

*Refereed Proceedings*

*The 13th International Conference on*

*Fluidization - New Paradigm in Fluidization*

*Engineering*

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Engineering Conferences International

Year 2010

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## CONFERENCE PROGRAM

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## Program

# Fluidization XIII: New Paradigm in Fluidization Engineering

May 16-21, 2010

*Hotel Hyundai, Gyeong-ju, Korea*

### Conference Co-Chairs

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**Sunday, May 16, 2010.**

16:00 – 18:00	<b>Conference Registration</b> Diamond Lobby (B1F)
16:30 – 17:30	<b>Organizing Committee Meeting</b> Sapphire (2F)
18:00 – 19:00	<b>Welcome Reception</b> Convention Hall (B1)
19:00 – 20:30	<b>Opening Remarks &amp; Dinner</b> Convention Hall (B1)
20:30 – 21:30	<b>Chairperson Meeting</b> Sapphire (2F)

**NOTES**

- Plenary talks will be held in Convention B (Level B1).
- Technical Sessions will be held in Convention A (Level B1) and Convention C (Level B1).
- Poster Sessions will be held in Convention B (Level B1).
- Breakfast will be in SARA (Level 1F) – coupons will be given at hotel check-in.
- Meals locations are listed in the program.
- Taping and photography of any presentations are prohibited.
- Speakers – Please leave at least 5 minutes for questions and discussion.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Be sure to make any corrections to your name/contact information on the Master Participant List or confirm that the listing is correct. A corrected electronic copy will be sent to all participants after the conference.

**Monday, May 17, 2010**

07:00 – 8:30	Breakfast – SARA - Coffee Shop (1F)	
	<b>PLENARY SESSION 1</b> Convention B (B1) <b>Chair:</b> Jamal Chaouki, Ecole Polytechnique Montreal, Canada	
08:30 – 09:30	<b>P-1: A PERSPECTIVE ON DEVELOPMENT OF NOVEL FLUIDIZED BED PROCESSES FOR A MORE SUSTAINABLE GLOBAL FUTURE</b> John R. Grace, University of British Columbia, Canada	
09:30 – 10:00	<b>COFFEE BREAK</b> Convention Lobby (B1)	
	<b>SESSION 1: DENSE FLUIDIZATION: BUBBLING AND SLUGGING I</b>	<b>SESSION 2: MEASUREMENT AND INSTRUMENTATION</b>
	Convention A (B1)	Convention C (B1)
	<b>Co-chairs</b> Ray Cocco, Particulate Solid Research Inc., USA Wei Fei, Tsinghua University, China	<b>Co-chairs</b> Ernst-Ulrich Hartge, Hamburg University, Germany Chang Keun Yi, KIER, Korea
10:00 – 10:15	<b>1-1: BUBBLE-FREE FLUIDIZATION OF PARTICLES IN THE VOIDS OF A PACKING OF COARSE SPHERES</b> Brunello Formisani, Rossella Girimonte, Patrizia Bafaro, Vincenzino Vivacqua Università della Calabria, Italy	<b>2-1: COMPARISON OF VARIOUS MEASUREMENT TECHNIQUES FOR CHARACTERIZING THE HYDRODYNAMICS OF GAS-SOLID FLUIDIZED BEDS</b> Mojgan Abbasi, Nasim Salehi-Nik, Reza Zarghami, Rahmat Sotude-Gharebagh, Navid Mostoufi University of Tehran, Iran
10:15 – 10:30	<b>1-2: PARTICLE CLUSTERS IN FLUIDIZED BEDS</b> Ray Cocco, S.B. Reddy Karri, Roy Hays, Ted Knowlton Particulate Solid Research, Inc., USA Frank Shaffer, National Energy Technology Laboratory, USA	<b>2-2: UNDERSTANDING CAPTURE EFFICIENCY IN FLUIDIZED BEDS</b> Kok-Seng Lim, Jonian Nikolov, Trevor D. Hadley VIC, Australia
10:30 – 10:45	<b>1-3: GAS AND SOLID MIXING IN THREE PARTITIONED FLUIDIZED BED</b> Gyoung Tae Jin, Seung-Yong Lee, Young-ju Seo, Solim Kang, Ho-Jung Ryu KIER, Korea	<b>2-3: DYNAMIC ELUTRIATION MEASUREMENT IN A CONTINUOUSLY OPERATED BUBBLING FLUIDIZED BED</b> W. de Vos, E. du Toit, W. Nicol University of Pretoria, South Africa

**Monday, May 17, 2010 (continued)**

<p>10:45 – 11:00</p>	<p><b>1-4: INVESTIGATION OF THE SHIFTING-PARAMETER AS A FUNCTION OF PARTICLE SIZE DISTRIBUTION IN A FLUIDIZED BED TRAVERSING FROM ONE REGIME TO ANOTHER</b></p> <p>C. Rautenbach, M.C. Melaaen, B.M. Halvorsen Telemark University College, Norway</p>	<p><b>2-4: NUMERICAL INVESTIGATION OF GAS SAMPLING FROM FLUIDIZED BEDS</b></p> <p>Tingwen Li, Yongmin Zhang, John Grace, Xiaotao Bi University of British Columbia, Canada China University of Petroleum, China</p>
<p>11:00 – 11:15</p>	<p><b>1-5: MOTION OF A LARGE OBJECT IN A 2D BUBBLING FLUIDIZED BED</b></p> <p>A. Soria-Verdugo, L. M. García-Gutiérrez, S. Sánchez-Delgado, U. Ruiz-Rivas Carlos III University of Madrid, Spain</p>	<p><b>2-5: FIBRE-OPTIC PROBE FOR THE SIMULTANEOUS MEASUREMENT OF GASEOUS SPECIES COMPOSITION AND SOLIDS VOLUME FRACTION</b></p> <p>Jean-Philippe Laviolette, Gregory S. Patience, Jamal Chaouki École Polytechnique de Montréal, Canada</p>
<p>11:15 – 11:30</p>	<p><b>1-6: MULTIPLE ORIFICE BUBBLE GENERATION IN GAS-SOLID FLUIDIZED BEDS: THE ACTIVATION REGION APPROACH</b></p> <p>S.Sánchez-Delgado, J.V. Briongos, A. Acosta-Iborra , D. Santana Carlos III University of Madrid, Spain</p>	<p><b>2-6: MAGNETIC RESONANCE (MR) MEASUREMENTS OF THE MASS FLUX IN GAS-SOLID FLUIDIZED BEDS</b></p> <p>C.R. Muller, D.J. Holland, A.J. Sederman, L.F. Gladden, J.S. Dennis University of Cambridge, UK; ETH Zurich, Switzerland.</p>
<p>11:30 – 11:45</p>	<p><b>1-7: PREDICTION AND VERIFICATION OF EFFECT OF BED LENGTH ON RTD OF COAL IN A BUBBLING FLUIDIZED BED</b></p> <p>Zhihong Liu, Masahiro Narukawa, Makoto Takafuji, Toshiyuki Suda IHI Corporation, Japan</p>	<p><b>2-7: AN ELECTRICAL CAPACITANCE TOMOGRAPHY STUDY OF PRESSURIZED FLUIDIZED BEDS</b></p> <p>Niels G. Deen, Willem Godlieb, Sander Gorter, J.A.M. Kuipers University of Twente, Dutch Polymer Institute, The Netherlands</p>
<p>11:45 – 12:00</p>	<p><b>1-8: PARTICLE ATTRITION MEASUREMENTS USING A JET CUP</b></p> <p>Ray Cocco, S.B. Reddy Karri, Yeook Arrington, Roy Hays, John Findlay, Ted Knowlton Particulate Solid Research, Inc. USA</p>	<p><b>2-8: FAST X-RAY TOMOGRAPHY OF A BUBBLING FLUIDIZED BED</b></p> <p>R.F. Mudde Delft University of Technology, The Netherlands</p>

