

Norwegian Catalysis Symposium 2009

Programme

Auditorium R8, Realfagbygget (Science building), Høgskoleringen 5, Gløshaugen, Trondheim.

Monday November 30, 2009

09:00 Coffe

09:50 Welcome
Anders Holmen

10:00 -12:00 Session 1. Chair: Erling Rytter, Hilde Venvik.

10:00 - 10:20 *On the steam reforming of producer gas for the production of clean bio-syngas.*
Espen Standal Wangen, Azhar Malik, Mehri Sanati, Edd A. Blekkan. Dept. Chemical Engineering, NTNU, Trondheim, Norway/Lund University, Ergonomics and Aerosol Technology Design Sciences, Lund, Sweden.

10:20 - 10:40 *The influence of additives in defining the active phase of the ethylene oxychlorination catalyst.*
Naresh Babu Muddada, U. Olsbye, L. Caccialupi, F. Cavani, T. Fuglerud, A. Marsella, S. Vidotto, G. Leofanti, D. Gianolio, S. Bordiga, C. Lamberti. inGAP, Department of Chemistry, University of Oslo, Norway/Dipartimento di Chimica Industriale e dei Materiali, Università di Bologna, Bologna, Italy/INEOS Norge A/S, Porsgrunn, Norway/INEOS Technologies - Vinyls R&D, Porto Marghera (Venezia), Italy/Consultant, Canegrate (Milano), Italy/Department of Inorganic, Physical and Materials Chemistry and NIS centre of excellence, University of Torino, Italy.

10:40 -11:00 *Platinum nanoparticle shape effect on propane dehydrogenation.*
Jun Zhu, Magnus Rønning, Yingda Yu, Anders Holmen, De Chen. Dept. of Chemical Engineering/Dept. of Materials Technology, NTNU, Trondheim, Norway.

11:00 - 11:20 *Conversion of methanol to hydrocarbons over 10-ring uni-directional acidic H-ZSM-22.*
Shewangizaw Teketel, Stian Svelle, Karl-Petter Lillerud, Pablo Beato, Unni Olsbye. inGAP, Dept. of Chemistry, University of Oslo, Norway/Haldor Topsøe, Lyngby, Denmark.

11:20 - 11:40 *Fischer-Tropsch synthesis in a microstructured reactor.*
Rune Myrstad, Sigrid Eri, Peter Pfeifer, Erling Rytter, Anders Holmen. SINTEF Materials and Chemistry, Trondheim, Norway/Statoil, Research Centre, Trondheim, Norway/Forschungszentrum Karlsruhe, Eggenstein-Leopoldshafen, Germany/NTNU, Trondheim, Norway.

11:40 - 12:00 *Experimental study of compact dimethyl ether synthesis from syngas.*
Fatemeh Hayer, Hamidreza Bakhtiary D., Rune Myrstad, Hilde J. Venvik, Anders Holmen.
Dept. of Chemical Engineering, NTNU, Trondheim, Norway/SINTEF Materials and Chemistry, Trondheim, Norway.

12:00 Lunch

13:00 - 16:00 Session 2. Chair: Unni Olsbye, Edd A. Blekkan.

13:00 Plenary I: *Mass spectrometry for the analysis of zeolite formation processes.* Professor Ferdi Schüth, Max-Planck Institute, Mülheim, Germany

14:00 - 14:20 *Effect of support on the intrinsic activity and selectivity for Co-based Fischer-Tropsch catalysts.*

Jia Yang, Erik Tveten, Øyvind Borg, Erling Rytter, Anders Holmen. Dept. of Chemical Engineering, NTNU, Trondheim, Norway/Statoil Research Centre, Trondheim, Norway.

14:20 - 14:40 *Deactivation studies in Co-based Fischer-Tropsch catalysts.*

Alexey Voronov, Nikolaos E. Tsakoumis, Øyvind Borg, Erling Rytter, Anders Holmen, Magnus Rønning. Dept. of Chemical Engineering, NTNU, Trondheim, Norway/Statoil Research Centre, Trondheim, Norway.

14:40 - 15:00 *In-situ electron microscopy study of catalyst nano particle reduction.*

Roya Dehghan, John C. Walmsley, Thomas W. Hansen, Jakob B. Wagner, Anders Holmen, Erling Rytter, Øyvind Borg. Dept of Physics, NTNU, Trondheim, Norway/SINTEF Materials and Chemistry, Trondheim, Norway/Electron Nanoscopy Centre for Technical University of Denmark/Dept. of Chemical Engineering, NTNU, Trondheim, Norway/Statoil R&D Research Centre, Trondheim, Norway.

