



Program

Energy and Material Flows in Sustainable Petrochemistry - Opportunities and Implications

Petrochemistry Division

November 27 - 29, 2024, Hamburg



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PROGRAM OVERVIEW

Wednesday, November 27, 2024	
13.00 - 13.15	Opening and Welcome Address
13.15 - 15.30	Carbon Sources I
15.30 - 16.15	Coffee Break
16.15 - 18.15	Carbon Sources II
Thursday, November 28, 2024	
08.30 - 10.15	Carbon Sources III
10.15 - 10.45	Coffee Break
10.45 - 12.45	Numerical Methods
12.45 - 13.45	Lunch Break
13.45 - 15.30	Industry Transformation
15.30 - 16.45	Poster Session & Coffee
16.45 - 18.00	Multiphase Catalysis
20.00	Conference Dinner

Friday, November 29, 2024	
09.00 -11.30	Process Engineering Aspects
11.30 - 11.35	Concluding Remarks and Conference Summary
11.35 - 12.00	End of the Conference Coffee

SCIENTIFIC COMMITTEE:

Dr. Michael Bender, BASF SE, Ludwigshafen

Prof. Dr. -Ing. Jakob Burger, Technische Universität München, Straubing

Dr. Arnim Fiscoeder, BP Europa SE, Bochum

Dr. Axel Göhrt, INEOS, Köln

Dr. Harald Häger, Evonik Performance Materials GmbH, Marl

Prof. Dr. Marco Haumann, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen

Prof. Dr. Andreas Jess, Universität Bayreuth

Prof. Dr. Johannes A. Lercher, Technische Universität München

Dr. Mario Marchionna, Saipem S.p.A., San Donato Milanese

Prof. Dr. Jörg Sauer, KIT, Karlsruhe

Prof. Dr. Jennifer Strunk, Technische Universität München, München

Dr. Andreas J. Vorholt, Max-Planck-Institut für Chemische Energiekonversion, Mühlheim an der Ruhr

Prof. Dr. Dieter Vogt, Technische Universität Dortmund

WEDNESDAY, NOVEMBER 27, 2024

OPENING AND WELCOME ADDRESS

13.00 h

Gesa Netzeband

Managing Director, DGMK e.V.

Dieter Vogt

Chairman DGMK-Division Petrochemistry

SESSION: CARBON SOURCES I

Chairperson: Dieter Vogt

13.15 h

Keynote Lecture: The Ethenolysis Biorefinery offers direct commercial access to 1-decene and methyl-9-decenoate via Olefin Metathesis from renewable rape seed methyl ester: a status report

A. Kohl

Verbio SE, Leipzig

14.00 h

Upgrading bio-derived molecules through oxidative cleavage of C=C bonds over zeolite-based catalysts

P. Treu¹, D. Gonçalves¹, J.-D. Grunwaldt^{1,2}, E. Saracı^{1,2}

¹Institute of Catalysis Research and Technology, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen;

²Institute for Chemical Technology and Polymer Chemistry, Karlsruhe Institute of Technology, Karlsruhe.

14.30 h

Gasification of contaminated biomass to synthesize renewable fuels

J. Dutzi, A. Vadarlis, N. Boukis, J. Sauer

Institute of Catalysis Research and Technology (IKFT), Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/Germany

15.00 h **CO2 methanation combined with capture processes or applied to unseparated streams**
J. Rossetti¹, A. Gramegna¹, M. Tommasi¹, S. Naz Degerli¹, G. Ramis²
¹Chemical Plants and Industrial Chemistry Group, Dip. Chimica, Università degli Studi di Milano, CNR-SCITEC and INSTM Unit Milano-Università, Milan, Italy, ²Dip. Ing. Chimica, Civile ed Ambientale, Università degli Studi di Genova and INSTM Unit Genova, Genoa, Italy

15.30 h **Coffee Break**

WEDNESDAY, NOVEMBER 27, 2024

SESSION: CARBON SOURCES II

Chairperson: Harald Häger

16.00 h **Keynote Lecture: Enhanced Biomass Valorisation to achieve 100% Carbon Efficiency by Effectively Suppressing Carbon Dioxide Formation**

J. Albert

Universität Hamburg, Institut für Technische und Makromolekulare Chemie, Hamburg, Germany

16.45 h **From Theory to Demo: Scaling up a new methanol process for small decentral sustainable feedstocks**

M. Checinski, R. Krähnert, C. Vollmann, M. Mosterz, H. Mehmke, D. Radzinski

C1 Green Chemicals AG, Berlin, Germany

17.15 h **Recycling of Spent FCC Catalyst to Zeolite ZSM-5**

L. A. Haufe, V. Timoshev, M. Seifert, J. J. Weigand

Faculty of Chemistry and Food Chemistry, TU Dresden, Dresden, Germany

17.45 h **Influencing the product quality in chemical recycling of mixed thermoplastics by temperature-staged pyrolysis**

N. Netsch, S. Tavakkol, D. Stapf

Karlsruhe Institute of Technology (KIT), Institute for Technical Chemistry (ITC), Karlsruhe, Germany

