

Program

Green Chemical Reaction Engineering for a Sustainable Future



ISCRE 20

Beyond the Kyoto Protocol

The 20th International Symposium on Chemical Reaction Engineering

Sun 7—Wed 10 September 2008

Kyoto International Conference Center, Kyoto, JAPAN



ISCRE 20 is hosted by



the Society of Chemical Engineers, Japan

and operated by

the SCEJ Divisions of
Chemical Reaction Engineering,
Energy Engineering, and

Environmental Engineering

and

the Asia-Pacific Chemical Reaction Engineering (APCRE) Working Party



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Welcome to ISCRE 20

First of all, I would like to welcome all participants from across the world for attending ISCRE 20. We are very much honored to host the most prestigious symposium of Chemical Reaction Engineering here in Kyoto, Japan.

In 2004 Asia-Pacific Chemical Reaction Engineering (APCRE) Working Party solicited Kyoto as the site of ISCRE 20. Since then we have been preparing to make this symposium meaningful and fruitful. Our chemical engineering society, the Society of Chemical Engineers, JAPAN (SCEJ), decided to host ISCRE 20, and three divisions of SCEJ: Division of Energy, Division of Chemical Reaction Engineering, and Division of Environment are in charge of managing this symposium in cooperation with the APCRE Working Party. We have organized the Scientific Committee which is comprised of 44 members solicited from the Working Parties of Chemical Reaction Engineering of North America, Europe, and Asia-Pacific. Japanese Organizing Committee is comprised of 17 members of Advisory Board and 30 members of Steering Committee. I believe that these committees are largest in the 40 years of history of ISCRE. Kyoto International Conference Center, where COP 3 was held and the so-called Kyoto Protocol was announced in 1997, was chosen as the symposium site, and the main theme was chosen to be “Green Chemical Reaction Engineering for a Sustainable Future” which is most suitable to this Conference Center.

Responding the Call for Papers 374 abstracts were submitted for the presentation from 38 countries worldwide. They were subjected to the peer review by the Scientific Committee members, resulting in the acceptance of 311 papers. Finally 283 papers are to be presented as 194 oral and 89 poster presentations. We decided to accommodate as many oral presentations as possible to meet with the request of the authors. Then 6 parallel oral sessions will run everyday.

We are very pleased to have a special lecture given by Mr. Yoshimitsu Kobayashi, the President of Mitsubishi Chemical Corporation, on Sep. 7 just before the Reception. Mr. Kobayashi is to talk about “Japanese Chemical Industry Programs Aimed at Achieving Sustainability” which will surely attract the attention of all the participants. Distinct plenary speakers were also solicited by the Scientific Committee: two from North America, two from Europe, and two also from Asia-Pacific. Their talks on the cutting edge works on Chemical Reaction Engineering will also stimulate all the participants.

Selected papers are published in special issues of Chemical Engineering Science and Journal of Chemical Engineering of Japan. Now the manuscripts submitted for the special issues are under strict peer review. The Program Committee members in the Steering Committee are in charge of the reviewing process. We are grateful to the Program Committee members for their hard efforts. My thanks go as well to reviewers involved in the special issues. Without the assistance of these people we can not publish the special issues. The special issue of J. Chem. Eng. Japan will be published in December this year, and that of CES will be published in spring next year. CD-ROMs storing the papers accepted for the special issues will be distributed to all regular participants.

We are grateful to the Ministry of Education, Science, Sports and Culture, Japan for her supporting this symposium through a Grant-in-Aid for Scientific Research. Financial supports from fourteen companies are also greatly acknowledged. My special thanks go to the Scientific Committee members and the Steering Committee members for their contribution to this symposium.

September 7, 2008



Hiroshi Komiyama
Chair
Steering Committee of ISCRE 20

Welcoming Message from SCEJ

Representing the Society of Chemical Engineers of Japan, I would like to welcome all participating in ISCRE 20 from all over the world. I have learned that the first ISCRE was held in Washington, DC in 1970. Since then the ISCRE has been held 19 times in Europe, North America, and since 2002 in Asia also. It is a real honor and privilege for us to hold the memorable 20th ISCRE here in an ancient capital city Kyoto.

Chemical Reaction Engineering is a very powerful discipline of Chemical Engineering that can handle any systems involving chemical reactions. Chemical Reaction Engineering has contributed to the developments of various industries including chemical industry. The discipline is now covering systems ranging from nano scale, micro scale, to macro scale.

Now humanity is facing to tackle conflicting problems: Global Warming and Sustainable Development. Needless to say, everyone from every part of the globe must work together to solve the problems, since the problems are global ones. I believe that Chemical Reaction Engineering will surely be one of leading disciplines that can provide realistic solutions to the problems.

In this symposium 194 oral presentations and 89 poster presentations including cutting edge works of Chemical Reaction Engineering related to energy and environment issues are scheduled under the main theme of “Green Chemical Reaction Engineering for a Sustainable Future”. I sincerely hope that this symposium calling upon the wisdom of Chemical Reaction Engineering will find a clue to realize both the protection against global warming and the sustainable development through volatile discussion. There is no doubt that Kyoto International Conference Center, where the Kyoto Protocol was announced in 1997, is the most appropriate place to discuss the problems.

It is my wish that this ISCRE 20 will be a milestone toward the new frontier of Chemical Reaction Engineering. Finally I wish for the health and happiness of all participants.

September 7, 2008



Kanji Shono

President
The Society of Chemical Engineers, Japan

Scientific Committee

Adesoji Adesina	<i>University of New South Wales</i>
Alexis T. Bell	<i>University of California, Berkeley</i>
Kurt Vanden Bussche	<i>UOP</i>
Jean-Claude Charpentier	<i>ENSIC CNRS Nancy France</i>
Jiri Drahos	<i>Institute of Chemical Process Fundamentals, Academy of Sciences, Czech Republic</i>
Milorad P. Dudukovic	<i>Washington University</i>
Koichi Fujie	<i>Toyohashi University of Technology</i>
Asterios Gavriilidis	<i>University College London</i>
Akira Igarashi	<i>Kogakuin University</i>
Sibudjing Kawi	<i>National University of Singapore</i>
Toshinori Kojima	<i>Seikei University</i>
Hiroshi Komiyama	<i>University of Tokyo</i>
Bhaskar D. Kulkarni	<i>National Chemical Laboratory, Pune</i>
Jan Lerou	<i>Velocys, Inc.</i>
Janez Levec	<i>University of Ljubljana</i>
Jinghai Li	<i>Chinese Academy of Sciences</i>
Dan Luss	<i>University of Houston</i>
Guy Marin	<i>Ghent University</i>
Takao Masuda	<i>Hokkaido University</i>
Ian S. Metcalfe	<i>University of Newcastle upon Tyne</i>
Kouichi Miura	<i>Kyoto University</i>
In-Sik Nam	<i>Pohang University of Science and Technology</i>
Ryszard Pohorecki	<i>Warsaw University of Technology</i>
Piyasan Praserttham	<i>Chulalongkorn University</i>
Abdul Rahman Mohamed	<i>Universiti Sains Malaysia</i>
Albert Renken	<i>Ecole Polytechnique Federale de Lausanne</i>
Hyun-Ku Rhee	<i>Seoul National University</i>
Jesus Santamaria	<i>University of Zaragoza</i>
Jaap C. Schouten	<i>Eindhoven University of Technology</i>
Andreas Seidel-Morgenstern	<i>Max-Planck Institute & Otto von Guericke Universitat</i>
Moshe Sheintuch	<i>Technion – Israel Institute of Technology</i>
Andrzej Stankiewicz	<i>DSM Research</i>
Hugh Stitt	<i>Johnson Matthey Catalysts</i>
Bala Subramaniam	<i>University of Kansas</i>
Sankaran Sudaresan	<i>Princeton University</i>
Kai Sundmacher	<i>Max-Planck Inst.</i>
Theodore T. Tsotsis	<i>University of Southern California</i>
Arvind Varma	<i>Purdue University</i>
John Villadsen	<i>Technical University of Denmark</i>
Hung-Shan Weng	<i>National Cheng Kung University</i>
Gabriel Wild	<i>ENSIC CNRS Nancy France</i>
Koichi Yamada	<i>Seikei University</i>
Wei-Kang Yuan	<i>East China University of Science and Technology</i>
Po Lock Yue	<i>Hong Kong University of Science and Technology</i>

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	Minoru Seki	<i>Chiba University</i>
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	Tomohiko Tagawa	<i>Nagoya University</i>
	Satoshi Tsuneda	<i>Waseda University</i>
	Atsushi Tsutsumi	<i>University of Tokyo</i>
	Akihiro Yamasaki	<i>Seikei University</i>

Special Lecture

Room A, 16:10 – 16:50, Sun 7 Sep.

