hoth, TU Bergakademie Freiberg/D; K. Knöller, Helmholtz in Helmholtz Centre for Environmental Research, Halle/D
- 10:30 COFFEE BREAK WITH POSTER PRESENTATION

(Bio)-Remediation

Chairs: B. Dold / F. Glombitza

- 11:00 **Sustainable approach for the immobilization of metals in the saturated zone: *in situ* bioprecipitation near a non-ferrous industry**
K. Vanbroekhoven, S. Van Roy, L. Diels, J. Gemoets, VITO, Moi/B; P. Verkaeren, MWH, Mechelen/B; L. Zeuwts, Smet GWT, Dessel/B; K. Feyaerts, F. Van den Broeck, Umicore, Olen/B
- 11:20 **Development and application of a biological system for removal of manganese from contaminated waters**
R. Mariner, D.B. Johnson, K.B. Hallberg, Bangor University/UK
- 11:40 **In-lake bioreactors for the treatment of acid mine water in pit lakes**
V. Preuss, Brandenburg University of Technology, Cottbus/D; M. Horn, Ingenieurbüro Horn, Fehrbellin/D; M. Koschorreck, UFZ-Helmholtz Centre for Environmental Research, Magdeburg/D; G. Luther, Ingenieurbüro Horn, Fehrbellin/D; K. Wendt-Potthoff, W. Geller, UFZ-Helmholtz Centre for Environmental Research, Magdeburg/D
- 12:00 **Sulfate reduction under acidic conditions in high rate bioreactor systems for treatment of mining and metallurgical waste and process water**
M.F.M. Bijmans, P.N.L. Lens, C.J.N. Buimans, Wageningen University/NL

PROGRAMME

Tuesday, 4 September 2007

- 12:20 **Biosorption as main uranium accumulation mechanism in wetlands**
A. Schöner, G. Büchel, University of Jena/D; M. Sauter, University of Göttingen/D
- 12:40 **Sulfur product layer in sphalerite biooxidation: evidences for a mechanism of formation**
D.M. Zapata, M. Márquez, M. Ossa, National University of Colombia, Medellin/CO
- 13:00 Lunch

Interfacial Processes

Chairs: S. Willscher / A. Bergel

- 14:00 **KEYNOTE LECTURE**
Recent advances in electron transfer between biofilms and metals
A. Bergel, CNRS, Toulouse/F
- 14:40 **Investigations on the sorting of finest particles by biocoagulation**
H.Z. Kuyumcu, J. Pinka, Technical University Berlin/D
- 15:00 **Effect of LPS removal on the electrophoretic softness of *Acidithiobacillus ferrooxidans* cells grown in presence of different metal ions**
M.N. Chandraprabha, J.M. Modak, K.A. Natarajan, Indian Institute of Science, Bangalore/IND
- 15:20 **Is the quorum sensing type AI-1 system of *Acidithiobacillus ferrooxidans* involved in its attachment to mineral surfaces?**
L.M. Ruiz, A. Gonzalez, University of Chile, Santiago/RCH; M. Frezza, L. Soulere, Y. Queneau, A. Doutheau, Université Lyon 1/F; T. Rohwerder, W. Sand, Universität Duisburg-Essen/D; C.A. Jerez, N. Guilliani, University of Chile, Santiago/RCH
- 15:40 COFFEE BREAK WITH POSTER PRESENTATION

Chairs: A. Bergel / S. Willscher

- 16:10 **KEYNOTE LECTURE**
The Wismut uranium mining remediation project – experiences and results from 15 years
M. Hagen, Wismut GmbH, Chemnitz/D
- 16:50 **Pyrite surface alteration as effect of microbial activity and crystallographic orientation**
K. Etzel, University Kiel/D; H. Huber, R. Rachel, M. Thomm, University Regensburg/D; W. Depmeier, University Kiel/D
- 17:10 **The catalytic influence of *Sulfolobus metallicus* in the bioleaching of chalcopyrite: role of attached and planktonic population**
V. Gautier, B. Escobar, T. Vargas, University of Chile, Santiago/RCH
- 17:30 **POSTER SESSION**
- 19:30 End of the 2nd day

PROGRAMME

Wednesday, 5 September 2007

Molecular- and Microbiology I

Chairs: D.E. Rawlings / D.B. Johnson

- 8:30 **KEYNOTE LECTURE**
Biomining in the post-genomic age: advances and perspectives
C. Jerez, University of Chile, Santiago/CL
- 9:10 **Concentrate mineralogy dictates the composition of bioleaching microbial consortia**
D.B. Johnson, Y. Liu, K. Coupland, K.B. Hallberg, N. Okibe, University of Wales, Bangor/UK
- 9:30 **Geographical distribution and physiological diversity of moderately thermophilic members of the *Thermoplasmatales***
R. Hawkes, CSIRO, Wembley, WA/AUS; J. Plumb, CSIRO, Wembley, WA/AUS; G. O'Hara, Murdoch University/AUS
- 9:50 **Microbial ecology of *Leptospirillum spp.* in Río Tinto, a model of interest to biohydrometallurgy**
R. Amils, Universidad Autonoma Madrid, Madrid/E; A. Garcia-Moyano, E. Gonzalez-Toril/E
- 10:10 **Molecular assessment of microbial diversity and community structure at uranium mines of Jadugoda, India**
P. Sar, P. Dhal, E. Islam, S. Kazy, Indian Institute of Technology, Kharagpur/IND
- 10:30 COFFEE BREAK WITH POSTER PRESENTATION

Molecular- and Microbiology II

Chairs: D.B. Johnson / D.E. Rawlings

- 11:00 **Related arsenic resistance transposons occur in *Leptospirilli* isolated from different continents**
A. Kloppers, S.M. Deane, D.E. Rawlings, Stellenbosch University/ZA
- 11:20 **Interactions of *Acidithiobacillus ferrooxidans* with heavy metals, various forms of arsenic and pyrite**
S.R. Dave, K.H. Gupta, Gujarat University, Ahmedabad/IND
- 11:40 **Arsenic oxidation by a moderately acidophilic, facultative chemolithoautotrophic *Thiomonas sp.***
D. Slyemi, J. Ratouchniak, V. Bonnefoy, C.N.R.S., Marseille/F
- 12:00 **The effect of multiple stresses on *Sulfolobus*-like cultures in bioleaching systems: super-imposing stress responses to metal concentration and solids loading**
N.J. Coram-Uliana, K. Ntshabele, R.P. van Hille, S.T.L. Harrison, University of Cape Town/ZA
- 12:20 **The selection and characteristics of acidophiles for bio-reactor processing of chalcopyrite at high temperature**
H. Luckarift, P.R. Norris, University of Warwick, Coventry/UK

PROGRAMME

Wednesday, 5 September 2007

- 12:40 **Differential genetic expression in heap bioleaching process of low-grade copper sulphide ore at Escondida Mine, Chile**
C. Demergasso, Universidad Católica del Norte, Antofagasta/RCH; P. Galleguillos, Centro de Investigación Científica y Tecnológica para la Minería, Antofagasta/RCH; F. Galleguillos, Universidad Católica del Norte, Antofagasta/RCH; V. Zepeda, Centro de Investigación Científica y Tecnológica para la Minería, Antofagasta/RCH; D. Castillo, Johannesburg Technology Centre BHP-Billiton/ZA
- 13:00 LUNCH

Molecular- and Microbiology III

Chairs: M. Tsezos / C. Jerez

- 14:00 **Insights into the metabolism and ecophysiology of three *acidithiobacilli* species by comparative genome analysis**
J. Valdes, I Pedroso, R Quatrini, D.S. Holmes, Life Science Foundation, Santiago/RCH
- 14:20 **Involvement of iron-oxidation enzyme system in sulfur oxidation of *A. Ferrooxidans* ATCC 23270**
T.M. Taha, T. Kanao, T. Sugio, Okayama University/J
- 14:40 **The effect of total iron concentration and iron speciation on the rate of ferrous iron oxidation kinetics of *Leptospirillum ferriphilum* in continuous tank systems**
J. Petersen, T.V. Ojumu, University of Cape Town, Rondebosch/ZA
- 15:00 **A new acid-stable, Fe-oxidizing/O₂-reducing supercomplex spanning both inner and outer membranes, isolated from the extremophile *Acidithiobacillus***
C. Castelle, M. Guiral, M.T. Giudici-Ortoni, CNRS, Marseille/F
- 15:20 COFFEE BREAK WITH POSTER PRESENTATION

