

## STREAM II HALL II

SEPTEMBER 13, Monday

### Section II. CHEMICAL REACTION ENGINEERING AND REACTOR DESIGN—NOVEL EXPERIMENTAL APPROACHES, MODELING, SCALE-UP AND OPTIMIZATION

**Chairperson:** Professor Mikhail Sinev, Semenov Institute of Chemical Physics RAS, Moscow, Russia

06.40–07.00 08.40–09.00	OP-II-1	<b>Kersten S.R.A.</b> <b>CONVERSION OF METHANE INTO HYDROGEN OR OLEFINS: A STUDY EVALUATING DIFFERENT REACTORS</b> <i>University of Twente, the Netherlands</i>
07.00–07.20 09.00–09.20	OP-II-2	<b>Nardi L., Maestri M.</b> <b>KINETIC INSIGHTS INTO CO<sub>2</sub> ACTIVATION VIA REVERSE WATER - GAS SHIFT ON Rh CATALYSTS</b> <i>Politecnico di Milano, Milan, Italy</i>
07.20–07.40 09.20–09.40	OP-II-3	<b>Vandewalle L.A.<sup>1</sup>, Geerts M.<sup>1,2</sup>, Reyniers P.A.<sup>2</sup>, Marin G.<sup>1</sup>, Van Geem K.<sup>1</sup></b> <b>COMPUTATIONAL FLUID DYNAMICS SIMULATION OF DECOKING IN STEAM CRACKING REACTORS</b> <sup>1</sup> <i>Ghent University, Ghent, Belgium</i> <sup>2</sup> <i>BASF Antwerpen, Antwerpen, Belgium</i>
07.40–08.00 14.40–15.00	OP-II-4	<b>Ignatov A.S.<sup>1,2</sup>, Vernikovskaya N.V.<sup>1,2</sup>, Chumachenko V.A.<sup>1</sup></b> <b>MATHEMATICAL MODELING OF AMMONIA OXIDATION TO NITROUS OXIDE IN MICROCHANNEL REACTOR</b> <sup>1</sup> <i>Boreskov Institute of Catalysis SB RAS, Novosibirsk, Russia</i> <sup>2</sup> <i>Novosibirsk State Technical University, Novosibirsk, Russia</i>
08.00–08.20 10.00–10.20	OP-II-5	<b>Saufi A.<sup>1</sup>, Frassoldati A.<sup>1</sup>, Faravelli T.<sup>1</sup>, Cuoci A.<sup>1</sup>, Calabria R.<sup>2</sup>, Chiariello F.<sup>2</sup>, Massoli P.<sup>2</sup></b> <b>CFD MODELING OF THE EVAPORATION, AUTO-IGNITION AND COMBUSTION OF DROPLETS OF FPBO SURROGATE COMPONENTS</b> <sup>1</sup> <i>Politecnico di Milano, Milan, Italy</i> <sup>2</sup> <i>Istituto Motori, ICT and Technologies for Energy and Transportation, National Research Council of Italy, Naples, Italy</i>

**08.20–08.40**      **OP-II-6**      **Cuoci A.<sup>1</sup>, Frassoldati A.<sup>1</sup>, Faravelli T.<sup>1</sup>, Lui M.<sup>2</sup>, Marchitti F.<sup>2</sup>, Passoni R.<sup>2</sup>**  
**10.20-10.40**      **NUMERICAL MODELING OF CHEMICAL VAPOR INFILTRATION (CVI) WITH DETAILED HOMOGENEOUS AND HETEROGENEOUS KINETICS**  
*<sup>1</sup>Politecnico di Milano, Milan, Italy*  
*<sup>2</sup>Brembo SpA, Curno, Italy*

**08.40–09.00 Coffee break**

## **Section II. CHEMICAL REACTION ENGINEERING AND REACTOR DESIGN–NOVEL EXPERIMENTAL APPROACHES, MODELING, SCALE-UP AND OPTIMIZATION**

