

Engineering Conferences International
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Preliminary Program (8/22/06)

Process Intensification and Innovation Process (PI)² Conference II – Cleaner, Sustainable, Efficient Technologies for the Future

September 24 - 29, 2006
Christchurch, New Zealand

25TH SEPTEMBER 2006

MONDAY MORNING (REACTION AND SEPARATION)

8:00 - 8:15 Welcoming Remarks and Opening of the Conference - Conference Chairs – Dr Costas Tsouris and Dr Laurence Weatherley

Welcome from ECI - Dr John Chen, President of the American Institute of Chemical Engineers, Lehigh University, USA

Opening remarks – Professor Peter Jackson, President of the Institution of Engineers, New Zealand

Session Chairs – Costas Tsouris and Laurence Weatherley

8:15 - 9:00 Plenary / Reaction & Separation

(1.) A.G.Livingstone - Imperial College, London – United Kingdom.
REACTION AND SEPARATION MADE EASY WITH ORGANIC SOLVENT
NANOFILTRATION ANDREW LIVINGSTON (PLENARY) [ECI/PI2/10]

9:00 - 9:25 (2.) W.Kaminski, J.Marszalek, A.Stachecka -Technical University of Łódź, Poland
RENEWABLE ENERGY SOURCE - DEHYDRATED ETHANOL [ECI/PI2/023]

9:25 - 9:50 (3.) L.R. Weatherley, Department of Chemical and Petroleum Engineering, The University of Kansas, USA, J Petera, Technical University of Łódź, Poland
PROCESS INTENSIFICATION OF LIQUID-LIQUID EXTRACTION USING HIGH
VOLTAGE ELECTRICAL FIELDS[ECI/PI2/021]

9:50 - 10:20 Break

10:20- 10:45 (4) J.Zelenka, W.Gangl, P.Letonja, M.Siebenhofer, R.J.Marr - University of Technology, Graz, Austria.
ANODIC OXIDATION OF WASTEWATER CONSTITUENTS IN OPEN CELL
ELECTROLYSIS[ECI/PI2/72A]

8/23/2006

- 10:45- 11:10 (5) R.Khaledi - Imperial Oil Ltd, Calgary, Canada and B.R.Young - University of Auckland, New Zealand.
SIMULATION AND CONTROL OF COMPOSITION AND CONVERSION IN REACTIVE DISTILLATION [ECI/PI2/019]
- 11:10- 11:35 (6) K. B. Lee, A. Verdooren, , H. S. Caram and S. SircarH. - Lehigh University, USA.
HIGH TEMPERATURE ADSORPTIVE SEPARATION OF HYDROGEN-CARBON DIOXIDE GAS MIXTURES IN THE PRESENCE OF STEAM. [ECI/PI2/046]
- 11:35- 12:00 (7) S.Krumdieck and J.Wallace - University of Canterbury, New Zealand.
COMPACT, LOW ENERGY CO₂ MANAGEMENT USING AMINE SOLUTION AND PACKED BUBBLE COLUMN [ECI/PI2/040]
- 12:00 – 12:25 (8) A.P. Harvey, J.G.M. Lee, M.T. Azizan and M. Ryder - University of Newcastle upon Tyne, UK.
INTENSIFICATION OF BIODIESEL PROCESSING: INTEGRATING EXTRACTION OF RAPESEED OIL WITH REACTION TO BIODIESEL [ECI/PI2/002]

MONDAY AFTERNOON (REACTION & SEPARATION)

