

DGMK

International Conference

**Circular Economy –  
A Fresh View on  
Petrochemistry**

October 9 – 11, 2019  
Dresden, Germany



German Society for Petroleum and Coal  
Science and Technology  
Petrochemistry Division

This international conference provides a forum for chemists and engineers from refinery, petrochemistry and the chemical industry as well as from academia to discuss aspects of transitioning to a circular economy in the petrochemical industry.

Eight Keynote Lectures, 19 Lectures and 18 Posters will be presented at the conference. Additional “last minute posters“ are welcome. Authors who intend to present a “last minute poster“ are kindly requested to contact the Scientific Chairmen at or before the conference.

The best poster of the conference will be selected by the attendees for the “Best Poster Award“.

This international conference is organised by the DGMK *German Society for Petroleum and Coal Science and Technology* in association with the *Società Chimica Italiana* (SCI) and the Austrian ÖGEW *Österreichische Gesellschaft für Erdölwissenschaften*

Scientific Chairmen:

Dr. Michael Bender, BASF SE, Ludwigshafen

Dr. Holger Blanke, BP Europa SE, Bochum

Dr. Harald Häger, Evonik Performance Materials GmbH,  
Marl

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. Dieter Vogt, Technische Universität Dortmund

## Programme

**Wednesday, October 9, 2019**

12.00 **Registration at the Conference Desk**

13.00 **Opening and Welcome Address**  
Johannes Lercher

**Session Chairman: Dieter Vogt**

13.30 *Keynote Lecture:* T. Schaffranek  
BASF SE, Ludwigshafen  
**The Role of Chemistry in a Circular Economy -  
Decoupling Growth from Resource Consumption**

14.15 J. Weiermüller, A. Akermann, R. Ulber  
University of Kaiserslautern, Department of Mechanical  
and Process Engineering, Chair of Bioprocess  
Engineering, Germany  
**Biorefineries – A Sustainable Approach of  
Utilizing Brewers' spent Grains**

14.45 D. Klinger\*, M. Friedemann\*/\*\*, B. Meyer\*/\*\*  
\*Fraunhofer-Institute for Microstructure of Materials and  
Systems, \*\*Technische Universität Bergakademie  
Freiberg, Germany  
**CARBONTRANS – A Concept for Chemical  
Recycling of Carbonaceous Wastes**

15.15 M. Marchionna  
Saipem, Technology Innovation, San Donato Mil., Italy  
**Innovative Sustainable Solutions to Treat Waste  
or Residual/Opportunity Feedstocks**

15.45 **Coffee Break**

## Wednesday, October 9, 2019

- 16.15 *Keynote Lecture:* S. Brandani  
School of Engineering, University of Edinburgh, Scotland  
**Selection of Novel Nanoporous Materials for Carbon Capture Applications**
- 17.00 M. Kirchmann, C. Hauber, A. Haas  
hte GmbH, Heidelberg, Germany  
**High Throughput Testing of Catalysts with Fast Deactivation for Methanol-to-Hydrocarbons (MTH)**
- 17.30 C. Jonscher, M. Seifert, M. S. Marschall, T. Gille, O. Busse, J. J. Weigand  
Technische Universität Dresden, Germany  
**Investigation of the Influence of Si/Al Ratio on the Deactivation of ZSM-5 Zeolites in the Conversion of Ethanol to Hydrocarbons**

Next Conference:

### **Future Feedstocks and Technologies for Fuels and Chemicals**

October 7 – 9, 2020  
Berlin, Germany

Save the Date!

