

PROGRAMME

10 – 12 May 2021 · Online Event

Annual Meeting on Reaction Engineering 2021 (Jahrestreffen Reaktionstechnik)

www.processnet.org/REAKT2021



GENERAL INFORMATION

VIRTUAL VENUE

The annual meeting will be accessible via the Converia Virtual Venue
www.react21.virtual-venue.io

CAREER FORUM

This year's NaWuReT Career Forum hosts a **speed networking event** on **11 May 2021, 16:30 – 17:45**.

[ACCESS to CAREER FORM](#)

Conference participants from academia and industry gather together to exchange information about job opportunities, professional background, business goals, and possible career entries. We will apply the Round Robin model, where participants meet each other sequentially in random pairings in a set time period of three minutes. After that, you change position to the next space.

As a early career professional or PhD student, you will have the chance to meet individually employees from industry. Confirmed participants from industry are BASF, Clariant, Covestro, and Evonik.

SOCIAL PROGRAMME: MEET UP WITH YOUR COLLEAGUES AND FRIENDS

11 May 2021, 18:00: "A drink from your region"

- » Join our social evening in participating in a quiz „Reaction Engineering in Daily Life“
- » Choose and prepare a typical drink from your region: tell your colleagues the regional and cultural features of that drink.

First part of the evening we will meet up all in one room for the quiz.

Later we will have smaller groups in break-out rooms to learn about regional and cultural traditions for drinks and drinking habits.

We invite you to take the chance to introduce a typical drink from your region with it's characteristics, e.g. to which food, time or occasion you will enjoy this drink. Feel free to prepare pictures or a short presentation.

ORGANIZER

DECHEMA e.V.
 Theodor-Heuss-Allee 25
 60486 Frankfurt am Main/D

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POSTER DISCUSSION

11 May 2021, 14:00 – 15:25

Visit the ePosters and discuss directly with the authors. A virtual meeting room will be generated individually by the authors: you will find the access link (click the button 'Details') directly under the ePoster in the Q&A area.

NETWORKING DURING COFFEE AND LUNCH BREAKS

In all coffee and lunch breaks we provide an interactive meeting option to video chat and text chat via Wonder.me. It's very easy to get in touch with your peers via this browser based software.

You can join a discussion with a group of up to 15 people or just 1 on 1. Please feel free to create a topic for a discussion which others can join.

PLENARY LECTURES / COMMITTEE

PLENARY LECTURES

Analysis and modelling of complex and coupled reaction-separation processes

Prof. Jakob Burger, Technische Universität München (TUM)/D

CFD of reacting flows at surfaces: methodologies and applications

Prof. Matteo Maestri, Politecnico di Milano/I

Metallurgical Reactors: Key enablers of the Circular Economy

Prof. Markus Reuter, SMS group GmbH, Düsseldorf/D

Circular Economy – Challenges & Opportunities for the Polymer Industry

Dr. Stephan Schubert, CAS Technology Center, Covestro AG, Leverkusen/D

SCIENTIFIC COMMITTEE

Prof. David W. Agar	TU Dortmund/D
Dr. Jonathan Bloh	DECHEMA Forschungsinstitut, Frankfurt am Main/D
Prof. Markus Busch	TU Darmstadt/D
Dr. Kai Ehrhardt	BASF SE, Ludwigshafen/D
Prof. Hannsjörg Freund	FAU Erlangen-Nürnberg/D
Prof. Olaf Hinrichsen	Technische Universität München/D
Prof. Elias Klemm	University of Stuttgart/D
Maximilian Kotzur	DECHEMA e.V., Frankfurt am Main/D
Prof. Ulrike Krewer	Karlsruhe Institute of Technology/D
Dr. Ricarda Leiberich	Lanxess Deutschland GmbH, Leverkusen/D
Dr. Stefan Palkovits	RWTH Aachen University/D
Prof. Jörg Sauer	Karlsruhe Institute of Technology/D (Chairman)
Prof. Thomas Turek	Clausthal University of Technology, Clausthal-Zellerfeld/D
Dr. Olaf Wachsen	CLARIANT, Frankfurt am Main/D
Prof. Gregor Wehinger	Clausthal University of Technology, Clausthal-Zellerfeld/D (Representative of NaWuReT)
Prof. Horst-Werner Zanthoff	Evonik Operations GmbH, Marl/D

SPONSOR / EXHIBITORS

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CLARIANT is a focused, sustainable and innovative specialty chemical company based in Muttenz, near Basel/Switzerland. On 31 December 2020, the company employed a total workforce of 13 235. In the financial year 2020, CLARIANT recorded sales of CHF 3.860 billion for its continuing businesses. The company reports in three business areas: Care Chemicals, Catalysis and Natural Resources. CLARIANT's corporate strategy is based on five pillars: focus on innovation and R&D, add value with sustainability, reposition portfolio, intensify growth, and increase profitability.

www.clariant.com

EXHIBITORS



Magritek is the global leader in manufacturing cryogen-free benchtop Nuclear Magnetic Resonance (NMR) spectrometers for the analytical instrument market. Magritek's revolutionary 80 MHz, 60 MHz and 43 MHz Spinsolve family of benchtop NMR models offer the highest sensitivity and resolution available in the market. These portable systems are robust and easy to use, allowing modern NMR methods to be performed on the chemistry lab bench or inside the fume hood next to a reactor. Spinsolve NMR spectrometers are used daily by scientists in research labs to quantify and identify sample compositions, confirm reaction completions and elucidate unknown molecular structures.