**Monday, May 17, 2010 (continued)**

12:00 – 12:15	<b>1-9: MIXING BEHAVIOR AND HYDRODYNAMIC STUDY OF GAS-SOLID-SOLID FLUIDIZATION SYSTEM: CO-FLUIDIZATION OF FCC AND COURSE PARTICLES</b>  Zeeshan Nawaz, Yujian Sun, Yue Chu, Fei Wei Tsinghua University, China	<b>2-9: DIGITAL IMAGE ANALYSIS OF BUBBLE FLOW DISTRIBUTION-INFLUENCE OF OPERATIONAL PARAMETERS</b>  Johanna Olsson, David Pallarès, Filip Johnsson Chalmers University of Technology, Sweden
12:15 – 12:30	<b>1-10: EFFECTS OF IMPOSED SOLIDS FLUX AND PRESSURE ON GAS BYPASSING IN DEEP FLUIDIZED BEDS OF GROUP A MATERIALS</b>  A. S. Issangya, S. B. Reddy Karri, T. M. Knowlton Particulate Solid Research, Inc., USA	<b>2-10: GELDART GROUP INDICATION FROM POWDER MEASUREMENTS WITH A ROTATING DRUM INSTRUMENT</b>  Emile S. Webster, Clive E Davies, Massey University, New Zealand
12:30 – 14:30	<b>LUNCH &amp; FREE TIME</b> Diamond Hall (B1)	
	<b>SESSION 3: DENSE FLUIDIZATION: BUBBLING AND SLUGGING II</b>	<b>SESSION 4: LIQUID AND THREE-PHASE FLUIDIZATION</b>
	Convention A (B1)	Convention C (B1)
	<u>Co-chairs</u> Ah-Hyung Alissa Park, Columbia University, USA Joachim Werther, Hamburg University, Germany	<u>Co-chairs</u> Norman Epstein, University of British Columbia, Canada Dong Hyun Lee, Sungkunkwan University, Korea
14:00 – 14:15	<b>3-1: PARTICLE BREAKAGE IN THE CYCLONES OF FLUIDIZED BED SYSTEMS</b>  Anja Püttmann, Marvin Kramp, Andreas Thon, Ernst-Ulrich Hartge, Joachim Werther Hamburg University of Technology, Germany	<b>4-1: A STUDY ON DENITRIFICATION IN A FLUIDIZED BED BIOREACTOR</b>  K. Vimala, L. Prasanna Lakshmi, P. S. Yelamarthi, National Institute of Technology, India
14:15 – 14:30	<b>3-2: STUDY OF SOLIDS ENTRAINMENT INTO ATTRITION JETS IN FLUIDIZED BEDS</b>  Feng Li, Cedric Briens, Franco Berruti, University of Western Ontario, Canada Jennifer McMillan Edmonton Research Centre Syncrude, Canada	<b>4-2: IMPACT BEHAVIOUR OF PARTICLES WITH LIQUID FILMS: ENERGY DISSIPATION AND STICKING CRITERIA</b>  Sergiy Antonyuk, Stefan Heinrich Hamburg University of Technology, Germany Stefan Palzer Nestlé Research Center Lausanne, Switzerland



**Monday, May 17, 2010 (continued)**

<p>14:30 – 14:45</p>	<p><b>3-3: EVALUATION OF THE MINIMUM VELOCITY OF POLYDISPERSE BED FLUIDIZATION COMPOUNDED OF BIOMASS PELLETS AND THEIR MIXTURES WITH FINE PARTICLES OF COAL</b></p> <p>Zorin Alexander, Isemin Rafail, Viryasov Dmitriy, Kuzmin Sergey Tambov State Technical University, Russia</p>	<p><b>4-3: PROCESSING OF PURE VEGETABLE OILS IN A CONTINUOUS FCC PILOT PLANT</b></p> <p>Peter Bielansky, Alexander Reichhold, Christoph Schönberger Vienna University of Technology, Austria</p>
<p>14:45 – 15:00</p>	<p><b>3-4: PREDICTION OF CATALYST ATTRITION IN AN INDUSTRIAL FLUIDIZED BED PLANT BASED ON LAB SCALE ATTRITION TESTS</b></p> <p>Andreas Thon, Anja Püttmann, Ernst-Ulrich Hartge, Stefan Heinrich, Joachim Werther Hamburg University, Germany Ecole Polytechnique, Canada Richard Bockrath, USA</p>	<p><b>4-4: HYDRODYNAMIC CHARACTERISTICS OF LIQUID-SOLID FLUIDIZATION OF BINARY MIXTURES IN TAPERED BEDS</b></p> <p>J. S. N. Murthy, S. Nandana, Phani Kiran S. V. G. R., V Ramesh, V. V. Basava Rao, T. Sankarshana University College of Technology, Osmania University, India</p>
<p>15:00 – 15:15</p>	<p><b>3-5: THE TRANSPORT DISENGAGEMENT HEIGHT (TDH) IN A BUBBLING FLUIDIZED BED (BFB)</b></p> <p>Chian W. Chan, Jonathan P.K. Seville, Jan Baeyens University of Warwick, UK</p>	<p><b>4-5: EFFECTS OF LIQUID SWIRLING ON THE GAS HOLDUP AND OXYGEN TRANSFER IN THREE-PHASE FLUIDIZED BEDS</b></p> <p>Myun-Jae Seo, Hyun-Oh Lim, Sung-Mo Son, Yong Kang, CNU Yong-Jun Cho, Hi-Chul Yang, KAERI Sang-Done Kim, KAIST Heon Jung, Ho-Tae Lee, KIER Korea</p>
<p>15:15 – 15:30</p>	<p><b>3-6: EFFECTS OF PARTICLE SIZE AND FLUIDIZING VELOCITY ON THE CHARGE DENSITY OF ENTRAINED FINES</b></p> <p>Muammar Omar, Kwang Seok Choi, Xiaotao T. Bi, John R. Grace University of British Columbia, Canada</p>	<p><b>4-6: ELECTRICITY GENERATION CHARACTERISTICS OF AN ANAEROBIC FLUIDIZED BED MICROBIAL FUEL CELL</b></p> <p>Qingjie Guo, Shuju Zhao, Xuyun Wang, Xuehai Yue, Liangyu Hou Qingdao University, China</p>
<p>15:30 – 15:45</p>	<p><b>3-7: AGGLOMERATION DURING FLUIDIZED-BED COMBUSTION OF BIOMASS</b></p> <p>Teng Haipeng, Li Shiyuan, Lu Qinggang Chinese Academy of Science, China</p>	