**Thursday, October 10, 2019**

**Session Chairman: Harald Häger**

- 08.30 *Keynote Lecture:* W. Leitner  
Max Planck Institute for Chemical Energy Conversion,  
Mülheim a.d.R. and RWTH Aachen University, Germany  
**Closing the Carbon Cycle – Catalytic Conversion  
of Alternative Feedstocks for the Chemical Value  
Chain**
- 09.15 D. Bianchi\*, A. Bosetti\*, S. Chiaberge\*, D. Moscotti\*\*  
\*Eni S.p.A. Renewable Energy and Environmental R&D  
Center – Novara, Italy, \*\* Eni S.p.A. Downstream Research  
& Technological Innovation – San Donato Milanese  
Research Centre, Italy  
**Production of Advanced Biofuels by  
Hydrothermal Liquefaction of Sorted Organic  
Domestic Waste**
- 09.45 I. Rossetti\*, A. Tripodi\*, M. Frosi\*, G. Ramis\*\*,  
N. Mahinpey\*\*\*  
\*Chemical Plants and Industrial Chemistry Group, Dip.  
Chimica, Università degli Studi di Milano, CNR-ISTM and  
ISTM Unit Milano-Università, Milano, Italy, \*\*Dip. Ing.  
Chimica, Civile ed Ambientale, Università degli Studi di  
Genova, Genoa, Italy, \*\*\* Dept. of Chemical and Petroleum  
Engineering, Schulich School of Engineering, University of  
Calgary, Canada  
**Bio-ethylene Production: From Reaction Kinetics  
to Plant Scale**
- 10.15 **Coffee Break**
- 10.45 *Keynote Lecture:* N. Schödel, A. Behrens,  
A. Meiswinkel  
Linde AG, Pullach  
**Carbon Capture and Utilization – An Alternative  
Approach for Chemical Production?**
- 11.30 P. G. Moses  
Haldor-Topsoe A/S, Lyngby, Denmark  
**CO<sub>2</sub> as Feedstock for Chemical Industry Using  
eCO<sub>s</sub><sup>TM</sup> Technology**
- 12.00 H. Ruland  
Max-Planck-Institut für Chemische Energiekonversion,  
Mülheim a.d.R.  
**Strategies to Convert CO<sub>2</sub> to Methanol**
- 12.30 **Lunch Break**

**Thursday, October 10, 2019**

**Session Chairman:** Mario Marchionna

- 13.30 *Keynote Lecture:* H. Niemantsverdriet  
Syngaschem BV, Eindhoven, The Netherlands  
**Hydrogen, Oxygen and Synthesis Gas for Storage of Energy and Greening of Coal-based Technology**
- 14.15 A. J. Vorholt\*, R. Kuhlmann\*\*, W. Leitner\*, A. Behr\*\*  
\*Max-Planck-Institut für Chemische Energiekonversion, Abteilung Molekulare Katalyse, Mülheim a.d.R., Germany, \*\*TU Dortmund, Fakultät für Bio- und Chemieingenieurwesen, Lehrstuhl für Technische Chemie, Dortmund, Germany  
**Formamides from CO<sub>2</sub> – Catalyst Development for a Continuous Process**
- 14.45 K.U. Künnemann\*, S. Schlüter\*\*, M. Skiborowski\*\*, J.M. Dreimann\*, D. Vogt\*  
\*Laboratory of Industrial Chemistry, Department of Biochemical and Chemical Engineering TU Dortmund University, \*\*Laboratory of Fluid Separations, Department of Biochemical and Chemical Engineering TU Dortmund University  
**Process Intensification of Thermomorphic Multiphase Systems for the Homogeneously Catalyzed Hydroaminomethylation in a Continuously Operated Miniplant**

**23rd World Petroleum Congress**  
December 6 -10, 2020 in Houston



**Innovative Energy Solutions**

Further information: [www.23wpc2020.com](http://www.23wpc2020.com)

**Thursday, October 10, 2019**

**15.15 Poster Session and Coffee**

**Survey of Posters on Display: Andreas Jess**

The Posters are on display during the whole conference.