Biosorption and -accumulation

Chairs: C. Jerez / M. Tsezos

- 15:40 **KEYNOTE LECTURE**
Biological removal of ions. The evolution of applications
M. Tsezos, University of Athens/GR
- 16:20 **Lead and gold removal using sugar-beet pectin gels with and without immobilized *Fucus vesiculosus***
A. Ballester, Y.N. Mata, M.L. Blazquez, F. Gonzalez, J.A. Munoz, Universidad Complutense de Madrid/E
- 16:40 **A novel hydrogenation and hydrogenolysis catalyst using palladized biomass of Gram negative and Gram positive bacteria**
N. Creamer, I.P. Mikheenko, K. Deplanche, P. Yong, J. Wood, University of Birmingham/UK; K. Pollmann, S. Selenska-Pobell, FZD-Rosendorf, Dresden/D; L.E. Macaskie, University of Birmingham/UK
- 17:00 **Closing Remarks**
- 19:30 **CONFERENCE DINNER**
- 23:30 End of the 3rd day

POSTER

Topic B: Bioleaching Technology and Biobeneficiation

- 1 **Bioleachability of chalcopyrite ore using diverse acidophiles**
K. Qayum, M.A. Ghauri, N. Akhtar, K. Akhtar, NIBGE, Faisalabad/PK
- 2 **In situ oxidation modes performed by *Acidithiobacillus ferrooxidans* in different sulfides**
S.F.S. Tada, UNICAMP, Campinas/BR; D.M.H. Ossa, UNICAMP and UNESP, Campinas and Araraquara/BR; L.F.C. Ferraz, F.C. Reis, UNICAMP, Campinas/BR; A.P. Felício, UNESP, Araraquara/BR; M.T.M. Novo, UNESP and UFSCar, Araraquara and São Carlos/BR; O. Garcia Jr., UNESP, Araraquara/BR; L.M.M. Ottoboni, UNICAMP, Campinas/BR
- 3 **Biological transformation of kimberlite ores**
M. Gericke, Mintek, Randburg/ZA; B. Benvie, L. Kruger, De Beers, Johannesburg/ZA
- 4 **Bioleaching of a zinc sulfide ore by thermophilic consortia isolated from Copahue volcano**
A. Giaveno, National University of Comahue, Neuquen/RA; E. Donati, National University of La Plata/RA
- 5 **Mineralogy of colombian arsenopyrite-pyrite concentrated biooxidation products by FTIR and XRD techniques**
A. Muñoz, Sao Paulo State University, Araraquara/BR; A.C. Gaviria, M.A. Marquez, Colombia National University, Medellin/CO; O. Garcia, Sao Paulo State University, Araraquara/BR
- 6 **Electrochemical noise analysis of CPE chalcopyrite in the presence of *Acidithiobacillus ferrooxidans***
D.G Horta, D. Bevilacqua, H.A. Acciari, O. Garcia Jr, A.V. Benedetti, São Paulo State University, Araraquara/BR
- 7 **Application of thermophilic chemolithotrophic microorganisms in two stage process of bacterial-chemical leaching of sulfide copper concentrate**
M. Muravyov, Moscow State University of Environmental Engineering/RUS; N. Fomchenko, Russian Academy of Science, Moscow/RUS; V. Biryukov, Moscow State University of Environmental Engineering/RUS
- 8 **Influence of chelators on iron dissolution during the quality improvement of quartz sands and feldspars**
I. Styriakova, Slovak Academy of Sciences, Kosice/SK
- 9 **Biooxidation and cyanidation for gold and silver recovery from acid mine drainage generating tailings (Ticapampa, Peru)**
A.A. Nagy, E.D. Gock, Technical University Clausthal/D; F. Melcher, T. Atmaca, L. Hahn, A. Schippers, Federal Institute for Geosciences and Natural Resources (BGR), Hanover/D
- 10 **Biooxidation of sulphide minerals of marjanbulak deposit**
S. Kukanova, L.I. Zainitdiniva, I.V. Koroleva, Uzbek Academy of Sciences, Tashkent/UZB

POSTER

- 11 **A view on the organic matter and metalloporphyrins biodegradation as characteristic compounds of black shale ores**
Z. Sadowski, A. Szubert, E. Jazdzyk, I. Maliszewska, Wrocław University of Technology/PL
- 12 **Bioleaching of complex copper-bearing sulfide by cultures composed of different microbial communities**
X. Xuehui, X. Shengmu, L. Jianshe, Central South University, Changsha/PRC
- 13 **Microbial leaching of metals from printed circuit boards**
S. Willscher, M. Katzschner, K. Jentzsch, TU Dresden, Pirna/D; S. Matys, TU Dresden/D; H. Pöllmann, University of Halle-Wittenberg, Halle/D
- 14 **Bioleaching of copper from black shales at alkaline pH**
V. Groudeva, Sofia University, Sofia/BG
- 15 **Cobalt and nickel recoveries from laterite tailings by organic and inorganic bioacids**
C.O. Coto, Universidad de la Habana/C; F.G. Galizia, Universidad Nacional de La Plata/C; G.E. Gonzalez, E.H.I. Hernandez, Universidad de la Habana/C; D.E. Donati, Universidad Nacional de la Plata/RA
- 16 **Bioleaching of iron from highly contaminated kaolin clay by *Aspergillus niger*: effect of organic acid biosynthesis**
M. Pazouki, Materials and Energy Research Center, Karaj/IR; M.R. Hosseini, M. Ranjbar, University of Shahid Bahonar, Kerman/IR; F. Ghavipankeh, Materials and Energy Research Center, Karaj/IR
- 17 **Optimization of kaolin bleaching by *Aspergillus niger***
M. Ranjbar, E. Aghaie, M.R. Hosseini, University of Shahid Bahonar, Kerman/IR; M. Pazouki, F. Ghavipankeh, Materials and Energy Research Center, MeshkinDasht, Karaj/IR
- 18 **Batch and continuous bioleaching of a zinc sulphide concentrate by moderate thermophile microorganisms**
P.S. Pina, V.A. Leao, Universidade Federal de Ouro Preto, MG/BR
- 19 **Application of mesophilic mixed microorganisms for recovery of valuable metals from spent refinery catalysts**
D. Kim, D. Mishra, Korea Institute of Geosciences and Mineral Resources, Daejeon/ROK; D.E. Ralph, Parker CRC for Hydro-metallurgy, Perth/AUS; J.G. Ahn, Korea Institute of Geosciences and Mineral Resources, Daejeon/ROK; Y.H. Rhee, Chungnam National University, Daejeon/ROK
- 20 **Bioleaching of non-metallic raw materials**
I. Styriakova, Slovak Academy of Sciences, Kosice/SK; M. Lovas, Institute of Geotechnics, Kosice/SK
- 21 **Bioleaching of talvivaara ore in neutral and acid medium**
T. Farbiszewska, J. Farbiszewska-Kiczma, T. Grobelski, Opole University/PL

