

Conference Program

Separations Technology VI: New Perspectives on Very Large-Scale Operations

October 3 – 8, 2004

Kingfisher Resort

Fraser Island, Queensland, Australia

Conference Co-Chairs

Chris Fell, University of New South Wales, Australia

George E. Keller II, MATRIC, USA

International Organizing Committee

Weiyang Fei, Tsinghua University, PRC

Paul Greenfield, University of Queensland, Australia

C. Judson King, University of California, Berkeley, USA

Dr Norman Li, NL Chemical Technology, USA

Max Lu, University of Queensland, Australia

Geoff Stevens, University of Melbourne, Australia

Co-Sponsors

American Institute of Chemical Engineers, Separations Division

Institution of Chemical Engineers

Australian Academy of Science

Australian Academy of Technological Sciences and Engineering

National Science Foundation

Orica Australia Pty Ltd

Rio Tinto Group

Stanwell Corporation

US Filter Pty Ltd

Western Mining Corporation

CSIRO

CRC for Coal in Sustainable Development

CRC for Greenhouse Gas Technologies

CRC for Water Quality and Treatment

ENGINEERING CONFERENCES INTERNATIONAL, INC

Six Metro Tech Center – Brooklyn, NY 11201

T: +1-718-260-3743 - F: +1-718-260-3754

E: info@eci.poly.edu – www.engconfintl.org/4aq.html

Engineering Conferences International (ECI) is the successor program to the United Engineering Foundation conferences program that was established in 1962 to provide an opportunity for the exploration of problems and issues of concern to engineers from many disciplines. ECI is a not-for-profit partnership between the Engineering Conferences Foundation and Polytechnic University.

ECF BOARD MEMBERS

Barry C. Buckland
John C. Chen
Richard A. Gross
Allen I. Laskin
Shivendra S. Panwar
Gary W. Poehlein
Ramesh Shah
P. Somasundaran

ECF Technical Liaison: Herman Bieber

ECI Director: Barbara K. Hickernell

ECI Conferences Coordinator: Kevin Korpics

Engineering Conferences International
6 Metro Tech Center
Brooklyn, NY 11201
+1 718 260 3743
+1 718 260 3754
info@eci.poly.edu
www.engconfintl.org

All material copyright Engineering Conferences International

Sunday, October 3, 2004

- | | |
|---------------|---------------------------------------|
| 17:00 – 18:30 | Registration (Atrium) |
| 18:30 - 19:30 | Welcome Reception (Writers Room) |
| 19:30 - 21:00 | Opening Dinner (Poolside/Writers Den) |

Important Notes:

1. Please turn your cellphone to “off” or “vibrate” in the session room.
2. No smoking at conference sessions or socials please.
3. You and your paid guests must wear the badge-holder with badge in order to be admitted with no cost to meals.
4. All breakfasts and lunches are in the Maheno Room.
5. All oral and poster sessions are in the Conference Room.
6. All coffee breaks are on the Stirling Deck.

Monday, October 4, 2004

- 07:00 - 08:00 Breakfast
- 08:00 – 08:20 Welcome
Chris Fell and George Keller, Conference Co-Chairs;
Herm Bieber, ECI
- 08:20 **SESSION I: Defining the Challenges**
- 08:20 - 09:10 **Separations on a Very Large Scale**
C. Judson King
University of California, Berkeley
- 09:10- 10:00 **Separations Needs of the Minerals Processing Industry**
Ray Shaw
Rio Tinto, Australia
- 10:00 - 10:30 Coffee Break
- 10:30 - 11:15 **Japanese R&D on CO₂ Capture**
Takahisa Yokoyama
Central Research Institute of Electric Power Industry, Japan
- 11:15 - 12:00 **Membrane Bioreactors for Water Treatment**
Roger Ben Aim
University of Toulouse, France
- 12:00 - 12:45 **Open Forum on Engineering Challenges in Separation**
Paul Greenfield
University of Queensland, Australia
- 12:45 - 14:00 Lunch
- 14:00 - 17:30 *ad hoc* discussions, free time
- 17:30 **SESSION II: Interesting Technology Developments**
- 17:30 - 18:00 **Thermodynamics: What is New?**
Stan Sandler
University of Delaware, USA
- 18:00 - 18:30 **Wetting of Particles in the Prediction of Mineral Separation**
Daniel Fornasiero
Ian Wark Research Institute, Australia
- 18:30 - 19:00 **Plum Flower Mini Ring – A Highly Efficient Packing for CO₂ Capture and Separation**
Weiyang Fei
Tsinghua University, People's Republic of China