15:00 - 15:20 *Performance of rare-earth metal bis(tetramethylaluminate) complexes in isoprene polymerization: Ancillary ligand, cocatalyst, and metal size effects.*

Rannveig Litlabø, Melanie Zimmermann, H. Martin Dietrich, Karl W. Törnroos and Reiner Anwander. Dept of Chemistry, University of Bergen, Norway/Institut für Anorganische Chemie, Universität Tübingen, Germany.

15:20 - 15:40 *Mechanistic analysis and catalytic improvement of a highly cis-selective Rh(I) cyclopropanation catalyst.*

Marianne Lenes Rosenbergl, Mats Tilset, Dept. of Chemistry, University of Oslo, Norway.

15:40 - 16:00 *The mechanism of phosphine dissociation in Grubbs catalysts for olefin metathesis.*

Yury Minenkov, G. Occhipinti and Vidar R. Jensen, Dept. of Chemistry, University of Bergen, Norway.

16:00 - 16:30 Annual Meeting Catalysis Group, Norwegian Chemical Society. Stian Svelle, University of Oslo, President.

16:30 – 18:00 Poster presentations

20:45 Dinner at Lian Restaurant (transport from the city centre at 20:00).

Tuesday December 1, 2009

09:00 - 12:00 Session 3 Chair: Steinar Kvisle, Magnus Rønning.

09:00 Plenary II. *Selective Nanocatalysis of Organic Transformations by Metals. Concepts, Instruments and Model Systems.* Professor Gabor Somorjai, University of California, Berkeley, USA

10:00 - 10:20 *Utilization of CO₂ via Catalysis with Ionic Liquids.*

Richard H. Heyn, Terje Didriksen, Silje Håkonsen, Knut Thorshaug and Ørnulv B. Vistad. SINTEF Materials and Chemistry, Dept. of Process Chemistry, Oslo, Norway

10:20 - 10:40 *Implementation of parallel/high throughput strategies for evaluation of deNO_x catalyst systems.*

Lenka Hannevold, Duncan Akporiaye, Arne Karlsson, Martin Plassen, Elisabeth Myhrvold. Joanna Prostack. SINTEF, Material and Chemistry, Oslo, Norway.

10:40 - 11:00 *The effect of organic nitrogen compounds on gas oil hydrodesulfurization studied in a pilot plant.*

Håkon Bergem, Camilla Otterlei, Bodil Thorvaldsen, Per Aksel Skjølvsvik, Bente Seljestokken, Jorunn S. Rosvoll, Edd A. Blekkan. Dept. of Process Technology, SINTEF, Trondheim, Norway/Dept. of Chemical Engineering, NTNU, Trondheim, Norway/Statoil Research Centre, Trondheim, Norway.

11:00 - 11:20 *Functionalized zirconium-MOFs: Stability and applications.*

Merete Hellner Nilsen, Søren Jakobsen, Mathivathani Kandiah, Fredrik Lundvall, Sandrine Bénard, Sandro N. Usseglio, Unni Olsbye, Mats Tilset, Karl Petter Lillerud inGap, Dept. of Chemistry, University of Oslo, Norway.

11:20 - 11:40 *Sol-gel derived zirconia coated calcium oxide nanoparticles for CO₂ capture.*

Kazi Saima Sultana, Estelle Vanhaecke, Tiejun Zhao, Magnus Rønning and De Chen. Dept. of Chemical Engineering, NTNU, Trondheim, Norway.

11:40 - 12:00 *Formation of mesoporosity in zeolite H-SSZ-13 by desilication*

Linn Sommer, Davide Mores, Stian Svelle, Michael Stöcker, Bert Weckhuysen, Unni Olsbye. Center for Materials Science and Nanotechnology/inGAP, Dept. of Chemistry, University of Oslo, Norway/Inorganic Chemistry and Catalysis, DEBYE Institute for Nanomaterials Science, Utrecht University, Utrecht, The Netherlands/SINTEF Materials and Chemistry, Dept. of Hydrocarbon Process Chemistry, Oslo, Norway.

12:00 - 12:15. *The KOSK-II Programme.* Mats Tilset, University of Oslo, Chair of the KOSK Programme Board.

12:15 Lunch

13:00 - Annual meeting inGAP - Closed meeting (Organizer: Unni Olsbye, Univ. of Oslo)

13:00 - Laboratory tour (Organizer: Karin W. Dragsten, NTNU)

Poster presentations

P1

Spray drying of porous alumina support for Fischer-Tropsch catalysis.