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- 23 **The effect of fluid flow on inoculation, colonisation and leaching of chalcopyrite in a simulated packed bed reactor**
R.P. van Hille, O. Tupikina, N. Spurr, S.T.L. Harrison, University of Cape Town/ZA
- 24 **Development of biotechnology on flotation tailings reprocessing in copper-concentrating factory in almalıy mining and metallurgical complex**
M.G. Sagdieva, S.I. Borminskyi, Uzbekistan Academy of Sciences, Tashkent/UZB; K.S. Sanakulov, O.P. Vasilyonok, Almalıy Mining and Metallurgical Complex/UZB
- 25 **Deferization of kaolinic sand by iron oxidizing and iron reducing bacteria**
D. Kupka, V. Sepelak, M. Lovas, Slovak Academy of Sciences, Kosice/SK
- 26 **Ferric iron regeneration in a real heap leaching solution in fluidized bed reactor**
P. Nurmi, B. Özkaya, A.H. Kaksonen, J.A. Puhakka, Tampere University of Technology/FIN
- 27 **The potential for bioleaching the copper ores of the Zambian copperbelt**
J. Manchisi, University of Cape Town/ZA; S. Simukanga, University of Zambia, Lusaka/Z; A. Sicalwe, Konkola Copper Mines Plc., Chingola/Z; P. Gaylard, G.S. Hansford, University of Cape Town/ZA
- 28 **Effect of temperature on bioleaching of chalcopyrite concentrates containing high concentrations of silver: opposite rules apply**
Y. Liu, N. Okibe, D.B. Johnson, University of Wales, Bangor/UK
- 29 **Microbial populations in a 110 ton-scale column for the recovery of metals from black schist ores**
K.B. Hallberg, D.B. Johnson, University of Wales, Bangor/UK; J. Langwaldt, Geological Survey of Finland, Outokumpu/FIN; C. Jouliau, BRGM, Orléans/F
- 30 **Combined activity test for bioleaching activities**
T. Rohwerder, W. Sand, University Duisburg-Essen/D
- 31 **Biolixiviation of zinc from sphalerite by wild strain *Acidithiobacillus ferrooxidans***
D.M.H. Ossa, Universidade Estadual de Campinas/BR; S.L. Marquez, M.G. Marquez, Universidad Nacional de Colombia, Medellín/CO
- 32 **Jarosite, schwertmannite and sulfur: microchemical, structure and morphology during biooxidation process of iron rich sphalerite**
D. Zapata, M. Márquez, M. Ossa, National University of Colombia, Medellín/CO
- 33 **Data mining models to characterize microbial populations in copper ore bioleaching processes**
C. Meneses, C. Demergasso, J. Iratchet, D. Urrutia, Universidad Católica del Norte, Antofagasta/RCH

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- 34 Biooxidation of olympiada refractory gold sulfide concentrate**
V.K. Sovmen, V.N. Guskov, A.V. Belyi, Polus, Krasnoyarsk/RUS;
T.F. Kondrateva, G.I. Karavaiko, Winogradsky Institute of
Microbiology, Moscow/RUS
- 35 Monitoring of hydrocarbon gaseous compounds formed during bioleaching of copper sulphide minerals with mesophilic microorganisms**
R. Luca, T. Vargas, B. Escobar, B. Townley, University of Chile,
Santiago/RCH
- 36 Bioleaching of a mixed copper dust emanating from copper smelters**
F. Bakhtiari, M. Zivdar, H. Ateshi, Sistan & Balouchestan University,
Zahedan/IR; M. Vosoughi, Sharif University of Technology, Tehran/IR;
S.A. Seied Baghery, Rafsanjan/IR
- 37 Optimization of chalcopyrite concentrate bioleaching using thermophil**
R. Ghazi, M. Ranjbar, Z. Manafi, Sarcheshmeh Copper Complex,
Rafsanjan/IR
- 38 Bacterial leaching of a copper ore containing activated pyrite**
Z. Manafi, S.A. Seyedbagheri, Sarcheshmeh Copper Complex,
Rafsanjan/IR
- 39 An investigation on the biodegradation of organics used at a copper solvent extraction plant**
M. Zolfaghari, Sarcheshmeh Copper Complex, Rafsanjan/IR;
N. Gholbang, G. Emtiazi, Esfahan University, Esfahan/IR;
Z. Manafi, Sarcheshmeh Copper Complex, Rafsanjan/IR
- 40 Investigation of viscosity and thermodynamic properties on the bioleaching solution**
M. Liu, R. Renman, W. Jiankang, W. Dianzuo, General Research
Institute for Nonferrous Metals, Beijing/PRC
- 41 Process enhancement of bioleaching of covellite concentrate**
E. Zhou, J. Wen, R. Ruan, D. Wang, General Research Institute for
Nonferrous Metals, Beijing/PRC
- 42 Study on selective restraint of pyrite during copper bioleaching**
R. Renman, Z. Guiying, W. Jiankang, W. Biao, Research Institute
for Nonferrous Metals, Beijing/PRC
- 43 Bacterial dephosphorization of an iron ore**
A. Ballester, Universidad Complutense de Madrid/E; P. Delvasto,
C. Garcia, J.A. Munoz, M.L. Blazquez, F. Gonzalez/E; J.M. Igual,
IRNASA-CSIC, Salamanca/E
- 96 The effect of pH, temperature and high ionic strength on the rate of ferrous iron oxidation by *Leptospirillum ferriphilum* in continuous culture**
T.V. Ojumu, J. Petersen, G.S. Hansford, University of Cape Town,
Rondebosch/ZA

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- 97 Kinetic measurement of biological oxidation of ferrous iron at low ferric to ferrous ratios in a controlled potential batch reactor**

T. Kamunga Kazadi, J. Petersen, University of Cape Town, Rondebosch/ZA

Topic E: Environmental Problems

- 44 Treatment of uranium containing drainage water in a technical plant by means of microbial reduction**

F. Glombitza, S. Kutschke, G.E.O.S. Freiberg Ingenieurgesellschaft mbH, Halsbrücke/D; G. Kießig, A. Zellmer, Wisutec GmbH, Chemnitz/D

- 45 Development and application of a method for the prediction and assessment of the seepage water quality**

F. Glombitza, J. Pinka, S. Kutschke, E. Janneck, R. Kahnt, G.E.O.S. Freiberg Ingenieurgesellschaft mbH, Halsbrücke/D

- 46 Bacterial accumulation of heavy metals in anaerobic sludge**

A. Arora, Sudhir Saxena, Indian Agricultural Research Institute, New Delhi/IND

- 47 Iron isotope fractionation by biogeochemical processes in mine tailings**

R.B. Herbert Jr., Uppsala University/S; A. Schippers, Federal Institute for Geosciences and Natural Resources (BGR), Hanover/D

- 49 Microbial and geochemical characterization of acid generating hard coal tailings dumps in Saxonia/Germany**

S. Willscher, S. Starke, M. Katzschnier, TU Dresden, Pirna/D; T. Hertwig, Beak Consultants GmbH, Freiberg/D; M. Frenzel, GUB Ingenieurgesellschaft mbH, Zwickau/D; M. Felix, LfUG Sachsen, Dresden/D

- 50 Biodegradation of organic matter and release of heavy metals from the copper bearing black shale of Fore Sudetic Monocline (Poland)**

R. Matlakowska, A. Sklodowska, Warsaw University/PL

- 51 Characterization and imaging of biogeochemical processes and suitable model systems**

F. Haegel, P. Klauth, E. Klumpp, A. Kemna, Forschungszentrum Jülich/D

- 53 Environmental Risk Management of an Abandoned Mining Site in Hungary**

K. Gruiz, E. Vaszita, Z. Siki, V. Feigl, Budapest University of Technology and Economics/H

- 54 New Xochiquetzalli method for ion sulphide determination in aqueous media application to tailings analysis**

R.E. Rivera-Santillan, L. Juarez-Garcia, Universidad Nacional Autonoma de Mexico/MEX

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- 55 **A study of the operating parameters of a fixed bed sulfate reducing bacteria (SRB) reactor for the treatment of metal bearing waste water**

M. Tsezos, P. Kousi, E. Remoundaki, A. Hatzikioseyan, National Technical University of Athens/GR;

Topic I: Interfacial Processes

- 56 **Effect of acidianus *thiobacillus ferroxidans* on flotation of pure pyrite and chalcopyrite**

R. Hosseini Tabatabaei, M. Oliazade, M. Kolahdoozan, University of Tehran/IR

- 57 **Bioflotation of a black shale copper ore**

I. Spasova, M. Nicolova, S. Groudev, University of Mining and Geology, Sofia/BG

- 58 **Surface hydrophobicity of an acidophilic heterotrophic bacteria of mine origin under metal stress**