**Monday, May 17, 2010 (continued)**

15:45 – 16:00	<p><b>3-8: INVESTIGATION OF THE EFFECT OF FLUIDIZATION TIME ON ELECTROSTATIC CHARGE GENERATION IN GAS-SOLID FLUIDIZED BEDS</b></p> <p>Amanda Giffin, Andrew Sowinski, Poupak Mehrani University of Ottawa, Canada</p>	
16:15 – 16:45	<p align="center"><b>COFFEE BREAK</b> Convention Lobby (B1)</p>	
17:00 – 19:00	<p align="center"><b>INDIVIDUAL MEETING &amp; DISCUSSION</b> Convention Lobby (B1)</p>	
19:00 – 21:00	<p align="center"><b>DINNER</b> Convention Hall (B1)</p>	
21:00 – 23:00	<p align="center"><b>POSTER SESSION 1 &amp; SOCIAL HOUR (ORAL SESSION 1, 2, 3 &amp; 4 PAPERS)</b> Convention B (B1) <b>Co-Chairs:</b> Woo Hyun Kim, KIMM, Korea Bung Ho Song, Kunsan National University, Korea</p>	

**Tuesday, May 18, 2010**

07:00 – 8:30	Breakfast – SARA - Coffee Shop (1F)	
	<b>PLENARY SESSION 2</b> Convention B (B1) <b>Chair:</b> Xiaotao Bi, University of British Columbia, Canada	
08:30 – 09:30	<b>P-2: A SINGLE PARTICLE VIEW OF FLUIDIZATION</b> Jonathan Seville, University of Warwick, UK	
09:30 – 10:00	<b>COFFEE BREAK</b> Convention Lobby (B1)	
	<b>SESSION 5: NOVEL FLUIDIZED-BED REACTORS I</b>	<b>SESSION 6: CIRCULATION AND FAST FLUIDIZATION</b>
	Convention A (B1)	Convention C (B1)
	<b>Co-chairs</b> Hans Kuipers, University of Twente, Netherland Qingjie Guo, Qingdao University, China	<b>Co-chairs</b> Atsushi Tsutsumi, University of Tokyo, Japan Piero Salatino, Università degli Studi di Napoli Federico II, Italy
10:00 – 10:15	<b>5-1: A NOVEL CONSTRUCTION OF A LOW-PRESSURE-DROP AIR NOZZLE WORKING WITH A 535MWE CFB BOILER</b>  Pawel Mirek, Wojciech Nowak Czestochowa University of Technology Poland Marcin Klajny FW Energia OY, Finland Janusz Jabłoński PGE Elektrownia Turow S.A. Poland	<b>6-1: THE EFFECTS OF DISTRIBUTOR DESIGN ON THE SOLIDS DISTRIBUTION IN A CFB RISER</b>  Jing Xu, Botao Peng, Chao Zhang, Jesse Zhu University of Western Ontario, Canada
10:15 – 10:30	<b>5-2: CHEMICAL-LOOPING STEAM METHANE REFORMING FOR HYDROGEN PRODUCTION IN A CIRCULATING FLUIDIZED BED REACTOR</b>  Kang Seok Go, Young Wook Jeon, Sang Done Kim, KAIST Chu Sik Park, KIER Korea	<b>6-2: DECAY FACTOR WITH EXPERIMENTAL VARIABLES IN TWO CIRCULATING FLUIDIZED BED (CFB) RISERS</b>  Hyun Suk Lee, Jong Hun Lim, Dong Hyun Lee SungKyunKwan University Sang Soon Park, Ho Jeong Chae, Soon Yong Jeong KRICT Korea

Tuesday, May 18, 2010 (continued)

10:30 – 10:45	<p><b>5-3: DEVELOPMENT OF A CONTINUOUS NANOPARTICLE COATING WITH ELECTROSPRAYING</b></p> <p>N. Ellis University of British Columbia, Canada C.U. Yurteri, J.R. van Ommen Delft University of Technology, The Netherlands</p>	<p><b>6-3: EFFECT OF DISTRIBUTOR DESIGN ON SOLIDS CIRCULATION AND GAS BYPASS IN AN INTERNAL CIRCULATING FLUIDIZED BED REACTOR</b></p> <p>Terris T. Yang, Honeywell International, USA Xiaotao T. Bi, University of British Columbia, Canada</p>
10:45 – 11:00	<p><b>5-4: SPINNING STRAW INTO GOLD: TURNING ACADEMIC PAPERS INTO COMMERCIAL FLUIDIZED BED REACTOR DESIGNS</b></p> <p>Charles O. Bolthrunis, Michael Hagan, Waheed A. Mukaddam Cambridge Chemical Technology Inc., USA</p>	<p><b>6-4: RADIAL DISTRIBUTION OF PARTICLE CLUSTERS IN A DOWNER REACTOR UNIT</b></p> <p>Mohammad Ashraful Islam, Stefan Krol, Hugo I. de Lasa University of Western Ontario, Canada</p>
11:00 – 11:15	<p><b>5-5: THE HOT GAS DESULFURIZATION IN A COMPACT TWO BEDS SYSTEM INTEGRATED WITH COAL GASIFICATION AND FISHER-TROPSCH SYSTEM</b></p> <p>Young Cheol Park, Sung-Ho Jo, Seung-Yong Lee, Chang-Keun Yi KIER, Korea</p>	<p><b>6-5: FLOW BEHAVIORS IN A HIGH SOLID FLUX CIRCULATING FLUIDIZED BED COMPOSED OF A RISER, A DOWNER AND A BUBBLING FLUIDIZED BED</b></p> <p>Guoqing Guan, Chihiro Fushimi, Masahiro Ikeda, Yu Nakamura, Atsushi Tsutsumi University of Tokyo, Japan Toshiyuki Suda, IHI Corporation, Japan Masanori Ishizuka, Hiroyuki Hatano, Satoru Matsuda, Yoshizo Suzuki AIST, Japan</p>
11:15 – 11:30	<p><b>5-6: REACTION CHARACTERISTICS OF TWO WATER GAS SHIFT CATALYSTS IN A BUBBLING FLUIDIZED BED REACTOR FOR SEWGS PROCESS</b></p> <p>Ho-Jung Ryu Sung-Ho Jo, Young Cheol Park, Chang-Keun Yi KIER, Korea</p>	