Session Chairs – Xiong-Wei Ni and David Wood

- 2:00 - 2:30 Keynote / Reaction & Separation
(9) H.Liu, Z.Ma and J.Chen - Chinese Academy Sciences, China.
CHEMICAL SEPARATION PROCESS INTENSIFICATION: FROM CONCEPT TO PRACTICE [ECI/PI2/015]
- 2:30 - 2:55 (10) G. Demel, C. Rohde, M. Siebenhofer, R. Marr - TU Graz, Austria.
PHOTOCHEMICAL REACTIONS WITH L,L-EXTRACTION [ECI/PI2/73]
- 2:55 - 3:20 (11) Ahmad Ziad Bin Sulaiman - University College of Engineering & Technology, Malaysia and M.Y.Rosli - Universiti Teknologi Malaysia, Malaysia.
THE EFFECTIVENESS OF IN-SITU HIGH INTENSITY ULTRASONICS (HIU) IN INCREASING THE RATE OF FILTRATION IN PALM OIL REFINING PROCESS [ECI/PI2/078]
- 3:20 - 3:45 Break
- 3:45 - 4:10 (12) T.Deuschle and M.Piesche - University of Stuttgart, Germany, and U. Janoske - University of Cooperative Education, Mosbach, Germany.
A CFD-MODEL DESCRIBING FILTRATION, REGENERATION AND DEPOSIT REARRANGEMENT EFFECTS IN GAS FILTER SYSTEMS [ECI/PI2/018]
- 4:10 - 4:35 (13) J. A. Arizmendi-Sanchez and P.N. Sharratt - The University of Manchester, UK.
PHENOMENA-BASED MODULARISATION OF CHEMICAL PROCESS MODELS TO APPROACH INTENSIVE OPTIONS [ECI/PI2/024]
- 4:35 - 5:00 (14) B.R.Young - University of Auckland, New Zealand, and R.Tellez - Aspen Technology Inc., Canada, and W.Y. Svrcek, University of Calgary, Canada
A FIVE-STEP, STEADY-STATE METHOD TO EVALUATE THE CONTROLLABILITY OF A HEAT EXCHANGER NETWORK [ECI/PI2/058]
- 5:00 – 5:25 (15) C.Gruber - TU Graz, Austria.
ABSORPTION OF NO_x IN REACTIVE ABSORBENTS FROM DILUTE OFF GAS [ECI/PI2/72]

Monday Evening

5:00 - 6:30 Poster Session - (Poster will remain displayed until Thursday)

7:00 - 8:30 Dinner

26TH SEPTEMBER 2006
TUESDAY MORNING (NOVEL REACTORS)

Session Chairs – Roshan Jachuck and Bala Subramaniam

8:15 - 9:00 Plenary / Novel Reactors

(16) Xiong-Wei Ni - Heriot Watt University, Edinburgh, Scotland.
PROCESS INTENSIFICATIONS UTILISING OSCILLATORY BAFFLED PLUG FLOW
REACTORS [ECI/PI2/026]

9:00 - 9:25 (17) Tie-Pan Shi, Hyun-Jin Lee, D. H. Busch, B.Subramaniam - Center for Environmentally
Beneficial Catalysis, University of Kansas, USA.
DIRECT SYNTHESIS OF PROPYLENE GLYCOL FROM PROPYLENE UNDER ELEVATED
PRESSURE [ECI/PI2/052]

9:25 - 9:50 (18) B. Wang and A. B. Yu - The University of New South Wales, Australia
NUMERICAL STUDY OF THE GAS-LIQUID-SOLID FLOW IN
HYDROCYCLONES WITH DIFFERENT CONFIGURATION OF VORTEX FINDER
[ECI/PI2/045]

9:50 - 10:20 Break

10:20- 10:45 (19) C.Tsouris - Oak Ridge National Laboratory, USA.
CONTINUOUS-JET HYDRATE REACTOR [ECI/PI2/037]

10:45- 11:10 (20) E. Doroodchi, G.M. Evans, N. Shah, A. Nguyen - University of Newcastle, Australia and
M.P. Schwarz, G.L. Lane - CSIRO Minerals . Australia.
INFLUENCE OF TURBULENCE INTENSITY ON BUBBLE AND PARTICLE DRAG
COEFFICIENTS [ECI/PI2/028]

11:10- 11:35 (21) S.Ghorai and K.D.P.Nigam - Indian Institute of Technology, Delhi, India.
AN INTENSIFIED TECHNIQUE FOR SHEAR STRESS ENHANCEMENT IN
COILED FLOW INVERTER [ECI/PI2/029]

11:35- 12:00 (22) V.Kumar, V. Shirke, K.D.P. Nigam - Indian Institute of Technology, Delhi, India.
PERFORMANCE OF KENICS STATIC MIXER AT HIGHER REYNOLDS NUMBER
[ECI/PI2/070]

12:00-12:25 (23) S. Ambatipati and R.J.J.Jachuck - Clarkson University, Potsdam, USA
PROCESS INTENSIFICATION: MASS TRANSFER CHARACTERIZATION OF SLUG FLOW
IN A NARROW CHANNEL REACTOR [ECI/PI2/084]

TUESDAY AFTERNOON (NOVEL REACTORS)

