DECHEMA

VDI

CONFERENCE PROGRAMME

18 – 20 July 2022
Congress Center Würzburg/Germany

Annual Meeting on Reaction Engineering and ProcessNet Subject Division Heat and Mass Transfer 2022

www.dechema.de/react_hmt_2022

PROCESSNET
EINE INITIATIVE VON DECHEMA UND VDI-GVC

GENERAL INFORMATION

VENUE

Congress Center Würzburg
Pleichertorstraße
97070 Würzburg

INTERNET ACCESS

WiFi access is available for free throughout the conference venue. As WiFi can be used by all participants, a loss of efficiency is possible.

Network: **Mevent**
Password: **dechema0722**

BOOK OF ABSTRACTS

A book of abstracts from all lectures and posters is available online for all participants of the meeting at **www.dechema.de/react_hmt_2022_BOA**

OFFICE HOURS CONFERENCE DESK

Monday, 18 July 2022	10:00 – 18:00
Tuesday, 19 July 2022	08:30 – 18:45
Wednesday, 20 July 2022	08:30 – 13:45

CONTACT

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PLENARY LECTURES / COMMITTEES

PLENARY LECTURES

VDI Wärmeatlas – a success story for transfer from science to practice
Prof. Dr.-Ing. Peter Stephan, TU Darmstadt/D

Radiotracer Methods, CFD and Scale-Up: Current Status and Future Trends
Prof. Shantanu Roy, Indian Institute of Technology - Delhi, New Delhi/IND

Electrifying Organic Synthesis
Prof. Siegfried Waldvogel, Johannes Gutenberg University Mainz/D

Reactor Technologies for Sustainable Chemical Production with Renewable Electricity and CO_2, N_2, O_2, and H_2O
Prof. Elias Klemm, University of Stuttgart/D

SCIENTIFIC COMMITTEE

Scientific Committee for Heat & Mass Transfer

Dr. Jens Artz	DECHEMA e.V., Fankfurt
Prof. Stephan Scholl	TU Braunschweig
Dr. Sven Sommerfeld	Bayer AG, Leverkusen

Scientific Committee for Reaction Engineering

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

SOCIAL EVENTS

SOCIAL PROGRAMME

MONDAY, 18 JULY 2022 **20:00 – 23:00**

NaWuReT Get Together: Scientific Career Opportunities

NaWuReT invite you to chat and discuss your plans and ideas for the future. While you can share your experience and network with colleagues from different working groups, some guests will set impulses and will be available to answer your questions.

Registration is for free. Prior registration is desirable but not mandatory. The consumption of food and beverages is at your own expense.

Address:
Gasthaus Alte Mainmühle
Mainkai 1
97070 Würzburg

TUESDAY, 19 JULY 2022 **19:00 – 23:00**

CONFERENCE DINNER

The Conference Dinner will take place at the beer garden of **Würzburger Hofbräukeller**.


© Würzburger Hofbräukeller

They provide us delicious beer from the own brewery, Franconian wine and also refreshing alcolholfree beverages. There will be also some entertaining live music during the dinner. This social event will give you the opportunity to meet all colleagues in a relaxed atmosphere to continue your discussions and increase your network.

You can reach the dinner location in 20 min by walk or in 15 min by tram (from the station „Congress Centrum“).

Address:
Würzburger Hofbräukeller
Jägerstr. 17
97082 Würzburg

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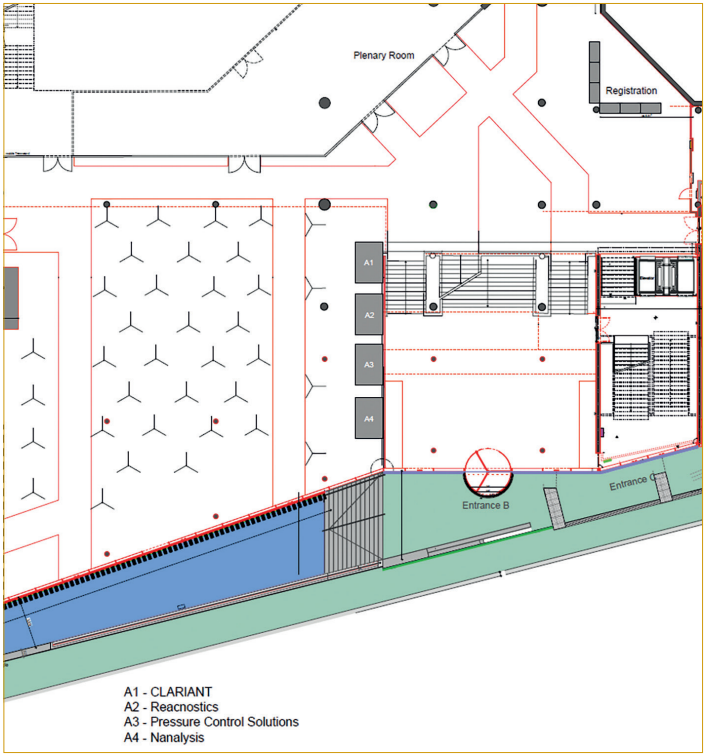