19:00 - 19:30

New Generation Gas Separation Membranes

Max Lu

ARC Centre for Functional Nanomaterials,
University of Queensland, Australia

19:30 - 21:00

Dinner (Sand Bar)

21:00 - 22:00

Informal Poster Session with Social Hour

Tuesday, October 5, 2004

- 07:00 - 08:00 Breakfast
- 08:00 **SESSION III: Energy and Hydrocarbons**
- 08:00 - 08:45 **The Magnitude of the Scale of CO₂ Separation Operations Needed to Achieve Near Zero Emissions from Coal**
John Wright
CSIRO, Australia
- 08:45 - 09:30 **Separation Needs of the Natural Gas Industry**
Rod Duke
Woodside Energy Limited, Australia
- 09:30 - 10:15 **Important Advances in Gas Separation for Gasification Applications**
Gary Stiegel
DOE National Energy Technology Laboratory, USA
- 10:15 - 10:45 Coffee Break
- 10:45 **SESSION IV: Water**
- 10:45 - 11:30 **NEWater: Singapore Experience of Water Recycle**
Tan Thai Pin
Public Utilities Board, Singapore
- 11:30 - 12:15 **Functional Magnetic Nanoparticles for Environmental Separations**
Alan Hatton
MIT, USA
- 12:15 - 12:45 **Short Presentations of Poster Papers**
- Hybrid Pre-Treatment Techniques for Water Desalination by RO**
Ghulam Mustafa
University of New South Wales, Australia
- Removal of Red Dye from Wastewater Using Bentonite**
Qiu-Hong Hu
University of Queensland, Australia
- Hydrothermal Analysis of Carbonised Template Molecular Sieve Silica Membranes**
Mikel Duke
University of Queensland, Australia

**Transport Properties of Methanol and Water in
Nanocomposite Nafion-Silica Membranes**

Brad Ladewig
University of Queensland, Australia

12:45 - 13:45

Lunch

13:45 - 17:30

ad hoc discussions, free time

17:30

SESSION V: Minerals Processing

17:30 – 18:00

Progress in Separation Technology for the Mineral Industry

Jan Miller
University of Utah, USA

18:00 - 18:30

Improving Interfacial Contacting Mechanisms (tbc)

Graeme Jameson
Centre for Multiphase Studies, Univ. Newcastle, Australia

18:30 - 19:00

Cyclones for Large Scale Separation

Peter Holtham
Julius Kruttschnitt Minerals Research Centre, Australia

19:00 - 19.30

**Dewatering of Suspensions Including Flocculation,
Thickening, Filtration and Centrifugation**

Peter Scales
Particulate Fluids Processing Centre, Univ.of Melbourne, Australia

19:30 - 21:00

Dinner (Dingo Deck)

21:00 - 22:00

Poster Session and Social Hour

Wednesday 6 October, 2004

- 07:00 - 08:00 Breakfast
- 08:00 **SESSION VI: Gas Separations**
- 08:00 - 08:40 **New Generation TSA technology for High Throughput Air Separations**
George E Keller II
MATRIC, USA
- 08:40 - 09:20 **Developments in Adsorption for Large Scale Gas Separations**
Paul Webley
Monash University, Australia
- 09:20 - 10:00 **ITM Oxygen for Air Separation**
Phil Armstrong
Air Products and Chemicals, USA
- 10:00 – 10:30 Coffee Break
- 10:30 **SESSION VII: Water and Wastewater**
- 10:30 - 11:00 **Water and Wastewater Treatment Using Magnetic Field-Enhanced Filtration/Sorption**
Jim Navratil, Clemson Univ., USA
- 11.00 - 11.30 **Operating the MIEX Process with Coagulation or Microfiltration**
Mary Drikas
Australian Water Quality Centre, Australia
- 12:00 - 13:00 Lunch
- 13:00 - 19:00 Afternoon excursion; informal meetings
- 19:00 - 20:30 Dinner (Dingo Deck)
- 20:30 - 21:30 **SESSION VIII: Short Presentations from Selected Poster Papers with Discussion** (and Social Hour)
- The Superior Aspects of the ARC Downcomer Tray with Total Deflectors**
Zhi-Bing Zhang
Nanjing University, People's Republic of China