K. Pakshirajan, Indian Institute of Technology, Guwahati/IND; P.C. Banerjee, Mayo Clinic, Rochester/USA

- 59 **Characterization of jarosites formed over a temperature gradient from 2 to 40°C**

F.S. Jones, J.M. Bigham, Ohio State University, Columbus, OH/USA; B. Özkaya, E. Sahinkaya, J.A. Puhakka, Tampere University of Technology/FIN; O.H. Tuovinen, Ohio State University, Columbus, OH/USA

- 60 **Influence of growth substrate and attachment substratum on EPS- and biofilm-formation by *Acidithiobacillus ferrooxidans* A.**

K. Harneit, W. Sand, University Duisburg-Essen/D

- 61 **Selective coagulation in chalcopyrite/pyrite mineral system using *Acidithiobacillus* group bacteria**

A. Vilinska, K. Hanumantha Rao, E. Forssberg, Lulea University of Technology/S

- 62 **Study of the attachment behaviour of different strains of *Acidithiobacillus spp.* to pyrite**

K.Z. Mafanya, T. Rohwerder, W. Sand, University Duisburg-Essen/D

- 63 **Combined atomic force and epifluorescence microscopy of biofilms formed by leaching bacteria**

S. Mangold, K. Harneit, W. Sand, University Duisburg-Essen/D

- 64 **Novel steel corrosion protection by microbial extracellular polymeric substances (EPS) – biofilm-induced corrosion inhibition**

M. Grooters, K. Harneit, M. Wöllbrink, W. Sand, University Duisburg-Essen/D; R. Stadtler, W. Fürbeth, DECHEMA e.V., Frankfurt/D

- 65 **Inhibition of microbiologically influenced corrosion of mild steel and stainless steel 316 by an organic inhibitor**

X. Sheng, Y.P. Ting, S.O. Pehkonen, National University of Singapore/SGP

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Topic M: Molecular- and Microbiology

- 66 **Identification, some characterizations and bioleaching application of an iron-oxidizing bacterium, *Acidithiobacillus ferrooxidans* KLipis-3-1 isolated from Malaysia**
S.-C. Yee, C.-P. Lim, K.-Y. Ng, Malaysia University of Science and Technology (MUST), Petaling Jaya/MAL
- 69 **Transporter protein genes are up-regulated by covellite in *Acidithiobacillus thiooxidans***
F.C. Reis, D.J. Madureira, UNICAMP, Campinas/BR;
D.M.H. Ossa, UNICAMP and UNESP, Campinas/BR;
S.F.S. Tada, L.M.M. Ottoboni, UNICAMP, Campinas/BR
- 70 **Quantification of biomining microbes using quantitative real-time polymerase chain reaction**
C.M. Zammit, L.A. Mutch, Curtin University of Technology, Perth/AUS;
H.R. Watling, Parker Centre for Integrated Hydrometallurgy Solutions, Perth/AUS; E.L.J. Watkin, Curtin University of Technology, Perth/AUS
- 71 **Up- and down-regulated genes in *Acidithiobacillus ferrooxidans* exposed to chalcopyrite**
L. Ferraz, F.C. Reis, S.F.S. Tada, Campinas State University/BR;
D.M.H. Ossa, A.P. Felicio, São Paulo State University, Araraquara/BR;
M.T.M. Novo, São Carlos Federal University/BR; O. Garcia Jr, São Paulo State University, Araraquara/BR; L.M.M. Ottoboni, Campinas State University/D
- 72 **Chalcopyrite and bornite differentially affect proteins synthesis in *Acidithiobacillus ferrooxidans***
A.P. Felicio, O. Garcia Jr., M.C. Bertolini, São Paulo State University, Araraquara/BR; L.F.C. Ferraz, F.C. Reis, L.M.M. Ottoboni, Campinas State University/BR; E. Oliveira, M.A. Odena, Plataforma de Proteômico-Parc Científic de Barcelona/E; M.T.M. Novo, São Carlos Federal University, São Carlos/BR
- 73 **Iron oxidation kinetics of *Leptospirillum ferriphilum* dominated culture at pH below one**
B. Özkaya, E. Sahinkaya, P. Nurmi, A.H. Kaksonen, J.A. Puhakka, Tampere University of Technology/FIN
- 74 **Metabolism peculiarities of the genus *Sulfobacillus* bacteria**
A.E. Zhuravleva, I.A. Tsaplina, Winogradsky Institute of Microbiology RAS, Moscow/RUS; A.D. Ismailov, L.M. Zakharchuk, Moscow State University/RUS; G.I. Karavaiko, Winogradsky Institute of Microbiology RAS, Moscow/RUS
- 75 **Isolation, characterization and phylogenetic analysis of *acidiphilium*-like bacterium from acid mine drainage**
Y. Zhang, Y. Yang, J. Liu, Central South University, Changsha/PRC
- 76 **Bacterial oxidation of elemental sulfur: changes in oxidation kinetics**
M. Mandl, B. Pokorna, Masaryk University, Brno/CZ

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- 77 **Quantification of microorganisms involved in cemented layer formation in sulfidic mine tailings (Freiberg, Saxony, Germany)**
D. Kock, T. Graupner, D. Rammlmair, A. Schippers, Federal Institute for Geosciences and Natural Resources (BGR), Hanover/D
- 78 **Identification of microbes isolated from leachate collected from four experimental bioleaching columns**
L.A. Mutch, E.L.J. Watkin, Curtin University of Technology, Perth/AUS; H.R. Watling, CSIRO Minerals, Perth/AUS
- 79 **Identification and characterization of a novel nickel-resistant determinant from *Leptospirillum ferriphilum* UBK03**
J. Tian, N. Wu, Chinese Academy of Agricultural Science, Beijing/PRC; J. Li, Y. Liu, East China Institute of Technology, Fuzhou/PRC; J. Guo, B. Yao, Y. Fan, Chinese Academy of Agricultural Science, Beijing/PRC
- 80 **The diversity of benthic microorganisms in acidic mine lake sediment**
H.A. Pham, J. Plumb, C. Oldham, The University of Western Australia, Perth/AUS
- 81 **Microbial diversity in iron oxidation tank of AMD treatment plant for an abandoned sulphur mine**
K. Suto, H. Bacosa, C. Inoue, Tohoku University, Sendai/J; E. Matsushima, DOWA Techno Engineering Co. LTD., Okayama/J
- 82 **Reduction of soluble and solid ferric iron by *Acidiphilium* SJH**
A. Vaskova, D. Kupka, Slovak Academy of Sciences, Kosice/SK
- 83 **Isolation of *Leptospirillum ferrooxidans* SRPCBL for enhanced ferric regeneration in stirred tank and column**
S.R. Dave, Gujarat University, Ahmedabad/IND
- 84 **Isolation and characterization of psychrotolerant arsenite-oxidizing bacterium from gold mine in Zloty Stok**
L. Drewniak, A. Sklodowska, University of Warsaw/PL
- 85 **Arsenic hypertolerant bacteria isolated from gold mine rocks biofilms**
L. Drewniak, A. Styczek, A. Sklodowska, University of Warsaw/PL
- 86 **Development of extremophilic iron oxidizing consortium and fixed film bioreactor for generation of ferric lixivient**
S.R. Dave, T.J. Shah, D.R. Tipre, Gujarat University, Ahmedabad/IND
- 87 **Microbial communities in acid mine water from two different copper mines in China**
X. Xuehui, Central South University, Changsha/PRC; X. Shengmu, H. Zhiguo, L. Jianshe, Q. Guanzhou, Changsha/PRC
- 88 **Accumulation of chromium reducing bacteria using potential controlled electrochemical cultivation**
N. Matsumoto, S. Hirano, N. Ohmura, CRIEPI, Chiba/J
- 89 **Research on isc operon in *Acidithiobacillus ferrooxidans* ATCC 23270**
J. Liu, Y. Zhang, M. Geng, J. Zeng, G. Qiu, Central South University, Changsha/PRC

