

# 11<sup>th</sup> Workshop on Fats and Oils as Renewable Feedstock for the Chemical Industry

Dortmund/Germany, May 30 – June 01, 2022  
Hotel Dorint An den Westfalenhallen, Room Picasso 1-3

## Monday, May 30, 2022

- 15.00 Registration and Welcome Coffee
- 15.45 **Welcome and Opening**
- Jürgen O. Metzger, *abiosus* e.V.
- Markus Dierker, President of German Society of Fat Research (DGF)
- Thomas Seidensticker, TU Dortmund
- 16.00 – 17.30 *First Session*
- Chair: Thomas Seidensticker*
- 16.00 – 16.30 **A personal journey through 15 years of Oleochemistry (M)**  
L1 Michael A. R. Meier, KIT, Karlsruhe, Germany
- 16.30 – 17.00 **The role of chemists and chemical engineers in a sustainable world (M)**  
L2 David Cole-Hamilton, University of St. Andrews, UK
- 17.00 – 17.30 **Industrial applications of plant-based hydrocarbons (M)**  
L3 Markus Dierker, BASF, Düsseldorf, Germany
- 18.30 – 21.00 **Opening Mixer and Poster Session**

(M) Main Lecture 30 min. including discussion  
(D) Discussion Lecture 20 min including discussion

## Tuesday, May 31, 2022

9.00 – 10.50 *First morning session*

*Chair: Mike Meier*

9.00 – 9.30 **Homogeneous Catalysis for the Functionalization of Oleochemicals: From Laboratory to Miniplant Scale (M)**  
L4 Thomas Seidensticker, TU Dortmund University, Germany

9.30 – 9.50 **Homogeneously transition metal catalyzed oxidation of methyl oleate with H<sub>2</sub>O<sub>2</sub> – selectivity control and catalyst separation (D)**  
L5 Johanna Vondran, Thomas Seidensticker, TU Dortmund University, Germany

9.50 – 10.10 **Triphasic gas/liq/liq segmented slug flow reactor for selectivity control in continuous reactions (D)**  
L6 Niclas von Vietinghoff, Thomas Seidensticker, David W. Agar, TU Dortmund University, Germany

10.10 – 10.30 **Chemical Reaction Engineering of Vegetable Oils Epoxidation (D)**  
L7 Vincenzo Russo, Tommaso Cogliano, Rosa Turco, Pasi Tolvanen, Adriana Freitas Aguilera, Tapio Salmi, Riccardo Tesser, Martino Di Serio, Università di Napoli Federico II, Napoli, Italy

10.30 – 10.50 ***In vivo* Synthetic Olefin Metathesis Catalysis in Microalgae Lipid Droplets**  
L8 Natalie S. Schunck, Stefan Mecking, University of Konstanz, Konstanz, Germany

10.50 – 11.20 **Coffee break**

11.20 – 12.50 *Second morning session*

*Chair: Thomas Brück*

11.20 – 11.50 **Conversion of unsaturated fatty acids into industrial speciality and fine chemicals using chemo- and biocatalysts (M)**  
L9 Harald Gröger, University of Bielefeld, Bielefeld, Germany

11.50 – 12.10 **Biocatalytic synthesis of oleochemicals (D)**  
L10 Robert Kourist, Elia Calderini, Yue Sun, Kamela Myrtollari, Technische Universität Graz, Graz, Österreich

12.10 – 12.30 **H<sub>2</sub>O<sub>2</sub> tunnel engineering for making robust BVMO to produce oleochemicals efficiently (D)**  
L11 Eun Ji Seo<sup>a,b</sup>, Uwe T. Bornscheuer<sup>b</sup>, Jin-Byung Park<sup>a\*</sup>,  
<sup>a</sup> Ewha Womans University, Seoul, Republic of Korea; <sup>b</sup> Greifswald University, Greifswald, Germany