**Chairperson: Dr. Anthony Basuni Hamzah, Tokyo Institute of Technology, Japan**

**09.00–09.20**      **OP-II-7**      **Di Serio M.<sup>1</sup>, Russo V.<sup>1,2</sup>, Hreczuch W.<sup>3</sup>**  
**11.00-11.20**      **MICROREACTOR MODELLING FOR ETHOXYLATION REACTIONS**  
*<sup>1</sup>University of Naples Federico II, Naples, Italy*  
*<sup>2</sup>Åbo Akademi University, Turku/Åbo, Finland*  
*<sup>3</sup>MEXEO, Kędzierzyn-Koźle, Poland*

**09.20–09.40**      **OP-II-8**      **Kocic S.<sup>1</sup>, Philippe R.<sup>1</sup>, Nikitine C.<sup>1</sup>, Coudercy C.<sup>1</sup>, Afanasiev P.<sup>2</sup>, Loridant S.<sup>2</sup>, Fongarland P.<sup>2</sup>**  
**11.20-11.40**      **APPRAISAL AND MODELLING OF INTERNAL MASS TRANSFER LIMITATIONS IN LIGHT OLEFINS SYNTHESIS USING BIFUNCTIONAL CATALYSTS (OX-ZEO PROCESS)**  
*<sup>1</sup>Lyon–Université Lyon 1, Villeurbanne, France*  
*<sup>2</sup>University of Lyon, Université Claude Bernard Lyon 1, Research Institute for Catalysis and Environment of Lyon (IRCELYON), Villeurbanne, France*

**09.40–10.00**      **OP-II-9**      **Fratolocchi L., Groppi G., Visconti C.G., Lietti L., Tronconi E.**  
**11.40-12.00**      **TOWARDS THE OPTIMIZATION OF THE INTERNALS DESIGN TO BOOST THE HEAT TRANSFER PERFORMANCES OF COMPACT FISCHER-TROPSCH REACTORS**  
*Politecnico di Milano, Milan, Italy*

**10.00–10.30 Coffee break**

## SEPTEMBER 14, Tuesday

### Section II. CHEMICAL REACTION ENGINEERING AND REACTOR DESIGN—NOVEL EXPERIMENTAL APPROACHES, MODELING, SCALE-UP AND OPTIMIZATION