11:30 – 11:45	<p><b>5-7: EXPERIMENTAL AND COMPUTATIONAL STUDY ON THE BUBBLE BEHAVIOR IN A 3-D FLUIDIZED BED WITH A VERTICAL-AXIS, ROTATING DISTRIBUTOR</b></p> <p>A. Acosta-Iborra, F. Hernández-Jiménez, C. Sobrino, M. de Vega Carlos III University of Madrid, Spain</p>	<p><b>6-7: CHARACTERIZATION OF TURBULENT REGIME BEHAVIOR IN THE DILUTE ZONE OF A CIRCULATING FLUIDIZED BED RISER</b></p> <p>Abdelghafour Zaabout, Hervé Bournot, René Occelli IUSTI Technopôle de Château, France Bousselham Kharbouch Faculté des Sciences Tétouan, Morocco</p>
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Tuesday, May 18, 2010 (continued)

11:45 – 12:00	<p><b>5-8: A NOVEL CHEMICAL LOOPING COMBUSTION PROCESS: PRESSURE DROP AND SOLID CIRCULATION RATE MODELLING</b></p> <p>Yazdanpanah Mohammad-Mahdi, Hoteit Ali, Forret Ann, Gauthier Thierry IFP-Lyon, France; Delebarre Arnaud Université Henri Poincaré, France</p>	<p><b>6-8: THE INFLUENCE OF PARTICLE ATTRITION ON SORBENT INVENTORY AND PARTICLE SIZE DISTRIBUTION IN AIR-BLOWN CIRCULATING FLUIDIZED BED COMBUSTORS</b></p> <p>Piero Salatino, Fabio Montagnaro, Università degli Studi di Napoli Federico II, Italy; Fabrizio Scala, Massimo Urciuolo Consiglio Nazionale delle Ricerche, Italy</p>
12:00 – 12:15	<p><b>5-9: HYDRODYNAMICS ON CHEMICAL LOOPING COMBUSTION USING MULTIPHASE CFD WITH KINETIC THEORY OF GRANULAR FLOW</b></p> <p>Jonghwun Jung POSCO, South Korea; Isaac K. Gamwo U.S. Department of Energy, USA</p>	<p><b>6-9: CO-COMBUSTION OF KOREAN ANTHRACITE WITH VARIOUS FUELS IN A COMMERCIAL CIRCULATING FLUIDIZED BED BOILER</b></p> <p>Jong-Min Lee, Dong-Won Kim, Pyeong-Ki Seon, Jae-Sung Kim KEPCO, Korea</p>
12:15 – 12:30		<p><b>6-10: THE SOLIDS FLOW IN THE RISER OF A CFB VIEWED BY POSITRON EMISSION PARTICLE TRACKING (PEPT)</b></p> <p>Chian W. Chan, Jonathan P.K. Seville, Jan Baeyens, University of Warwick, UK</p>
12:30 – 19:00	<p><b>LUNCH &amp; SK ENERGY, POSCO TOUR</b> Diamond Hall (B1)</p>	
19:00 – 21:00	<p><b>BANQUET</b> Convention Hall (B1)</p>	

Tuesday, May 18, 2010 (continued)

21:00 – 23:00	<p align="center"><b>POSTER SESSION 2 &amp; SOCIAL HOUR (ORAL SESSION 5 &amp; 6 PAPERS)</b> Convention B (B1) <b>Co-Chairs</b> Uen Do Lee, Korea Institute of Industrial Technology, Korea Ho Jung Ryu, KIER, Korea</p>
PM 2	<p><b>DEVELOPMENT OF A FLUIDIZED BED REACTOR FOR WATER GAS SHIFT REACTION</b> See-Hoon Lee, KIER, Korea</p>
PM 4	<p><b>EXPERIMENTAL STUDY ON DENSE PHASE PNEUMATIC CONVEYING OF PULVERIZED COAL</b> Wei Wang, Tsinghua University, China</p>
PM 7	<p><b>STEADY-STATE LONG-TERM OPERATION EXPERIENCE IN A 50 KWTH CHEMICAL LOOPING COMBUSTOR WITH NATURAL GAS SYNGAS AS FUELS</b> Ho-Jung Ryu, KIER, Korea</p>
PM 10	<p><b>FLUIDIZATION CHARACTERISTICS OF GROUP A/C POWDERS UNDER MECHANICAL VIBRATING CONDITION</b> Yoshihide Mawatari, KIT, Japan</p>
PM 15	<p><b>HYDRODYNAMIC AND MIXING CHARACTERISTICS OF A CIRCULATING FLUIDIZED BED GASIFIER</b> Uen do Lee, KIIT, Korea</p>
PM 16	<p><b>AN EXPERIMENTAL STUDY OF AIR-BLOWN BIOMASS GASIFICATION IN A BUBBLING FLUIDIZED</b> Young Doo Kim, KIIT, Korea</p>
PM 17	<p><b>TAR REDUCTION OF BIO-SYNGAS WITH VARIOUS SOLID MATERIALS IN A SOLID BED REACTOR</b> Hyo Jae Jeong, Yonsei University, Korea</p>
PM 19	<p><b>DIGITAL IMAGE ANALYSIS OF BUBBLING FLOW DISTRIBUTION - INFLUENCE OF OPERATIONAL PARAMETERS</b> Johanna Olsson, Chalmers University, Sweden</p>
PM 21	<p><b>ONE-DIMENSIONAL MODELING OF OXY-FUEL FLUIDIZED BED COMUSTION FOR CO<sub>2</sub> CAPTURE</b> Sadegh Seddighi, Chalmers University, Sweden</p>
PM 22	<p><b>FLUIDIZED BED MEMBRANE REACTOR FOR HIGH-PURITY HYDROGEN PRODUCTION UTILIZING IN-SITU CO<sub>2</sub> CAPTURE</b> Andres Mahecha-Botero, University of British Columbia, Canada</p>