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Science & Engineering

REACNOSTICS is modeling, constructing and building chemical research reactors for the spatially resolved investigation of catalytic processes.

Our methodology comprises simulations and operando measurements of concentration & temperature profiles in combination with spectroscopic catalyst characterization.

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www.reacnostics.com

PROGRAMME AT A GLANCE

Monday, 10 May 2021		Tuesday, 11 May 2021		Wednesday, 12 May 2021	
Chair:	Jörg Sauer	Chair:	Hannsjörg Freund	Chair:	Ulrike Krewer
9:00	Welcome and Awarding of „Hanns-Hofmann-Prize“	09:00	PLENARY LECTURE Jakob Burger	09:00	Lecture of the Winner of „Hanns-Hofmann-Prize“
9:15	PLENARY LECTURE Matteo Maestri	9:30	Q&A		New Reactor Concepts
9:45	Q&A	9:40	Short Break	Chair:	Ulrike Krewer
9:55	Short Break		Heterogeneous Catalysis	09:15	Emanuele Moioli
	Modelling & Simulation	Chair:	David Agar	09:30	Giulia Littwin
Chair:	Thomas Turek	09:50	Bjarne Kreitz	09:45	Q&A
10:05	Riccardo Uglietti	10:05	Bruno Lacerda de Oliveira Campos	10:00	Coffee Break and Networking
10:20	Erik von Harbou	10:20	Lukas Maier		Photochemistry
10:35	Gregor Wehinger	10:35	Q&A	Chair:	Kai Ehrhardt
10:50	Q&A	10:50	Coffee Break and Networking	10:30	Dirk Ziegenbalg
11:05	Coffee Break and Networking		Electrochemical Processes	10:45	Susann Triemer
	InSitu Monitoring	Chair:	Elias Klemm	11:00	Q&A
Chair:	Gregor Wehinger	11:20	Nicolai Schmitt	11:10	Short Break
11:35	Bahne Sosna	11:35	Jörn Brauns		Future Circular Economy
11:50	Marion Björnhorst	11:50	Florian Baakes	Chair:	Kai Ehrhardt
12:05	Jens Bremer	12:05	Max König	11:20	Esther Brepohl
12:20	Q&A	12:20	Q&A	11:35	Mathias Seitz
12:35	Short Presentations of the Exhibitors	12:40	Lunch Break and Networking	11:50	Q&A
12:55	Lunch Break and Networking	13:40	Short Introduction of Poster Programme	Chair:	Olaf Wachsen
	High Temperature Reactions	14:00	Poster Discussions	12:00	PLENARY LECTURE Stephan Schubert
Chair:	Olaf Hinrichsen	15:25	Short Break	12:30	Q&A
14:00	Patrick Lott	Chair:	Ricarda Leiberich	12:40	Poster Prize Awarding
14:15	Aliya Magazova	15:30	PLENARY LECTURE Markus Reuter	12:50	Closing of Scientific Programme
14:30	Abigail Perez Ortiz	16:00	Q&A	13:00	End of conference
14:45	Q&A	16:10	End of lectures		
15:00	Short Presentation of the Research Fellow	16:30-17:45	Career Forum		
15:10	End of lectures	18:00	Meet up with colleagues		
15:30-16:30	General Meeting of the Working Group Reaction Engineering				

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We engage with the issues of the future. This approach is deeply rooted in our brand: we focus on appreciation – in all areas in which we are active. The result is innovative solutions to lower emissions, reduce raw material consumption, and create sustained added value. This is precious to us.

LECTURE PROGRAMME

Monday, 10 May 2021

*Chair: J. Sauer Karlsruhe Institute of Technology (KIT)/D*09:00 **Welcome and Awarding of "Hanns-Hofmann-Prize"**

09:15 **PLENARY LECTURE**
CFD of reacting flows at surfaces: methodologies and applications
 M. Maestri, Politecnico di Milano/I

09:45 Q&A with M. Maestri

09:55 **Short Break****MODELLING & SIMULATION***Chair: T. Turek, Clausthal University of Technology, Clausthal-Zellerfeld/D*

10:05 **Multiscale modeling of mass transfer limited fluidized bed reactors: An experimental and numerical study**

R. Uglietti¹; D. La Zara²; A. Goulas²; M. Bracconi¹; J. van Ommen²; M. Maestri¹; ¹ Politecnico di Milano/I; ² Delft University of Technology, Delft/NL

10:20 **Interaction of reaction and internal fluid dynamics in jet loop reactors**

O. Bey¹; E. von Harbou¹; ¹ BASF SE, Process Research and Chemical Engineering, Ludwigshafen/D

10:35 **Instabilities in fixed bed reactors with downwards directed flows for the oligomerization of 1-Butene**

G. Wehinger¹; N. Paul²; A. Rix²; T. Six²; J. Knossalla²; R. Franke²; ¹ Clausthal University of Technology, Clausthal-Zellerfeld/D; ² Evonik Operations GmbH, Marl/D