Session Chairs - Susan Krumdieck and Paul Sharratt

2:00 - 2:30 Keynote / Novel Reactors

(24) Prof. Dr. rer. nat. Holger Loewe - Johannes Gutenberg University, Germany and V.Hessel -
TU Eindhoven University of Technology, Eindhoven, The Netherlands
NEW APPROACHES FOR PROCESS INTENSIFICATION - MICROSTRUCTURED
REACTORS CHANGING PROCESSING ROUTES [ECI/PI2/027]

2:30 - 2:55 (25) M. Vicevic, K. Novakovic, K.V.K. Boodhoo, A.J. Morris - University of Newcastle upon
Tyne, United Kingdom
KINETICS OF STYRENE FREE RADICAL POLYMERISATION IN THE SPINNING DISC
REACTOR [ECI/PI2/039]

2:55 - 3:20 (26) H.S. Caram and B.J. Carnish - Dept. of Chemical Engineering, Lehigh University - USA
THE REVERSE FLOW CHROMATOGRAPHIC REACTOR [ECI/PI2/038]

3:20 - 3:45 Break

3:45 - 4:10 (27) T.E. Agustina, H. M. Ang, V. K. Pareek - Curtin University of Technology, Western Australia.

TREATMENT OF WINERY WASTEWATER USING A PHOTOCATALYTIC REACTOR
[ECI/PI2/035]

4:10 - 4:35 (28) Arunabha Kundu, Ji Eun Ahn, Sang-Son Park, Yong Gun Shul and Hak Soo Han-
Department of Chemical Engineering, Yonsei University, Republic of Korea.

PROCESS INTENSIFICATION BY MICRO-CHANNEL REACTOR FOR STEAM
REFORMING OF METHANOL [ECI/PI2/047]

4:35 - 5:00 (29) Daisuke Kobayashi1, Hideyuki Matsumoto and Chiaki Kuroda - Tokyo Institute of
Technology, Japan

IMPROVEMENT OF INDIRECT ULTRASONIC IRRADIATION METHOD FOR
INTENSIFICATION OF EMULSION POLYMERIZATION PROCESS [ECI/PI2/048]

5:00-5:25 (30) Gino V. Baron: Vrije Universiteit Brussel, Belgium

CATALYTIC MIXERS BASED ON MICROFIBER ELEMENTS: FLOW, MIXING AND
MASS TRANSFER [ECI/PI2/054]

5:25 - 7:00 Poster Session

(Posters will remain displayed until Thursday)

7:00 - 8:30 Dinner

27TH SEPTEMBER 2006

WEDNESDAY MORNING (BIOPROCESSING):

Session Chairs - Conan Fee and H S Muralidhara

- 8:15 - 9:00 Plenary / Bioprocessing (31) Roshan Jachuck - Clarkson University, USA.
BIOPROCESSING AND INTENSIFICATION [ECI/PI2/001]
- 9:00 - 9:25 (32) L. Prasanna Lakshmi and Y. Pydi Setty – National Institute of Technology, Warangal, India
MASS TRANSFER STUDIES ON BIOLOGICAL DENITRIFICATION IN A FLUIDIZED BED BIOREACTOR [ECI/PI2/008]
- 9:25 - 9:50 (33) L.R. Weatherley - The University of Kansas, USA and N. Miladonovic – The University of Canterbury, New Zealand
INTENSIFICATION OF AMMONIA REMOVAL IN A COMBINED ION-EXCHANGE AND NITRIFICATION COLUMN [ECI/PI2/009]
- 9:50 - 10:20 Break
- 10:20 - 10:45 (34) Courtney Mee, Mahmoud Reza Banki and D.W. Wood - Department of Chemical Engineering, Princeton University, USA.
TOWARDS THE ELIMINATION OF CHROMATOGRAPHY IN PROTEIN PURIFICATION: EXPRESSING PROTEINS ENGINEERED TO PURIFY THEMSELVES [ECI/PI2/74]
- 10:45 - 11:10 (35) C. S. MacLeod and A.P. Harvey - University of Newcastle upon Tyne, United Kingdom – “INTENSIFICATION OF BIODIESEL PRODUCTION BY HETEROGENIZATION OF THE REACTION STEP [ECI/PI2/005]
- 11:10 - 11:35 (36) K. Boodhoo, P. Puri, T. Ndlovu and E.C. Toogood - University of Newcastle-upon-Tyne, England.
INTENSIFICATION OF GAS-LIQUID MASS TRANSFER USING NOVEL POROUS IMPELLERS FOR APPLICATION TO FERMENTATION PROCESSES [ECI/PI2/003]
- 11:35 - 12:00 (37) L.R. Weatherley - The University of Kansas, USA, D. Rooney - The Queens University of Belfast, Northern Ireland
ENZYMATIC CATALYSIS AND ELECTROSTATIC PROCESS INTENSIFICATION FOR PROCESSING OF NATURAL OIL [ECI/PI2/86]
- 12:00 - 12:25 (38) A. Beuger and P. Gostomski – Chemical and Process Engineering, University of Canterbury, New Zealand - MANIPULATION AND CONTROL OF ENVIRONMENTAL PARAMETERS IN UNSATURATED BIOFILMS: INFLUENCE ON ACTIVITY AND STABILITY IN BIOFILTRATION [ECI/PI2/066]
- 12:25 - 12:50 (39) C.J. Fee – University of Canterbury, New Zealand and A. Chand, Waikato University, New Zealand
INTENSIFICATION OF MINOR MILK PROTEIN PURIFICATION PROCESSES [ECI/PI2/076]