PM 24	<b>HYDRODYNAMICS OF A MEMBRANE ASSISTED FLUIDIZED BED-COMPARISON BETWEEN EXPERIMENT AND A CONTINUUM MODEL</b> Jelle f. De Jong, University of Twente, The Netherlands
PM 25	<b>MEASUREMENT TECHNIQUE FOR ELECTROSTATIC CHARGE GENERATION IN GAS-SOLID FLUIDIZED BEDS</b> Andrew Sowinski, University of Ottawa, Canada
PM 26	<b>DETERMINATION OF BUBBLE CHARACTERISTICS IN A FLUIDIZED BED BY ARTIFICIAL NEURAL NETWORKS (ANN)</b> M. A. Izquierdo, RERI, Spain

**Wednesday, May 19, 2010**

07:00 – 08:30	Breakfast – SARA - Coffee Shop (1F)	
	<b>PLENARY SESSION 3</b> Convention B (B1) <b>Chair:</b> Ted Knowlton, Particulate Solid Research, Inc., USA	
08:30 – 09:30	<b>P-3: FLUIDIZATION OF NANOPOWDERS: EXPERIMENTS, MODELING, AND APPLICATIONS</b> J.Ruud van Ommen, Delft University of Technology, The Netherlands	
09:30 – 10:00	<b>COFFEE BREAK</b> Convention Lobby (B1)	
	<b>SESSION 7: NOVEL FLUIDIZED-BED REACTORS</b>	<b>SESSION 8: REACTOR PERFORMANCE I</b>
	Convention A (B1)	Convention C (B1)
	<b>Co-chairs</b> Karl Ernst Wirth, University of Erlangen-Nuremberg, Germany Yongseung Yun, IAE, Korea	<b>Co-chairs</b> Christoph Pfeifer, Vienna University of Technology, Austria Jeong Hoo Choi, Konkuk University, Korea
10:00 – 10:15	<b>7-1: GAS-SOLID FLUIDIZATION IN A MICROFLUIDIC CHANNEL</b> Fei Wang, Liang-Shih Fan Ohio State University, USA	<b>8-1: A MODEL ON AN ENTRAINED BED-BUBBLING BED PROCESS FOR CO<sub>2</sub> CAPTURE FROM FLUE GAS</b> Jeong-Hoo Choi, Konkuk University, Korea Chang-Keun Yi, Sung-Ho Jo, KIER, Korea
10:15 – 10:30	<b>7-2: NOVEL TWO-INTERCONNECTED FLUIDIZED BED SYSTEM FOR SELECTIVE SOLID CIRCULATION</b> Ho-Jung Ryu, Jaehyeon Park, Dowon Shun, Seung-Yong Lee KIER, Korea	<b>8-2: CO-GASIFICATION OF COAL AND WOOD IN A DUAL FLUIDIZED BED GASIFIER VARIATION OF FLUIDIZATION CONDITIONS AND LOAD RATIO</b> Isabella Aigner, Christoph Pfeifer, Hermann Hofbauer Vienna University of Technology, Austria
10:30 – 10:45	<b>7-3: MULTIPLE-LOOP CHEMICAL REACTOR DESIGN WITH PRESSURE</b>	<b>8-3: INVESTIGATION OF CHANGE OF VOLUMETRIC FLOW IN FLUIDIZED-BED</b>

	<b>BALANCE CONSIDERATION</b> Trevor D. Hadley, Ken Chiang, Nick R. Burke, Kok-Seng Lim CSIRO, Australia	<b>REACTORS</b> Andrés Mahecha-Botero, Alexander Nguyen, John R. Grace University of British Columbia, Canada; Franz Haseidl Technische Universität München, Germany; Tingwen Li National Energy Technology Laboratory, USA
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Wednesday, May 19, 2010 (continued)

10:45 – 11:00	<b>7-4: AERATION AND MIXING BEHAVIOURS OF BINARY MIXTURES OF NANO-SIZED POWDERS UNDER SOUND VIBRATION</b> P. Ammendola, R. Chirone Istituto di Ricerche sulla Combustione – CNR Italy	<b>8-4: STEAM GASIFICATION OF LOW RANK COAL CHAR IN A THERMOBALANCE REACTOR AND A FLUIDIZED BED REACTOR</b> Byungho Song, Xueyan Zhu Kunsan National University; Woongsig Moon Micro Science Tech Co., Ltd.; Won Yang Korea Inst. Ind. Technology Korea
11:00 – 11:15		<b>8-5: INFLUENCE OF PROCESS PARAMETERS ON FLUIDISED BED DRYING OF POWDERED MATERIALS</b> Piero Bareschino, Antonio Marzocchella Università degli Studi del Sannio, Italy; Piero Salatino Università degli Studi di Napoli 'Federico II', Italy
11:15 – 11:30	<b>7-6: EXPERIMENTS AND MODELLING OF MICRO-JET ASSISTED FLUIDIZATION OF NANOPARTICLES</b> J. Ruud van Ommen Delft University of Technology, The Netherlands; David M. King, Alan Weimer University of Colorado, USA; Robert Pfeffe, Arizona State University, USA; Berend G.M. van Wachem Imperial College London, UK	<b>8-6: HEAVY METAL VAPORIZATION IN FLUIDIZED BED COMBUSTION OF SOLID WASTE AND COAL</b> Q. Falcoz, D. Gauthier, G. Flamant, S. Abanades Laboratoire Procédés Matériaux et Energie Solaire, France J. Liu Huazhong University of Science & Technology, China