10:50 Q&A Modelling & Simulation

11:05 **Coffee Break and Networking****INSITU MONITORING***Chair: G. Wehinger, Clausthal University of Technology, Clausthal-Zellerfeld/D*

11:35 **Probing local diffusion and reaction in a catalyst pellet**

B. Sosna¹; O. Korup¹; R. Horn¹; ¹ Hamburg University of Technology (TUHH), Hamburg/D

11:50 **Spatially resolved measurement of simultaneous isocyanic acid hydrolysis and nitrogen oxides reduction on SCR catalysts**

M. Eck¹; D. Schweigert¹; M. Björnhorst¹; O. Deutschmann¹; ¹ Karlsruhe Institute of Technology (KIT), Karlsruhe/D

12:05 **New Insights on Fixed-Bed Reactor Dynamics via Real-Time Distributed Temperature Sensing**

J. Bremer¹; R. Zimmermann²; K. Sundmacher¹; ¹ Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg/D; ² Otto-von-Guericke Universität Magdeburg/D

12:20 Q&A InSitu Monitoring

12:35 **Short Presentations of the Exhibitors**12:55 **Lunch Break and Networking**

LECTURE PROGRAMME

Monday, 10 May 2021

HIGH TEMPERATURE REACTIONS*Chair: O. Hinrichsen, Technische Universität München/D*

14:00 **Gas phase pyrolysis of methane: An experimental study and numerical simulations**
 M. Mokashi¹; P. Lott¹; D. Heitlinger¹; R. Pashminehazar¹; A. Shirsath¹; H. Müller¹;
 S. Lichtenberg¹; S. Angeli¹; T. Sheppard¹; S. Tischer¹; L. Maier¹; J. Grunwaldt¹;
 O. Deutschmann¹; ¹ Karlsruhe Institute of Technology (KIT), Karlsruhe/D

14:15 **Simulation of plasma methane pyrolysis for CO₂-free H₂**
 A. Magazova¹; S. Bøddeker²; N. Bibinov²; D. Agar¹; ¹ TU Dortmund/D; ² Ruhr-Universität Bochum/D

14:30 **Autothermal Oxidative Coupling of Methane for Ethylene Production: Parametric study from a Lab to a Mini-plant Reactor**
 A. Perez Ortiz¹; A. Penteado¹; T. Karsten¹; E. Esche¹; V. Grigull²; R. Schomäcker³; J. Repke¹;
¹ Technische Universität Berlin / Fachgebiet Dynamik und Betrieb technischer Anlagen, Berlin/D; ² ECO Erneuerbare Energien GmbH, Rotenburg (Wümme)/D; ³ Technische Universität Berlin / Institut für Chemie, Berlin/D

14:45 Q&A High Temperature Reactions

15:00 **Short Presentation of the Research Fellow**15:10 **End of Lectures**15:30 **General Meeting of the Working Group Reaction Engineering (15:30 – 16:30)**

LECTURE PROGRAMME

Tuesday, 11 May 2021

Chair: H. Freund, FAU Erlangen-Nürnberg/D

09:00 **PLENARY LECTURE**
Analysis and modelling of complex and coupled reaction-separation processes
 J. Burger, Technische Universität München (TUM)/D

09:30 Q&A with J. Burger

09:40 Short Break

HETEROGENEOUS CATALYSIS*Chair: D. Agar, TU Dortmund/D*

09:50 **Microkinetic modeling of the CO₂ methanation on Ni catalysts with an automatically generated mechanism**
 B. Kreitz¹; G. Wehinger¹; F. Goldsmith²; T. Turek¹; ¹ Clausthal University of Technology, Clausthal-Zellerfeld/D; ² Brown University, Providence, RI/USA

10:05 **Surface reaction kinetics of the methanol synthesis on Cu/Zn-based catalysts**
 B. Lacerda de Oliveira Campos¹; K. Herrera Delgado¹; S. Wild¹; F. Studt¹; S. Pitter¹; J. Sauer¹; ¹ Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D

10:20 **Effective Transport Properties of Porous Media from Microstructure Image Data**
 L. Maier¹; J. Matthies¹; U. Niekens¹; ¹ ICVT Uni Stuttgart/D

10:35 Q&A Heterogeneous Catalysis

10:50 Coffee Break and Networking

ELECTROCHEMICAL PROCESSES*Chair: E. Klemm, University of Stuttgart/D*

11:20 **Best practice for accurate determination of ORR catalyst activity in gas diffusion electrode half-cells**
 N. Schmitt¹; B. Etzold¹; ¹ Technische Universität Darmstadt/D

11:35 **Model-based evaluation of dynamic operating concepts for alkaline water electrolyzers powered by renewable energy**
 J. Brauns¹; T. Turek¹; ¹ Clausthal University of Technology, Clausthal-Zellerfeld/D

11:50 **Illuminating catalytic species during the thermal runaway of lithium-ion batteries**
 F. Baakes¹; U. Krewer¹; ¹ Karlsruhe Institute of Technology (KIT), Karlsruhe/D

12:05 **Electrochemical CO₂ reduction to Oxalate – Applying Gas Diffusion Electrodes in Aprotic Media**
 M. König¹; D. Pant²; E. Klemm¹; ¹ Universität Stuttgart/D; ² VITO - Flemish Institute for Technological Research, Mol/B