- 12.30 – 12.50 **Biotechnological production of odour-active fatty aldehydes by  $\alpha$ -dioxygenase and aldehyde dehydrogenase (D)**  
L12 Jean-Philippe Kanter<sup>1</sup>, Philipp J. Honold<sup>1</sup>, Andreas K. Hammer<sup>2</sup>, Christoph Harms<sup>3</sup>, Egon Gross<sup>3</sup>, Uwe Bornscheuer<sup>4</sup>, Marco A. Fraatz<sup>1</sup>, Jakob P. Ley<sup>3</sup>, Holger Zorn<sup>1,2</sup>  
<sup>1</sup>Justus Liebig University Giessen, Giessen, Germany. <sup>2</sup>Fraunhofer Institute for Molecular Biology and Applied Ecology Giessen, Germany. <sup>3</sup>Symrise AG, Holzminden, Germany. <sup>4</sup>University of Greifswald, Greifswald, Germany
- 12.50 – 14.00 **Lunch break**  
Restaurant Davidis
- 14.00 – 15.30 *First afternoon session*  
*Chair: Markus Dierker*
- 14.00 – 14.30 **A Review of the Solid-Catalysed Isomerisation of Oleic Acid to Iso-Oleic Acid - How understanding of the reaction at molecular level has led to improved catalyst design and efficiency (M)**  
L13 Sophie C.C. Wiedemann, Tanja van Bergen-Brenkman, Roel Moonen, Croda Nederland B.V., Gouda, The Netherlands
- 14.30 – 14.50 **Montmorillonite clay catalysts for oleochemical processing (D)**  
L14 Oscar Kelly, Callum Morris, Adam Mudashiru, Adam Brookbanks, BYK Additives Limited, Widnes, Cheshire, United Kingdom
- 14.50 – 15.10 **Sustainable bio-based surfactants (D)**  
L15 Gemma Solduga<sup>1</sup>, Niklas Thiel<sup>2</sup>, Clariant, Frankfurt<sup>1</sup>, Burgkirchen<sup>2</sup>, Germany
- 15.10 – 15.30 **Epoxidized Vegetable oils as additive for Bioplastics (D)**  
L16 Rosa Turco<sup>1,2</sup>, Gabriella Santagata<sup>2</sup>, Cinzia Pezzella<sup>3</sup>, Riccardo Tesser<sup>1</sup>, Martino Di Serio<sup>1</sup>; <sup>1</sup>Department of Chemical Sciences, University of Naples Federico II, Naples, Italy; <sup>2</sup> Institute for Polymers, Composites and Biomaterials, CNR, Pozzuoli, Italy; <sup>3</sup> Department of Agricultural Sciences, University of Naples Federico II, Portici, Italy
- 15.30 – 16.00 **Coffee break**

- 16.00 – 17.30      *Second afternoon session*
- Chair: Luc Averous*
- 16.00 – 16.30      **Plant oil-based polymers for closed loop recycling and non-persistence** (M)
- L17                      Stefan Mecking, University of Konstanz, Konstanz, Germany
- 16.30 – 16.50      **Sustainable Syntheses of Non-Isocyanate Polyurethanes based on Renewable 2,3-Butanediol** (D)
- L18                      Anja Kirchberg, Masood Khabazian Esfahani, Michael A. R. Meier, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
- 16.50 – 17.10      **Plant oil based radically polymerizable monomers for sustainable polymers** (D)
- L19                      Sylvain Caillol, ICGM, Univ Montpellier, CNRS ENSCM, Montpellier, France
- 17.10 – 17.30      **Styrene-free thermosetting resins from vegetable oils** (D)
- L20                      Fabio Bertini, Adriano Vignali, Nicoletta Ravasio, Federica Zaccheria, CNR SCITEC “G. Natta”, Milano, Italy
- 19.00                      **Conference Dinner**
- Restaurant Davidis

## Wednesday, June 01, 2022

- 9.00 – 10.30      *First morning session*
- Chair: Johannes de Vries*
- 9.00 – 9.30              **Biobased polyurethanes based on different macromolecular architectures from different resources** (M)
- L21                      Luc Averous, University of Strasbourg, Strasbourg, France
- 9.30 – 9.50              **A more sustainable chemistry with elemental sulfur surplus: towards the design of novel polymers** (D)
- L22                      Timo Sehn,<sup>1</sup> Daniel Döpping,<sup>1</sup> Patrick Theato,<sup>1,2</sup> Hatice Mutlu<sup>1</sup>,  
<sup>1</sup>Soft Matter Synthesis Laboratory, Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany, <sup>2</sup>Institute for Chemical Technology and Polymer Chemistry, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