11:30 – 11:45	<p><b>7-7: DESIGN OF NEW FLUIDIZED BED REACTORS FOR CVD – PROCESSES</b></p> <p>T. Strer, M. Schober, K.-E. Wirth University of Erlangen-Nuremberg, Germany</p>	<p><b>8-7: COMBUSTION CHARACTERISTICS AND EMISSION OF HAZARDOUS AIR POLLUTANTS IN COMMERCIAL FLUIDIZED BED COMBUSTORS FOR SEWAGE SLUDGE</b></p> <p>Ha-Na Jang, Seong-Bum Park, Hansol EME Co. Ltd, Korea; Jeong-Hun Kim, Yong-Chil Seo, Yonsei University, Korea</p>
11:45 – 12:00	<p><b>7-8: PLASMA-ENHANCED CHEMICAL VAPOUR DEPOSITION ON PARTICLES IN AN ATMOSPHERIC CIRCULATING FLUIDIZED BED</b></p> <p>J. Ruud van Ommen, Delft University of Technology Elena Abadjieva, Yves L.M. Creyghton TNO Defence, Security and Safety, The Netherlands</p>	<p><b>8-8: ATTRITION OF BED MATERIALS AND FUEL PELLETS FOR FLUIDIZED BED GASIFICATION APPLICATION</b></p> <p>P. Ammendola, R. Chirone, F. Miccio, G. Ruoppolo, F. Scala Istituto di Ricerche sulla Combustione, Italy</p>

**Wednesday, May 19, 2010 (continued)**

12:00 – 12:15	<p><b>7-9: CHALLENGES WITH THE COUPLING OF FLUIDIZED BEDS FOR CHEMICAL LOOPING COMBUSTION</b></p> <p>Marvin Kramp, Andreas Thon, Ernst-Ulrich Hartge, Stefan Heinrich, Joachim Werther Hamburg University of Technology, Germany</p>	<p><b>8-9: SHEAR-ASSISTED FLUIDIZED BED POWDER-COATING</b></p> <p>Piero Bareschino, Francesco Pepe Università degli Studi del Sannio, Italy; Piero Salatino Università degli Studi di Napoli Federico II, Italy</p>
12:15 – 12:30	<p><b>7-10: CHARACTERISTICS AND KINETICS OF BIOMASS PYROLYSIS IN A MICRO FLUIDIZED BED REACTOR</b></p> <p>Jian Yu, Qiang Li, , Shiqiu Gao, Guangwen Xu Chinese Academy of Science, Jianhong Zhu, Zhengkang Duan Xiangtan University, China</p>	
12:30 – 14:00	<p><b>LUNCH &amp; FREE TIME</b> Diamond Hall (B1)</p>	
	<p><b>SESSION 9: HEAT AND MASS TRANSFER</b></p>	<p><b>SESSION 10: SPOUTED BEDS AND ROTATING FLUIDIZATION</b></p>
	<p>Convention A (B1)</p>	<p>Convention C (B1)</p>
	<p><b>Co-chairs</b> Shigekatsu Mori, Nagoya University, Japan Anton Larsson, Chalmers University of Technology, Sweden</p>	<p><b>Co-chairs</b> Satoru Watano, Osaka Prefecture University, Japan Yi Cheng, Tsinghua University, China</p>

14:00 – 14:15	<p><b>9-1: NUMERICAL EXPERIMENT ON EFFECT OF SURFACE ROUGHNESS FOR HEAT AND FLOW AROUND TWO CONTACTING PARTICLES</b></p> <p>Azri bin Alias, Kuwagi K, Bin Mokhtar M.A., Takami T. Okayama University of Science, Horio M. Tokyo University of A&amp;T, Japan</p>	<p><b>10-1: STUDY OF THE MINIMUM SPOUTING VELOCITY IN A DRAFT-TUBE CONICAL SPOUTED BED</b></p> <p>Haritz Altzibar, Gartzen Lopez, Martin Olazar, Javier Bilbao University of the Basque Country, Spain</p>
14:15 – 14:30	<p><b>9-2: HEAT TRANSFER TO IMMERSSED COOLING TUBES AND PARTICLES IN A FLUIDIZED BED REACTOR</b></p> <p>Y. Kobayashi, Y. Mori, A. Goto Sumitomo Chemical Company, Japan H.T. Bi , J.R. Grace University of British Columbia, Canada</p>	<p><b>10-2: FILM COATING ONTO COHESIVE FINE PARTICLES BY A NOVEL ROTATING FLUIDIZED BED COATER</b></p> <p>Tetsufumi Kondo, Hideya Nakamura, Tomohiro Iwasaki, Satoru Watano, Osaka Prefecture University Daisuke Iwamoto Nara Machinery Co., Ltd., Japan</p>

Wednesday, May 19, 2010

14:30 – 14:45	<p><b>9-3: RELATIONSHIP BETWEEN STRUCTURE AND HEAT TRANSFER COEFFICIENT IN FAST FLUIDIZED BEDS</b></p> <p>Baolin Hou, Qingshan Zhu, Hongzhong Li Chinese Academy of Science, China</p>	<p><b>10-3: A CONICAL SPOUTED BED REACTOR FOR THE VALORISATION OF WASTE TIRES</b></p> <p>Gartzen Lopez, Maider Amutio, Gorka Elordi, Maite Artetxe, Haritz Altzibar, Martin Olazar Universidad del País Vasco, Spain</p>
14:45 – 15:00	<p><b>9-4: MODELING OF MASS LOSS OF CHAR PARTICLES DURING COMBUSTION AND INTERACTION WITH INERT MATERIAL</b></p> <p>Piotr Pelka, Jacek Leszczynski Czestochowa University of Technology, Poland</p>	
15:00 – 15:15	<p><b>9-5: HEAT RECOVERY FROM MELTED BLAST FURNACE SLAG USING FLUIDIZED BED</b></p> <p>Tadaaki Shimizu, Daisuke Haga, Go Mikami, Takayuki Takahashi, Kenji Horinouchi Niigata University, Japan</p>	<p><b>10-5: HYDRODYNAMICS OF A SPOUT-FLUID BED WITH AN ENLARGED COLUMN FOR FINE PARTICLES</b></p> <p>Jian Xu, Lei Gong, Xiaojun Bao, Weisheng Wei China University of Petroleum, China</p>
15:15 – 15:30	<p><b>9-6: BASIC STUDY FOR COAL MOISTURE CONTROL INTEGRATING PNEUMATIC CLASSIFICATION TECHNIQUE</b></p>	<p><b>10-6: BIOMASS GASIFICATION IN ROTATING FLUIDIZED BED</b></p>

	Zhou-en Liu, Yin Wang, Yajun Tian, Wenfeng Ji, Guangwen Xu Chinese Academy of Science Yimin Xie, Shenyang Institute of Chemical Technology, China	Mania Abdollahi-Neisiani, Christophe Guy, Jamal Chaouki Ecole Polytechnique, Canada
15:30 – 15:45		<b>10-7: NUMERICAL AND EXPERIMENTAL STEADY STATE FLOW AND HEAT TRANSFER IN A CONTINUOUS SPOUTED BED</b>  Cezar A. Rosa, José T. Freire, Federal University of São Carlos, Brazil; Hamid Arastoopour, IIT, USA
15:45 – 16:00		<b>10-8: PARTICLE SEGREGATION IN TAPERED FLUIDIZED BEDS</b>  T. M. Gernon, Trinity College, Ireland R.S.J.Sparks, University of Southampton, UK M.A.Gilbertson, University of Bristol, UK