12:20 Q&A Electrochemical Processes

12:40 Lunch Break and Networking

LECTURE PROGRAMME

Tuesday, 11 May 2021

13:40 **Short Introduction of the Poster Programme**
 J. Friedland¹; B. Kreitz²; ¹ Ulm University, Ulm/D; ² Clausthal University of Technology, Clausthal-Zellerfeld/D

14:00 Poster Discussions

15:25 Short Break

Chair: R. Leiberich, Lanxess Deutschland GmbH, Leverkusen/D

15:30 **PLENARY LECTURE**
Reaction Engineering for Metallurgical Processes – Key technologies for the circular economy
 M. Reuter, SMS group GmbH, Düsseldorf/D

16:00 Q&A with M. Reuter

16:10 End of Lectures

16:30 Career Forum (16:30 – 17:45)

18:00 **Networking Event**
Meet up with colleagues (18:00 – 20:00)

LECTURE PROGRAMME

Wednesday, 12 May 2021

*Chair: U. Krewer, Karlsruhe Institute of Technology/D*09:00 **Lecture of the Winner of "Hanns-Hofmann-Prize"**

NEW REACTOR CONCEPTS

*Chair: U. Krewer, Karlsruhe Institute of Technology/D*09:15 **Production of grid-quality synthetic natural gas with heat recovery in a new industrial-scale chemical reactor**E. Moiolì¹; A. Züttel²; ¹ Paul Scherrer Institute, Villigen/CH; ² EPFL, Sion/CH09:30 **Heat Transfer Characteristics of Additively Manufactured Periodic Open Cellular Structures as Novel Catalyst Supports**G. Littwin¹; H. Freund¹; ¹ Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Lehrstuhl für Chemische Reaktionstechnik, Erlangen/D

09:45 Q&A HH-Prize-Lecture & New Reactor Concepts

10:00 **Coffee Break and Networking**

PHOTOCHEMISTRY

*Chair: K. Ehrhardt, BASF SE, Ludwigshafen/D*10:30 **Unsteady Operation as Potent Approach to Intensify Photoreactions**D. Ziegenbalg¹; Ü. Tastan¹; F. Guba¹; F. Gaulhofer¹; M. Sender¹; ¹ Ulm University, Ulm/D10:45 **Kinetic model for the photocatalyzed oxidation step in the partial synthesis of an antimalarial**S. Triemer¹; M. Schulze²; R. Schenkendorf²; U. Krewer³; A. Seidel-Morgenstern⁴; ¹ Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg/D; ² Technical University Braunschweig/D; ³ Karlsruhe Institute of Technology (KIT), Karlsruhe/D; ⁴ Max Planck Institute for Dynamics of Complex Technical Systems & Otto von Guericke University, Magdeburg/D

11:00 Q&A Photochemistry

11:10 **Short Break**

LECTURE PROGRAMME

Wednesday, 12 May 2021

FUTURE CIRCULAR ECONOMY

*Chair: K. Ehrhardt, BASF SE, Ludwigshafen/D*11:20 **Continuous back to monomer recycling of PET from composite materials using a twin-screw extruder**E. Brepohl¹; L. Biermann²; C. Lücking²; M. Kirstein²; C. Eichert³; S. Scholl¹; ¹ TU Braunschweig/D; ² RITTEC Umwelttechnik GmbH/ TU Braunschweig/D; ³ RITTEC Umwelttechnik GmbH, Lüneburg/D11:35 **Catalytic Depolymerisation of Polyolefinic Plastic Waste**M. Seitz¹; S. Schröter¹; ¹ Hochschule Merseburg/D

11:50 Q&A Future Circular Economy

*Chair: O. Wachsen, CLARIANT, Frankfurt am Main/D*12:00 **PLENARY LECTURE****Circular Economy – Challenges & Opportunities for the Polymer Industry**
S. Schubert, CAS Technology Center, Covestro AG, Leverkusen/D

12:30 Q&A with S. Schubert

12:40 **Poster Prize Awarding**12:50 **Closing of Scientific Programme**13:00 **End of conference**

(Programme subject to change.)

POSTER PROGRAMME

FUTURE CIRCULAR ECONOMY

- P 1.01 **Screening investigations for the development of a back to monomer recycling method for PET containing composite materials**
L. Biermann¹; D. Quast¹; E. Brepohl²; C. Eichert³; S. Scholl²; ¹ RITTEC Umwelttechnik GmbH/ Technische Universität Braunschweig, Braunschweig/D; ² TU Braunschweig, Institut für Chemische und Thermische Verfahrenstechnik, Braunschweig/D; ³ RITTEC Umwelttechnik GmbH, Lüneburg/D
- P 1.02 **The potential of adsorption to achieve energy-efficient separation of itaconic acid from glucose in biorefineries**
J. Deischer¹; J. Pastoors²; J. Büchs²; R. Palkovits¹; ¹ RWTH Aachen University - Institut für Technische und Makromolekulare Chemie (ITMC), Aachen/D; ² RWTH Aachen University - Aachener Verfahrenstechnik/Bioverfahrenstechnik (AVT.BioVT), Aachen/D
- P 1.03 **A new reactor for the flexible use of power-to-gas in biogas upgrading**
E. Moiola¹; A. Gantenbein¹; S. Biollaz¹; T. Schildhauer²; ¹ Paul Scherrer Institute, Villigen/CH
- P 1.04 **Sustainable Chemical Production with Electricity from renewable sources: CHEM|ampere**
C. Lobo¹; E. Klemm¹; ¹ University of Stuttgart, Stuttgart/D
- P 1.05 **Long term stability of carbon supported iron catalysts during Fischer-Tropsch-Synthesis**
S. Schultheis¹; N. Lorenz²; A. Drochner¹; B. Etzold¹; ¹ TU Darmstadt/D