“Japanese chemical industry programs aimed at achieving sustainability”

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Yoshimitsu Kobayashi,
*President & CEO,
Mitsubishi Chemical Corporation*



Plenary 3:
Room A, Sep. 9, 9:00 – 9:40

“Process Intensification @ BASF”

10

Ferdinand Lippert,
*Senior Vice President,
Chemical Engineering,
BASF*



Plenary 4: Room A, Sep. 9, 17:00 – 17:40

“Reaction Engineering: Status and Future Challenges”

12

Milorad P. Dudukovic,
Prof., Washington University



Plenary Lectures

Plenary 1: Room A, 9:30 – 10:10, Mon 8 Sep.

“Chemical reaction engineering: History, recent developments, future scope”

6

Jaap C. Schouten,
*Prof., Eindhoven University of
Technology*



Plenary 5: Room A, Sep. 10, 9:00 – 9:40

“Coal liquefaction technologies— Development in China and chemical reaction engineering challenges”

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Zhenyu Liu,
*Prof., Beijing
University of
Chemical
Technology*



Plenary 2: Room A, 16:10 – 16:50, Mon 8 Sep.

“Towards a new of chemical reaction engineering — Supercritical hydrothermal synthesis of organic-inorganic hybrid nanoparticles—”

8

Tadafumi Adschiri,
Prof., Tohoku University



Plenary 6: Room A, Sep. 10, 15:50 – 16:30

“Coping with the challenges of energy and the environment: Emerging opportunities for reaction engineering”

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Dion Vlachos,
*Prof., University of
Delaware*



General information

Welcome Reception

Hall "Swan", Sun 7 Sep., 17:00 – 20:00

Welcome reception is held just after the special lecture by Mr. Yoshimitsu Kobayashi. The reception is informal and opened to all participants by following the good tradition of ISCRE. Drinks and snacks will be served by buffet style. Vegetarian dishes are also served.

Dinner during Poster Session

Hall "Swan", Mon 8 Sep., 18:00 – 20:00

Poster session is scheduled on Sep. 8, 17:00 – 20:00. Its first 1 h is devoted to discussion without meals. From 18:00 to 20:00 meals and drinks are served by buffet style to all participants by courtesy of supporting companies without extra charge. Vegetarian dishes are also served.

Conference Dinner

Restaurant "Sakura", Tue 9 Sep., 18:00 – 20:00

Conference dinner is sit-down dinner, but foods are served only to tables. Tables for vegetarian dishes are arranged.

Conference dinner is not included in the registration fee. Those who wish to join the conference dinner need separate tickets. A limited number of tickets will be available at the registration desk until 15:00, Sep. 8 by the first-come basis.

Lunch

Lunches are served by courtesy of supporting companies without extra charge, and are served by buffet style at Restaurant "Sakura" on Sep. 8, 9, and 10. Vegetarian dishes are also served.

Internet Access

Free access wireless LAN is available in the Main Lobby of the 1st floor of the Conference Center. Connection using a LAN cable is also available at the Business Center in the Main Lobby during the office hours (8:00 – 18:00). Several free access cables are available when you bring your own computer. Detailed information for connection is found at <http://www.icckyoto.or.jp/en/equip/network.html>

Program for accompanying persons

No official programs are arranged for accompanying persons. Tour desk of JTB is available next to the registration desk.

Conference Office Hours

Sunday, September 7	13:00 – 18:00
Monday, September 8	8:00 – 20:00
Tuesday, September 9	8:00 – 20:00
Wednesday, September 10	8:00 – 18:00

Registration

Online registration and on-site registration are available. Please register at the registration desk on the site after the online registration deadline of Sep. 3.

Registration Fees

Registration fee	before/on July 1	after/on July 2
Regular registration	JPY 60,000	JPY 70,000
Student registration	JPY 30,000	JPY 35,000
Accompanying person	JPY 10,000	JPY 10,000
Conference dinner fee	JPY 8,000	JPY 10,000

The regular registration and student registration include participation in all the technical sessions and reception as well as the Book of Abstracts, the Program Booklet, the conference bag, and the special issues published after the conference. The accompanying person registration includes all the meals.

Cancellations and Refunds

10% of the registration fee is charged as administration cost for cancellation received by July 1. 20% of the registration fee is reimbursed for cancellation received between July 2 and August 31. Thereafter no reimbursement will be made. However, the book of abstracts and the CD-ROMs of the special issues will be mailed for the cancellation received after July 2. Only written cancellations will be accepted.



Special issues

Special issues of *Chemical Engineering Science* and *Journal of Chemical Engineering of Japan* will be published for the ISCRE 20 papers in Dec. 2008 & Jan. 2009 (JCEJ) and in May 2009 (CES). CD-ROMs of the special issues will be delivered to the registered participants after the conference.

Language

The conference language is English.

Conference Venue

Kyoto International Conference Center (ICC Kyoto)
Takaragaike, Sakyo-ku, Kyoto 6060-01, Japan
Tel. +81-(0)75-705-1234
URL: <http://www.icckyoto.or.jp>

Symposium Secretariat

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URL: <http://www2.scej.org/iscre20/>

Guideline for Paper Presenters and Session Chairs

To Oral Presenters

- Computer-operated beamer projectors (LCD projectors) will be provided for presentation. No overhead projector for transparencies will be available.
- As a general rule, please bring your own laptop to connect to the projector for your presentation. If you are not able to bring a laptop, please bring a USB thumb drive storing your presentation file as a Microsoft Power Point file. Power Point 2007 file, pptx file, is not acceptable.
- The projector has only a usual analog mini D-sub 15 pin connector. Please bring an adapter for interface conversion if necessary.
- Oral presentations of contributed papers are strictly limited to 20 minutes, including time for discussion and a break for changing speakers.
- Each oral presenter must make contact with a session chair during the break right before the session including his/her presentation.
- It is recommended that presenters check if their presentation slides are properly projected on a screen before the morning plenary session or during the break before the session including their presentation.

To Poster Presenters

- The poster sessions will be held at the hall "Swan".
- Boards and pushpins for poster setup will be provided. Each board size is 900 mm W × 2100 mm H. Posters should be placed within the area of the board. A0 size (841 mm × 1189 mm) may be appropriate if the presenter wishes to prepare his/her poster as a single sheet.
- Poster presenters must put up their posters on the designated boards between 13:00 and 17:00 on Monday, September 8.
- Presenters must be present at their posters for at least two hours of the designated poster session period. Presenters can spend the rest of the period on meal.
- After the poster sessions are closed, posters must be taken away by the presenters by 20:30 on Monday, September 8. Posters left on the boards until the next morning will be discarded.

To Session Chairs

- Please be present at a session chair's desk during the break right before the session you chair and check if the presenters show up.
- Oral presentations of contributed papers are strictly limited to 20 minutes, including time for discussion and a break for changing speakers. Please manage to keep the schedule.
- If any presenter does not show up at the session's room, the time for the presenter should be a break and the session should be restarted on schedule.

Timetable

Sun 7th

13:00	Registration [Hallway, 1F]
16:00	Break
16:10	Special lecture: [Room A] <i>"Japanese chemical industry programs aimed at achieving sustainability"</i> Mr. Yoshimitsu Kobayashi, President & CEO, Mitsubishi Chemical Corporation (Chair: Prof. Toshinori Kojima, Seikei University)
16:50	Break
17:00	Reception (Buffet foods & drinks) ["Swan"]
19:00	

Opening Ceremony: (MC: Kouichi Miura) [Room A]
 Opening remark: Hiroshi Komiyaama, Chair of ISCRE 20

9:15 Welcome address
 Kanji Shono, President, the Society of Chemical Engineers, Japan

9:30 **Plenary 1:** [Room A]
 "Chemical reaction engineering: History, recent developments, future scope"
 Prof. Jaap C. Schouten, Eindhoven University of Technology
 (Chair: Prof. Gabriel Wild, ENSIC CNRS Nancy)

10:10 Coffee break (30 min) [Hallway, 2F]

1 **Session 1A1:** [Room A]
 Sustainable development
 (Chair: Prof. Hugo I. de Lasa, Prof. Satoshi Tsuneda)

10:40 1A01 Jing-Hong Zhou
 East China Univ. Sci. & Tech.