SESSION: CARBON SOURCES III

Chairperson: Michael Bender

08.30 h **Keynote Lecture: Renewable Raw Materials and Petrochemicals: A Status Analysis**

A. Kindler

BASF SE, Ludwigshafen

09.15 h **Investigation of the cobalt/support interface in thin-film model catalysts for Fischer-Tropsch reaction using XPS**

A. Skaltsogiannis¹, E. Sireci², J. Frisch¹, R. Garcia-Diez¹, C. Jimenez¹, A. Steigert¹, R.G. Wilks¹, F. Studt^{2,3}, M. Bär^{1,4,5}

¹Helmholtz-Zentrum Berlin f. Materialien u. Energie GmbH (HZB), Dept. of Interface Design, Berlin, Germany, ²KIT, Inst. of Catalysis Research a. Technology, Karlsruhe, Germany, ³KIT, Inst. for Technical Chemistry a. Polymer Chemistry, Karlsruhe, Germany, ⁴HZB, Energy Materials In-Situ Laboratory Berlin (EMIL), Berlin, Germany, ⁵Helmholtz-Inst. Erlangen-Nürnberg for Renewable Energy (HI ERN), Dept. of X-ray Spectroscopy at Interfaces of Thin Films, Berlin, Germany

09.45 h **Preparation of model catalyst systems to optimize sustainable aviation fuel production via Fischer-Tropsch synthesis**

C. Hsu¹, R. Elbuga-Ilica^{1,2}, E. Sireci¹, D. Zhao^{1,2}, E. Saraçi^{1,2}, A. Zimina^{1,2}, F. Studt¹, J.-D. Grunwaldt^{1,2}, M. Wolf¹

¹Inst. of Catalysis Research and Technology, ²Inst. for Chemical Technology and Polymer Chemistry, KIT, Germany

10.15 h Coffee Break

THURSDAY, NOVEMBER 28, 2024

SESSION: INDUSTRY TRANSFORMATION

Chairperson: Mario Marchionna

10.45 h **Keynote Lecture: Steam cracker of the future:
Path towards net zero emissions and improved
energy efficiency**

M. Reitz

BASE SE, Ludwigshafen, Germany

11.30 h **Optimization of heat pump and vapor
recompression technologies for high-boiling
mixtures**

T. Steenweg¹, T. Six¹, N. Paul¹, A. Rix²

¹Evonik Oxeno GmbH & Co. KG, Technical Engineering Marl,
Germany, ²Evonik Operations GmbH, Engineering Marl,
Germany

12.00 h **Keynote Lecture: SALCOS - Salzgitter's path to
climate-friendly steel production**

M. Zappe

Salzgitter AG, Salzgitter, Germany

12.45 h **Lunch Break**

THURSDAY, NOVEMBER 28, 2024

SESSION: NUMERICAL METHODS

Chairperson: Jörg Sauer

- 13.45 h** **Keynote Lecture: State of Data & AI in Petrochemistry**
How advancements in Data and AI can create opportunities towards a sustainable future
S. Werner
Thoughtworks Deutschland GmbH, Hamburg, Germany
- 14.30 h** **AI-Based Design of Chemical Processes by Deep Reinforcement Learning**
A. Wolf, J. Pirnay, D. G. Grimm, J. Burger
Technical University of Munich, Straubing, Germany
- 15.00 h** **Completing the Matrix for Efficient Process Design - Advancing the Prediction of Thermodynamic Parameters and Physical Properties by Machine Learning**
T. Aeverbeck¹, A. Kühl¹, G. Sadowski², C. Held²,
T. Seidensticker²
¹Laboratory for Industrial Chemistry, TU Dortmund University, ²Laboratory of Thermodynamics, TU Dortmund University

POSTER SESSION & COFFEE

Chairperson: Andreas Jess

- 15.30 h** **Further information on page 16**

THURSDAY, NOVEMBER 28, 2024

SESSION: MULTIPHASE CATALYSIS

Chairperson: Dieter Vogt

16.45 h **Award of the "Carl-Zerbe Preis"**

D. Vogt

Chairman DGMK-Division "Petrochemistry"

**Lecture of the Award-winner: Magnetic Induction
in Catalysis: Toward Adaptive Catalytic Systems
for Challenging Hydrogenation and
Hydrodeoxygenation Reactions**

A. Bordet

Max Planck Institute for Chemical Energy Conversion,
Mülheim an der Ruhr, Germany

17.30 h **Conversion of CO₂ into Valuable Chemicals by
Utilization of Synergetic Zn(x)Cu(100-x) as well
as ZnO(x)CuO(100-x) Catalysts in Aqueous-Fed
Systems**

E. U. Onoh^{1,2}, I. Stamatelos², J. Pasel², G. Ayalneh
Tiruye¹

¹Materials Science Program/Department of Chemistry
College of Natural and Computational Sciences, Addis Ababa
University, Addis Ababa, Ethiopia, ²EK14-Electrochemical
Process Engineering Forschungszentrum Jülich GmbH,
Jülich, Germany