Wednesday Afternoon (Free)

6:00 - 8:00 Banquet Dinner

28TH SEPTEMBER 2006
THURSDAY MORNING (MATERIALS)

Session chairs – David Trent

Plenary / Materials

- 9:00 - 9:45 (40) Plenary: K.N.Marsh – The University of Canterbury, New Zealand.
IONIC LIQUIDS. ARE THEY SALTS OR HIGH BOILING ORGANIC LIQUIDS?
[ECI/PI2/065]
- 9:45 – 10:10 (41) A.Khanna, S.S. Rath, T.Banerjee, Indian Institute of Technology, Kanpur, India
INFINITE DILUTION ACTIVITY COEFFICIENTS FOR PHOSPHONIUM BASED IONIC
LIQUIDS [ECI/PI2/051]
- 10:10-10:40 Break
- 10:40- 11:05 (42) H.M. Cave, S.P. Krumdieck, M.C. Jermy - University of Canterbury, New Zealand
DEVELOPMENT OF A MODEL FOR HIGH PRECURSOR CONVERSION EFFICIENCY
PULSED - PRESSURE CHEMICAL VAPOR DEPOSITION (PP-CVD) PROCESSING
[ECI/PI2/042]
- 11:05- 11:30 (43) A.B.Yu, C.Jayasundara, R.Y. Yang,- The University of New South Wales, Australia, and
D. Curry - Xstrata Technology, Brisbane, Australia.
DISCRETE PARTICLE SIMULATION OF PARTICLE FLOW IN ISA MILL - EFFECT OF
GRINDING MEDIUM PROPERTIES [ECI/PI2/068]
- 11:30- 11:55 (44) E.D. McCarthy, W.A. Dunk, K.V.K. Boodhoo – University of Newcastle-upon-Tyne,
England. TAILORING PARTICLE PROPERTIES THROUGH PRECIPITATION IN A
NARROW CHANNEL REACTOR [ECI/PI2/030]
- 11:55- 12:20 (44A) C.Tsouris - Oak Ridge National Laboratory, USA.
ELECTROSORPTION OF IONS FROM AQUEOUS SOLUTIONS [ECI/PI2/013]

THURSDAY AFTERNOON (MATERIALS)

Session chairs – Aibing Yu and Geoff Evans

- 2:00 - 2:30 (45) Keynote: Bala Subramaniam – Center for Environmentally Beneficial Catalysis, The
University of Kansas, USA. CARBON DIOXIDE - EXPANDED LIQUIDS: VERSATILE
MEDIA FOR PROCESS INTENSIFICATION [ECI/PI2/069 and ECI/PI2/085]
- 2:30 - 2:55 (46) Hong Jin, Bala Subramaniam and Jing Fang - Center for Environmentally Beneficial
Catalysis, University of Kansas, USA
PROCESS INTENSIFICATION BY EMPLOYING CO₂-EXPANDED LIQUIDS (CXLS) AS
ALTERNATIVE SOLVENTS – A CASE STUDY OF HOMOGENEOUS CATALYTIC
HYDROFORMYLATION OF HIGHER OLEFINS [ECI/PI2/053]
- 2:55 - 3:20 (47) B. Hallmark, C.H. Hornung and M.R. Mackley- University of Cambridge, England.
LOW-COST HEAT EXCHANGE AND MICRO REACTOR INNOVATION USING
PLASTIC MICROCAPILLARY FILMS (MCFS) [ECI/PI2/041]
- 3:20 - 3:45 Break
- 3:45 - 4:10 (48) A.V. Soudarev, A.S. Molchanov, A.A. Souryaninov - Ceramic Heat Engines Center,
St.Petersburg, Russia, and V. G. Konakov - NTZ Glass and Ceramics, St.Petersburg, Russia.
DEVELOPMENT OF HYDROGEN STORAGE WITH USE OF MAGNESIUM HYDRITE
AND CARBON NANO STRUCTURAL MATERIAL - BASED SORBENT [ECI/PI2/057]