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- 90 **Effect of sulphate concentration on the community structure and activity of sulphate reducing bacteria**
O. Oyekola, R.P. van Hille, S.T.L Harrison, University of Cape Town/ZA
- 91 **Kinetics of ferrous iron oxidation by moderate thermophile microorganisms**
P.S. Pina, V.A. Leão, Núcleo de Valorização de Materiais Minerais, Ouro Preto, MG/BR; J. Frenay, Université Liège/B
- 92 **Iron oxidation and bioleaching potential at low temperatures**
M. Dopson, Umea University/S; D. Kupka, Slovak Academy of Sciences, Kosice/SK; A.-K. Halinen, R. Rahunen, B. Özkaya, E. Sahinkaya, Tampere University of Technology/FIN; O. I. Rzhepishevskaya, Umea University/S; A. H. Kaksonen, Tampere University of Technology/FIN; O.V. Karnachuk, Tomsk State University/RUS; O.H. Tuovinen, Ohio State University, Columbus/USA; J.A. Puhakka, Tampere University of Technology/FIN
- 93 **Salt-tolerant, iron- and sulfur-oxidizing acidophilic bacteria**
C. Davis-Belmar, J. Nicolle, P.R. Norris, University of Warwick, Coventry/UK
- 94 **High-level resistance to cobalt and nickel but probably no transenvelope efflux: metal resistance in the cuban *Serratia marcescens* strain C-1**
J. Marrero, University of Havana/C; G. Auling, University of Hanover/D; O. Coto, University of Havana/C; D.H. Nies, University of Halle-Wittenberg/D
- 95 **Microbial community of the talvivaara demonstration-scale bioheap**
A. Halinen, N. Rahunen, K. Määttä, A. Kaksonen, Tampere University of Technology/FIN; M. Riekkola-Vanhanen, Talvivaara Project Ltd., Sotkamo/FIN; J. Puhakka, Tampere University of Technology/FIN
- 98 **Microbial diversity in a pilot plant for producing iron hydroxysulfates**
E. Heinzl, S. Hedrich, J. Seifert, M. Schlömann, TU Bergakademie, Freiberg/D
- 99 **Isolation and characterisation of microorganisms from copper bearing black shale of Lubin copper mine (Poland)**
R. Matlakowska, Warsaw University/PL; K.B. Hallberg, University of Wales, Bangor/UK; A. Sklodowska, Warsaw University/PL
- 100 **Iron homeostasis strategies in acidophilic iron oxidizers: comparative genome analysis**
R. Quatrini, V. Martínez, H. Osario, F.A. Veloso, I. Pedroso, J. Valdés, Life Science Foundation, Santiago/RCH; E. Jedlicki, University of Chile, Santiago/RCH; D.S. Holmes, Life Science Foundation, Santiago/RCH
- 101 **Discovery of small regulatory RNAs in the extremophile *Acidithiobacillus* genus suggests novel genetic regulation**
A. Shmaryahu, D.S. Holmes, Life Science Foundation, Santiago/RCH

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- 102 Analysis of the microbial community in an acid ground water characterized by sulfate reduction activity**
K. Gumnior, N. Hoth, M. Schlömann, J. Seifert, TU Bergakademie Freiberg/D
- 103 Characterization of new iron oxidizing bacteria from an acid mine water treatment plant**
S. Hedrich, E. Heinzl, J. Seifert, TU Bergakademie Freiberg/D; K.B. Hallberg, D.B. Johnson, University of Wales, Bangor/UK; M. Schlömann, TU Bergakademie Freiberg/D
- 104 Elemental sulfur oxidation in *Acidiphilium spp.***
T. Rohwerder, C. Janosch, W. Sand, University Duisburg-Essen/D
- 105 Monitoring of microbial community inhabiting a low-grade copper sulphide ore by Quantitative Real Time PCR based on 16S rRNA**
F. Remonsellez, Biotecnor Ltda., Antofagasta/RCH; P. Galleguillos, Centro de Investigación Científica y Tecnológica para la Minería, Antofagasta/RCH; F. Galleguillos, Universidad Católica del Norte, Antofagasta/RCH; D. Castillo, Johannesburg Technology Centre /ZA; C. Demergasso, Universidad Católica del Norte, Antofagasta/RCH; D. Rautenbach, Johannesburg Technology Centre/ZA
- 106 Bacterial activity at low temperature of cultures from low-grade copper sulphide bioleaching process in the Escondida Mine, Chile**
C. Demergasso, Universidad Católica del Norte, Antofagasta/RCH; V. Zepeda, Centro de Investigación Científica y Tecnológica para la Minería, Antofagasta/RCH; F. Galleguillos, Universidad Católica del Norte, Antofagasta/RCH; D. Castillo, Johannesburg Technology Centre /ZA; P. Galleguillos, Centro de Investigación Científica y Tecnológica para la Minería, Antofagasta/RCH
- 107 Isolation and molecular characterization of sulfate-reducing bacteria in acid mine drainage**
V. Albis Leao, Núcleo de Valorização de Materiais Minerais, Ouro Preto/BR
- 108 C-di-GMP pathway in *Acidithiobacillus ferrooxidans*: analysis of putative diguanylate cyclases (DGCs) and phosphodiesterases (PDEs) bifunctional proteins**
L. Ruiz, University of Chile, Santiago/RCH; W. Sand, Universität Duisburg-Essen/D; C.A. Jerez, N. Guiliani, University of Chile, Santiago/RCH
- 109 Sulfur oxidation and coupled iron reduction at low temperatures**
D. Kupka, Slovak Academy of Sciences, Kosice/SK; M. Dopson, Umea University/S; O.H. Tuovinen, Ohio State University, Columbus/USA
- 110 Comparison of microbiological populations of mineral heaps and mine wastes of differing ages in active and abandoned copper mines**
C.G. Bryan, Université Louis Pasteur, Strasbourg/F; K.B. Hallberg, D.B. Johnson, University of Wales, Bangor/UK

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- 111 Proteomic studies in *Acidithiobacillus ferrooxidans* cells induce by synthetic acyl-homoserine lactones**
A. Gonzalez, M.-J. Gallardo, University of Chile, Santiago/RCH; M. Frezza, L. Soulere, Y. Queneau, A. Doutheau, Université Lyon 1/F; C.A. Jerez, N. Guillani, University of Chile, Santiago/RCH
- 112 Searching for useful bacteria on chalcopyrite bioleaching from Japanese disused mines**
S.J. Joe, M. Sakoda, C. Tadashi, K. Kida, N. Nakamura, T. Tamura, Metals Technology Center, Kosaka/J
- 113 Comparative bioreduction of Fe(III) with *Geobacter metallireducens* and *bacillus infernus***
A. Ballester, J. Crespo, J.A. Munoz, F. Gonzalez, M.L. Blazquenz, Universidad Complutense de Madrid/E
- 114 The use of CARD-FISH to evaluate the quantitative microbial ecology involved in the continuous bioleaching of a cobaltiferous concentrate**
R. Amils, E. Diaz, E. Gonzalez-Toril, Universidad Autonoma Madrid/E; C. Jouliau, BRGM, Orleans/F

Topic R: (Bio)-Remediation

- 115 Integrated system to biological solubilization and precipitation of heavy metals**
G. Cabrera, J.M. Gómez, D. Cantero, University of Cádiz, Puerto Real/E
- 121 Chemical and bio-chemical methods for the acid mine drainage remediation**
A. Luptakova, T. Spaldon, Slovak Academy of Sciences, Kosice/SK; M. Balintova, Technical University in Kosice/SK
- 123 Bioremediation in situ of an alkaline soil polluted with heavy metals**
V. Groudeva, A. Doycheva, K. Krumova, S. Groudev, Sofia University/BG
- 124 Mine waste stabilization with biosludge and Ca carbonate residues: column experiments**
R. Herbert, L. Höckert, Uppsala University/S; M. von Brömssen, H. Friis, Ramböll Sverige AB, Stockholm/S; G. Jacks, Royal Institute of Technology, Stockholm/S
- 125 Hydrolysed cellulose material as sulfate reduction electron door to treat metal- and sulfate containing waste water**
A.-M. Lakaniemi, L.M. Nevatalo, A.H. Kaksonen, J.A. Puhakka, Tampere University of Technology/FIN
- 126 Application possibility of bentonite and zeolite in bioremediation**
K. Jablonovska, I. Styriakova, Slovak Academy of Sciences, Kosice/SK