PROGRAMME AT A GLANCE

Monday, 18 July 2022

12:00	Registration and Lunch	
	Franconia Hall	
	Chair: Sauer	
13:00	*WELCOME ADDRESS* Sauer & Scholl	
13:10	*PLENARY LECTURE* Prof. Shantanu Roy	
14:00	Bracconi	
14:25	Kutscherauer	
14:50	COFFEE BREAK IN EXHIBITION AREA	
	Chair: Scholl	
15:20	Welzel	
15:45	Quarz	
16:10	Appelhaus	
	Franconia Hall	**Room 5 & 6**
16:35-16:45	*Short Presentations of the Research Fellow*	*Short Poster Presentations Heat and Mass Transfer*
16:45-17:00	*Short Presentations of the Exhibitors*	
17:00-17:15	*Short Introduction of Poster Programme*	
17:15-20:00	*Poster Party in Exhibition Area*	
20:00-22:00	*NaWuRet Get together*	

Tuesday, 19 July 2022

	Franconia Hall	
	Chair: Krewer	
09:00	*PLENARY LECTURE* Prof. Elias Klemm	
09:50	ROOM CHANGE	
	Franconia Hall	**Room 5 & 6**
	Electrification	*Fouling*
	Chair: Krewer	Chair: Sommerfeld
09:55	Löffelholz	Schumacher
10:20	Matthies	Jarmatz
10:45	COFFEE BREAK IN EXHIBITION AREA	
	Modelling & Reactor Design	*Transport properties*
	Chair: Freund	Chair: Wetzel
11:15	Ambrosetti	Rodrigues
11:40	Brune	O´Neill
12:05	Semmel	Bravo
12:30	Zimmermann	Schmidt
12:55	LUNCH BREAK IN EXHIBITION AREA	
	Reactor Diagnostics	*Evaporation*
	Chair: Zanthoff	Chair: Schnabel
14:00	Buchholz	Deeb
14:25	Korup	Steiner
14:50	Güttel	Laube
15:15	COFFEE BREAK	
	Franconia Hall	
	Chair: Scholl	
15:45	*PLENARY LECTURE* Prof. Peter Stephan	
16:35	*Poster Discussions*	
	Franconia Hall	**Room 5 & 6**
17:30-18:45	*General Assembly of the Working Group Reaction Engineering* (Mitgliederversammlung der Fachgruppe Reaktionstechnik)	*Advisory Board Meeting of Subject Division Heat & Mass Transfer* (Beiratssitzung der Fachgruppe Wärme- und Stoffübertragung)
19:00-23:00	*Conference Dinner*	

PROGRAMME AT A GLANCE

Wednesday, 20 July 2022

	Franconia Hall	Room 5 & 6
	Novel Processes	*Equipment Characterization*
	Chair: Agar	Chair: Hammerschmidt
09:00	*Awarding and Lecture of the winner of „Hanns-Hofmann-Prize“*	Will
09:25	Medicus	Schiffer
09:50	Ruede	Heckmann
10:15	Himmelmann	Faden
10:40	COFFEE BREAK IN EXHIBITION AREA	
	Kinetics	*Condensation*
	Chair: Turek	Chair: Jasch
11:10	Kreitz	Losher
11:35	Kuhn	Buckmann
12:00	Röse	Zimmermann
12:25	ROOM CHANGE	
	Franconia Hall	
	Chair: Krewer	
12:30	*PLENARY LECTURE* Prof. Siegfried Waldvogel	
13:15	*Poster Awards & Young Talent Award*	
13:30	*Closing* Wachsen, Sommerfeld	
13:45	End of Meeting and Lunch	