Wednesday, May 19, 2010 (continued)

16:00 – 19:30	<b>INDIVIDUAL MEETING &amp; DISCUSSION</b> Convention Lobby (B1)
19:30 – 21:00	<b>DINNER</b> Convention Hall (B1)
21:00 – 23:00	<b>POSTER SESSION 2 &amp; SOCIAL HOUR (ORAL SESSION 7, 8, 9 &amp; 10 PAPERS)</b> Convention B (B1) <b>Co-Chairs</b> Heon Jung, KIER, Korea Hee Chul Yang, KAERI, Korea

**Thursday, May 20, 2010**

07:00 – 8:30	Breakfast – SARA - Coffee Shop (1F)	
	<b>PLENARY SESSION 4</b> Convention B (B1) <b>Chair:</b> David Pallares, Chalmers University of Technology, Sweden	
08:30 – 09:30	<b>P-4: FLUIDIZATION—PAST &amp; FUTURE</b> Masayuki Horio, Tokyo University of A&T, Japan	
09:30 – 10:00	<b>COFFEE BREAK</b> Convention Lobby (B1)	
	<b>SESSION 11: REACTOR MODELING &amp; SIMULATION I</b>	<b>SESSION 12: REACTOR PERFORMANCE II</b>
	Convention A (B1)	Convention C (B1)
	<b>Co-chairs</b> Madhava Syamlal, NETL/DOE, USA Jong Hwun Jung, POSCO, KOREA	<b>Co-chairs</b> Jelle De Jong, University of Twente, The Netherlands Mark Gilbertson, University of Bristol, UK
10:00 – 10:15	<b>11-1: NUMERICAL STUDY OF BUBBLING FLUIDIZED BEDS: INFLUENCE OF IMMERSSED TUBES, EXTRACTION METHODS AND AVERAGING PERIODS</b>  Matthias Schreiber, Teklay Weldeabzgi Asegehegn, Hans Joachim Krautz Brandenburg University of Technology Cottbus, Germany	<b>12-1: THE EFFECT OF GAS TEMPERATURE AND VELOCITY ON COAL DRYING IN FLUIDIZED BED DRYER</b>  Jaehyeon Park, Dowon Shun, Dal-Hee Bae, Sihyun Lee, Jeong Hak Seo, KIER Jae Hyeok Park Hanyang University, Korea
10:15 – 10:30	<b>11-2: NUMERICAL STUDY OF BUBBLE HYDRODYNAMICS FOR GAS-SOLID FLUIDIZED BEDS WITH AND WITHOUT HORIZONTAL TUBES</b>  Teklay Weldeabzgi Asegehegn, Hans Joachim Krautz Brandenburg University of Technology Cottbus, Germany	<b>12-2: PERFORMANCE COMPARISON OF SYNGAS METHANATION ON FLUIDIZED AND FIXED BED REACTORS</b>  Yingli Wang, Jiao Liu, Qiang Li, Jian Yu, Fabing Su, Guangwen Xu Chinese Academy of Science, China

<p>10:30 – 10:45</p>	<p><b>11-3: DIRECT NUMERICAL SIMULATION OF FLUIDIZED BED WITH IMMERSSED BOUNDARY METHOD</b></p> <p>Kuwagi K., Utsunomiya H., Shimoyama Y., Hirano H., Takami T. Okayama University of Science, Japan</p>	<p><b>12-3: FLUIDIZATION TECHNOLOGY FOR STABLE STARTUP OF COMMERCIAL FCC UNIT</b></p> <p>Sung Won Kim, Gyung Rok Kim, Jae Wook Shin SK Energy Institute of Technology; Ik Sang Yoo, Hun Sik Kang SK Energy Ulsan Complex; Sang Hoon Park SK Energy, Korea</p>
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**Thursday, May 20, 2010 (continued)**

<p>10:45 – 11:00</p>	<p><b>11-4: TIME-AVERAGED MODELLING OF CFBS – ANALYSIS OF THE TERMS IN THE MOMENTUM EQUATIONS</b></p> <p>Sirpa Kallio, Maiju Seppälä, Veikko Taivassalo VTT, Finland</p>	<p><b>12-4: ONE-DIMENSIONAL MODELING OF OXY-FUEL FLUIDIZED BED COMBUSTION FOR CO<sub>2</sub> CAPTURE</b></p> <p>Sadegh Seddighi, David Pallarès, Filip Johnsson Chalmers University of Technology, Sweden</p>
<p>11:00 – 11:15</p>		<p><b>12-5: FLUIDIZED BED COMBUSTION OF C<sub>1</sub>-C<sub>4</sub> N-ALKANES</b></p> <p>Jean-Philippe Laviolette, Gregory S. Patience, Jamal Chaouki École Polytechnique de Montréal, Canada</p>
<p>11:15 – 11:30</p>	<p><b>11-6: DEM-CFD MODELLING OF A FLUIDIZED BED SPRAY GRANULATOR</b></p> <p>Lennart Fries, Sergiy Antonyuk, Stefan Heinrich Hamburg University of Technology, Germany; Stefan Palzer Nestlé Research Center Vers-Chez-Les-Blanc, Switzerland</p>	<p><b>12-6: SYNGAS PRODUCTION WITH A DUAL FLUIDIZED BED GASIFIER FOR POLYGENERATION</b></p> <p>Uen Do Lee, Young Doo Kim, Hyo Jae Jeong, In Soo Choi, Yeon Kyung Sung, Tae U Yoo Korea Inst. Ind. Technol., Korea Jae Hun Song SeenTec Co., Ltd., Korea</p>
<p>11:30 – 11:45</p>	<p><b>11-7: CFD SIMULATION OF THE REACTING FLOW PROCESS OF COAL PYROLYSIS TO ACETYLENE IN HYDROGEN PLASMA DOWNER REACTORS</b></p> <p>Binhang Yan, Changning Wu, Yong Jin, Yi Cheng Tsinghua University, China</p>	<p><b>12-7: FLUIDIZED BED GASIFICATION OF BIOMASS: A SUBSTANCE FLOW ANALYSIS</b></p> <p>Umberto Arena, Fabrizio Di Gregorio, Lucio Zaccariello, M.Laura Mastellone Second University of Naples, Italy</p>