POSTER

- 127 Processing of flotation tailings from different copper mills in a way of biohydrometallurgy**
M.G. Sagdieva, S.I. Borminskiy, Z.E. Rakhmatullaeva, Uzbekistan Academy of Sciences, Tashkent/UZB; A.K. Tonkikh, National University of Uzbekistan, Tashkent/UZB; K.S. Sanakulov, Almalik Mining and Metallurgical Complex/UZB; B. Scott, Whitehorse Copper Tailings, Tagish/CDN
- 128 Enhancing reductive processes by autochthonic sulphate-reducing bacteria in lignite overburden dumps**
A. Simon, N. Hoth, M. Dilbat, TU Bergakademie Freiberg/D
- 129 Bioremediation of dredged sediments polluted by heavy metals**
F. Beolchini, Polytecnic University of Marche, Ancona/I; S. Ubaldini, B. Passariello, IGAG-CNR, Roma/I; N. Gul, D. Ture, Süleyman Demirel University, Isparta/TR; F. Vegliò, University of L'Aquila/I; R. Danovaro, A. Dell'Anno, Polytecnic University of Marche, Ancona/I
- 130 Bioreactor system for the biodegradation of toxic organic waste and simultaneous removal and selective separation of metals**
M.J. de Moura, J. Sousa, A. Reis, M. Costa-Ferreira, INETI/DB/UBB, Lisboa/P
- 131 Laboratory investigations on the interactions of soil, water and microorganisms with manganese**
Ch. Lorenz, D. Merten, M. Lonschinski, G. Haferburg, G. Büchel, Friedrich-Schiller-Universität Jena/D
- 132 Chemical stabilization combined with phytostabilisation applied to mine waste contaminated soils in Hungary**
V. Feigl, A. Atkári, Budapest University of Technology and Economics/H; N. Uzinger, Hungarian Academy of Sciences, Budapest/H; K. Gruiz, Budapest University of Technology and Economics/H
- 133 Heavy metal removal in biological permeable reactive barriers**
F. Pagnanelli, S. Mainelli, L. Toro, La Sapienza, Rome/I; F. Beolchini, Polytecnic University of Marche, Ancona/I; F. Vegliò, I. De Michelis, University of L'Aquila/I

Topic S: Biosorption and -accumulation

- 135 Sorption of Co ions to the biogenic Mn oxides produced by a Mn-oxidizing fungus, *paraconiothyrium sp.*-like strain**
K. Sasaki, M. Matsuda, T. Urata, T. Hirajima, Kyushu University, Fukuoka/J; H. Konno, Hokkaido University, Sapporo/J
- 136 The role of carotenoid pigment at biosorption and bioaccumulation of hexavalent chromium ions by *Rhodotorula mucilaginosa* UCM Y-1776**
O. Mameeva, T. Kasatkina, V. Podgorsky, Zabolotny Institute of Microbiology and Virology of NAS of Ukraine, Kiev/UA

POSTER

- 137 Biosorption of heavy metals by *Pseudomonas aeruginosa* from a contaminated site with petroleum**
R.M. Pérez, A. Abalos, University of East, Santiago de Cuba/C;
J.M. Gómez, D. Cantero, University of Cadiz, Puerto Real/E
- 139 Waste biomass characterization and metal-biomass interactions study**
L. Svecova, M.S. Kubal, Institute of Chemical Technology, Prague/CZ; E. Guibal, Ecole des Mines d'Alès/F
- 140 Waste fungal biomass for mercury biosorption – column studies**
L. Svecova, M.S. Kubal, Institute of Chemical Technology, Prague/CZ; E. Guibal, Ecole des Mines d'Alès/F
- 141 Removal of heavy metals and uranium from contaminated waters in biosorption columns**
K. Steudel, G. Horak, S. Willscher, W. Pompe, P. Werner, Technical University Dresden/D
- 142 Sorption of heavy metals from waste waters by biogenic iron sulphides**
A. Luptakova, E. Macingova, M. Kusnierova, Slovak Academy of Sciences, Kosice/SK
- 143 Engineering the *Escherichia coli* maltose binding protein MalE for adsorption of charged pollutants**
S.B. Choi, S.-M. Park, D.-H. Kim, Y.-S. Yun, Chonbuk National University, Jeonju/ROK
- 144 Mercury sorption on a biopolymer (chitosan)**
K. Campos Gavilan, Universidad Peruana Cayetano Heredia, Alès/F; F. Peirano Blondet, Ecole des Mines d'Alès/F; M. Ly Arrascue, H. Maldonado Garcia, Universidad Peruana Cayetano Heredia, Lima/PE; E. Guibal, Ecole des Mines d'Alès/F
- 145 Heavy metal tolerance and copper uptake in yeast isolated from Patagonia Argentina**
L. Lavalle, M. Portillo, P. Chiacchiarini, Universidad Nacional de Comahue, Neuquen/RA; E. Donati, Universidad Nacional de La Plata/RA
- 146 Biosorption of iron and arsenic in cellulosic biomass studied using high energy X-rays**
R. Pinto de Carvalho, G. Cordeiro Silva, V.S. Ciminelli, Universidade Federal de Minas Gerais, Belo Horizonte, MG/BR
- 147 Biorecovery of gold from electronic scrap and jewellery wastes by *Desulfovibrio desulfuricans* and *Escherichia coli* and biomanufacture of active Au-nanomaterial**
K. Deplanche, University of Birmingham/UK; N.J. Creamer, V.S. Baxter-Plant, Birmingham/UK; I.P. Mikheenko, D. Sanyahumbi, University of Birmingham/UK; G. Attard, Cardiff University, Wales/UK; L.E. Macaskie, University of Birmingham/UK

POSTER

- 148 The recovery of platinum group metals from secondary sources**
A. Murray, I.P. Mikheenko, N.A. Rowson, L.E. Macaskie, University of Birmingham/UK
- 149 A novel fuel cell catalyst for clean energy production based on a bionanocatalyst**
P. Yong, I.P. Mikheenko, L.E. Macaskie, University of Birmingham/UK
- 150 Regulation of PCE dechlorinating activity by Electrochemical cultivation**
S.H. Shi-ichi Hirano, N.M. Norio Matsumoto, N.O. Naoya Ohmura, Central Research Institute of Electric Power Industry, Chiba/J

POSTER PRESENTATION / EXHIBITION**POSTER PRESENTATION**

Posters must be placed on the assigned boards by Monday, September 3, 2007 at 10:40 at the latest.

Authors are requested to be present at their posters during the **Poster Party** on Monday, September 3, 2007, from 17:20 until 20:00 and during the **Poster Session** on Tuesday, September 4, 2007 from 17:30 until 19:30.

Posters will also be viewed and discussed during the coffee breaks. A poster prize will be awarded.

EXHIBITION

In parallel to the scientific sessions, companies are invited to present their products and processes in the field of the IBS 2007. The exhibition area is close to the lecture hall and the coffee breaks which allows the ideal integration of lectures, poster discussions and exhibition.