- 9.50 – 10.10      **Synthesis of fully biobased and reprocessable polyurethane foams (D)**  
 L23                 Baptiste Quienne, Florian Cuminet, Julien Pinaud, Sylvain Caillol\*, Institut Charles Gerhardt Montpellier, Université Montpellier, CNRS, ENSCM, Montpellier, France
- 10.10 – 10.30     **Terpene-Based Biopolymers as Novel Functional Biomaterials - Synthesis, Analysis and Applications (D).**  
 L24                 Malte Winnacker, Magdalena M. Kleybolte, Andreas J. G. Beringer, Technische Universität München, München, Germany
- 10.30 – 11.00     **Coffee Break**
- 11.00 – 12.30     *Second morning session*  
                          *Chair: Sophie Wiedemann*
- 11.00 – 11.30     **Synthetic biotechnology for material innovation- CO2 conversion to carbon fiber composites and innovative lightweight materials (M)**  
 L25                 Thomas Brück, Technical University of Munich, Munich, Germany
- 11.30 – 12.00     **Sustainable polymers. Use of renewable resources and recycling (M)**  
 L26                 Johannes de Vries, LIKAT, Rostock, Germany
- 12.00 – 12.30     **Isomerizing Metathesis as a Concept for the Valorization of Fatty Acid Derivatives (M)**  
 L27                 Lukas J. Gooßen, Ruhr-Universität Bochum, Bochum, Germany
- 12.30 – 12.45     **Poster Award and Closing Remarks**  
                          **Best Poster Award**  
                          Award committee: Lukas Gooßen, Harald Gröger, Stephan Mecking  
                          **Closing Remarks**  
                          Thomas Seidensticker
- 12.45                 **End of Workshop**
- 13.00                 **Closing Lunch**  
                          Restaurant Davidis

## Poster

- P1 **The role of Stabilizers in H<sub>2</sub>O<sub>2</sub> for the Peroxyformic Acid Synthesis and Decomposition Kinetics**  
Riccardo Tesser, Vincenzo Russo, Tommaso Cogliano, Rosa Turco, Rosa Vitiello, Tapio Salmi, Martino Di Serio, Department of Chemical Science, Università di Napoli Federico II, Napoli, Italy
- P2 **Büchi „Miniclave“ A suitable tool for the downscale process development of Fatty Acid Ethyl Ester – Biodiesel**  
Axel Ingendoh, Inachem GmbH, Odenthal, Germany
- P3 **Ruthenium catalyzed oxidative cleavage of high oleic sunflower oil**  
L. Santos Correa, M. A. R. Meier, Institute of Organic Chemistry (IOC) and Institute of Biological and Chemical Systems– Functional Molecular Systems (IBCS-FMS), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
- P4 **Functionalization of oleo chemicals: Developing sustainable processes by integrated catalyst recycling**  
Astrid I. Seifert<sup>1</sup>, Johanna Vondran<sup>2</sup>, Thomas Seidensticker<sup>2</sup>, Kerstin Wohlgemuth<sup>1</sup>, <sup>1</sup>TU Dortmund University, Laboratory of Plant and Process Design, Dortmund, Germany, <sup>2</sup>TU Dortmund University, Laboratory of Industrial Chemistry, Dortmund, Germany
- P5 **Synthesis of linoleic acid hydroperoxides using immobilized LOX for the application in a flow reactor system**  
Valentin Gala Marti, Ulrich Schörken, Faculty of Applied Natural Sciences, TH Köln, Leverkusen, Germany
- P6 **Pd-Nanoparticles in Multi-Phase Catalysis: Semi-Hydrogenation of Poly-Unsaturated Fatty Acid Derivatives**  
Maximilian Spiekermann, Florian Lehmann, Thomas Seidensticker, Laboratory of Industrial Chemistry, Department of Biochemical and Chemical Engineering, TU Dortmund University, Dortmund, Germany
- P7 **Organic Solvent Nanofiltration: Recycling of an unmodified Grubbs-Hoveyda catalyst in the self-metathesis of cardanol**  
Alexander Kühl, Daniel Fakesch, Dieter Vogt, Thomas Seidensticker, Laboratory of Industrial Chemistry, Department of Biochemical and Chemical Engineering, TU Dortmund University, Dortmund, Germany
- P8 **Synthesis of amino-functionalized oleochemicals via hydroaminomethylation with integrated catalyst recycling**  
Anna Kampwerth, Dieter Vogt, Thomas Seidensticker, Laboratory of Industrial Chemistry, Department of Biochemical and Chemical Engineering, TU Dortmund University, Dortmund, Germany