PROGRAMME

Monday, 18 July 2022

12:00	**Registration and Lunch**	
		Room: Franconia Hall
	Chair: J. Sauer, Karlsruher Institut für Technologie (KIT), Eggenstein-Leopoldshafen/D	
13:00	**WELCOME ADDRESS**	
13:10	**PLENARY LECTURE** **Radiotracer Methods, CFD and Scale-Up: Current Status and Future Trends** Prof. Shantanu Roy, Indian Institute of Technology - Delhi, New Delhi/IND	
14:00	**KEYNOTE LECTURE** **Coupling kMC simulations and CFD reactive models of catalytic reactors through Machine Learning techniques** M. Bracconi[1]; M. Maestri[1]; [1] Politecnico di Milano, Milano/I	
14:25	**KEYNOTE LECTURE** **A conjugated heat and mass transfer model to implement reaction in particle resolved CFD simulations of catalytic fixed beds** M. Kutscherauer[1]; S. Anderson[1]; G. Mestl[2]; S. Böcklein[2]; T. Turek[1]; G. Wehinger[1]; [1] Clausthal University of Technology, Clausthal-Zellerfeld/D; [2] Clariant AG, Heufeld/D	
14:50	Coffee Break in Exhibition Area	
15:20	**KEYNOTE LECTURE** **Fouling in continuously operated tubular reactor for the radical polymerization of N-Vinylpyrrolidone** S. Welzel[1]; U. Nieken[1]; [1] University of Stuttgart - Institute of Chemical Process Engineering, Stuttgart/D	
15:45	**KEYNOTE LECTURE** **Mass transfer during fabrication of catalyst coated membranes (CCM) for polymer electrolyte membrane (PEM) fuel cells or water electrolysis** P. Quarz[1]; N. Zimmerer[1]; L. Löttert[1]; P. Scharfer[1]; W. Schabel[1]; [1] KIT - Karlsruhe Institute of Technology, Karlsruhe/D	
16:10	**KEYNOTE LECTURE** **Understanding fluid dynamics in wiped film evaporators – modeling of residence time and flow behavior** D. Appelhaus[1]; K. Jasch[1]; S. Scholl[1]; [1] TU Braunschweig, Braunschweig/D	
16:35	**Short Poster Presentations Heat and Mass Transfer** (16:35-17:15)	*Room: 5+6*
16:35	**Short Presentation of the Research Fellow** (16:35 – 16:45)	*Room: Franconia Hall*
16:45	**Short Presentations of the Exhibitors**	*Room: Franconia Hall*
	Chairs: Dr. Marion Börnhorst, Dr. Jens Friedland	
17:00	**Short Introduction of Poster Programme**	*Room: Franconia Hall*
17:15	**POSTER PARTY** (17:15 – 20:00)	