1A02 Henky Muljana
 University of Groningen

1A03 Roberto Lavecchia
 Sapienza University

1A04 Megumi Otsuka
 Akita Nat. College of Tech.

1K1: [Room K]
 Novel reactors & process development I
 (Chair: Prof. Theodore Tsotsis, Prof. Tomohiko Tagawa)

1K01 Ramesh Gupta
 Exxon Mobil Res. Eng.

1K02 Peter Bassler
 BASF SE

1K03 Gianpiero Groppi
 Politecnico di Milano

1K04 Kalyani Vishwas Pangarkar
 Delft University of Technology

1K2: [Room K]
 Novel reactors & process development II
 (Chair: Dr. Alberto Malandrino, Prof. Naotsugu Itoh)

1K05 Theodore Tsotsis
 University of Southern California

1K06 Aneta Pashkova
 DECHEMA e.V.

1I1: [Room I]
 Modeling & simulation I
 (Chair: Prof. Milos Marek, Prof. Moshe Sheintuch)

1I01 Saikat Chakraborty
 Indian Inst. Tech. - Kharagpur

1I02 Christelle A Herman
 Universite Libre de Bruxelles

1I03 G. Santhosh Reddy
 University of Houston

1I04 Hyuk Jae Kwon
 Pohang Univ. Sci. & Tech.

1H1: [Room H]
 Catalysts & catalytic reaction engineering I
 (Chair: Dr. Gunther Kolb, Prof. Shigeru Sugiyama)

1H01 Indranil Roy Choudhury
 Ghent University

1H02 Teruoki Tago
 Hokkaido University

1H03 Xinggui Zhou
 East China Univ. Sci. & Tech.

1H04 Yi-Chen Shen
 Yuan Ze University

1I2: [Room I]
 Modeling & simulation II
 (Chair: Dr. Saikat Chakraborty, Prof. Eugeny Y. Kenig)

1I05 Rodrigo J. G. Lopes
 University of Coimbra

1I06 Zeljko V. Kuzeljevic
 Washington University in St. Louis

1G1: [Room G]
 Materials processing I
 (Chair: Prof. Arvind Varma, Prof. Qin-Hui Zhang)

1G01 Shin Mukai
 Hokkaido University

1G02 Hideki Matsune
 Kyushu University

1G03 Zheng Zou
 Wuhan Institute of Technology

1H2: [Room H]
 Catalysts & catalytic reaction engineering II
 (Chair: Prof. Joris W. Thybaut, Dr. Yasushi Ozawa)

1H05 Hamza N. Mounzer
 Birmingham University

1H06 Stefania Specchia
 Politecnico di Torino

1G2: [Room G]
 Materials processing II
 (Chair: Prof. Tawatchai Charinpanitkul, Prof. S. Mukai)

1G05 Palghat A. Ramachandran
 Washington University in St. Louis

1G06 Jian-Guo Yu
 East China Univ. Sci. & Tech.

12:00 Lunch (1 h 10 min) ["Sakura"]

1 **Session 1A2:** [Room A]
 Energy & environment I
 (Chair: Prof. Erik Heeres, Prof. Adesoji A. Adesina)

1A05 Milos Marek
 Inst. Chem. Tech. - Prague

1A06 Isabella Nova
 Politecnico di Milano

2 **Session 1J2:** [Room J]
 Microreactors & micro-structured systems I
 (Chair: Prof. Minoru Seki, Dr. Christophe A. Serra)

1J05 Martin Wichert
 Institut für Mikrotechnik Mainz

1J06 Liubov Kiwi-Minsker
 Ecole polytech. fed. de Lausanne

13:50	1A07 Dan Luss University of Houston	1K07 Tomoya Inoue Nat. Inst. Adv. Ind. Sci. & Tech.	1J07 Jean-Marc Commenge CNRS-ENSIC	1I07 Teerasit Komkrajang Chulalongkorn University	1H07 Yupin Phuphuak Thammasat University	1G07 Qin-Hui Zhang East China Univ. Sci. & Tech.
14:10	1A08 Atsushi Iizuka The University of Tokyo	1K08 Giuseppe Barbieri Inst. Membr. Tech. NRC	1J08 Thomas R. Dietrich mikroglas chemtech	1I08 Juraj Slava Slovak University of Technology	1H08 Igor Schreiber Inst. Chem. Tech. - Prague	
14:30	Coffee break (30 min) [Hallway, 2F]					
1	Session 1A3: [Room A] Energy & environment II (Chair: Prof. Piyasan Praserttham, Prof. Adesoji A. Adesina)	Session 1K3: [Room K] Novel reactors & process development III (Chair: Dr. Tomoya Inoue, Prof. Theodore Tsotsis)	Session 1J3: [Room J] Microreactors & micro-structured systems II (Chair: Dr. Christophe A. Serra, Prof. Minoru Seki)	Session 1I3: [Room I] Modeling & simulation III (Chair: Dr. Jan J. Verstraete, Dr. Saikat Chakraborty)	Session 1H3: [Room H] Catalysts & catalytic reaction engineering III (Chair: Prof. Igor Schreiber, Dr. Yasushi Ozawa)	Session 1G3: [Room G] Materials processing III (Chair: Prof. Qin-Hui Zhang, Prof. S. Mukai)
15:00	1A09 Marco Hartmann University of Karlsruhe	1K09 Zeljko Kotanjac University of Twente	1J09 Jan J. Lerou Velocys	1I09 Anton Alvarez Instituto Mexicano del Petroleo	1H09 Son-Ki Ihm KAIST	1G09 Apinan Sootittantawat Chulalongkorn University
15:20	1A10 Alessandra Beretta Politecnico di Milano	1K10 Danai Poulidi Newcastle University	1J10 Stefan Loebbecke Fraunhofer ICT	1I10 Zdenek Grof Inst. Chem. Tech. - Prague	1H10 Hirotsuka Koga Kyushu University	1G10 Tawatchai Charinpanitkul Chulalongkorn University
15:40	1A11 Hiroyuki Hatano Nat. Inst. Adv. Ind. Sci. & Tech.	1K11 Christof Hamel Otto-von-Guericke-Universitat		1I11 Ulf Brinkmann Technical University of Dortmund	1H11 Gunther Kolb Institut für Mikrotechnik Mainz	
16:00	Break					
16:10	Plenary 2: [Room A] "Towards a new of chemical reaction engineering—Supercritical hydrothermal synthesis of organic-inorganic hybrid nanoparticles—" Prof. Tadafumi Adschiri, Tohoku University (Chair: Prof. Akira Igarashi, Kogakuin University)					
16:50	Break					
17:00	Poster sessions ["Swan"] Presentation: 17:00 – 20:00 Buffet foods & drinks: 18:00 – 20:00					
20:00						

9:00

Plenary 3: [Room A]**"Process intensification @ BASF"**

Dr. Ferdinand Lippert, Senior Vice President, Chemical Engineering, BASF

(Chair: Prof. In-Sik Nam, Pohang University of Science and Technology)

9:40

Coffee break (30 min) [Hallway, 2F]

2**Session 2A1:** [Room A]
Energy & environment III

(Chair: Prof. Kong-Wei Cheng, Prof. Yukitaka Kato)

2A01 Peter Heidebrecht
Max-Planck-Institute2A02 Arvind Varma
Purdue University2A03 Mohamed Halabi
Eindhoven Univ. Tech.2A04 Albin Pintar
National Institute of Chemistry2A05 Timo Roestenberg
Twente University2A06 Sander Noorman
University of Twente2A07 Hugo Ignacio de Lasa
University of Western Ontario2A08 Aharon Yuso Maddai
Technion-Israel Institute of Technology**Session 2K1:** [Room K]
Novel reactors & process development IV