ELECTROCHEMICAL REACTION ENGINEERING

- P 2.01 **Partial Oxidation of Methane in a Cold Plasma Reactor**
S. Müller¹; M. Kohns¹; E. Ströfer¹; H. Hasse¹; ¹ Laboratory of Engineering Thermodynamics (LTD), Technische Universität Kaiserslautern, Kaiserslautern/D
- P 2.02 **The Continuous Kolbe Electrolysis of Biogenic Acids**
N. Kurig¹; J. Meyers¹; S. Palkovits¹; F. Holzhäuser¹; R. Palkovits¹; ¹ RWTH Aachen University, Aachen/D
- P 2.03 **Flow-Cell Solutions for CO₂ Electrolysis**
P. Rößner¹; E. Klemm¹; ¹ Universität Stuttgart, Stuttgart/D
- P 2.04 **ElKaSyn – Electrocatalytic Synthesis of Alcohols via CO₂RR**
M. Schmidt¹; E. Klemm¹; ¹ University Stuttgart, Stuttgart/D
- P 2.05 **Feasibility of demand response in the chemical industry**
N. Milojevic¹; R. Schomäcker²; ¹ TU Berlin, Berlin/D; ² Technische Universität Berlin/D
- P 2.06 **Simulative Assessment of Material and Transport Property Influences on Fuel Cell Polarization Curves**
L. Hüfner¹; K. Jeschonek¹; B. Etzold¹; ¹ Technische Universität Darmstadt - Ernst Berl Institute of Technical and Macromolecular Chemistry, Darmstadt/D

20 – 23 September 2021 · Online Event

ECCE 13 & ECAB 6

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Event no. 767



Gesellschaft für Chemische Technik
und Biotechnologie e.V.

POSTER PROGRAMME

- P 2.07 **Study on scalable electrochemical reactor for on-site production of vanadium electrolyte for an all-vanadium redox-flow battery**
O. Zielinski¹; U. Kunz²; T. Turek²; ¹ TU Clausthal - Forschungszentrum Energiespeicher-technologien, Goslar/D; ² TU Clausthal - Institute for Chemical and Electrochemical Process Engineering, Clausthal-Zellerfeld/D

EXPERIMENTAL REACTOR DIAGNOSTICS

- P 3.01 **Liquid Phase Selective Oxidation of Propylene to Propylene Oxide on Titanium Silicalite Catalyst in a Compact Profile Reactor**
A. Aquino¹; R. Horn¹; O. Korup¹; ¹ Hamburg University of Technology (TUHH) / Reacnostics GmbH, Hamburg/D
- P 3.02 **Investigations on spatially resolved kinetics of iron-based Fischer-Tropsch reaction**
F. Wolke¹; J. Schöne¹; E. Reichelt¹; M. Jahn¹; R. Horn²; ¹ Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden/D; ² TUHH, Hamburg University of Technology, Hamburg/D
- P 3.03 **Sorption-enhanced water-gas shift reaction for synthesis gas production from pure CO: Investigation of sorption parameters and reactor configurations**
T. Stadler¹; P. Barbig¹; J. Kiehl¹; P. Pfeifer¹; ¹ Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D
- P 3.04 **CO₂ Methanation – Comparison of axial temperature and concentration measurements with simulations**
J. Martin¹; S. Fläischlen¹; B. Kreitz¹; G. Wehinger¹; T. Turek¹; ¹ Clausthal University of Technology - Institute of Chemical and Electrochemical Process Engineering, Clausthal-Zellerfeld/D
- P 3.05 **Optimization of Chemical Reactions with Tailored Flow Structures**
F. Kexel¹; A. von Kameke¹; J. Fitschen¹; M. Hoffmann¹; M. Schlüter¹; ¹ TU Hamburg/D
- P 3.06 **A novel reactor for temperature, concentration and spectroscopic profile measurements of NH₃ oxidation under industrial conditions**
J. Pottbacker¹; S. Jakobtorweihen¹; O. Korup¹; M. Menon²; R. Horn¹; ¹ Hamburg University of Technology (TUHH), Hamburg/D; ² Yara International, Porsgrunn/N

REACTION KINETICS AND REACTOR MODELLING & SIMULATION

- P 4.01 **Kinetic description of the Hydroaminomethylation with mechanistic kinetic models**
W. Kortuz¹; S. Kirschtowski¹; A. Seidel-Morgenstern²; C. Hamel³; ¹ Otto von Guericke University, Magdeburg/D; ² Otto von Guericke University / Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg/D; ³ Otto von Guericke University/ Anhalt University of Applied Sciences, Magdeburg/D
- P 4.02 **Thermodynamically rigorous description of the open circuit voltage of redox flow batteries**
N. Hayer¹; M. Kohns¹; ¹ TU Kaiserslautern, Lehrstuhl für Thermodynamik (LTD), Kaiserslautern/D