For further details please contact the Congress Office.

geiling@dechema.de

SOCIAL EVENTS

SUNDAY, SEPTEMBER 2, 2007

1) Excursion to the Rheingau Winegrowing Area

The Rheingau is one of the smallest German wine-growing-areas – but an outstanding one! This is due to the fact that all the valleys face southwards. Here you can breathe the air of culture, the Romans were the first to settle along the Rhine and in Medieval times many castles and monasteries were built. Your first stop will be at Vollrads Castle and this will be your first opportunity on this day to taste a typical Rheingau Riesling. Next stop will be Castle Johannisberg, which is one of the most famous residences in Germany. It is located on the 50° latitude, which is the northern frontier of wine-growing in Germany. From Johannisberg the tour will take you to the famous German monument called the "Germania" which is located on the Ruedesheim mountains. This is a very historical area and the beginning of the world heritage Middle Rhine-Valley. This is where the period of Rhine Romantic started

which produced hundreds of legends about the castles, the Rhinegold, etc. Do you want to hear some of those stories? From the monument you will take a hiking-tour through the vineyards to the famous little town of Ruedesheim. In the afternoon the bus will take you to Eberbach Monastery, an old Cistercian Monastery of the 12th Century. This is where the inside shooting of the film "The name of the Rose" with Sean Connery was made in 1986. It is an impressive location – don't forget to bring your camera!



Meeting time: 9:30 h at the DECHEMA House
(end of the tour approx. 17:00 h)

Departure/Arrival: DECHEMA e.V., Theodor-Heuss-Allee 25,
60486 Frankfurt am Main

Charge per person: 59 € (incl. bus transfer, guided tour, entrances,
picnic lunch with water and wine, VAT)
Registration necessary!

For more information concerning the Rheingau Winegrowing Area
please visit www.regionalpark-rheingau.de

SOCIAL EVENTS

SUNDAY, SEPTEMBER 2, 2007

2) Guided City Tour of Frankfurt am Main

Small town – big business

A guided walk through Frankfurt's historic centre and into the bank district.

The Römerberg in the old town centre has a 1000 year-old history. Here the German kings were elected and merchants dealt at the trade fairs.

The democratic parliament of 1848 met in St. Paul's church. Around the corner is the house where Goethe, Germany's most famous poet, was born. Shopping and fashion are best on the Zeil. The European Central Bank and many commercial banks in shiny skyscrapers offer a display of modern architecture, and the Alte Oper shows all the splendour of the belle époque.



Meeting time: 13:30 h (duration until approx. 16:30 h)

Meeting/

Returning place: Römerberg (old town square, by the fountain),
60311 Frankfurt am Main

Charge per person: 9.50 € (incl. entrance, guide, VAT)
Registration necessary!

Special remarks/cancellations:

Tours with insufficient bookings may be cancelled at short notice. In such cases the participation charge will be refunded.

Refunds on purchased tickets are only possible if the cancellation is made in writing to the conference secretariat by **August 6, 2007** at the latest.

If you are interested in a bus tour, tours on other days or special tours please visit www.frankfurt-tourismus.de under the button Sightseeing & Tours and make the reservation directly there.

SOCIAL EVENTS

SUNDAY, SEPTEMBER 2, 2007

Welcome Reception including Opening **17:30 – 20:30 h**

To welcome the symposium participants an informal gathering will take place at DECHEMA House, Frankfurt am Main. Drinks and snacks will be served by invitation of the organizer.

Ticket: free of charge (registration necessary!)

MONDAY, SEPTEMBER 3, 2007

TUESDAY, SEPTEMBER 4, 2007

Poster Party **Monday, 17:20 – 20:00 h**

Poster Session **Tuesday, 17:30 – 19:30 h**

In order to give each participant adequate opportunity for an intensive discussion of the posters an informal Poster Party and a Poster Session with beer and snacks will take place by invitation of the organizer. Poster authors are requested to be present at their posters.

Ticket: free of charge (registration necessary!)

WEDNESDAY, SEPTEMBER 5, 2007

Conference Dinner **19:30 – 23:30 h**

If you are a wine lover and not very familiar with German wines, the Vinum offers you an excellent opportunity to experience good German wines in a traditional ambience and a conveniently situated location. The rustic and very „gemütliche“ wine cellar is only a few steps away from the „Alte Oper“ or the elegant „Fressgasse“. It once belonged to the Schulz & Wagner wine – merchant's house and the old wine barrels can still be seen there.

Spend an entertaining evening together with your colleagues with culinary specialities and wine in a relaxed atmosphere on completion of the conference or before setting off on the Technical Excursion.

Enjoy a complimentary glass of wine. Zum Wohl!!

Charge per person: 29 € (incl. VAT, food and drinks)

Registration necessary!

Meeting time: 19:30 h

Meeting place: Vinum, Kleine Hochstrasse 9,
60313 Frankfurt
(www.vinum-frankfurt.de)

SOCIAL EVENTS

THURSDAY, SEPTEMBER 6, 2007 TO
SATURDAY, SEPTEMBER 8, 2007

Technical Post Conference Tour

We invite you to participate in a technical tour to see one of the greatest mining remediation projects of the world.

More than 6.5 billions euros were needed to rehabilitate the areas of the former uranium mining activities in East Germany. This includes the closing of the mines and the remediation of the landscape.

On Thursday, September 6, we will start in Frankfurt and go by bus via highway A 4 to Chemnitz. We will make one stop in Ronneburg, where we will first reach one of the uranium mining areas of the Federal State of Thuringia. This area was characterised by underground and open-cast mining. Furthermore, different kinds of leaching processes were carried out here. A big leaching heap with about 14 m tonnes of low-grade ore was constructed and was in operation until 1990. The open-cast mine Lichtenberg was one of the deepest in Europe with a depth of 240 m. You will be informed about the ongoing comprehensive remediation work – the refilling of the open-cast mine and the prevention of acid mine drainage water formation as well as the water treatment plant. One part of the mining area is integrated in the German Federal Garden Exhibition 2007 (BUGA) which we will visit.



Refilled open cast mine and remediated site Ronneburg (2006) with BUGA exhibition area



Pilot plant „Wetland Pöhla“ in 1999

SOCIAL EVENTS

We will continue the tour on Friday to visit one part of the mining area "Erzgebirge" and we will see the sites Pöhla and Schlema – Alberoda (Federal State of Saxony), where the deepest shaft of about 2000 m was in operation. You can see the treated piles and dumps and different water treatment plants of Schlema – Alberoda



Open cast mine in 1991 (Lichtenberg)

and Pöhla, where flooded and drainage waters are treated by means of chemical and biological processes.

We will stay two nights in Chemnitz. Accommodation in single and double rooms is available in

different locations. We ask for your understanding that reservation will be made on a first come first served basis.

It is planned to return to Frankfurt on Saturday morning and we will arrive in Frankfurt late in the afternoon. Due to organizational reasons this programme is subject to change. Detailed information concerning the schedule and the programme will be given separately on receipt of your binding registration.

Departure in Frankfurt:	Thursday, September 6, 2007 at 8:00 a.m.
Arrival in Frankfurt:	Saturday, September 8, 2007 expected for late afternoon
Departure/Arrival:	DECHEMA e.V., Theodor-Heuss-Allee 25, 60486 Frankfurt am Main
Charge per person:	289.00 € (incl. VAT, bus transfer, accommodation, food and drinks, entrees) Registration is obligatory!

Registrations will be arranged on a first come first served basis. **Deadline for registration is Wednesday, June 27, 2007 at the latest** as long as free capacity is available. Refunds on purchased tickets are only possible if the cancellation is made in writing to the conference secretariat by **June 27, 2007** at the latest.

Special remarks/cancellations:

Tours with insufficient bookings may be cancelled at short notice. In such cases the participation charge will be refunded.

GENERAL INFORMATION**CONFERENCE VENUE**

The Conference will be held at:

DECHEMA e.V.
Theodor-Heuss-Allee 25
60486 Frankfurt am Main

For details please visit www.dechema.de >>About the DECHEMA
>> directions to DECHEMA.

Routes to DECHEMA via plane, train, car or public transport are also shown there.