(Chair: Prof. A. Seidel-Morgenstern, Prof. Yasushi Sekine)

2K01 Zhenhao Xi
East China Univ. Sci. & Tech.2K02 Marco Meeuwse
Eindhoven Univ. Tech.2K03 Axel de Broqueville
Inventor2K04 Bin Yang
Velocys2K05 Po-Lock Yue
Hong Kong Univ. Sci. & Tech.**Session 2J1:** [Room J]
Microreactors & micro-structured systems III

(Chair: Dr. Thomas R. Dietrich, Prof. Kazuhiko Mae)

2J01 Manuel Nau
Technical University of Dortmund2J02 Xiaolei Fan
University of Bath2J03 Georgios Stefanidis
University Delaware2J04 Cheng-Yu Pan
Yuan Ze University2J05 K.T. Zuidhof
Eindhoven Univ. Tech.**Session 2I1:** [Room I]
Modeling & simulation IV

(Chair: Prof. In-Sik Nam, Prof. Yun-jin Fang)

2I01 Gabriel Wild
Nancy-University2I02 Jan J. Verstraete
Institut Francais du Petrole - Lyon2I03 Jean-Marc Schweitzer
Institut Francais du Petrole - Lyon2I04 Cristina Ferreira
Institut Francais du Petrole**Session 2H1:** [Room H]
Biochemical reaction engineering

(Chair: Prof. Satoshi Tsuneda, Prof. Tuncer H. Ozdamar)

2H01 Tuncer H. Ozdamar
Ankara University2H02 Pinar Calik
Middle East Technical University2H03 Tuncer H. Ozdamar
Ankara University2H04 Jin Il Kim
Purdue University2H05 Rene Schenkendorf
Max Planck Institute DCTS**Session 2G1:** [Room G]
Fluidized bed & multiphase reactors I

(Chair: Dr. Tadaaki Shimizu, Dr. Ning Yang)

2G01 Mohsen Hamidipour
Laval University2G02 Dominique Toye
University of Liege2G03 Bhaskar D. Kulkarni
National Chemical Laboratory - Pune2G04 Jyeshtharaj B. Joshi
University of Mumbai

11:50

Lunch (1 h 20 min) ["Sakura"]

2**Session 2A2:** [Room A]
Energy & environment IV

(Chair: Prof. Bala Subramaniam, Dr. Tomoya Inoue)

2A06 Sander Noorman
University of Twente2A07 Hugo Ignacio de Lasa
University of Western Ontario2A08 Aharon Yuso Maddai
Technion-Israel Institute of Technology**Session 2K2:** [Room K]
Resource conversion I

(Chair: Prof. Atsushi Tsutsumi, Prof. Fernando V. Díez)

2K06 Caroline Gentric
CNRS2K07 Devkumar Fulchand Gupta
National Chemical Laboratory -2K08 Katrin Peizer
Fritz-Haber-Inst., Max-Planck-Soc.**Session 2J2:** [Room J]
Microreactors & micro-structured systems IV

(Chair: Prof. Marc-Olivier Coppens, Prof. David Agar)

2J06 Xing-Gui Zhou
East China Univ. Sci. & Tech.2J07 Laurent Falk
LSGC-CNRS2J08 Carine Rosenfeld
CNRS / Univ. Louis Pasteur**Session 2I2:** [Room I]
Modeling & simulation V

(Chair: Prof. Tapio Salmi, Dr. Kazuya Goto)

2I06 Eduardo Coselli
Vasco de Toledo
Petrobras SA2I07 Maarten K. Sabbe
Ghent University2I08 Yasuki Kansha
The University of Tokyo**Session 2H2:** [Room H]
Catalysts & catalytic reaction engineering IV

(Chair: Prof. Son-Ki Ihm, Prof. Takami Kat)

2H06 Qiang Zhang
Tsinghua University2H07 Kae S. Wong
University of Bath2H08 Sergey Nikolaevich Gorodsky
Moscow St. Ac. Fine Chem. Tech.**Session 2G2:** [Room G]
Fluidized bed & multiphase reactors II

(Chair: Dr. Jinsheng Wang, Prof. Sang Done Kim)

2G06 Ning Yang
Chinese Academy of Sciences2G07 Swapna S. Rabha
Indian Inst. Tech. - Delhi2G08 Holger Marschall
Technical University of Munich

14:10	Break					Session 2G3: [Room G] Fluidized bed & multiphase reactors III
2	Session 2A3: [Room A] Energy & environment V (Chair: Prof. Akihiro Yamasaki, Prof. Bala Subramaniam)	Session 2K3: [Room K] Resource conversion II (Chair: Prof. Zhi Guo Yan, Prof. Atsushi Tsutsumi)	Session 2J3: [Room J] Microreactors & micro-structured systems V (Chair: Prof. Laurent Falk, Prof. Marc-Olivier Coppens)	Session 2I3: [Room I] Modeling & simulation VI (Chair: Dr. Kazuya Goto, Dr. Jean-Marc Schweitzer)	Session 2H3: [Room H] Catalysts & catalytic reaction engineering V (Chair: Prof. Kai Sundmacher, Prof. Akira Igarashi)	Session 2G3: [Room G] Fluidized bed & multiphase reactors III (Chair: Prof. Jyeshtharaj Joshi, Dr. Jinsheng Wang)
14:20	2A09 Yudy Halim Tan Technical University of Dortmund	2K09 Takashi Nakae Seikei University	2J09 Evgeny Rebrov Eindhoven Univ. Tech.	2I09 Yun-jin Fang East China Univ. Sci. & Tech.	2H09 Debdut S. Roy The University of Kansas	2G09 Juan-David Llamas CNRS / Nancy Universities
14:40	2A10 Martin J. Tuinier University of Twente	2K10 Takaaki Wajima Akita University	2J10 Aras Ghaini Technical University of Dortmund	2I10 Subramanya V. Nayak Washington University in St. Louis	2H10 Dionisios G. Vlachos University of Delaware	2G10 Willie Nicol University of Pretoria
15:00	2A11 Yukitaka Kato Tokyo Institute of Technology	2K11 Nakorn Worasuwannarak King Mongkut's Univ. Tech.	2J11 David Agar Technical University of Dortmund	2I11 Tapio Salmi Abo Akademi University	2H11 Nilenindran Sundra Govender Eindhoven Univ. Tech.	2G11 Frank E. Stuber Universitat Rovira i Virgili
15:20	Coffee break (30 min) [Hallway, 2F]					
2	Session 2A4: [Room A] Energy & environment VI (Chair: Dr. Norikazu Nishiyama, Prof. Akihiro Yamasaki)	Session 2K4: [Room K] Resource conversion III (Chair: Prof. Fernando V. Díez, Prof. Zhi Guo Yan)	Session 2J4: [Room J] Microreactors & micro-structured systems VI (Chair: Prof. David Agar, Prof. Laurent Falk)	Session 2I4: [Room I] Modeling & simulation VII (Chair: Dr. Jean-Marc Schweitzer, Prof. Tapio Salmi)	Session 2H4: [Room H] Catalysts & catalytic reaction engineering VI (Chair: Prof. Akira Igarashi, Prof. Son-Ki Ihm)	Session 2G4: [Room G] Fluidized bed & multiphase reactors IV (Chair: Prof. Sang Done Kim, Prof. Jyeshtharaj Joshi)
15:50	2A12 Debora Fino Politecnico di Torino	2K12 Kazuaki Yamagiwa Niigata University	2J12 Petr Koci Inst. Chem. Tech. - Prague	2I12 Dagmar R. D'hooge Ghent University	2H12 Patrick W.A.M. Wenmakers Eindhoven Univ. Tech.	2G12 Shantanu Roy Indian Inst. Tech. - Delhi
16:10	2A13 Sebastian Zurcher Universitat Karlsruhe (TH)	2K13 Erik J. Heeres University of Groningen	2J13 Marc-Olivier Coppens Rensselaer Polytechnic Institute	2I13 Yann Le Moullec CNRS	2H13 Adesoji Adediran Adesina University of New South Wales	2G13 Vivek Vinayak Ranade National Chemical Laboratory - Pune
16:30	2A14 Bala Subramaniam University of Kansas		2J14 Hailong Hu Akita University		2H14 Frederic Augier Institut Français du Pétrole	2G14 Yuya Matsunaga Nagoya University
16:50	Break					
17:00	Plenary 4: [Room A] "Reaction engineering: Status and future challenges" Prof. Milorad P. Dudukovic, Washington University (Chair: Dr. Jan J. Lerou, Velocys)					
17:40	Invitation to ISCRE 21: Prof. S. Sunderesan, Chair of ISCRE 21 [Room A]					
17:50	Break					
18:00	Conference dinner ["Sakura"]					
20:00						