POSTER PROGRAMME

- P 4.03 **Automated Isothermal Reaction Calorimetry in Continuous Flow**
T. Frede¹; I. Burke¹; H. Köster¹; N. Kockmann¹; ¹ TU Dortmund University - Department of Biochemical and Chemical Engineering, Equipment Design, Dortmund/D
- P 4.04 **Continuous Production of Poly(oxymethylene) Dimethyl Ethers from Methanol and Formaldehyde in a Fixed-Bed Reactor**
J. Voggenreiter¹; J. Burger¹; ¹ Technical University of Munich, Laboratory for Chemical Process Engineering, Straubing/D
- P 4.05 **Local Structure Effects on Flow Behavior in Slender Fixed Beds**
S. Fläischlen¹; M. Kutscherauer¹; G. Wehinger¹; ¹ Clausthal University of Technology, Institute of Chemical and Electrochemical Process Engineering, Clausthal-Zellerfeld/D
- P 4.06 **Direct hydrogen reduction of mineral iron carbonate: effect of matrix constituents in the hydrogen feed**
A. Loder¹; M. Siebenhofer¹; S. Lux¹; ¹ Graz University of Technology, Graz/A
- P 4.07 **Process Development and Design of the Chemo-Enzymatic Production of a Bio-Based Thermoplastic Using an Algae Feedstock**
M. Feigel¹; K. Hinrichsen¹; ¹ Technical University of Munich, Garching/D
- P 4.08 **Modeling the Direct Synthesis of Dimethyl Ether using Artificial Neural Networks**
N. Delgado Otalvaro¹; P. Bilir¹; K. Herrera Delgado¹; S. Pitter¹; J. Sauer¹; ¹ Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D
- P 4.09 **Catalytic hydrogenation of CO₂ to olefin-rich hydrocarbons: parameter study and kinetic analysis using supported iron catalysts**
L. Brübach¹; P. Pfeifer¹; ¹ Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D
- P 4.10 **A Multiphase Operator Splitting approach for the reactive Euler-Euler simulation of industrial fluidized systems with detailed microkinetic models**
D. Micale¹; R. Uglietti¹; M. Bracconi¹; M. Maestri¹; ¹ Politecnico di Milano/I
- P 4.11 **Improvement of CFD-DEM simulations using a three-level grid method**
D. Hirche¹; K. Hinrichsen¹; ¹ Technische Universität München, Garching b. München/D
- P 4.12 **Catalyst Deactivation During Propane Dehydrogenation - Comparison of Different Modeling Approaches**
A. Brune¹; A. Geschke²; A. Seidel-Morgenstern²; C. Hamel¹; ¹ Otto von Guericke University, Institute of Process Engineering and Anhalt University of Applied Sciences, Process Engineering, Magdeburg/D; ² Otto von Guericke University Magdeburg/D
- P 4.13 **Transient simulation of propane dehydrogenation in an integrated membrane reactor considering coke growth and catalyst activity**
J. Walter¹; A. Brune²; C. Hamel²; ¹ Otto von Guericke University Magdeburg/D; ² Anhalt University of Applied Sciences, Köthen, and Otto von Guericke University, Magdeburg/D
- P 4.14 **Model-based study of extractive dehydration of Xylose to Furfural**
F. Lali¹; B. Bottenbruch²; H. Frühwirth²; R. Güttel¹; ¹ Uni Ulm/D; ² Hochschule Biberach/D

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- P 4.15 **Analysis and simplification of kinetic models for methane chlorination and pyrolysis**
F. Keuchel¹; M. Heinlein¹; J. Hohlmann¹; D. Agar¹; ¹ TU Dortmund, Lehrstuhl für Chemische Verfahrenstechnik, Dortmund/D
- P 4.16 **Dynamics of Iron-based Catalysts for CO₂ Hydrogenation: Fundamental Study using Core@Shell Model Materials**
T. Heinz¹; C. Zambrzycki¹; R. Güttel¹; ¹ University Ulm /D
- P 4.17 **Theoretical studies on the reactor design of a rotating film reactor for hydrogen production from methane**
T. Becker¹; J. Jaworski¹; D. Agar¹; ¹ TU Dortmund/D
- P 4.18 **Numerical Simulation of Pellet Shrinkage in Random Packed Beds – Feasibility Study –**
J. Fernengel¹; R. Weber¹; N. Szesni²; R. Fischer²; K. Hinrichsen¹; ¹ Technical University of Munich, Garching near Munich/D; ² Clariant Produkte (Deutschland) GmbH, Bruckmühl/D
- P 4.19 **Photothermal and photokinetic effects in syngas conversion catalysts when irradiated with light**
H. Becker¹; D. Ziegenbalg²; R. Güttel²; ¹ Universität Ulm/D; ² Ulm University - Institute of Chemical Engineering, Ulm/D
- P 4.20 **Development of a semi-mechanistic kinetic model approach to describe dynamically operated CO₂ methanation**
M. Langer¹; D. Kellermann¹; H. Freund¹; ¹ Friedrich Alexander Universität (FAU), Erlangen/D
- P 4.21 **Advances in Modelling of a Trickle Bed Reactor for Liquid Phase Hydrogenation Reactions Influenced by Mass Transfer**
H. Held¹; M. Gstettenbauer¹; H. Freund¹; Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Lehrstuhl für Chemische Reaktionstechnik, Erlangen/D