**Chairperson: Professor Sascha Kersten, University of Twente, The Netherlands**

<b>06.40–07.00</b> <b>15.40-16.00</b>	<b>OP-II-10</b>	<b>Fukuda T.<sup>1</sup>, Hamzah A.B.<sup>2</sup>, Ookawara S.<sup>2,3</sup>, Yoshikawa S.<sup>2</sup>, Matsumoto H.<sup>2</sup></b> <b>CATALYTIC WALL PLATE MICROREACTOR STRUCTURALIZED FOR REACTANTS' ADVECTIVE TRANSPORT IMPROVEMENT IN DRY REFORMING OF METHANE</b> <i><sup>1</sup>National Institute of Advanced Industrial Science and Technology, Sendai, Japan</i> <i><sup>2</sup>Tokyo Institute of Technology, Tokyo, Japan</i> <i><sup>3</sup>Egypt-Japan University of Science and Technology, Alexandria, Egypt</i>
<b>07.00–07.20</b> <b>09.00-09.20</b>	<b>OP-II-11</b>	<b>Angulo M.<sup>1</sup>, Agirre I.<sup>1</sup>, Arratibel A.<sup>2</sup>, Llosa M.A.<sup>2</sup>, Pacheco D.A.<sup>2</sup>, Barrio V.L.<sup>1</sup>, Arias P.L.<sup>1</sup></b> <b>PORE THROUGH REACTORS, DEVELOPMENT, CHARACTERIZATION AND ACTIVITY TESTS</b> <i><sup>1</sup>Basque Country University, Bilbao, Spain</i> <i><sup>2</sup>Tecnalia Research &amp; Innovation, Donostia-San Sebastián, Spain</i>
<b>07.20–07.40</b> <b>14.20-14.40</b>	<b>OP-II-12</b>	<b>Kozhevnikov I.V.<sup>1</sup>, Chibiryayev A.M.<sup>1,2</sup>, Martyanov O.N.<sup>1,2</sup></b> <b>CONTINUOUS-FLOW REACTOR FOR ONE-STEP PRODUCING TETRAMETHYL ORTHOSILICATES FROM SILICA MATERIALS IN SUPERCRITICAL METHANOL</b> <i><sup>1</sup>Boreskov Institute of Catalysis SB RAS, Novosibirsk, Russia</i> <i><sup>2</sup>Novosibirsk State University, Novosibirsk, Russia</i>
<b>07.40–08.00</b> <b>14.40-15.00</b>	<b>OP-II-13</b>	<b>Kuznetsov V.L.<sup>1</sup>, Moseenkov S.I.<sup>1</sup>, Zavorin A.V.<sup>1</sup>, Golubtsov G.V.<sup>1</sup>, Goidin V.V.<sup>1</sup>, Rabinovich O.S.<sup>2</sup>, Malinovski A.I.<sup>2</sup>, Lyah M.Yu.<sup>2</sup></b> <b>INFLUENCE OF CATALYST CHARACTERISTICS ON THE FORMATION OF MWCNT - AGGLOMERATES DURING SYNTHESIS IN A FLUIDIZED BED REACTOR</b> <i><sup>1</sup>Boreskov Institute of Catalysis SB RAS, Novosibirsk, Russia</i> <i><sup>2</sup>A.V. Luikov Heat and Mass Transfer Institute, Minsk, Republic of Belarus</i>
<b>08.00–08.20</b> <b>10.00-10.20</b>	<b>OP-II-14</b>	<b>Bracconi M., Ambrosetti M., Maestri M., Groppi G., Tronconi E.</b> <b>A NOVEL RADIAL-FLOW REACTOR BASED ON CELLULAR SUBSTRATES FOR AFTER-TREATMENT APPLICATIONS</b> <i>Politecnico di Milano, Milan, Italy</i>

**08.20–08.40**      **OP-II-15**      **Shtyka O.<sup>1,2</sup>, Blaszczyk N.<sup>1</sup>, Ciesielski R.<sup>1,2</sup>, Kedziora A.<sup>1,2</sup>, Maniecki T.P.<sup>1,2</sup>**  
**10.20-10.40**      **FLAT CATALYST AS A HEATING ELEMENT OF A REACTOR**  
*<sup>1</sup>Lodz University of Technology, Lodz, Poland*  
*<sup>2</sup>National Research University of Electronic Technology, Institute of Advanced Materials and Technologies, Zelenograd, Moscow region, Russia*

**08.40–09.00 Coffee break**

**SEPTEMBER 15, Wednesday**

## **Section II. CHEMICAL REACTION ENGINEERING AND REACTOR DESIGN—NOVEL EXPERIMENTAL APPROACHES, MODELING, SCALE-UP AND OPTIMIZATION**

**Chairperson: Professor Joris Thybaut, Ghent University Belgium**

**06.40–07.00**      **OP-II-16**      **Gao M., Peng S., Li H., Ye M., Liu Z.**  
**14.40-15.00**      **UNVEILING THE ROLE OF SURFACE BARRIERS IN THE CATALYST DEACTIVATION BY COKING BY USE OF A REACTION-DIFFUSION MODEL**  
*Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China*

**07.00–07.20**      **OP-II-17**      **Flaischlen S., Martin J., Kreitz B. Turek T., Wehinger G.**  
**09.00-09.20**      **PARTICLE-RESOLVED CFD SIMULATIONS OF CO<sub>2</sub> METHANATION IN FIXED-BED REACTORS**  
*Clausthal University of Technology, Clausthal-Zellerfeld, Germany*