9:00 **Plenary 5:** [Room A]**"Coal liquefaction technologies— Development in China and chemical reaction engineering challenges"**

Prof. Zhenyu Liu, Beijing University of Chemical Technology

(Chair: Prof. Po-Loock Yue, Hong Kong University of Science and Technology)

9:40 **Coffee break** (30 min) [Hallway, 2F]**3** **Session 3A1:** [Room A]
Energy & environment
VII(Chair: Prof. Takuo Sugawara,
Prof. Masahiro Kishida)3A01 **Noriaki Sano**
University of Hyogo3A02 **Henri Delmas**
INPT3A03 **Tarek A. Gad Allah**
Seikei University3A04 **Jia-Ming Chern**
Tatung University3A05 **Benito Serrano**
Universidad de Zacatecas11:50 **Lunch** (1 h 20 min) ["Sakura"]**3** **Session 3A2:** [Room A]
Energy & environment
VIII(Chair: Prof. Jia-Ming Chern,
Prof. Toshinori Kojima)3A06 **Hui-Fang Cho**
National Chung Cheng University3A07 **Guan Ting Pan**
Nat. Taipei Univ. Tech.3A08 **Piyasan Prasertdam**
Chulalongkorn University**Session 3K1:** [Room K]
Novel reactors &
process development
V(Chair: Dr. Albin Pintar, Prof.
Kaoru Onoe)3K01 **Carla Sofia Pereira**
Porto University3K02 **Peter Lewis Silveston**
University of Waterloo3K03 **Naoki Tsuru**
The University of Tokyo3K04 **Tiefeng Wang**
Tsinghua University**Session 3K2:** [Room K]
Novel reactors &
process development
VI(Chair: Prof. Po-Loock Yue,
Prof. Choji Fukuhara)3K06 **Yasushi Sekine**
Waseda University3K07 **Yi Cheng**
Tsinghua University3K08 **Blanka Toukonniitty**
Ábo Akademi University**Session 3J1:** [Room J]
Fuel cells & electro-
chemical reaction
engineering I(Chair: Prof. Takao Masuda,
Prof. Manabu Ihara)3J01 **Michael Mangold**
Max Planck Institute DCTS3J02 **Motoaki Kawase**
Kyoto University3J03 **Nobuyoshi
Nakagawa**
Gumma University3J04 **Camilla Galletti**
Politecnico di Torino3J05 **Pannipha
Dokmaingam**
Joint Gra. Sch. Energy & Env.**Session 3J2:** [Room J]
Fuel cells & electro-
chemical reaction
engineering II(Chair: Prof. Nobuyoshi
Nakagawa, Prof. Motoaki
Kawase)3J06 **Hiroshi Fukunaga**
Shinshu University3J07 **Yongcheng Jin**
Tokyo Institute of Technology3J08 **Nunzio Russo**
Politecnico di Torino**Session 3I1:** [Room I]
Modeling & simulation
VIII(Chair: Prof. Enrico Tronconi,
Prof. Vemuri Balakotaiah)3I01 **Kazuuya Goto**
RITE3I02 **Yacine Haroun**
IFP / Inst. Mec. Fluid. Toulouse3I03 **Hannsjoerg Freund**
Max Planck Institute Magdeburg3I04 **Kenichi Mimura**
Utsunomiya University3I05 **Hyun T. Hwang**
University of Southern California**Session 3I2:** [Room I]
Modeling & simulation
IX(Chair: Dr. Yuichi Fujioaka,
Prof. Bela G. Lakatos)3I06 **Vemuri Balakotaiah**
University of Houston3I07 **Christophe A. Serra**
CNRS / Univ. Louis Pasteur3I08 **Bela G. Lakatos**
University of Pannonia**Session 3H1:** [Room H]
Catalysts & catalytic
reaction engineering
VII(Chair: Prof. Dion Vlachos,
Prof. Masahiko Matsukata)3H01 **Gregory Scott
Patience**
Ecole Polytechnique de Montreal3H02 **T. Alexander Nijhuis**
Eindhoven Univ. Tech.3H03 **C. P. Stemmet**
Eindhoven Univ. Tech.3H04 **Alan Thursfield**
Newcastle University3H05 **Suryanarayana
Prasad Vegendla**
Ghent University**Session 3H2:** [Room H]
Catalysts & catalytic
reaction engineering
VIII(Chair: Prof. Gregory S.
Patience, Dr. Norikazu
Nishiyama)3H06 **Binay K. Dutta**
Universiti Teknologi PETRONAS3H07 **Laura Torrente
Murciano**
Imperial College London3H08 **James Andrew
Bennett**
Birmingham University**Session 3G1:** [Room G]
Fluidized bed &
multiphase reactors V(Chair: Dr. Fabrizio Scala,
Prof. Juray De Wilde)3G01 **Wojciech Nowak**
Czesochowa Univ. Tech.3G02 **Tomasz Ozimowski**
BOT Elektrownia Turów SA3G03 **Rafal Pawel
Kobylecki**
Czesochowa Univ. Tech.3G04 **Changning Wu**
Tsinghua University**Session 3G2:** [Room G]
Fluidized bed &
multiphase reactors VI(Chair: Dr. Jaakko Juhani
Saastamoinen, Dr. Tadaaki
Shimizu)3G06 **Vaishali Suryawanshi**
Indian Inst. Tech. - Delhi3G07 **Evgeniy Burlutskiy**
Universite catholique de Louvain3G08 **Tadaaki Shimizu**
Niigata University

14:10	Coffee break (30 min) [Hallway, 2F]			
3	Session 3A3: [Room A] Energy & environment IX	Session 3K3: [Room K] Novel reactors & process development VII (Chair: Prof. Toshinori Kojima, Prof. Masahiro Kishida)	Session 3I3: [Room I] Modeling & simulation X (Chair: Prof. Bela G. Lakatos, Dr. Yuichi Fujioaka)	Session 3G3: [Room G] Fluidized bed & multiphase reactors VII (Chair: Dr. Tadaaki Shimizu, Prof. Yi Cheng)
14:40	3A09 Ryuichi Ashida Kyoto University	3K09 Ruediger von Watzdorf BASF SE	3I09 Enrico Tronconi Politecnico di Milano	3G09 Jaakko Juhani Saastamoinen VTT Tech. Res. Ctr. Finland
15:00	3A10 Pei-Shan Chen Yuan Ze University	3K10 T. P. Tiemersma University of Twente	3I10 Samir Bensaid Politecnico di Torino	3G10 Fabrizio Scala CNR
15:20	3A11 Dilek Varisli Middle East Technical University			3G11 Jinsheng Wang CANMET Energy Technology Ctr.
15:40	Break			
15:50	Plenary 6: [Room A] <i>"Coping with the challenges of energy and the environment: Emerging opportunities for reaction engineering"</i> Prof. Dion Vlachos, University of Delaware (Chair: Prof. Masahiko Matsukata, Waseda University)			
16:30	Closing remark: [Room A] Kouichi Miura, Vice chair of ISCRE 20			
17:00				

PA01	Fernando V. Diez University of Oviedo	PA02	Viatcheslav Kafarov Universidad Industrial de Santander	PA03	Hiroki Saito Seikei University	PA04	Olfa Daboussi Seikei University	PA05	Satoshi Funai Hokkaido University	PA06	Sung-ho Cho Korea Institute of Energy Research
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Session PA1: Energy & environment