REACTION ENGINEERING OF CATALYZED REACTIONS

- P 5.01 **Methanol Synthesis Investigations with Real Steel-Mill-Gases in an On-Site Technical Center**
K. Girod¹; S. Schlüter¹; H. Lohmann¹; S. Kaluza²; ¹ Fraunhofer Institut UMSICHT, Oberhausen/D; ² Hochschule Düsseldorf - University of Applied Sciences, Düsseldorf/D
- P 5.02 **High-throughput catalyst evaluation setup for Fischer-Tropsch catalysts for the synthesis of higher alcohols**
M. Medicus¹; F. Wolke¹; E. Reichelt¹; M. Jahn¹; ¹ Fraunhofer IKTS, Dresden/D
- P 5.03 **CFD/DEM simulation of industrial size packed beds at high Reynolds numbers and low tube to pellet diameters**
S. Ulmer¹; S. Zirngibl¹; B. Dittmar¹; S. Hoffmann¹; H. Zander¹; ¹ Linde GmbH, Linde Engineering, Pullach/D
- P 5.04 **Zeolite-catalyzed production of OME in an anhydrous liquid phase process**
M. Drexler¹; U. Arnold¹; P. Haltenort¹; J. Sauer¹; ¹ Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D

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- P 5.05 **Oxidative Coupling of Methane over Pt/Al₂O₃ to C₂ Products**
J. Chawla¹; S. Bastian¹; S. Schardt¹; L. Maier¹; S. Tischer¹; P. Lott¹; K. Ehrhardt²; F. Scheiff²; J. Bode²; S. Schunk³; O. Deutschmann¹; ¹ Karlsruher Institut für Technologie (KIT), Karlsruhe/D; ² BASF SE, Ludwigshafen/D; ³ hte GmbH, Heidelberg/D
- P 5.06 **Carbon Dioxide Hydrogenation**
S. Kleiber¹; A. Loder¹; M. Siebenhofer¹; S. Lux¹; ¹ Graz University of Technology, Graz/A
- P 5.07 **Quantifying the formation of stereoisomers on-line during an HWE reaction by benchtop NMR spectroscopy**
S. Suljić¹; J. Kolz¹; F. Casanova¹; ¹ Magritek GmbH, Aachen/D
- P 5.08 **Direct DME synthesis – investigations on dehydration catalysts and CO₂ influence**
S. Wild¹; D. Guse²; K. Herrera Delgado¹; M. Kind²; S. Pitter¹; S. Polierer¹; T. Zevaco¹; J. Sauer¹; ¹ Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D; ² Karlsruhe Institute of Technology (KIT), Karlsruhe/D
- P 5.09 **Investigation towards the influence of the catalyst sorption capacity on the dynamics of the methanation process**
M. Gäßler¹; D. Meyer¹; R. Güttel¹; ¹ Universität Ulm/D
- P 5.10 **Scale-up of prebiotic production by monolith based immobilized β-galactosidase pore-through-flow membrane reactor**
I. Pottratz¹; I. Müller¹; C. Hamel¹; ¹ Anhalt University of Applied Sciences, Köthen/D
- P 5.11 **Partial oxidation of methane to formaldehyde under anaerobic conditions – An experimental study**
C. Resech¹; ¹ Ulm Universität, Ulm/D
- P 5.12 **Understanding the role of metal-oxygen species in oxidation pathways of propane to acrylic acid**
T. Omojola¹; S. Wrabetz¹; S. Carey¹; P. Kube¹; G. Koch¹; R. Schlögl¹; A. Trunschke¹; ¹ Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin/D
- P 5.13 **Experimental studies of the influence of product adsorption on methanation on cobalt/zeolite catalysts**
K. Albers¹; ¹ Universität Ulm/D
- P 5.14 **Insights into the Pt catalyzed Ammonia-Oxidation at technical relevant conditions through a combined simulative and experimental study**
F. Kornemann¹; L. Stoltenberg¹; M. Haas²; M. Schöpp²; A. Wiser³; D. Born³; C. Renk⁴; A. Drochner¹; M. Votsmeier²; B. Etzold¹; ¹ Technische Universität Darmstadt - Ernst Berl Institute of Technical and Macromolecular Chemistry, Darmstadt/D; ² Umicore AG & Co. KG/Technische Universität Darmstadt, Hanau-Wolfgang/D; ³ Umicore AG & Co. KG, Hanau-Wolfgang/D; ⁴ ThyssenKrupp Industrial Solutions AG, Dortmund/D

POSTER PROGRAMME

P 5.15 **Direct transformation of ethene to propene in a reactor cascade: Study of the metathesis step applying tungsten-based catalysts**
 T. Wolff¹; M. Felischak¹; L. Perea²; C. Hamel³; A. Seidel-Morgenstern⁴; ¹ Max Planck Institut für Dynamik komplexer technischer Systeme, Magdeburg/D; ² Universidad Autónoma de Zacatecas/MEX; ³ Anhalt University of Applied Sciences Köthen/D; ⁴ Max Planck Institute for Dynamics of Complex Technical Systems and Otto von Guericke University, Magdeburg/D