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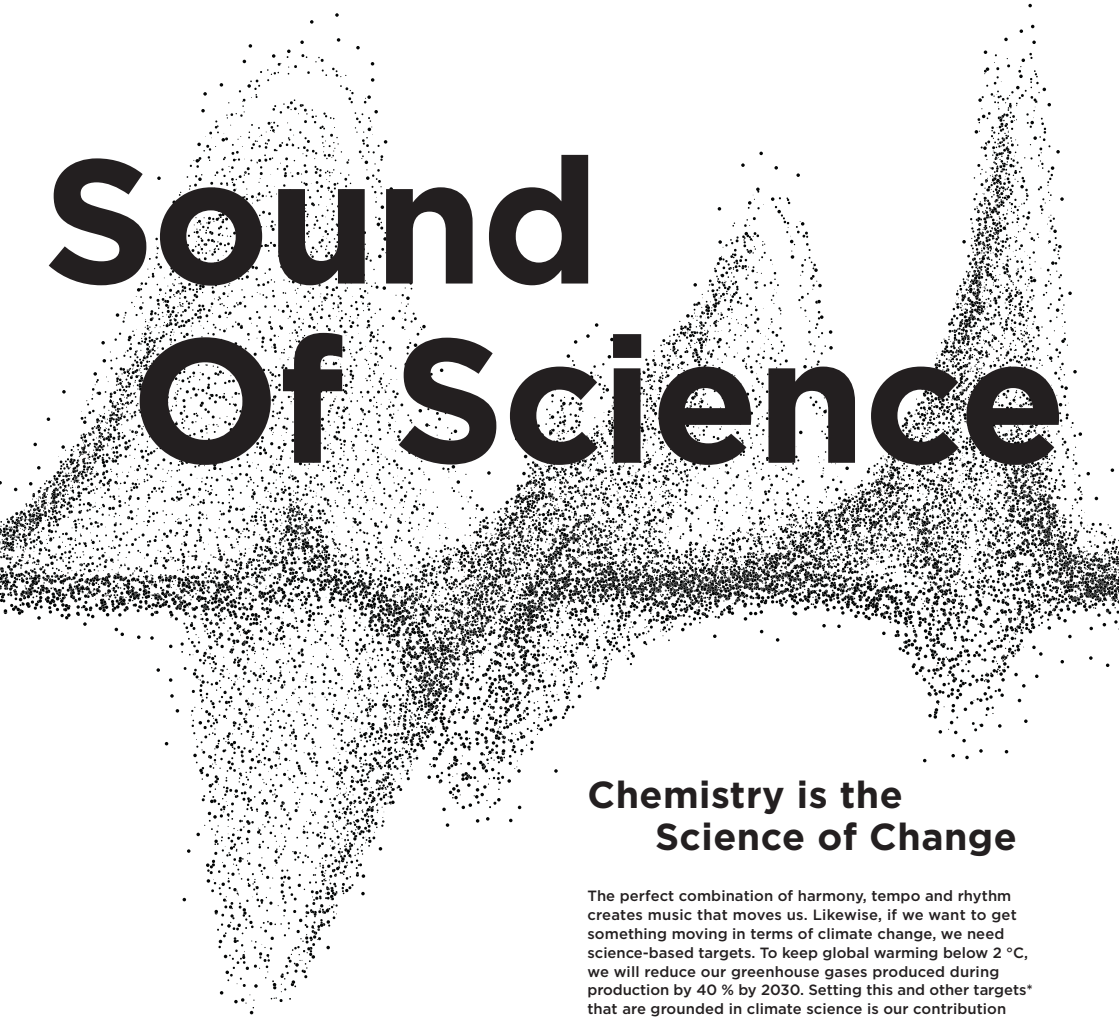

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* Furthermore: 40% less greenhouse gas emissions produced from the consumption of secondary energies (mainly electricity and steam) and 14% less other indirect greenhouse gas emissions (caused in the value chain).

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PROGRAMME

Tuesday, 19 July 2022

Room: Franconia Hall

Chair: U. Krewer, Kalrsruher Institut für Technologie (KIT), Karlsruhe/D

09:00 **PLENARY LECTURE**
Prof. Klemm

09:50 Room Change

Room: Franconia Hall

ELECTRIFICATION

Chair: U. Krewer, Kalrsruher Institut für Technologie (KIT), Karlsruhe/D

09:55 **How gas feed composition affects electrochemical CO_2 reduction at silver gas diffusion electrodes: A model study**
M. Löffelholz[1]; J. Osiewacz[1]; T. Turek[1]; [1] Clausthal University of Technology, Clausthal-Zellerfeld/D

10:20 **Oxide Ceramic Matrix Composites with direct electrical heating for use in high-temperature reaction engineering**
J. Matthies[1]; T. Schall[1]; U. Nieken[1]; [1] University of Stuttgart - Institute of Chemical Process Engineering, Stuttgart/D

10:45 Coffee Break in Exhibition Area

Room: Franconia Hall

MODELLING & REACTOR DESIGN

Chair: H. Freund, TU Dortmund, Dortmund/D

11:15 **Experimental investigation and mathematical modelling of packed copper foams for intensified methane steam reforming**
M. Ambrosetti[1]; A. Beretta[1]; G. Groppi[1]; E. Tronconi[1]; [1] Politecnico di Milano/I

11:40 **Modeling and Simulation of Catalyst Deactivation and Regeneration Cycles for Propane Dehydrogenation**
A. Brune[1]; J. Walter[1]; A. Seidel-Morgenstern[1]; C. Hamel[2]; [1] Otto-von-Guericke-Universität Magdeburg/D; [2] Anhalt University of Applied Sciences, Köthen, and Otto von Guericke University, Magdeburg, Köthen/D