CONGRESS OFFICE

DECHEMA e.V.
Ms. Heike Geiling
Theodor-Heuss-Allee 25
60486 Frankfurt am Main/Germany

Phone: +49 (0)69-7564-280
Fax: +49 (0)69-7564-176
Email: geiling@dechema.de
www.dechema.de/ibs2007

Conference Opening Hours

Sunday, September 2, 2007	16:00 to 20:30 h
Monday, September 3, 2007	7:30 to 20:00 h
Tuesday, September 4, 2007	8:00 to 19:30 h
Wednesday, September 5, 2007	8:00 to 17:00 h
Thursday, September 6, 2007	7:00 to 8:30 h
(Departure Technical Post Conference Tour)	

GENERAL INFORMATION

ACCOMMODATION

Reservation of accommodation for IBS 2007 participants in downtown Frankfurt in hotels of different categories will be made by

Tourismus + Congress GmbH Frankfurt am Main
Jutta Heinrich
Kaiserstraße 56
D-60329 Frankfurt am Main
Phone: +49 (0)69-2123-0396
Fax: +49 (0)69-2123-0776
Email: heinrich@infofrankfurt.de
Website: www.frankfurt-tourismus.de

Online booking is possible and information is available
in German:

www.frankfurt-tourismus.de/cms/tourismussuite/soko/ibs_de.html

in English:

www.frankfurt-tourismus.de/cms/tourismussuite/soko/ibs_en.html

Furthermore two hotels close to the conference site, the DECHEMA House, are available.

Hotel Mercure & Residenz Frankfurt

Voltastrasse 29
60486 Frankfurt am Main
Phone: +49 (0)69 7926-2710
Fax: +49 (0)69 7926-2707
Email: H1204@accor.com
Website: www.mercure.com/mercure/fichehotel/gb/mer/1204/fiche_hotel.shtml

Room Rates: Single room 89 €
Double room 114 €
incl. VAT, breakfast per night.

GENERAL INFORMATION**Dorint Novotel Frankfurt City**

Lise-Meitner-Straße 2

60486 Frankfurt am Main

Phone: +49 (0)69 79303-905

Fax: +49 (0)69 79303-930

Email: H1049@accor.com

Website: www.novotel.com/novotel/fichehotel/gb/nov/1049/fiche_hotel.shtml

Room Rates: Single room 91 €
Double rooms on request.
incl. VAT, breakfast per night.

Please arrange the accommodation by yourself **by August 6, 2007** at the latest and use the keyword „**Biohydro**“ to obtain the special rate.

DATES TO NOTE**May 2007**

Distribution of the programme

June 27, 2007

Deadline registration technical post-conference tour

Deadline early registration as a conference participant

August 6, 2007

Deadline Last-minute poster submission

Deadline for entry in the list of participants

Deadline for reservation of accommodation in the Dorint Novotel Frankfurt City and the Hotel Mercure & Residenz Frankfurt

September 2-7, 2007

17th International Biohydrometallurgy Symposium

GENERAL INFORMATION

REGISTRATION

Please complete the appropriate sections of the enclosed registration form and return it to DECHEMA e.V. Please use a separate copy for each participant.

Confirmation of registration and the invoice will be sent after receipt of the registration form. The conference ticket, the list of participants and the name tag will be available at the conference site. It is planned to distribute the conference proceedings onsite in Frankfurt.

In general there is no registration deadline as long as free capacity is available. Please note: registrations made after **August 6, 2007** are not guaranteed to appear in the list of participants.

REGISTRATION FEES*

Early registration by June 27, 2007 at the latest	
For participants from industry	525 €
Personal DECHEMA members ¹⁾	510 €
For participants from academia	410 €
Personal DECHEMA members ¹⁾	395 €
For students, pensioners, job seekers (proof of status required)	105 €
Personal DECHEMA members ¹⁾	90 €
Regular registration	
For participants from industry	595 €
Personal DECHEMA members ¹⁾	580 €
For participants from academia	460 €
Personal DECHEMA members ¹⁾	445 €
For students, pensioners, job seekers (proof of status required)	135 €
Personal DECHEMA members ¹⁾	120 €

* No VAT requested according to § 4.22UstG

1) Personal DECHEMA-Members and EFC/EFCE Passport-bearers

GENERAL INFORMATION

The registration fee includes admission to all sessions, the poster programme, the welcome reception on September 2, 2007, soft drinks during the breaks, lunch on September 3, 4 and 5, 2007, drinks and snacks during the poster sessions, list of participants and a special issue of the conference proceedings.

REMITTANCE OF FEES

Fees should be remitted on receipt of the invoice in favour of DECHEMA e.V., stating the invoice number, the name of the participant and the keyword “**ibs2007**”, to one of the DECHEMA accounts as stated on the invoice. Payment by credit card is also possible (see registration form).

CANCELLATIONS AND REFUNDS

30 EUR for administrative costs will be charged for cancellations received by **August 6, 2007**. Thereafter 80% of the registration fee will be invoiced; however the conference proceedings will be mailed. Only written cancellations will be accepted.

LAST-MINUTE POSTERS

It is still possible to submit “Last-Minute Posters” from June 2007. The deadline for last-minute poster submission is **August 6, 2007**. Please submit the title with a one-page abstract via the conference website www.dechema.de/ibs2007 under paper submission. The posters will be announced in the “Last Minute Information” of the IBS2007.

PROCEEDINGS

Detailed information is given on the conference website www.dechema.de/ibs2007.

VISA FORMALITIES

Participants from a number of countries may need an entry visa for the Federal Republic of Germany. It is recommended to apply for a visa well in advance of the symposium. If a formal invitation letter is needed, please order it in good time via the conference website www.dechema.de/ibs2007.

GENERAL INFORMATION

INSURANCE

The organizers cannot accept responsibility for loss or damage to the private property of participants and accompanying persons which may occur either during or arising from the symposium. Participants should therefore take whatever steps they consider necessary regarding insurance.

CAR PARKING

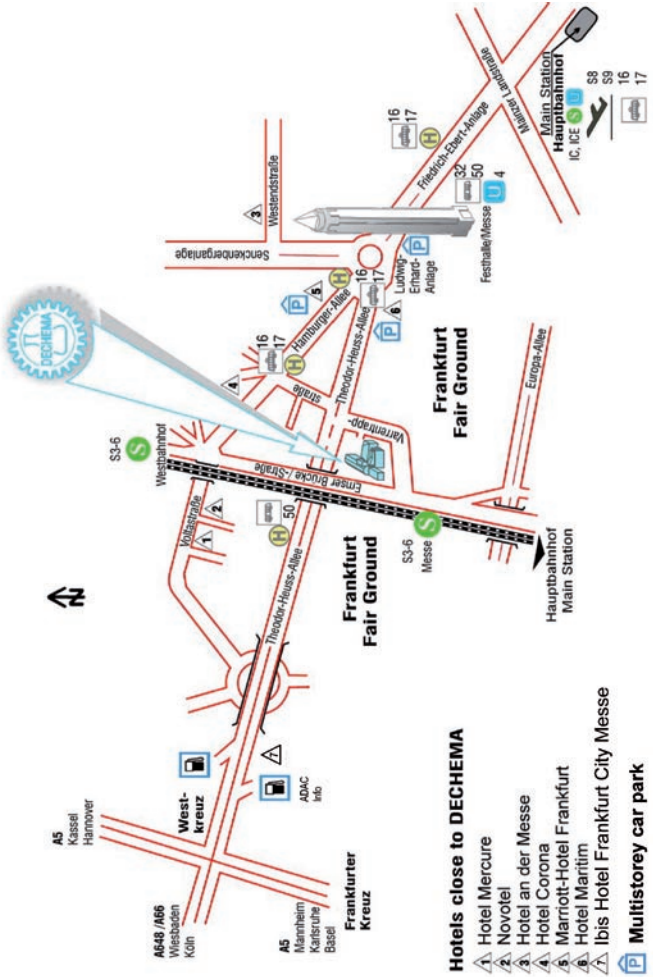
Parking spaces on DECHEMA site are restricted. Please use also the multistorey car parks along Theodor-Heuss-Allee; in the direction of the city, Congress-Center-Messe (CMF) or Messeturm.

Images:

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MAP



Hotels close to DECHEMA

- 1 Hotel Mercure
 - 2 Novotel
 - 3 Hotel an der Messe
 - 4 Hotel Corona
 - 5 Marriott-Hotel Frankfurt
 - 6 Hotel Maritim
 - 7 Ibis Hotel Frankfurt City Messe
- P** Multistorey car park