PA15	Atsushi Iizuka The University of Tokyo	PA12	Penmetisa V. K. K. Varma Indian Inst. Tech. - Delhi	PA11	Ana Narvaez Imperial College London	PA10	Hui-Hsiu Chen Nat. Taipei Univ. Tech.	PA09	Kong-Wei Cheng Chang Gung University	PA08	Faisal M. Althenayan University of New South Wales	PA07	Mario G. Villaseñor Universidad Michoacana de San Nicolás de Hidalgo
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PA16	Shigeru Sugiyama The University of Tokushima	PA17	Jiawei Wang University of Birmingham	PA18	Sang Wook Park Pusan National University	PA19	Zhi Guo Yan Wuhan Institute of Technology	PA20	Risa Arai Chuo University	PA21	Viviana Manuela Silva Porto University	PA22	Takuro Sakatsume Niigata University	PA23	Takafumi Sato Utsumomiya University	PA24	Daisuke Fukuoka Chiba Institute of Technology
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Session PA2: Sustainable development

Session PA3: Resource conversion

Session PB1: Modeling & simulation

PB08	Saurabh Y. Joshi University of Houston	PB07	Feng He East China Univ. Sci. & Tech.	PB06	Tai-Shang Chen Tatung University	PB05	Mayu Kuroki Tokyo Institute of Technology	PB04	Pekka Alfred Oinas Oulu Research Center	PB03	Hiroyuki Tominaga Tokyo Univ. Agric. & Tech.	PB02	Lenka Schreiberova Inst. Chem. Tech. - Prague	PB01	Christophe E. Wylock Free University of Brussels	PA25	Alexander Kronberg Encontech
PB09	Choji Fukuhara Shizuoka University	PB10	Yoshinisa Matsushita Tokyo Institute of Technology	PB11	Yoshihito Okubo Kyoto University	PB12	Salah H.M. Ajjbour Nagoya University	PB13	Kazuo Matsuyama Kao Corporation	PB14	Jose Rafael Hernandez Abo Akademi University	PB15	Giulia Bozzano Politecnico di Milano	PB16	Clemens Minnich RWTH Aachen University	PB17	Juergen Antes Fraunhofer ICT

Session PB2: Microreactors & micro-structured systems

Session PB3: Novel reactors & process development

PB26 Kang Seok Go KAIST	PB25 Takami Kai Kagoshima University	PB24 Jean-Pierre Leclerc LSGC	PB23 Volker M. Zahn Max Planck Institute DCTS	PB22 Toshinobu Shigematsu Sasebo Nat. College of Tech.	PB21 Anne-Marie Wilhelm Université de Toulouse	PB20 Roman Tschentscher Eindhoven Univ. Tech.	PB19 Ian Saxley Metcalfe Newcastle University	PB18 Naotsugu Itoh Utsunomiya University
PB27 Yong Kang Chungnam National University	PB28 Yun Yao Qingdao Univ. Sci. & Tech.	PB29 Rajesh K. Upadhyay Indian Inst. Tech. - Delhi	PC01 Dae-Won Park Pusan National University	PC02 Manju Mampambath Dhaman Pusan National University	PC03 You Jung Kim Seoul National University	PC04 Ji Bong Joo Seoul National University	PC05 Jun Zhu East China Univ. Sci. & Tech.	

Session PB4: Fluidized bed & multiphase reactors

Session PC1: Catalysts & catalytic reaction engineering

PC14 Masatoshi Nagai Tokyo Univ. Agric. & Tech.	PC13 Keizo Nakagawa The University of Tokushima	PC12 Surachai Artkia Suranaree University of Technology	PC11 Ji Sun Yun KAIST	PC10 Yasushi Ozawa Central Res. Inst. Electric Pow. Ind.	PC09 Yoshihiro Kawamura CASIO Computer	PC08 Yun-Fei Sun East China Univ. Sci. & Tech.	PC07 Kyung-ran Hwang Korea Institute of Energy Research	PC06 Wen-Xin Lu East China Univ. Sci. & Tech.
PC15 Hirotake Ishihara Kyushu University	PC16 Seong-Soo Hong Pukyong National University	PC17 Divesh Bhatia University of Houston	PC18 Shinji Kudo Kyoto University	PC19 Adrian Schumpe Braunschweig Univ. Tech.	PC20 Yang Ji East China Univ. Sci. & Tech.	PC21 Jun Wei Ge Wuhan Institute of Technology	PC22 Yuta Nakasaka Hokkaido University	PC23 Maria Olea Teesside University

Session PC2: Biochemical reaction engineering

PC30 Takaaki Tanaka Niigata University	PC29 Li Wang Shenyang Inst. Chem. Tech.	PC28 Wlodzimierz Sokol Univ. Tech. & Life Sci.	PC27 Dwaipayan Mukherjee Indian Inst. Tech. - Kharagpur	PC26 Alberto Cincotti Universita di Cagliari	PC25 Manuel L. Nunez Colombian Petroleum Institute	PC24 Kening Gong University of Kansas
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connected to
the row below

PC4: FCs & electrochem. react. eng.

PC35 Sunmook Lee The University of Tokyo	PC34 Amornchai Arpornwichanop Chulalongkorn University	PC33 Giacomo Cao University of Cagliari	PC32 Shinsuke Mori Tokyo Institute of Technology	PC31 Masakazu Matsumoto Chiba Institute of Technology
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connected to
the row above

Room A Mon 8th

Session 1A1: Sustainable development

Chair: Prof. Hugo I. de Lasa, *University of Western Ontario*,
Prof. Satoshi Tsuneda, *Waseda University*

(10:40 – 12:00)

- 1A01 **Hydrogenolysis of sorbitol to glycols over carbon nanofibers supported ruthenium catalysts** 24
Jing-Hong Zhou, Long Zhao, Zhi-Jun Sui, Xing-Gui Zhou
East China University of Science and Technology, State Key Laboratory of Chemical Engineering
- 1A02 **Green starch conversions: Studies on starch acetylation in supercritical CO₂** 26
Henky Muljana, Francesco Picchioni, Hero Heeres, Leon Janssen
University of Groningen, Department of Chemical Engineering
- 1A03 **Turning tomato processing waste into a valuable source of lycopene through enzymes** 28
Roberto Lavecchia, Antonio Zuorro
Sapienza University, Department of Chemical Engineering
- 1A04 **Photodecomposition of ethylene with hydrogen peroxide** 30
Katsuyasu Sugawara¹, Takuo Sugawara¹,
Hideaki Suzuki¹, Megumi Otsuka², Hitoshi Funayama²
¹Akita University; ²Akita National College of Technology

Session 1A2: Energy & environment I

Chair: Prof. Erik Heeres, *University of Groningen*,
Prof. Adesoji A. Adesina, *University of New South Wales*

(13:10 – 14:30)

- 1A05 **Effects of an upstream-located diesel oxidation catalyst on the performance of NO_x storage and reduction catalyst** 34
Jan Stepanek¹, Frantisek Plat¹, Petr Koci¹, Milos Marek¹,
Milan Kubicek²
¹Institute of Chemical Technology - Prague, Department of Chemical Engineering; ²Institute of Chemical Technology - Prague, Department of Mathematics
- 1A06 **Influence of the substrate properties on the performance of NH₃-SCR monolithic catalysts for the aftertreatment of diesel exhausts** 36
Isabella Nova¹, Enrico Tronconi¹, Thorsten Boger², Tom Collins³, Achim K. Heibel³
¹Politecnico di Milano, Dipartimento di Energia; ²Corning GmbH; ³Corning Inc., Diesel Technology Development, USA
- 1A07 **Behavior features of soot combustion in diesel particulate filter** 38
Karen Martirosyan, K. Chen, Dan Luss
University of Houston
- 1A08 **Characteristics and reactivity of waste cement particles for the desulfurization process** 40
Jiawei Wu¹, Atsushi Iizuka¹, Kazukiyo Kumagai¹, Akihiro Yamasaki², Yukio Yanagisawa¹
¹The University of Tokyo, Institute of Environmental Studies; ²Seikei University

Session 1A3: Energy & environment II

Chair: Prof. Piyasan Praserttham, *Chulalongkorn University*,
Prof. Adesoji A. Adesina, *University of New South Wales*

(15:00 – 16:00)