**07.20–07.40**      **OP-II-18**      **Schumacher J., Meyer D., Friedland J., Güttel R.**  
**09.20-09.40**      **MODELLING AND SIMULATION OF NON-ISOTHERMAL CATALYST PELLETS FOR UNSTEADY-STATE METHANATION OF CO/CO<sub>2</sub> MIXTURES**  
*Ulm University, Ulm, Germany*

07.40–08.00 09.40-10.00	OP-II-19	<p>Stagni A.<sup>1</sup>, Arunthanayothin S.<sup>2</sup>, Herbinet O.<sup>2</sup>, Battin-Leclerc F.<sup>2</sup>, Faravelli T.<sup>1</sup></p> <p><b>A WIDE-RANGE EXPERIMENTAL AND MODELING STUDY OF H<sub>2</sub>S PYROLYSIS AND OXIDATION IN JET-STIRRED AND FLOW REACTORS</b></p> <p><sup>1</sup>Politecnico di Milano, Milan, Italy <sup>2</sup>CNRS-Université de Lorraine, CNRS Nancy, France</p>
08.00–08.20 15.00-15.20	OP-II-20	<p>Zagoruiko A., Mikenin P., Lopatin S.</p> <p><b>PRODUCTION OF ELEMENTAL SULFUR AND HYDROGEN FROM HYDROGEN SULFIDE IN THE CYCLIC CHEMISORPTION-CATALYTIC REGIME</b></p> <p><i>Boreskov Institute of Catalysis SB RAS, Novosibirsk, Russia</i></p>
08.20–08.40 10.20-10.40	OP-II-21	<p>van Kampen J.<sup>1,2</sup>, Sebastiani F.<sup>1</sup>, Boon J.<sup>1,2</sup>, Vente J.<sup>1</sup>, van Sint Annaland M.<sup>2</sup></p> <p><b>SORPTION ENHANCED DIMETHYL ETHER SYNTHESIS: MAXIMISING CARBON EFFICIENCY</b></p> <p><sup>1</sup>Sustainable Process Technology, TNO, Petten, The Netherlands <sup>2</sup>Eindhoven University of Technology, Eindhoven, The Netherlands</p>

**08.40–09.00 Coffee break**

## **Section II. CHEMICAL REACTION ENGINEERING AND REACTOR DESIGN–NOVEL EXPERIMENTAL APPROACHES, MODELING, SCALE-UP AND OPTIMIZATION**

**Chairperson: Dr. Pierdomenico Biasi, CASALE SA, Lugano, Switzerland**

09.00–09.20 11.00-11.20	OP-II-22	<p>Guffanti S.<sup>1</sup>, van Kampen J.<sup>2</sup>, Visconti C.G.<sup>1</sup>, Boon G.<sup>2</sup>, Groppi G.<sup>1</sup></p> <p><b>SORPTION ENHANCED DIMETHYL ETHER SYNTHESIS: REACTOR MODELLING AND DESIGN</b></p> <p><sup>1</sup>Politecnico di Milano, Milan, Italy <sup>2</sup>Sustainable Process Technology, TNO, Petten, The Netherlands</p>
09.20–09.40 16.40-17.00	OP-II-23	<p>Zazhigalov S., Zagoruiko A.</p> <p><b>MATHEMATICAL MODELING OF VOLATILE ORGANIC COMPOUNDS OXIDATION PROCESS IN REVERSE-FLOW REACTOR WITH SIDE GAS INLET</b></p> <p><i>Boreskov Institute of Catalysis SB RAS, Novosibirsk, Russia</i></p>