**1** A. Carrasco, O. Busse, J. J. Weigand

Technische Universität Dresden, Germany

**In situ synthesis of Aluminium Phosphate Binder from clay for FCC Catalyst Production**

---

**2** O.Yu. Poletaeva\*, G.Yu. Kolchin\*\*, A.Yu. Leontev\*, E.R. Babayev\*\*\*, E.M. Movsumzade\*, I.I. Khasanov\*, A.L. Lapidus\*\*\*\*

\*Ufa State Petroleum Technological University, Ufa, Russia,

\*\*Sterlitamak branch of the Bashkir State University, Sterlitamak, Russia, \*\*\*Academician A.M. Guliyev Institute of Chemistry of Additives NAS of Azerbaijan, Baku, Azerbaijan, \*\*\*\*N.D. Zelinsky

Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia

**Influence of Heavy Oils Composition on the Physical Impact Processes during Transportation and Refining Pretreatment**

---

**3** M. Terhorst, A. J. Vorholt, T. Seidensticker, D. Vogt

TU Dortmund University, Laboratory of Industrial Chemistry, Dortmund, Germany

**CO<sub>2</sub>-Based Reactive Ionic Liquid as Immobilization Agent for Homogeneous Amination Catalysts**

---

**4** T. A. Faßbach, A. J. Vorholt

Max-Planck-Institute for Chemical Energy Conversion, Mülheim a.d.R., Germany

**Catalyst Recycling Using Reactive Ionic Liquids**

---

**5** G.Yu. Kolchina\*, V.A. Adigozalova\*\*, E.M.

Movsumzade\*\*\*

\*Sterlitamak branch of the Bashkir State University, Sterlitamak, Russia, \*\*Azerbaijan State Academy of Physical Culture and Sport, Baku, Azerbaijan, \*\*\*Ufa State Petroleum Technological University, Ufa, Russia

**Indices of Reactivity of Biomarkers of Naphthalan Oil**

---

**6** G.Yu. Kolchina\*, E.R. Babaev\*\*\*, O.Yu. Poletaeva\*\*, A.Yu. Bakhtina\*\*, E.M. Movsumzade\*\*

\*Sterlitamak branch of the Bashkir State University, Sterlitamak, Russia, \*\*Ufa State Petroleum Technological University, Ufa, Russia, \*\*\* Institute of Chemistry of Additives after Academician A.M. Guliyev, Azerbaijan National Academy of Sciences, Baku, Azerbaijan

**Study of the Interaction of S- and Se-containing Derivatives of Spatial-obstructed Phenols in Reactions with Peroxides**

---

**Thursday, October 10, 2019**

**7** M. Peters, C. Gelfort, D. Vogt, J. M. Dreimann, J. Martin  
TU Dortmund University, Germany  
**Enhancing Metathesis Reaction Performance via Organic Solvent Nanofiltration**

---

**8** M. Sanchez, Y. Liu, J. A. Lercher  
Department of Chemistry and Catalysis Research Institute,  
TU München, Garching, Germany  
**Hydride Transfer as Key Reaction for Steering Activity, Selectivity, and Stability in Methanol to Hydrocarbon Chemistry**

---

**9** M. S. Marschall\*, M. Ritschel\*, M. Hauck\*, L. Waurick\*,  
X. H. Vu\*\*, T. T. Dang\*\*, O. Busse\*, J. J. Weigand\*  
\*Technische Universität Dresden, Germany, \*\*Vietnam Petroleum  
Institute, Hanoi, Vietnam  
**Recycling of Spent FCC Catalysts – Production of Industrial Catalyst and Valuable Materials**

---

**10** J. Kocík\*, J. Kolena\*, J. Mück\*\*, K. Frolich\*\*  
\*Research Department, Unipetrol Centre for Research and  
Education, Inc., Litvínov-Záluží 1, Czech Republic, \*\*Department of  
Physical Chemistry, Faculty of Chemical Technology, University of  
Pardubice, Czech Republic  
**Conversion of Glycerol - a Side Product from Biodiesel Production - to Propylene Glycol**