- 1A09 **Catalytic partial oxidation of higher hydrocarbons over rhodium catalysts:**

An experimental and numerical study 44

Marco Hartmann, Lubow Maier, Hoang Duc Minh, Olaf Deutschmann
University of Karlsruhe, Institute for Chemical Technology and Polymer Chemistry

- 1A10 **Experimental and theoretical investigation on the transient and steady state behaviour of a catalytic partial oxidation reformer** 46
Matteo Lualdi, Ivan Tavazzi, Alessandra Beretta, Gianpiero Groppi, Alessandro Donazzi, Pio Forzatti
Politecnico di Milano, Dipartimento di Energia
- 1A11 **Low temperature gasification using lattice oxygen** 48
Hiroyuki Hatano
Advanced Industrial Science and Technology

Room G Mon 8th

Session 1G1: Materials processing I

Chair: Prof. Arvind Varma, *Purdue University*,
Prof. Qin-Hui Zhang, *East China University of Science and Technology*

(10:40 – 11:40)

- 1G01 **Synthesis of a unique monolithic silica microhoneycomb including 12-molybdo-phosphoric acid using the ice templating method** 52
Shin Mukai, Masatoshi Hashimoto, Shinya Murata
Hokkaido University, Division of Chemical Process Engineering
- 1G02 **Preparation of hollow nanosphere with double layer consisting of hydrophilic and hydrophobic copolymer** 54
Hideki Matsune, Daisuke Sakurai, Sakae Takenaka, Masahiro Kishida
Kyushu University
- 1G03 **Preparation and microwave absorption properties of Fe₃O₄ nano-particles by copper/iron ore cinder** 56
Zheng Zou, Ai Guo Xuan, Zhi Guo Yan, Yuan Xin Wu, Ning Li
Wuhan Institute of Technology, School of Chemical Engineering and Pharmacy; Key Laboratory for Green Chemical Process of Ministry of Education; Hubei Key Lab of Novel Chemical Reactor & Green Chemical Technology

Session 1G2: Materials processing II

Chair: Prof. Tawatchai Charinpanitkul, *Chulalongkorn University*,
Prof. Shin Mukai, *Hokkaido University*

(13:10 – 14:10)

- 1G05 **Global model for oxygen transport in 300mm Czochralski crystal growth of pure silicon in presence of CUSP magnetic field** 60
Prashant R Gunjal¹, Milind S Kulkarni², Palghat A. Ramachandran¹
¹Washington University in St. Louis, Department of Eng. Env. and Chemical Engineering; ²MEMC
- 1G06 **Lithium selective adsorption on low-dimensional titania nanoribbons** 62
Qin-Hui Zhang, Shao-Peng Li, Shu-Ying Sun, Xian-Sheng Yin, Jian-Guo Yu
East China University of Science and Technology, State Key Lab of Chemical Engineering

1G07 **LiMn₂O₄ spinel direct synthesis and lithium ion selective adsorption** 64
 Qin-Hui Zhang, Shu-Ying Sun, Shao-Peng Li, Xian-Sheng Yin, Jian-Guo Yu
 East China University of Science and Technology, State Key Lab of Chemical Engineering

Session 1G3: Materials processing III

Chair: Prof. Qin-Hui Zhang, East China University of Science and Technology,
 Prof. Shin Mukai, Hokkaido University

(15:00 – 15:40)

- 1G09 **Effect of reaction temperature and sonication pretreatment in the hydrothermal process on the morphology of titanate nano-structure** 68
 Nawin Viriya-empikul¹, Tawatchai Charinpanitkul², Noriaki Sano³, Apinan Soottitantawat², Takeyuki Kikuchi⁴, Kajornsak Faungnawakij¹, Wiwut Tanthapanichakoon¹
¹National Science and Technology Development Agency, National Nanotechnology Center; ²Chulalongkorn University, Department of Chemical Engineering, Center of Excellence in Particle Technology; ³Kyoto University, Department of Chemical Engineering; ⁴University of Hyogo, Department of Engineering Science
- 1G10 **Composite of MWCNT/PMMA for gaseous toluene detection** 70
 Amornwong Srisurichan¹, Adi Ilcham¹, Apinan Soottitantawat¹, Yongyuth Wanna², Noriaki Sano³, Tawatchai Charinpanitkul¹
¹Chulalongkorn University; ²National Nanotechnology Center; ³University of Hyogo

Room H Mon 8th

Session 1H1: Catalysts & catalytic reaction engineering I

Chair: Dr. Gunther Kolb, Institut für Mikrotechnik Mainz GmbH,
 Prof. Shigeru Sugiyama, The University of Tokushima

(10:40 – 12:00)

- 1H01 **A hybrid single event microkinetic (SEMK) model for the synergy between shape selective and non selective bifunctional zeolites** 74
 Indranil Roy Choudhury¹, J. W. Thybaut¹, P. Balasubramanian¹, J. F. M. Denayer², J. A. Martens³, G. B. Marin¹
¹Ghent University, Laboratory for Chemical Technology; ²Vrije Universiteit Brussel, Department of Chemical Engineering; ³K.U. Leuven, Centre for Surface Chemistry and Catalysis
- 1H02 **Control of acid-site location of MFI zeolite by catalytic cracking of silane and its application to olefin synthesis from acetone** 76
 Teruoki Tago¹, Mariko Sakamoto¹, Kazuyuki Iwakai¹, Hiroto Nishihara², Shin R. Mukai¹, Tunchiro Tanaka³, Takao Masuda¹
¹Hokkaido University, Division of Chemical Process Engineering; ²Tohoku University, Institute of Multidisciplinary Research for Advanced Materials; ³Kyoto University, Division of Molecular Engineering
- 1H03 **Ammoxidation of cyclohexanone over TS-1/CNF catalyst** 78
 Qian Zhao¹, Xingguo Zhou¹, Ping Li¹, Weikang Yuan¹, Alex Chi-Kin Yip², Xijun Hu²
¹East China University of Science and Technology, State Key Laboratory of Chemical Engineering; ²Hong Kong University of Science and Technology, Department of Chemical Engineering

1H04 **Desulfurization of gasoline and diesel by adsorption with Cu(I)-Y zeolite and α -alumina** 80
 Kuen-Song Lin, Yi-Chen Shen, Pei-Shan Chen, Ze-Ping Wang
 Yuan Ze University, Department of Chemical Engineering & Materials Science

Session 1H2: Catalysts & catalytic reaction engineering II

Chair: Prof. Joris W. Thybaut, Ghent University,
 Prof. Masahiko Matsukata, Waseda University

(13:10 – 14:30)

- 1H05 **Heterogeneous oxidation of 2-octanol on 5%Pt-1%Bi/carbon** 84
 Hamza N. Mounzer¹, Joe Wood¹, Hugh Stitt²
¹Birmingham University, Department of Chemical Engineering; ²Johnson Matthey Catalysts
- 1H06 **Ageing mechanisms on PdOx based catalysts for natural gas combustion in premixed burners** 86
 Stefania Specchia¹, Pietro Palmisano¹, Elisabetta Finocchio², Guido Busca², Guido Saracco¹
¹Politecnico di Torino, Department of Materials Science and Chemical Engineering; ²Universita di Genova, Department of Chemical and Process Engineering
- 1H07 **Effect of Ni doping on ceria magnesium oxide nanosize catalysts for CO oxidation** 88
 Yupin Phuphuak¹, Nurak Grisdanurak¹
¹Thammasat University, Department of Chemical Engineering; ²National Center of Excellence for Environmental and Hazardous Waste Management
- 1H08 **Network analysis of synergic dynamic effects of simultaneous oxidation and reduction in three-way catalytic converters** 90
 Otto Hadac¹, Martin Kohout¹, Milan Kubicek², Milos Marek¹, Igor Schreiber¹
¹Institute of Chemical Technology - Prague, Department of Chemical Engineering & Center for Nonlinear Dynamics of Chemical and Biological Systems; ²Institute of Chemical Technology - Prague, Department of Mathematics & Center for Nonlinear Dynamics of Chemical and Biological Systems

Session 1H3: Catalysts & catalytic reaction engineering III

Chair: Prof. Igor Schreiber, Institute of Chemical Technology – Prague,
 Prof. Masahiko Matsukata, Waseda University