12:05 **Kinetic investigations of DME synthesis at catalytic distillation conditions**
M. Semmel[1]; O. Salem[1]; A. Schaadt[1]; J. Sauer[2]; [1] Fraunhofer Institute for Solar Energy Systems ISE, Freiburg/D; [2] Karlsruhe Insitute of Technology (KIT), Karlsruhe/D

12:30 **Prototyping Core-Shell Catalyst Particles for Exothermic Reactions**
R. Zimmermann[1]; S. Weber[2]; J. Bremer[3]; V. Idakiev[1]; T. Sheppard[2]; L. Mörl[1]; K. Sundmacher[4]; [1] Otto-von-Guericke Universität Magdeburg/D; [2] Karlsruhe Institute of Technology (KIT), Karlsruhe/D; [3] Max-Planck Institut - Magdeburg/D; [4] Otto-von-Guericke Universität Magdeburg / Max-Planck-Institut für Dynamik komplexer technischer Systeme, Magdeburg/D

12:55 Lunch Break in Exhibition Area

PROGRAMME

Tuesday, 19 July 2022

Room: Franconia Hall

Chair: U. Krewer, Kalrsruher Institut für Technologie (KIT), Karlsruhe/D

09:00 **PLENARY LECTURE**
Prof. Klemm

09:50 Room Change

Room: 5+6

FOULING

Chair: S. Sommerfeld, Bayer AG, Leverkusen/D

09:55 **Deposit formation of multicomponent fluids in evaporating droplets and shear-driven films**
O. Schumacher[1]; A. Sielaff[1]; T. Gambaryan-Roisman[1]; P. Stephan[1]; [1] Technical University of Darmstadt/D

10:20 **Optimization of fouling prediction by the targeted generation of experimental training data**
N. Jarmatz[1]; W. Augustin[1]; S. Scholl[1]; [1] TU Braunschweig/D

10:45 Coffee Break in Exhibition Area

Room: 5+6

TRANSPORT PROPERTIES

Chair: T. Wetzel, Karlsruher Institut für Technologie (KIT), Karlsruhe/D

11:15 **Effective thermal conductivity of packed beds of cubical particles**
S. Rodrigues[1]; N. Vorhauer-Huget[1]; E. Tsotsas[1]; [1] Otto von Guericke University, Magdeburg/D

11:40 **Heat transfer and rheological behaviour of two-phase non-Newtonian fluids**
P. O'Neill[1]; L. Fischer[1]; R. Revellin[2]; J. Bonjour[2]; [1] Lucerne University of Applied Sciences and Arts, Horw/CH; [2] INSA - Lyon/F

12:05 **Mass transfer simulations for bimodal polymer-particle-composites**
V. Gracia-Medrano-Bravo[1]; P. Scharfer[1]; W. Schabel[1]; [1] Karlsruhe Institute of Technology (KIT) - Institute of Thermal Process Engineering, Karlsruhe/D

12:30 **Shadowgraph Method for the Accurate Determination of Thermal and Mass Diffusivities in Binary Fluid Mixtures**
P. Schmidt[1]; W. Wu[1]; M. Rausch[1]; A. Fröba[1]; [1] Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Erlangen/D

12:55 Lunch Break in Exhibition Area

PROGRAMME

Tuesday, 19 July 2022

Room: Franconia Hall

REACTOR DIAGNOSTICS

Chair: H. Zanthoff, Evonik Operations GmbH, Marl/D

14:00	**The effect of baffles on fluidized bed hydrodynamics – A magnetic resonance imaging study** H. Buchholz[1]; D. Brummerloh[1]; S. Benders[1]; A. Penn[1]; [1] Hamburg University of Technology (TUHH), Hamburg/D
14:25	**Iso-potential spectroscopy: A new concept for operando studies of solid catalysts in reactors from laboratory to industrial size** S. Stahl[1]; S. Sichert[2]; O. Korup[2]; R. Horn[2]; [1] Reacnostics GmbH, Hamburg/D; [2] Hamburg University of Technology, Hamburg/D
14:50	**The Periodic Transient Kinetics Method for Investigation of Kinetic Process Dynamics under Realistic Conditions** D. Meyer[1]; M. Gäßler[1]; J. Friedland[1]; R. Güttel[1]; [1] Ulm University - Institute of Chemical Engineering, Ulm/D
15:15	Coffee Break in Exhibition Area