- 4:10 - 4:35 (49) T.Kavitha and S.S. Narayanan - Sri Venkateshwara College of Engineering, India.
STUDIES OF SEPARATION OF METALS AND PLASTICS FROM ELECTRONIC SCRAP (PRINTED CIRCUIT BOARDS) [ECI/PI2/80]
- 4:35 - 5:00 (50) Z. Yaakob, L.J. Daud, A.B. Mohamad - Universiti Kebangsaan Malaysia, Malaysia
ROLE OF Pd ON CATALYSTS
SUPPORTED ON GAMMA ALUMINA FOR HYDROGEN PRODUCTION [ECI/PI2/064]
- 5:00 - 5:25 (51) Hiroshi Funakubo, Gouji Asano,- Tokyo Institute of Technology, Japan, and Kazuaki Tonari, Yukichi Takamatsu - Japan Pionics Co., Ltd., Hiratsuka, Japan, and Kunio Ohtsuki and Tsukasa Satake - Horiba, Ltd. Miyano Higashi, Kisshoin, Minami-ku, Kyoto 601-8510, Japan
IN-SITU GAS-PHASE FT-IR MONITORING OF LIQUID DELIVERY MOCVD PROCESS [ECI/PI2/017]

Thursday Evening

5:25 - 7:00 Poster Session

7:00 - 8:30 Dinner

29TH SEPTEMBER 2006
FRIDAY MORNING

8:15 - 10:00 WORKSHOP – Susan Krumdieck

10:00 – 12:00 VISION FOR THE FUTURE OF PI

Session Chairs – Costas Tsouris and Laurence Weatherley

10:00- 1030 (52) Keynote - Paul Sharratt - University of Manchester, United Kingdom
PI - TIME TO DELIVER [ECI/PI2/016]

10:30 – 1100 (53) Keynote - H. S. Muralidhara - Cargill, Inc. Savage, USA.
ROLE OF PROCESS INTENSIFICATION IN FOOD AND BIOPROCESSING FOR THE 21ST
CENTURY: CHALLENGES AND OPPORTUNITIES [ECI/PI2/079]

1030 - 12:00 Future needs and new ideas

12:00 Adjourn

13:30 Review and Planning Meeting of ECI and Steering Committee

POSTER PRESENTATION PAPERS

(44A) C.Tsouris - Oak Ridge National Laboratory, USA.
ELECTROSORPTION OF IONS FROM AQUEOUS SOLUTIONS[**ECI/PI2/013**]
(Also to be presented orally)

(34) Courtney Mee, Mahmoud Reza Banki and D.W.Wood - Department of Chemical Engineering, Princeton University, USA.
TOWARDS THE ELIMINATION OF CHROMATOGRAPHY IN PROTEIN PURIFICATION:
EXPRESSING PROTEINS ENGINEERED TO PURIFY THEMSELVES [**ECI/PI2/74**]
(Also to be presented orally)

(8) A.P. Harvey, J.G.M. Lee, M.T. Azizan and M. Ryder - University of Newcastle upon Tyne, UK.
INTENSIFICATION OF BIODIESEL PROCESSING: INTEGRATING EXTRACTION OF RAPESEED
OIL WITH REACTION TO BIODIESEL [**ECI/PI2/002**]
(Also to be presented orally)

(35)C. S. MacLeod and A.P. Harvey - University of Newcastle upon Tyne, United Kingdom –
“INTENSIFICATION OF BIODIESEL PRODUCTION BY HETEROGENIZATION OF THE
REACTION STEP [**ECI/PI2/005**]
(Also to be presented orally)