09.40–10.00 15.10-15.30	OP-II-24	<b>KVSS Bhargavi</b> , Ray D., Ch. Subrahmanyam <b>ROOM-TEMPERATURE TOLUENE DECOMPOSITION BY CATALYTIC NON-THERMAL PLASMA REACTOR</b> <i>Indian Institute of Technology, Hyderabad, Kandi, India</i>
10.00–10.20 12.00-12.20	OP-II-25	Riechmann P., <b>Schildhauer T.J.</b> <b>HEAT TRANSFER IN BUBBLING FLUIDISED BED REACTORS WITH IMMERSED VERTICAL HEAT EXCHANGERS</b> <i>Paul Scherrer Institute, Villigen, Switzerland</i>
10.20–10.40 06.20-06.40	OP-II-26	<b>Abrishamkar A.</b> <b>MICROREACTORS PAVE THE WAY FOR CONTROLLED REACTION, IN-DEPTH STUDY AND ENHANCED PROCESSING OF MATERIALS</b> <i>McMaster University, Hamilton, Ontario, Canada</i>

**10.40–11.00 Coffee break**

## SEPTEMBER 16, Thursday

### Section II. CHEMICAL REACTION ENGINEERING AND REACTOR DESIGN—NOVEL EXPERIMENTAL APPROACHES, MODELING, SCALE-UP AND OPTIMIZATION

**Chairperson:** *Dr. Tilman J. Schildhauer, Paul Scherrer Institute, Villige, Switzerland*

08.00–08.20 11.00-11.20	OP-II-27	<b>Sinev M.</b> <sup>1</sup> , Gordienko Y. <sup>1</sup> , Lagunova E. <sup>1</sup> , Fattakhova Z. <sup>1</sup> , Shashkin D. <sup>2</sup> , Ivakin Y. <sup>2</sup> <b>PARAMETRIC SENSITIVITY AND DESIGN OF REACTORS FOR CHEMICAL PROCESSES IN WATER FLUIDS</b> <sup>1</sup> <i>N.N. Semenov Institute of Chemical Physics RAS, Moscow, Russia</i> <sup>2</sup> <i>Lomonosov Moscow State University, Moscow, Russia</i>
08.20–08.40 11.20-11.40	OP-II-28	Skudin V.V., <b>Gavrilova N.N.</b> , Sapunov V. <b>THE RELATIONSHIP BETWEEN THE MODES OF THE CONTACTOR AND THE EXTRACTOR IN THE REACTOR WITH A MEMBRANE CATALYST</b> <i>D. Mendeleev University of Chemical Technology of Russia, Moscow, Russ</i>

08.40–09.00 10.40–11.00	OP-II-29	Balzarotti R., Ambrosetti M., Zheng L. Beretta A., Marangoni D., Groppi G., <b>Tronconi E.</b> <b>ELECTRIFIED STEAM REFORMING: RESISTIVE WASHCOATED SIC FOAMS AS INTERNAL HEATING ELEMENTS FOR HYDROGEN PRODUCTION</b> <i>Politecnico di Milano, Milan, Italy</i>
09.00–09.20 11.00–11.20	OP-II-30	<b>Wehinger G.</b> <sup>1</sup> , Scharf F. <sup>2</sup> <b>HEAT TRANSFER IN SLENDER PACKED BED REACTORS: EFFECT OF RADIATION</b> <sup>1</sup> <i>Clausthal University of Technology, Clausthal-Zellerfeld, Germany</i> <sup>2</sup> <i>BASF SE, Berlin, Germany</i>
09.20–09.40 11.20–11.40	OP-II-31	<b>Díaz-Sainz G.</b> <sup>1</sup> , Alvarez-Guerra M. <sup>1</sup> , Solla-Gullón J. <sup>2</sup> , García-Cruz L. <sup>2</sup> , Montiel V. <sup>2</sup> , Irabien A. <sup>1</sup> <b>FILTER PRESS REACTOR FOR THE CONTINUOUS ELECTROCATALYTIC REDUCTION OF CO<sub>2</sub> to FORMATE USING Bi-BASED ELECTRODES</b> <sup>1</sup> <i>University of Cantabria, Santander, Spain</i> <sup>2</sup> <i>University of Alicante, Spain</i>
09.40–10.00 11.40–12.00	OP-II-32	<b>Biasi P.</b> <sup>1</sup> , Panza S. <sup>1</sup> , Eckert R. <sup>2</sup> , Reitmeier S. <sup>2</sup> , Reitzmann A. <sup>2</sup> , Gebert S. <sup>2</sup> <b>THE WAY TO VALIDATE A NEW AMMONIA SYNTHESIS CATALYST: A COLLABORATION BETWEEN CASALE AND CLARIANT</b> <sup>1</sup> <i>Casale SA, Lugano, Switzerland</i> <sup>2</sup> <i>Clariant Produkte (Deutschland) GmbH, Heufeld/Munich, Germany</i>