Room: Franconia Hall

Chair: S. Scholl, Technische Universität Braunschweig, Braunschweig/D

15:45	**PLENARY LECTURE** **VDI Wärmeatlas - a success story for transfer from science to practice** P. Stephan[1]; [1] TU Darmstadt/D
16:35	**Poster Discussions in Exhibition Area**
17:30	**General Assembly of the Working Group Reaction Engineering** (Mitgliederversammlung) (17:30 – 18:45) – open to all interested attendees
19:00	**Conference Dinner at Würzburger Hofbräukeller** (19:00 – 23:00)

PROGRAMME

Tuesday, 19 July 2022

Room: 5+6

EVAPORATION

Chair: L. Schnabel, Fraunhofer-Institut für Solare Energiesysteme ISE, Freiburg/D

14:00 **Influence of the macro and micro structure of stainless steel tubes on the heat transfer of alcohols in pool boiling**
A. Luke[1]; M. Deeb[1]; [1] Universität Kassel/D

14:25 **Self-similar sprays with heat and mass transfer**
H. Hinterbichler[1]; H. Steiner[1]; G. Brenn[1]; [1] TU Graz/AT

14:50 **Tube flow of a liquid metal with circumferentially homogeneous and inhomogeneous thermal boundary condition**
T. Laube[1]; [1] Karlsruher Institut für Technologie (KIT)/D

15:15 Coffee Break in Exhibition Area

Room: Franconia Hall

Chair: S. Scholl, Technische Universität Braunschweig, Braunschweig/D

15:45 **PLENARY LECTURE**
VDI Wärmeatlas - a success story for transfer from science to practice
P. Stephan[1]; [1] TU Darmstadt/D

16:35 **Poster Discussions in Exhibition Area**

17:30 **Advisory Board Meeting of Subject Division Heat & Mass Transfer** (17:30 – 18:45)
(Beiratssitzung der Fachgruppe Wärme- und Stoffübertragung) – only for invited members

19:00 **Conference Dinner at Würzburger Hofbräukeller** (19:00 – 23:00)

PROGRAMME

Wednesday, 20 July 2022

Room: Franconia Hall

Chair: Prof. Jörg Sauer, Karlsruher Institut für Technologie, IKFT, Karlsruhe/D

09:00 **Awarding and Lecture of the winner of „Hanns-Hofmann-Prize“**

Room: Franconia Hall

NOVEL PROCESSES

Chair: D. Agar, Technische Universität Dortmund, Dortmund/D

09:25 **Up-scaling of Iron-based Fischer-Tropsch Synthesis of Higher Alcohols**
M. Medicus[1]; J. Mettke[1]; G. Kröner[1]; J. Abel[1]; F. Wolke[1]; E. Reichelt[1]; M. Jahn[1]; [1] Fraunhofer IKTS, Dresden/D

09:50 **Recent advances in catalytic distillation for H_2 release from LOHCs**
T. Ruede[1]; M. Geißelbrecht[2]; P. Preuster[2]; M. Wolf[2]; P. Wasserscheid[1]; [1] FZ Juelich / FAU Erlangen-Nürnberg, Erlangen/D; [2] FZ Juelich, Erlangen/D

10:15 **Ethanol to Ethylene Oxide: A Novel Process Concept**
R. Himmelmann[1]; S. Brand[2]; O. Wachsen[2]; G. Mestl[3]; E. Klemm[4]; [1] Clariant AG, Planegg/D; [2] Clariant AG, Frankfurt/D; [3] Clariant AG, Heufeld/D; [4] ITC Uni Stuttgart/D

10:40 Coffee Break in Exhibition Area

Room: Franconia Hall

KINETICS

Chair: T. Turek, Technische Universität Clausthal, Clausthal-Zellerfeld/D

11:10 **Detailed microkinetic modeling of emission oxidation chemistry on Pt catalysts**
B. Kreitz[1]; P. Lott[2]; J. Jelic[2]; K. Blöndal[1]; S. Angeli[2]; F. Studt[2]; F. Goldsmith[1]; O. Deutschmann[2]; [1] Brown University, Providence/USA; [2] Karlsruhe Insitute of Technology (KIT), Karlsruhe/D