- P9 **Synthesis of fatty amines by homogeneously catalyzed amination of fatty alcohols**  
Christian Heider, Dominik Pietschmann, Alina Winter, Dieter Vogt, Thomas Seidensticker, Technical University Dortmund, Laboratory of Industrial Chemistry, Dortmund, Germany
- P10 **Intensification strategies for homogeneously catalyzed hydroformylation of oleo chemicals in aqueous multiphase systems: Utilizing the "chaos"**  
T. Roth, M. Heyng, D. Vogt, T. Seidensticker, TU Dortmund University, Laboratory of Industrial Chemistry, Dortmund, Germany
- P11 **Hydroaminomethylation of oleochemicals in a continuously operated miniplant**  
Tim Riemer, Thomas Seidensticker, Dieter Vogt, Laboratory of Industrial Chemistry, Department of Biochemical and Chemical Engineering, TU Dortmund University, Dortmund, Germany
- P12 **Application of multiphase systems for the intensified production of furans from biomass**  
Nico Thanheuser<sup>1</sup>, Jesús Esteban<sup>2</sup>, Andreas J. Vorholt<sup>1</sup>, <sup>1</sup>Max-Planck-Institute for Chemical Energy Conversion, Mülheim an der Ruhr, Germany, <sup>2</sup>Department of Chemical Engineering. The University of Manchester, Manchester, United Kingdom
- P13 **Catalysis and Chemical Reaction Engineering for Biolubricants Productions**  
Rosa Vitiello, Francesco Taddeo, Rosa Turco, Vincenzo Russo, Riccardo Tesser, Martino Di Serio, Department of Chemical Science, Università di Napoli Federico II, Napoli, Italy
- P14 **Pulsed Electric Field (PEF) Treatment for Lipid Extraction from Microalgae**  
Aude Silve, Natalja Nazarova, Rüdiger Wüstner, Wolfgang Frey, Institute for Pulsed Power and Microwave Technology, Karlsruhe Institute of Technology, Karlsruhe, Germany
- P15 **Polythiomalonamides: Renaissance of Industrial Waste, i.e. Elemental Sulfur, in Functional Materials**  
Timo Sehn<sup>1</sup>, Patrick Theato<sup>1,2</sup>, Hatice Mutlu<sup>1</sup>, <sup>1</sup> Soft Matter Synthesis Laboratory, Karlsruhe Institute of Technology (KIT )Eggenstein-Leopoldshafen,Germany.<sup>2</sup> Institute for Chemical Technology and Polymer Chemistry, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
- P16 **Cost Effective Marriage of Poly(dithiocarbonates) with Elemental Sulfur**  
Timo Sehn, Hatice Mutlu, Soft Matter Synthesis Laboratory, Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany
- P17 **Synthesis of vinyl monomers from commercial olive oil via transesterification with N-hydroxyethyl acrylamide**  
Oliver J. Harris and Fiona L. Hatton, Department of Materials, Loughborough University, Loughborough, LE11 3TU

P18 **Optimized reaction conditions for the synthesis of 12-opda**  
Tim Lukas Guntelmann<sup>1\*</sup>; Karl-Josef Dietz<sup>2</sup>; Harald Gröger<sup>1</sup>, <sup>1</sup>Faculty of  
Chemistry, Bielefeld University, Bielefeld, Germany, <sup>2</sup>Faculty of Biology, Bielefeld  
University, Bielefeld, Germany