CONFERENCE DINNER

20.00 h

Parlament

Rathausmarkt 1, 20095 Hamburg

Phone +49 40 334680210

SESSION: PROCESS ENGINEERING ASPECTS

Chairperson: Marco Haumann

09.00 h **Keynote Lecture: Towards sustainable processes via membrane technology - application fields, design and evaluation**

V. Koleva, J. Dreimann, F. Gluth
Evonik Operations GmbH, Marl, Germany

09.45 h **Ga-Pt supported catalytically active liquid metal solutions (SCALMS) for propane dehydrogenation - from material stability optimization to kinetic investigation**

N. Madubuko¹, L. Röhm¹, N. Taccardi¹, M. Haumann¹,
A. Görling², P. Wasserscheid¹
¹Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU),
Lehrstuhl für Chemische Reaktionstechnik (CRT), Erlangen,
Germany, ²Friedrich-Alexander-Universität Erlangen-
Nürnberg (FAU), Lehrstuhl für Theoretische Chemie,
Erlangen, Germany

10.15 h **Investigating Phase Behaviour in Multiphase Catalysis**

J. T. Vossen^{1,2}, A. J. Vorholt¹, W. Leitner^{1,2}
¹Max Planck Institute for Chemical Energy Conversion,
Mülheim an der Ruhr, Germany, ²Institute for Technical and
Macromolecular Chemistry, RWTH Aachen University,
Aachen, Germany

- 10.45 h** **Keynote Lecture: Heterogenization of rhodium-based homogeneous catalysts in the context of large-scale production processes - the MACBETH approach**
R. Franke
Evonik Oxeno GmbH & Co. KG, Marl, Germany
- 11.30 h** **Concluding Remarks and Conference Summary**
D. Vogt
Chairman DGMK-Division "Petrochemistry"
- 11.35 h** **End of the Conference Coffee**

WEDNESDAY, NOVEMBER 28, 2024

POSTERSESSION AND COFFEE

Survey of Posters on Display: Andreas Jess

KIRCHHOF SAAL

15.30 - 16:45 h

A-01 Z-scheme photocatalysts for CO₂ conversion into fuels and chemicals

G. Ramis¹, S. Naz Degerli², A. Gramegna², M. Tommasi³,
I. Rossetti^{2,3}

¹Dip. Ing. Chimica, Civile ed Ambientale, Università degli Studi di Genova and
INSTM Unit Genova, Genoa, Italy, ²INSTM Unit Milano-Università, Milan, Italy
³Chemical Plants and Industrial Chemistry Group, Dip. Chimica, Università
degli Studi di Milano, Italy

A-02 Using hydrotreatment for upgrading plastic pyrolysis oil: Approaches and future challenges

C. Jendrzok, K. Raffelt, J. Sauer

Institute of Catalysis Research and Technology, Karlsruhe Institute of
Technology, Germany

A-03 E-Tandem: Innovation in e-fuel production From laboratory scale to continuous production

H. Stieber¹, W. Leitner^{1,2}, G. Prieto³, A. J. Vorholt¹

¹Max Planck Institute for Chemical Energy Conversion, Mülheim a.d. Ruhr,
Germany, ²Institute of Technical and Macromolecular Chemistry, RWTH
Aachen University, Aachen, Germany, ³ITQ Instituto de Tecnología Química
(CSIC-UPV), Spain

A-04 Supercritical water gasification of biomass model compounds and subsequent steam reforming to maximize H₂ yield

A. Vadarlis, J. Dutzi, A. Lemonidou, N. Boukis, J. Sauer

Institute of Catalysis Research and Technology (IKFT), Karlsruhe Institute of Technology, (KIT), Eggenstein-Leopoldshafen/Germany

A-05 Selective Hydrogenation in Multiphase Microcapillary Reactors: A Valuable Tool to Harmonize Feedstocks in Lab Scale

F. Lehmann, N. von Vietinghoff, T. Nakai, L. Nebel, P. Pey,

K. S. Wulle, D. Vogt, T. Seidensticker

Laboratory of Industrial Chemistry, Department of Biochemical and Chemical Engineering, TU Dortmund University, Dortmund, Germany

GENERAL INFORMATION

Venue

Haus der Patriotischen Gesellschaft
Trostbrücke 4-6 | 20457 Hamburg | Germany

Registration Desk

Opening Hours

Wednesday, November 27, 2024	12.00 h - 18.00 h
Thursday, November 28, 2024	08.00 h - 18.00 h
Friday, October 13, 2023	08.30 h - 12.00 h

Phone +49 151 56005706

Conference Preprints

Lectures and posters presented at the DGMK-Conference are published in full length in the DGMK-Conference Proceedings. These publications are registered under ISBN and ISSN and are sold on the book market after the conference. The DGMK- Conference Proceedings will be given to each conference participant in a digital format.

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Organiser

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the
Date

General Assembly of DGMK
November, 7, 2024, Hamburg