11:45 – 12:00	<p><b>11-8: CFD-DEM SIMULATION OF SYNGAS-TO-METHANE PROCESS IN A FLUIDIZED-BED REACTOR</b></p> <p>Changning Wu, Dayong Tian, Yi Cheng Tsinghua University, China</p>	<p><b>12-8: HIGH PERFORMANCE COMPUTING: CLEAN COAL GASIFIER DESIGNS USING HYBRID PARALLELIZATION</b></p> <p>M Syamlal, C Guenther, A Gel National Energy Technology Laboratory; S Pannala Oak Ridge National Lab., USA.</p>
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Thursday, May 20, 2010 (continued)

12:00 – 12:15	<p><b>11-9: CFD SIMULATION OF A LIQUID-FLUIDIZED BED OF BINARY PARTICLES</b></p> <p>Long Fan, John R. Grace, Norman Epstein University of British Columbia, Canada</p>	<p><b>12-9: TAILORED SYNTHESIS OF PRECIPITATED MAGNESIUM CARBONATES AS CARBON-NEUTRAL FILLER MATERIALS DURING CARBON MINERAL SEQUESTRATION</b></p> <p>Huangjing Zhao, Nathan Dadap, Ah-Hyung Alissa Park Columbia University, USA</p>
12:15 – 12:30	<p><b>11-10: COMPUTATIONAL STUDY OF LAYER INVERSION IN TWO-COMPONENT LIQUID-FLUIDIZED BEDS BY DEM-CFD</b></p> <p>Alberto Di Renzo, Fernando Cello, Francesco Paolo Di Maio Università della Calabria, Italy</p>	
12:30 – 14:30	<p><b>LUNCH &amp; FREE TIME</b> Diamond Hall (B1)</p>	
	<p><b>SESSION 13: REACTOR MODELING &amp; SIMULATION II</b></p>	<p><b>SESSION 14: NON-CONVENTIONAL FLUIDIZED BEDS</b></p>
	<p>Convention A (B1)</p>	<p>Convention C (B1)</p>
	<p><b>Co-chairs</b> Hamid Arastoopour, IIT, USA Yong-Chil Seo, Yonsei University, Korea</p>	<p><b>Co-chairs</b> Cedric Briens, University of Western Ontario, Canada Alberto Di Renzo, University of della Calabria, Italy</p>

14:30 – 14:45		<p><b>14-1: HYDRODYNAMICS OF UNCONVENTIONAL FLUIDIZED BEDS: SOLIDS FLOW PATTERNS AND THEIR INFLUENCE ON MIXING/SEGREGATION OF A LARGE FLOTSAM PARTICLE IN A BED OF FINER SOLIDS</b></p> <p>Roberto Solimene, Paola Ammendola, Giovanna Ruoppolo, Riccardo Chirone Istituto di Ricerche sulla Combustione – CNR, Italy</p>
14:45 – 15:00	<p><b>13-2: MODELING OF THE SOLIDS INVENTORY IN CFB BOILERS</b></p> <p>David Pallarès, Filip Johnsson Chalmers University of Technology, Sweden; Marko Palonen Metso Power Oy, Finland</p>	<p><b>14-2: EVALUATION OF FLUID DYNAMICS IN A HOT AND A COLD SYSTEM OF INTERCONNECTING FLUIDISED BEDS</b></p> <p>Fredrik Lind, Martin Seemann, Henrik Thunman Chalmers University of Technology, Sweden.</p>

Thursday, May 20, 2010 (continued)

15:00 – 15:15	<p><b>13-3: TOWARDS A THEORETICAL MODEL OF SEGREGATING FLUIDIZATION OF TWO-SOLID BEDS</b></p> <p>Brunello Formisani, Rossella Girimonte, Vincenzino Vivacqua Università della Calabria, Italy</p>	<p><b>14-3: DEM FLUIDIZATION OF SMART PARTICLES</b></p> <p>Amit Suri, Masayuki Horio Tokyo University of A&amp;T, Japan</p>
15:15 – 15:30	<p><b>13-4: ZERO-DIMENSIONAL MODELLING OF INDIRECT FLUIDIZED BED GASIFICATION</b></p> <p>Anton Larssona, David Pallares, Daniel Nevesa, Martin Seemann, Henrik Thunman Chalmers University of Technology, Sweden</p>	<p><b>14-4: EXPERIMENTAL QUANTIFICATION OF THE SOLIDS FLUX IN AN INTERNALLY CIRCULATING FLUIDIZED BED</b></p> <p>Trevor D. Hadley, Christian Doblin, José Orellana, Kok-Seng Lim CSIRO, Australia</p>
15:30 – 15:45		<p><b>14-5: PENETRATION OF HIGH VELOCITY HORIZONTAL GAS JETS INTO A FLUIDIZED BED AT HIGH TEMPERATURE</b></p> <p>Feng Li, Cedric Briens, Franco Berruti University of Western Ontario, Canada; Jennifer McMillan Edmonton Research Centre, Canada</p>

15:45 – 16:00	<b>13-6: CFD SIMULATION OF PHARMACEUTICAL PARTICLE DRYING IN A BUBBLING FLUIDIZED BED REACTOR</b> Jungkee Jang, Cezar Rosa, Hamid Arastoopour IIT, USA	<b>14-6: INVESTIGATION OF REFORMING ACTIVITY AND OXYGEN TRANSFER OF OLIVINE IN A DUAL CIRCULATING FLUIDISED BED SYSTEM WITH REGARD TO BIOMASS GASIFICATION</b> Stefan Koppatz, Tobias Pröll, Christoph Pfeifer, Hermann Hofbauer Vienna University of Technology, Austria
15:45 – 17:00	<b>ORGANIZING COMMITTEE &amp; ECI MEETING</b> Sapphire (2F)	
17:00 – 19:00	<b>POSTER SESSION 4 &amp; SOCIAL HOUR</b> <b>(Oral Session 11, 12, 13 &amp; 14 Papers)</b> Convention B (B1) <u><b>Co-chairs:</b></u> Jong Min Lee, KEPCO, Korea Sung Won Kim, SK Energy Int. Technology, Korea	
19:00 – 21:00	<b>FAREWELL PARTY</b> Convention Hall (B1)	

**Friday, May 21, 2010**

07:00 – 8:30	Breakfast – SARA - Coffee Shop (1F)
08:30 – 10:30	Departure of Buses
10:30 – 13:00	<b>LOCAL ORGANIZING COMMITTEE MEETING &amp; LUNCH</b> Diamond Hall (B1)