11:35 **Iron as recyclable metal fuel: Reaction kinetic analysis of iron oxide reduction with hydrogen**
C. Kuhn[1]; P. Rohlfs[1]; A. Düll[1]; M. Börnhorst[1]; O. Deutschmann[1]; [1] Karlsruhe Institute of Technology (KIT), Karlsruhe/D

12:00 **The Microkinetic Performance Barriers of Ruthenium and Iridium Oxides during the Electrocatalytic Oxygen Evolution Reaction**
J. Geppert[1]; P. Röse[1]; U. Krewer[1]; [1] Karlsruhe Insitute of Technology (KIT), Karlsruhe/D

Room: Franconia Hall

Chair: U. Krewer,Kalrsruher Institut für Technologie (KIT), Karlsruhe/D

12:30 **PLENARY LECTURE**
Prof. Siegfried Waldvogel, Johannes Gutenberg University Mainz/D

13:15 **Poster Awards & Young Talent Award**

13:30 Closing

13:45 End of Meeting and Lunch

PROGRAMME

Wednesday, 20 July 2022

Room: 5+6

EQUIPMENT CHARACTERIZATION

Chair: Dr. Jochen Hammerschmidt, Covestro Deutschland AG

09:00	**Detailed Brazed Plate Heat Exchanger Evaluation using Infrared Thermography** T. Will[1]; L. Schnabel[1]; J. Köhler[2]; [1] Fraunhofer-Institut für Solare Energiesysteme ISE, Freiburg/D; [2] TU Braunschweig, Institut für Thermodynamik, Braunschweig/D
09:25	**Thermal Characterisation of Highly Filled Polymer Composite Material for Corrosion-Sensitive Heat Exchangers** N. Schiffer[1]; [1] Technoform Tailored Solutions Holding GmbH, Fuldabrück/D
09:50	**Mass transport in porous media applied to the electrode production and moisture management during battery assembly** T. Heckmann[1]; J. Eser[1]; A. Altvater[1]; P. Scharfer[1]; W. Schabel[1]; [1] Karlsruhe Institute of Technology (KIT), Karlsruhe/D
10:15	**Combined uncertainty and sensitivity analysis of the melting process in a macro-capsule filled with PCM** M. Faden[1]; D. Brüggemann[2]; [1] Universität Bayreuth, Bayreuth/D; [2] Universät Bayreuth, Bayreuth/D
10:40	Coffee Break in Exhibition Area

Room: 5+6

CONDENSATION

Chair: K. Jasch, Technische Universität Braunschweig, Braunschweig/D

11:10	**Investigation of the condensation heat transfer of pure substances and binary mixtures on horizontal tubes** T. Losher[1]; H. Klein[1]; S. Rehfeldt[1]; [1] Technische Universität München, Garching/D
11:35	**Experimental study on the condensation of pure substances in outer pillow-plate channels** F. Buckmann[1]; E. Kenig[1]; [1] Universität Paderborn, Paderborn/D
12:00	**Experimental investigation of heat and mass transfer during ethanol-water mixture condensation in a vertical double pipe** C. Zimmermann[1]; C. Dagli[1]; J. Hesse[1]; M. Martensen[1]; S. Kabelac[1]; [1] Leibniz University Hannover, Hannover/D

Room: Franconia Hall

Chair: U. Krewer,Kalrsruher Institut für Technologie (KIT), Karlsruhe/D

12:30	**PLENARY LECTURE** Prof. Siegfried Waldvogel, Johannes Gutenberg University Mainz/D
13:15	**Poster Awards & Young Talent Award**
13:30	Closing
13:45	End of Meeting and Lunch

POSTER

Posters of the Group of Heat and Mass Transfer

Electrification of the Process Industry

P 1.01 **Direct electrification of a washcoated SiSiC foam for methane steam reforming: Experimental and modeling study**
L. Zheng[1]; M. Ambrosetti[1]; D. Marangoni[1]; A. Beretta[1]; G. Groppi[1]; E. Tronconi[1]; [1] Politecnico di Milano, Milano/I