P 5.16 **Homogeneously catalyzed liquid phase oxidation in a milli reactor: Model-based evaluation of experimental results**
 J. Friedland¹; R. Güttel¹; ¹ Ulm University, Ulm/D

P 5.17 **Exploring Catalyst Dynamics in a Fixed Bed Reactor by Correlative Operando Spatially Resolved Structure Activity Profiling**
 B. Wollak¹; D. Doronkin²; D. Espinoza Astudillo¹; T. Sheppard²; O. Korup¹; M. Schmidt³; S. Alizadefanloo⁴; C. Schroer⁴; F. Rosowski¹; J. Grunwaldt²; R. Horn¹; ¹ Hamburg University of Technology (TUHH), Hamburg/D; ² KIT - Karlsruhe Institute of Technology, Karlsruhe/D; ³ REACNOSTICS GmbH, Hamburg/D; ⁴ Deutsches Elektronen Synchrotron DESY, Hamburg/D

NEW REACTOR CONCEPTS

P 6.01 **Experimental Investigation of Mass Transport Processes in a Microstructured Membrane Reactor for the Direct Synthesis of Hydrogen Peroxide**
 L. Trinkies¹; A. Düll¹; B. Deschner¹; M. Kraut¹; R. Dittmeyer¹; ¹ Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D

P 6.02 **Application of multiphase reactions in a Taylor-Couette Disc Contactor: economic isolation of carboxylic acids from dilute aqueous effluents by reactive extraction**
 G. Rudelstorfer¹; A. Graftschatter¹; M. Siebenhofer¹; S. Lux¹; ¹ Graz University of Technology, Graz/A

P 6.03 **Towards Scale-Up of Photoreactors – the MISCOP Project**
 F. Gaulhofer¹; D. Ziegenbalg¹; A. Peschl²; ¹ Ulm University, Ulm/D; ² Peschl Ultraviolet GmbH, Mainz/D

P 6.04 **Achieving Inter-Laboratory Comparability of Photochemical Experiments with a Modular, Documented and Characterized Experimental Setup**
 D. Kowalczyk¹; F. Huber¹; M. Sender¹; S. Rau¹; D. Ziegenbalg¹; ¹ Universität Ulm/D

P 6.05 **Challenges during the long-term operation of an electrically rechargeable zinc-air battery with a two-electrode setup**
 S. Genthe¹; U. Kunz¹; T. Turek¹; ¹ Clausthal University of Technology, Clausthal-Zellerfeld/D

P 6.06 **Application of 3D Printed Reactors to Optimize Continuous Acrylate Polymerization**
 K. Zentel¹; A. Reinbeck¹; S. Hapke¹; C. Deckert¹; W. Pauer¹; G. Luinstra¹; ¹ TU Hamburg/D

P 6.08 **Contributions to Photochemical Engineering: photo reactor design**
 P. Kant¹; M. Klumpp¹; G. Ozin²; R. Dittmeyer¹; ¹ Institute for Micro Process Engineering, Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D; ² Department of Chemistry, University of Toronto, Toronto/CDN

P 6.09 **Forced periodic operation of methanol synthesis: Design and test of a laboratory setup**
 M. Felischak¹; T. Wolff¹; D. Nikolic²; C. Seidel³; A. Kienle⁴; M. Petkovska⁵; A. Seidel-Morgenstern⁴; ¹ Max Planck Institut für Dynamik komplexer technischer Systeme, Magdeburg/D; ² University of Belgrade, Faculty of Technology and Metallurgy, Belgrade/SRB; ³ Otto-von-Guericke Universität, Magdeburg/D; ⁴ Otto-von-Guericke Universität Magdeburg & Max-Planck-Institut für Dynamik komplexer technischer Systeme, Magdeburg/D; ⁵ University of Belgrade, Institute for Chemistry, Technology and Metallurgy, Belgrade/SRB

NOVEL PROCESSES

P 7.01 **Continuous hydrothermal synthesis (CHTS) of Ceria nanoparticles: modeling vs. experiment**
 C. Schüßler¹; M. Türk¹; ¹ Karlsruhe Institute of Technology (KIT), Campus South, Karlsruhe/D

MISCELLANEOUS

P 8.01 **3D-printed monoliths for acid-catalyzed reactions**
 S. Hock¹; C. Rein¹; M. Rose¹; ¹ TU Darmstadt Ernst-Berl-Institut, Darmstadt/D

P 8.02 **Reaction Optimization of a Suzuki-Miyaura Cross-Coupling using Design of Experiments**
 J. Bobers¹; L. Hahn¹; T. Averbek¹; N. Kockmann¹; ¹ TU Dortmund University, Dortmund/D

P 8.03 **Water influence on the loading of liquid organic hydrogen carriers (LOHC) with heterogeneous catalysts**
 B. Bong¹; R. Palkovits¹; ¹ RWTH Aachen University - Institut für Technische und Makromolekulare Chemie (ITMC), Aachen/D

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