Anna Lind, Anders Holmen, Sigrid Eri, Torild Hulsund Skagseth, Erling Rytter. SINTEF Materials and Chemistry, Trondheim, Norway/Dept. of Chemical Engineering, NTNU, Trondheim, Norway/Statoil Research Centre, Trondheim, Norway.

P2

Electro-oxidation of CO and methanol on Ru-Pt core-shell nanoparticles supported on carbon materials.

Navaneethan Muthuswamy, M. Piotr Ochal, Jose Gomez, Mikhail Tsympkin, Magnus Rønning, Svein Sunde, De Chen. Dept. of Chemical Engineering /Dept. of Material Science and Engineering, NTNU, Trondheim, Norway.

P3

Possible reaction mechanisms of the catalytic dehydrogenation of propane.

Ilya V. Gorelkin, Edd A. Blekkan. Dept. of Chemical Engineering, NTNU, Trondheim, Norway.

P4

Preparation and characterization of Ni based bimetallic catalysts for steam reforming of methane.

Anh H. Dam, H. M. Wang, Roya Dehghan, John Walmsley, Anders Holmen and De Chen. Dept. of Chemical Engineering/Dept. of Physics, NTNU, Trondheim, Norway

P5

In situ diffuse reflectance FTIR (DRIFT) spectroscopy on supported nickel and noble metal catalysts.

Christoph Sprung, B. Arstad, U. Olsbye. Dept. of Chemistry, Center of Materials Science and Nanotechnology, University of Oslo, Norway/SINTEF Materials and Chemistry, Oslo, Norway.

P6

Alkylaluminum chemistry of alkaline-earth metals and divalent lanthanides.

Olaf Michel, Christian Meermann, Karl W. Törnroos, Reiner Anwander. Dep. of Chemistry, University of Bergen, Norway/Institut für Anorganische Chemie, Universität Tübingen, Germany.

P7

CHA and SAPO-34: Lattice stability dependence on position of acid sites.

Mahsa Zokaie, Ole Swang, Stian Svelle, Merete Hellner Nilsen, Unni Olsbye and Karl Peter Lillerud. inGAP Centre for Research-Based Innovation/Center for Materials Science and Nanotechnology, Dept. of Chemistry, University of Oslo, Norway.

P8

Development of Au catalysts for the functionalization of alkanes: Precursor synthesis and C-H activation.

Ajay Venugopal, Manik Kumer Ghosh, Richard H. Heyn, Anthony P. Shaw, Ole Swang, Karl W. Törnroos and Mats Tilstet. SINTEF Materials and Chemistry, Dept. of Process Chemistry, Oslo, Norway/Dept. of Chemistry, University of Bergen, Norway/Center of Theoretical and Computational Chemistry, Dept. of Chemistry, University of Oslo, Norway.

P9

Investigations into structure-reactivity relationships in rare-earth metal-promoted Ziegler-Natta polymerization.

H. Martin Dietrich, Karl W. Törnroos and Reiner Anwänder. Dept. of Chemistry, University of Bergen, Norway/Institut für Anorganische Chemie, Universität Tübingen, Tübingen, Germany.

P10

Microstructural observations in metal dusting studies.

John C. Walmsley, J.Z. Albertsen and J. Friis. SINTEF Materials and Chemistry, Trondheim, Norway/Dept. of Materials Science and Engineering, NTNU, Trondheim, Norway/Statoil, Research Centre, Trondheim, Norway.

P11

Methanol synthesis from syngas in a millisecond microstructured reactor.

Hadimreza Bakhtiary, Fatemeth Hayer, Xuyen Kim Phan, Rune Myrstad, Peter Pfeifer, Hilde J. Venvik, Anders Holmen. Dept. of Chemical Engineering, NTNU, Trondheim, Norway/SINTEF Materials and Chemistry, Trondheim, Norway/Karlsruhe Institute of Technology, Institute for Micro Process Engineering, Eggenstein-Leopoldshafen, Germany.

P12

Experimental study of methanol synthesis in a PdCeO₂ stacked microchannel reactor.

Xuyen Kim Phan, Hamidreza Bakhtiary, Rune Myrstad, Hilde J. Venvik, Janina Thormann, Peter Pfeifer, Anders Holmen. Dept. of Chemical Engineering, NTNU, Trondheim, Norway/SINTEF Materials and Chemistry, Trondheim, Norway/Karlsruhe Institute of Technology, Institute for Micro Process Engineering, Eggenstein-Leopoldshafen, Germany.