**The Study of Coagu-Flocculation Mechanism of Flocculant
and its Experimental Research**

Zhan Hanhui

Zhuzhou Institute of Technology, People's Republic of China

Advanced Oily Wastewater Treatment in Large Scale

M. Alizadehfard

Amirkabir University of Technology, Iran

**Effects of Flow Parameters and Inlet Geometry on the
Collection Efficiency of Cyclone Separators**

Bingtao Zhao

Donghua University, People's Republic of China

**THMS Removal from Drinking Water in Large Scale Using
GAC and Nanofiltration**

A. Samadi

Tarbiat Modarres University, Iran

Thursday 7 October, 2004

- 07:00 - 08:00 Breakfast
- 08:00 **SESSION IX: Minimizing CO₂ Emissions**
- 08:00 - 08:30 **Design of Membrane Systems for Large-Scale CO₂ Separation**
Dianne Wiley
University of New South Wales, Australia
- 08:30 - 09:00 **CO₂ Separation for Geosequestration: The Options**
Geoff Stevens
University of Melbourne, Australia
- 09:00 – 09:30 **Inorganic Membrane Reactors for Dehydrogenation and Water Gas Shift Reactions**
Joe da Costa
ARC Centre for Functional Nanomaterials, Australia
- 09:30 – 10:30 **Short Presentations from Selected Poster Papers with Discussion**
- CO₂ recovery using a plasma modified gas absorption membrane**
Julianna Franco
University of Melbourne, Australia
- Separating Methanol from MBTE by Pervaporation through AF2400 Films**
Olga Bukhteeva
University of New South Wales, Australia
- End-to-End Economic Evaluation of Membrane Capture and Geological Storage of CO₂ Mixtures**
Minh Ho
University of New South Wales, Australia
- Inorganic-Organic Mesoporous Membranes for CO₂ Separation**
Jeremy Graham
Monash University, Australia
- Layer Double Hydroxydes for CO₂ Separation**
Ram Reddy
University of Queensland, Australia
- 10:30 - 11:00 Morning Coffee

11:00	<u>SESSION X: Process Developments</u>
11:00 - 11:30	Modelling, Simulation and Optimisation of Flotation Circuits Emmy Manlapig Julius Kruttschnitt Mineral Research Centre, Australia
11.30 - 12.00	Membrane Processes for the Natural Gas Processing Industry Andre Da Costa Chevron Texaco Energy Technology Company. USA
12:00 – 12:30	Carbon Dioxide Permeation and Separation Performance of Cellulosic Hollow Fibre Membranes Jie Xingming Dalian Institute of Chemical Physics, People's Republic of China
12:30 - 13:30	Lunch
13:30 - 19:00	<i>ad hoc</i> discussions, free time
19:00 - 22:30	Conference Dinner Speaker: Dr Robin Batterham Chief Scientist of Australia

Friday, 8 October 2004

07:30 – 08:30 Breakfast

08:30 **SESSION XI: Key International Developments**

08:30 - 09:30 **Panel Session and Discussion - The Path Forward**

A group of six international delegates will provide comments, reflections and perspectives on large scale separations

George Keller, MATRIC

Judson King, UC Berkeley

Weiyang Fei, Tsinghua University

Roger Ben Aim, Toulouse University

Graeme Jameson, University of Newcastle

Gary Stiegel, US Department of Energy

09:30 - 10:30 **Short Presentations from Selected Poster Papers with Discussion**

Adsorption of Metal Organic Complexes Derived from Bioleaching of Nickel Laterite Ores

A. Deepatana

University of Sydney, Australia

The Use of Ionic Liquids in Solvent Extraction Processes

Kelly Ka Lai Yung

University of Melbourne, Australia

Leaching of Low Grade Nickel Laterite Ores by Fungi Metabolic Acids

Jessica Tang

University of Sydney, Australia

Approach of Julius Kruttschnitt Centre to Separations in Minerals Processing (tbc)

Mike Daniel

Julius Kruttschnitt Minerals Research Centre, Australia

10:30 - 11:00 Coffee Break

11.00 - 12:00 **Closing Session - Summary of Conference Outcomes**

Clean Energy

Max Lu

ARC Centre for Functional Nanomaterials, Australia

Sustainable Minerals Processing

Geoff Stevens

University of Melbourne, Australia

Water

Chris Fell

University of New South Wales, Australia

12:00 - 13:00

Lunch and Departure