---

**11** A. Gradel\*/\*\*/\*\*\*, J. A. Wünning\*\*\*\*, T. Plessing\*,  
A. Jess\*\*/\*\*  
\*Institute for Water- and Energy Management, University of Applied  
Sciences (UAS) Hof, Germany, \*\*Chair of Chemical Engineering  
(CVT), University Bayreuth, Germany, \*\*\*Center of Energy  
Technology (ZET), University Bayreuth, Germany, \*\*\*\*WS Wärme-  
prozesstechnik GmbH, Renningen, Germany  
**Clean Gasification of Biomass with Integrated Tar Adsorption**

---

**12** A. Duerksen, C. Kern, A. Jess  
Chair of Chemical Engineering, Faculty of Engineering Science,  
University of Bayreuth, Germany  
**Influence of an Alternating Fischer-Tropsch/Hydrogenolysis Process on the Product Selectivity and Activity**

---

**13** N. Herrmann, J. Bianga, T. Seidensticker, J.M.  
Dreimann, D. Vogt  
Laboratories of Industrial Chemistry, TU Dortmund, Germany  
**Intensification of Aqueous Biphasic Hydroformylation of Unsaturated Oleochemicals by a Jet-loop Reactor**

---



Thursday, October 10, 2019

**14** C. Heßelmann\*, T. Wolf\*\*, C. Körner\*\*/\*\*, J. Albert\*, P. Wasserscheid\*

\*Friedrich-Alexander University Erlangen-Nürnberg, Institute of Chemical Reaction Engineering, Germany, \*\*Friedrich-Alexander University Erlangen-Nürnberg, Joint Institute of Advanced Materials and Processes, Fürth, Germany, \*\*\*Friedrich-Alexander University Erlangen-Nürnberg, Department of Materials Science, Chair of Materials Science and Technology for Metals, Erlangen, Germany  
**Additive Manufacturing Meets Reaction Engineering – Novel Raney® Copper Catalyst Structures for Methanol Synthesis**

---

**15** P. Schühle\*, S. Reichenberger\*\*, G. Marzun\*\*, J. Albert\*

\*University of Erlangen-Nuremberg, Institute of Chemical Reaction Engineering, \*\*University of Duisburg-Essen, Faculty of Chemistry, Technical Chemistry, Germany  
**Application of In<sub>2</sub>O<sub>3</sub>-catalysts for Slurry Phase Hydrogenation of CO<sub>2</sub> to Methanol: Influence of Reaction Conditions, Support and Catalyst Preparation**

---

**16** R. Grün, C. Breitung

Chair of Technical Thermodynamics, Technische Universität Dresden, Germany

**Development of a Transient Catalyst Characterization Method for Methanol Synthesis**

---

**17** L. Smith, N. F. Dummer, M. Douthwaite, D. Willock, S. H. Taylor, G. H. Hutchings

Cardiff Catalysis Institute, Cardiff University, Cardiff, USA

**Gas Phase Glycerol Valorisation over Ceria Nanocrystals with Well-defined Morphologies**

---

**18** S. Püschel, T. Rösler, A. J. Vorholt

Max-Planck-Institute for Chemical Energy Conversion, Mülheim a.d.R., Germany

**Reductive Hydroformylation for the Production of Alcohols Used in Synthetic Fuel Blends**

---

**Session Chairman:** Mario Marchionna

16.45 *Keynote Lecture:* O. Schneider  
OMV Refining & Marketing GmbH, Wien, Austria  
**ReOil – OMV's Pace to Circular Economy**

17.30 M. Seitz, S. Schröter, D. Thamm, A. Engelhardt, J. Klapproth, M. Klätte, V. Cepus  
HS Merseburg, Verfahrenstechnik / Technische Reaktionsführung, Germany  
**Thermo-chemical Depolymerisation Technologies to Recover Olefins**

18.00 L.G. Seidl, R.P. Lee, F. Keller, B. Meyer  
Institute of Energy Process Engineering and Chemical  
Engineering, TU Bergakademie Freiberg, Germany  
**Chemical Utilization of Carbonaceous Waste and  
Lignite – A Case Study of Sustainable Olefin  
Production in Germany**