P13

Synthesis and characterization of Ni hydrotalcite catalyst for hydrogen production using co-precipitation, spray drying, microemulsion method.

Tayyaba Noor, Anna Lind, Anders Holmen, De Chen. Dept. of Chemical Engineering, NTNU, Trondheim, Norway/SINTEF Materials and Chemistry, Trondheim, Norway.

P14

Kinetic study of methane steam reforming over hydrotalcite-based Ni catalyst modified by different metals.

Hongmin Wang, Ahn H. Dam, D. Wayne Blaylock, Tappei Ogura, Yian Zhu, Anders Holmen, William H. Green, De Chen. Massachusetts Institute of Technology, Cambridge, Massachusetts, USA/Dept of Chemical Engineering, NTNU, Trondheim, Norway.

P15

Ce-Zr-Al mixed oxide nanocomposites supported Rh: a promising catalyst for partial oxidation of methane to syngas.

Sara Boullouso-Eiras, Tiejun Zhao, Estelle Vanhaecke, Yingda Yu, De Chen, Anders Holmen
Dept. of Chemical Engineering/Dept. of Material Science and Technology, NTNU,
Trondheim, Norway.

P16

Microcalorimetry and microkinetic modelling of catalytic reactions.

Eleni Patanou, De Chen, Edd A. Blekkan. Dept. of Chemical Engineering, NTNU,
Trondheim, Norway.

P17

Insights into catalyst deactivation phenomena in Co-based Fischer-Tropsch.

Nikolaos E. Tsakoumis, Alexey Voronov, Magnus Rønning, Øyvind Borg, Erling Rytter and
Anders Holmen. Dept. of Chemical Engineering, NTNU, Trondheim, Norway/Statoil R&D,
Research Centre, Trondheim, Norway.

P18

Effect on cobalt particle size, alumina and its porosity on hydrocarbon selectivity in Fischer-Tropsch synthesis.

Shreyas Rane, Øyvind Borg, Erling Rytter, Anders Holmen. Dept. of Chemical Engineering,
NTNU, Trondheim, Norway/Statoil, Reseach Center, Trondheim, Norway.

P19

Composite of conducting polymers and carbon nanostructures for energy storage.

Fan Huang, Estelle Vanhaecke, Magnus Rønning, De Chen. Dept. of Chemical Engineering,
NTNU, Trondheim, Norway.

P20

Elaboration of model compounds for catalysis by the means of ALD.

Madeleine Diskus, Ola Nilsen and Helmer Fjellvåg.

inGAP Centre for Research-Based Innovation/Center for Materials Science and
Nanotechnology, Dept. of Chemistry, University of Oslo, Norway.

P21

Synthesis of perovskites using carbon nanotubes as templates and their applications in methane partial oxidation.

Oana Mihai, De Chen, Anders Holmen. Dept. of Chemical Engineering, NTNU, Trondheim,
Norway.

P22

Carbon nanostructures synthesis on foils.

Estelle Vanhaecke, Fan Huang, De Chen, Magnus Rønning. Dept. of Chemical Engineering,
NTNU, Trondheim, Norway.

P23

Amino-functionalized Zr-MOF as catalyst for the Knoevenagel reaction

Sandrine Bénard, Søren Jakobsen, Mathivathani Kandiah, Merete Hellner Nilsen, Fredrik Lundvall, Sandro N. Usseglio, Unni Olsbye, Mats Tilset, Karl Petter Lillerud. inGAP Centre for Research-Based Innovation, Dept. of Chemistry, University of Oslo, Norway.

P24

The polar functional group tolerance of transition metal catalysts for olefin polymerization

Wouter Heyndrickx, G. Occhipinti and Vidar R. Jensen. Dept. of Chemistry, University of Bergen, Norway.

P25

Catalysts for sorbent enhanced steam reforming (SER) of methane in temperature swing reactors.

Christoph Sprung, Bjørnar Arstad, Unni Olsbye. Dept. of Chemistry, Center of Materials Science and Nanotechnology, University of Oslo, Norway/SINTEF Materials and Chemistry, Oslo, Norway.

P26

Carbon nanofiber/carbon felt supported Cu-CeO₂ catalyst: a promising structured catalyst for preferential oxidation of CO in H₂-rich gases.

Tiejun Zhao, Yingda Yu, De Chen, Magnus Rønning. Dept. of Chemical Engineering/Dept. of Material Science and Technology, NTNU, Trondheim, Norway.