**10.00–10.20 Coffee break**

### Section III. Chemical Reactors and Technologies for Targeted Applications

**Chairperson: Professor Challapalli Subrahmanyam, Indian Institute of Technology Hyderabad, Telangana, India**

10.20–10.40 12.20–12.40	OP-III-22	Wichert M. <sup>1</sup> , Neuberg S. <sup>1</sup> , Schürer J. <sup>1</sup> , Keller S. <sup>1</sup> , Valenteijn H. <sup>1</sup> , <b>Kolb G.</b> <sup>1,2</sup> <b>DEVELOPMENT OF A TWO STAGE REACTOR CONCEPT FOR THE METHANATION OF CARBON DIOXIDE FROM RENEWABLE SOURCES</b> <sup>1</sup> <i>Fraunhofer IMM, Mainz, Germany</i> <sup>2</sup> <i>Eindhoven University of Technology, Eindhoven, The Netherlands</i>
10.40–11.00 12.40–13.00	OP-III-23	<b>Porta A.</b> , Visconti C.G., Lietti L. <b>INTENSIFICATION OF CO<sub>2</sub> METHANATION BY CATALYST AND PROCESS DESIGN</b> <i>Politecnico di Milano, Milan, Italy</i>

11.00–11.20 07.00–07.20	OP-III-24	Simakov D. <b>CO<sub>2</sub> HYDROGENATION REACTOR: EXPERIMENTAL PROOF-OF-CONCEPT AND TECHNO-ECONOMIC FEASIBILITY ASSESMENT</b> <i>University of Waterloo, Waterloo, Ontario, Canada</i>
11.20–11.40 08.20–08.40	OP-III-25	Olivieri G.V., da Silva H.N., de Quadros Jr. J.V., Giudici R. <b>KINETIC MODELLING AND NMPC SIMULATION FOR THE EPOXIDATION REACTION OF THE SOYBEAN OIL</b> <i>Universidade de São Paulo, Brazil</i>
11.40–12.00 08.40–09.00	OP-III-26	Figueiredo M.T. <sup>1</sup> , Leite S.A. <sup>1,2</sup> , Leite B.S. <sup>1</sup> , Dangelo J.H. <sup>2</sup> , Baêta B.E.L. <sup>3</sup> <b>STUDY OF AGITATION IN ANAEROBIC BIODIGESTERS</b> <sup>1</sup> <i>Federal University of Viçosa, Florestal, Brazil</i> <sup>2</sup> <i>University of Campinas, Brazil</i> <sup>3</sup> <i>University of Ouro Preto, Brazil</i>
12.00–12.20 08.00–08.20	OP-III-27	Chub O. <sup>1</sup> , Saadatkah N. <sup>1</sup> , Dubois J.-L. <sup>2</sup> , Patience G.S. <sup>1</sup> <b>EFFECT OF CATALYST AND REACTION CONDITIONS ON POLYMETHYL METHACRYLATE (PMMA) DEPOLMERIZATION IN FLUIDIZED BED REACTOR</b> <sup>1</sup> <i>Ecole Polytechnique de Montreal, Canada</i> <sup>2</sup> <i>Arkema, Colombes, France</i>

**12.40 Closing  
HALL I**