20.00 **Conference Dinner**  
**zeitlos restaurant & café**  
Olbrichtplatz 2, 01099 Dresden  
Phone + 49 351 88948079

**Friday, October 11, 2019**

**Session Chairman: Johannes Lercher**

- 8.30 *Keynote Lecture:* J. Holladay, R. Rousseau, R. Weber, J. Holladay, O. Y. Gutierrez, J. Lercher  
Pacific Northwest National Laboratory, Richland, WA, USA  
**Storing Energy in Chemical Bonds – Strategies for Electrochemical Conversion of Organic Waste to Petrochemicals and Fuels**
- 9.15 G. Herz, N. Müller, E. Reichelt, S. Megel, M. Jahn  
Fraunhofer IKTS, Dresden, Germany  
**High-temperature Co-electrolysis – A Key Step for CO<sub>2</sub> Emission Mitigation in Industrial Processes**
- 9.45 M. Tan\*, Y. Liu\*, A. Jentys\*, O. Gutierrez\*\*, L. Meyer\*\*, C. Chin\*\*\*, J. A. Lercher\*/\*\*  
\*Department Chemie & Catalysis Research Center, TU München, Garching bei München, Germany; \*\*Institute for Integrated Catalysis, Pacific Northwest National Laboratory, Richland, USA; \*\*\*Department of Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, Canada  
**Linking Catalysis with Electrochemical Conversion – Towards Understanding the Complexity of Electrocatalytic Reduction of Organic Chemicals**
- 10.15 I. Rossetti\*, G. Ramis\*\*  
\*Chemical Plants and Industrial Chemistry Group, Dip. Chimica, Università degli Studi di Milano, CNR-ISTM and ISTM Unit Milano-Università, Milano, Italy, \*\*Dip. Ing. Chimica, Civile ed Ambientale, Università degli Studi di Genova, Genoa, Italy  
**Photocatalytic Approaches to Circular Economy: CO<sub>2</sub> Photoreduction to Regenerated Fuels and Chemicals and H<sub>2</sub> Production from Wastewater**
- 10.45 **Coffee Break**

**Friday, October 11, 2019**

**Session Chairman: Holger Blanke**

- 11.15 *Keynote Lecture:* R. Schlögl  
Fritz-Haber-Institut of Max-Planck-Society, Berlin,  
Germany, Max-Planck-Society for Chemical energy  
Conversion, Mülheim a.d.R., Germany  
**Carbon as a Future Energy Carrier**
- 12.00 Nga Thi Quynh Do\*, S. Haag\*, V. Gronemann\*\*,  
T. Schuhmann\*\*, T. Oelmann\*\*, M. Gorny\*\*,  
H. Schwarz\*\*\*, S. Werner\*\*\*, S. J. Reitmeier\*\*\*,  
S. Gebert\*\*\*, A. Reitzmann\*\*\*  
\*Air Liquide Forschung und Entwicklung, Frankfurt a. M.,  
Germany, \*\*Air Liquide Engineering and Construction,  
Frankfurt a. M., Germany, \*\*\*Clariant, BU Catalysts,  
Munich, Germany  
**Layer Management for Methanol Process**
- 12.30 T. Stiegler\*, K. Meltzer\*\*, A. Tremel\*\*, M. Baldauf\*\*,  
P. Wasserscheid\*/\*\*\*, J. Albert\*  
\*Friedrich-Alexander-Universität Erlangen-Nürnberg,  
Erlangen, Germany, \*\*Siemens AG, Corporate  
Technology, Research in Energy and Electronics,  
Erlangen, \*\*\*Forschungszentrum Jülich GmbH, Erlangen  
**Development of a Structured Reactor System for  
CO<sub>2</sub> Valorisation under Dynamic Operating  
Conditions**
- 13.00 **Concluding Remarks and Conference Summary**  
Johannes Lercher

**Lunch**

The conference is jointly organized by DGMK and



Società Chimica Italiana



Österreichische Gesellschaft  
für Erdölwissenschaften



*Photo: Wikimedia*

The Venue: Dreikönigskirche in Dresden

## General Information

### Venue:

**DreiKönigsKirche Dresden** - Haus der Kirche  
Hauptstraße 23  
D-01097 Dresden  
Phone: +49 351 8124 103

The venue is located in the city centre of Dresden (Neustadt).