(15:00 – 16:00)

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¹*Delft University of Technology, Catalysis Engineering / Delft University of Technology, Process and Product Engineering*; ²*Paul Scherrer Institut, Laboratory for Energy and Materials Cycles*; ³*Delft University of Technology, Process and Product Engineering*; ⁴*Delft University of Technology, Catalysis Engineering*

Session 1K2: Novel reactors & process development IIChair: Dr. Alberto Malandrino, *ENI SpA*,
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Room G Tue 9th

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Chair: Dr. Tadaaki Shimizu, *Niigata University*,
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Chair: Prof. Son-Ki Ihm, *KAIST*, Prof. Takami Kai, *Kagoshima University*
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Chair: Prof. Akira Igarashi, *Kogakuin University*,
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Chair: Prof. In-Sik Nam, *Pohang University of Science and Technology*,
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(10:10 – 11:30)

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Chair: Prof. Tapio Salmi, *Åbo Akademi University*,
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Chair: Dr. Kazuya Goto, *RITE*,
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¹Abo Akademi, Process chemistry centre; ²Kemira research centre

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Chair: Dr. Jean-Marc Schweitzer, Institut Français du Pétrole - Lyon,
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Chair: Dr. Thomas R. Dietrich, mikrogas chemtech,
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Prof. David Agar, Technical University of Dortmund

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¹East China University of Science & Technology, State Key Laboratory of Chemical Engineering; ²LOCIE-Universite de Savoie

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Prof. Marc-Olivier Coppens, Rensselaer Polytechnic Institute

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¹Technical University of Dortmund, Department of Biochemical and Chemical Engineering; ²National Chemical Laboratory - Pune, Catalysis, Reactors and Separation Unit & Indian Institute of Technology - Mumbai, Chemical Engineering Department; ³National Chemical Laboratory - Pune, Catalysis, Reactors and Separation Unit

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Room A Wed 10th

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Prof. Masahiro Kishida, *Kyushu University*

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Chair: Prof. Toshinori Kojima, *Seikei University*,
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Room G Wed 10th

Session 3G1: Fluidized bed & multiphase reactors V

Chair: Dr. Fabrizio Scala, *CNR, Istituto di Ricerche sulla Combustione*,
Prof. Juray De Wilde, *Universite catholique de Louvain*

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Room H Wed 10th	
Session 3H1: Catalysts & catalytic reaction engineering VII	
Chair: Prof. Dion Vlachos, <i>Univ. of Delaware, Department of Chemical Engineering</i> , Prof. Masahiko Matsukata, <i>Waseda University</i>	
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	¹ Max Planck Institute Magdeburg, Physical and Chemical Process Engineering; ² University of Erlangen-Nuremberg, Department of Chemical Reaction Engineering; ³ University of Erlangen-Nuremberg, Regionales Rechenzentrum Erlangen	
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	¹ University of Southern California, Mork Family Department of Chemical Engineering and Materials Science; ² Media and Process Technology, Inc.	

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Chair: Prof. Takao Masuda, *Hokkaido University*,
Prof. Bela G. Lakatos, *University of Pannonia*

(13:10 – 14:10)

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	University of Pannonia, Department of Process Engineering	

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Prof. Takao Masuda, *Hokkaido University*

(14:40 – 15:20)

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	¹ Politecnico di Milano, Dipartimento di Energia; ² Daimler AG, Abteilung GR/VPE	
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Chair: Prof. Takao Masuda, *Hokkaido University*,
Prof. Manabu Ihara, *Tokyo Institute of Technology*

(10:10 – 11:50)

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	¹ The Joint Graduate School of Energy and Environment; ² Chulalongkorn University	

Session 3J2: Fuel cells & electrochemical reaction engineering II

Chair: Prof. Nobuyoshi Nakagawa, *Gunma University*,
Prof. Motoaki Kawase, *Kyoto University*

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	¹ Shinshu University, Department of Fine Materials Engineering; ² The University of Tokyo	
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Room K Wed 10th**Session 3K1: Novel reactors & process development V**

Chair: Dr. Albin Pintar, *National Institute of Chemistry, Slovenia*,
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¹*Abo Akademi University, Department of Industrial Chemistry and Reaction Engineering*; ²*Abo Akademi University, Heat Engineering Laboratory*

Session 3K3: Novel reactors & process development VII

Chair: Prof. Choji Fukuhara, *Shizuoka University*,
Prof. Po-Lock Yue, *Hong Kong University of Science and Technology*

(14:40 – 15:20)

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¹*BASF SE, Reaction Engineering*; ²*DEG Engineering*
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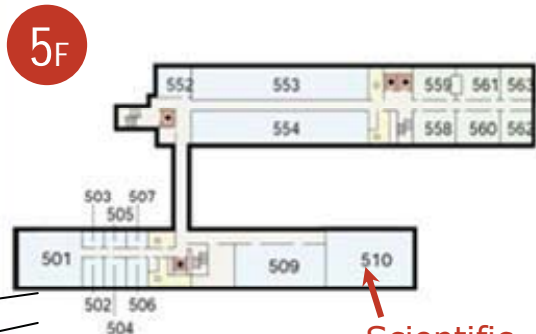
Room layout

Kyoto International Conference Center

Room J
[Microreactors & microstructured systems, Fuel cells & electrochemical reaction engineering]

Room I
[Modeling & simulation]
(120 m², 30–80 chairs each)

Room K
[Resource conversion, Novel reactors & process development]



Scientific Committee meeting

2F



Room A
[Plenary, Sustainable development, Energy & environment]
(950 m², 250–500 chairs)

Subway
K01 Kokusaikaikan exit

Room H
[Catalysts & catalytic reaction engineering, Biochemical reaction engineering]

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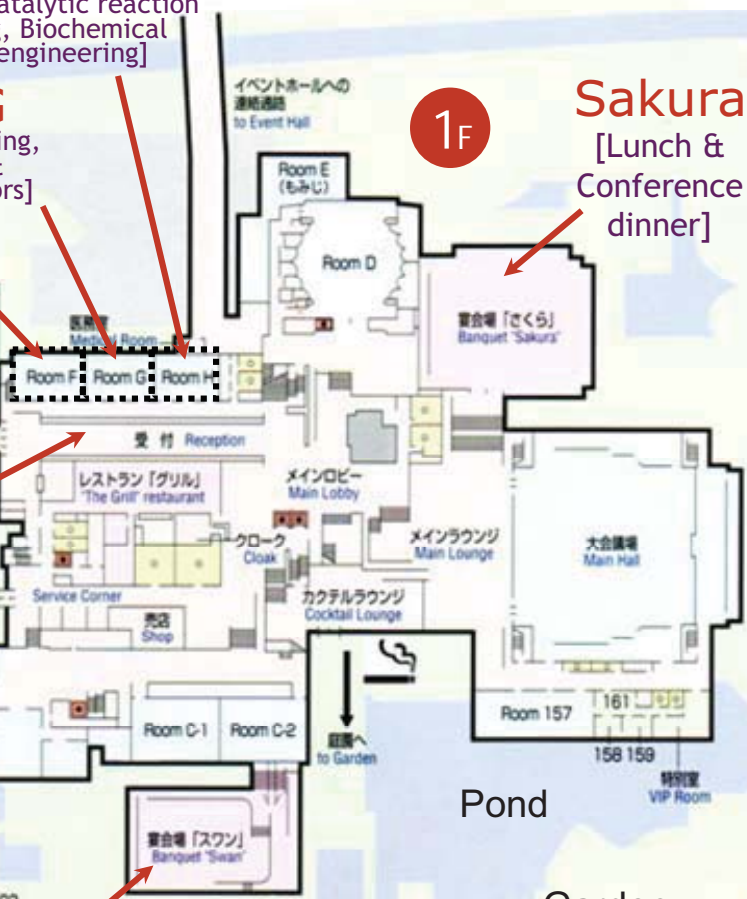
ISCRE secretariat office

Sakura
[Lunch & Conference dinner]

京都宝ヶ池プリンスホテル
Kyoto Takaragaike Prince Hotel

Main entrance

Registration



Swan [Reception & Poster session]

Pond

Garden

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Supporting organizations

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