**Conference Secretary:** Christa Jenke / Ines Musekamp  
**DGMK** Phone: +49 40 639004 12 / 71  
Überseering 40 Telefax: +49 40 639004 50  
D-22297 Hamburg Email: jenke@dgmk.de  
musekamp@dgmk.de

### On-Site Conference Secretary at the Dreikönigskirche Dresden

Wednesday, October 9, 2019	12.00 – 18.00
Thursday, October 10, 2019	08.00 – 18.30
Friday, October 11, 2019	08.00 – 13.00

**Conference Language:** English

### Hotel Reservation:

Participants are requested to make their own hotel reservation. There will be no hotel reservation by DGMK. Special **DGMK-rates** (under the heading "DGMK") are offered at:

#### Hotel Martha Dresden

Nieritzstr. 11, D-01097 Dresden  
Phone: +49 351 81 76 333  
Email: rezeption@hotel-martha-dresden.de

**Rate:** Single room € 84,00/night incl. breakfast

#### Hotel Bayerischer Hof Dresden

Antonstr. 33-35, D-01097 Dresden  
Phone: +49 351 829 370  
Email: info@bayerischer-hof-dresden.de

**Rate:** Single room € 80,00/night incl. breakfast

Please make your hotel reservation not later than  
**September 15, 2019.**

## Registration:

Please fill in the enclosed registration form and return it to the Conference Secretary. One registration form is requested for each participant. Registration should be done by

**September 16, 2019**

<b>Registration Fee:</b>	<i>registration</i>	
	by	after
	16.09.19	16.09.19
Individual Members of DGMK, SCI or ÖGEW (Industry)	€ 570,00	€ 610,00
Individual Members of DGMK, SCI or ÖGEW (University)	€ 310,00	€ 340,00
Students* - Individual Members of DGMK, SCI or ÖGEW	free	€ 110,00
Non-Members (Industry)	€ 600,00	€ 640,00
Non-Members (University)	€ 340,00	€ 370,00
Students* - Non-Members	€ 150,00	€ 180,00

\*up to the age of 30; copy of student card requested

### **The registration fee includes:**

- participation in the conference
- conference preprints (DGMK-Tagungsbericht)
- coffee/tea/cold drinks during the coffee breaks  
Lunch on Thursday, October 10, 2019
- Conference dinner on Thursday, October 10, 2019
- Lunch on Friday, October 11, 2019

### **Payment:**

Payment is requested after receipt of the invoice.

### **Refunds:**

Refunds will be made for cancellation received in writing until September 16, 2019. Substitutions may be made at any time for registered participants unable to attend.

### **Conference Preprints:**

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

# Registration

Fax: +49 40 639004 12

**for the DGMK / SCI / ÖGEW- Conference  
“Circular Economy – A Fresh View on  
Petrochemistry”  
October 9 - 11, 2019 in Dresden**

---

Title, First Name, Name

---

Company/Institution

---

Address

---

---

Phone

---

E-Mail

I register for the conference

as a member of DGMK or  
SCI / ÖGEW

  

as a non-member

I am employed in the  
Industry

Academia

I am a Student\*  
(\*up to the age of 30)

I shall pay after confirmation of the registration form and receipt  
of an invoice

Herewith I agree to the data protection conditions of the DGMK  
(dgmk/datenschutz).

---

Date / Signature



Please return to:

**DGMK**  
Deutsche Wissenschaftliche Gesellschaft  
für Erdöl, Erdgas und Kohle e.V.  
**Mrs. Christa Jenke**  
Überseering 40  
D-22297 Hamburg