Condition Diagnostics of Equipment and Processes

P 2.01 **Heat regeneration model for external heat engines operating with dense working fluids**
N. Mügge[1]; A. Kronberg[2]; M. Glushenkov[2]; E. Kenig[1]; [1] Paderborn University, Paderborn/D; [2] Encontech B.V., Enschede/NL

P 2.02 **Investigations on Spatially Resolved Temperature Profiles in Vertical Tubes during Heat Transfer Processes**
N. Schwerdtfeger[1]; A. Schulte[1]; K. Jasch[1]; S. Scholl[1]; [1] TU Braunschweig/D

P 2.03 **Direct measurement of the liquid-solid mass transfer in packed beds via a novel relaxation exchange magnetic resonance method**
S. Elgersma[1]; A. Sederman[1]; M. Mantle[1]; G. Lynn[1]; [1] University of Cambridge/UK

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P 3.01 **Numerical investigations of coupled solid and fluid heat transfer in periodic open cellular structures (POCS)**
K. Dubil[1]; T. Wetzel[1]; B. Dietrich[1]; [1] Karlsruhe Institute of Technology (KIT), Karlsruhe/D

P 3.02 **Performance of a Pillow Plate Thermosiphon Reboiler for Hexa-nol, Pentanol and their Mixtures**
Y. Lu[1]; K. Jasch[1]; S. Scholl[1]; [1] TU Braunschweig/D

P 3.03 **Experimental assessment of process intensification by increased transverse dispersion in 3D-printed logpile structures**
L. Rosseau[1]; I. Roghair[1]; M. van Sint Annaland[1]; [1] Technische Universiteit Eindhoven/NL

P 3.04 **Determination of Particle Diffusivity in Free Media and Under Confinement Using Photon Correlation Spectroscopy**
W. Wu[1]; M. Knoll[2]; A. Fröba[2]; [1] Friedrich-Alexander-University Erlangen-Nürnberg (FAU), Erlangen/D; [2] Friedrich Alexander Universität Erlangen-Nürnberg (FAU), Erlangen/D

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X. Lu[1]; A. Kharaghani[1]; [1] Otto-von-Guericke-Universität Magdeburg/D

P 3.06 **Development of a high performance cold storage unit for backup cooling systems**
M. Grabo[1]; J. Waschull[2]; G. Sonnenrein[3]; E. Kenig[1]; F. Buckmann[1]; [1] Paderborn University, Paderborn/D; [2] Institut für Luft- und Kältetechnik gemeinnützige Gesellschaft mbH, Dresden/D; [3] Axiotherm GmbH, Eisenberg/D

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P 3.07 **Experimental and theoretical determination of particle concentration in polymer-bimodal spherical particle composites**
V. Gracia-Medrano-Bravo[1]; P. Scharfer[1]; W. Schabel[1]; [1] Karlsruhe Institute of Technology (KIT) - Institute of Thermal Process Engineering, Karlsruhe/D

P 3.08 **The Elephant Problem - Determining Bulk Thermal Diffusivity**
R. Beaufait[1]; S. Ammann[1]; L. Fischer[1]; [1] Lucerne University of Applied Sciences and Arts, Horw/CH

P 3.09 **Effect of diffusivity and chemical reactions on the determination of mass transfer coefficients in columns with structured packing**
L. Mapura Ramirez[1]; [1] Universität Paderborn/D

P 3.10 **Applications for Phase change dispersions (PCD) as isothermal heat transfer fluids with high storage density**
F. Wunder[1]; M. Rädle[1]; J. Repke[2]; [1] Mannheim University of Applied Sciences, Mannheim/D; [2] Technical University Berlin/D

P 3.11 **O_2 Production Using MIEC and Steam Circulation Process**
K. Khajryan[1]; T. Storch[1]; T. Grab[1]; R. Kircheisen[2]; R. Kriegel[2]; T. Fieback[1]; [1] TU Bergakademie Freiberg, Freiberg/D; [2] Fraunhofer IKTS, Hermsdorf/D

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H. Margraf[1]; A. Luke[2]; [1] Universität Kassel - Technische Thermodynamik, Kassel/D; [2] Universität Kassel/D

P 3.13 **Heat input into a rotary kiln reactor with reaction**
S. Schröter[1]; M. Seitz[1]; [1] Hochschule Merseburg/D

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N. Weber[1]; M. Dreyer[1]; [1] Universität Bremen/D

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A. Al-Lami[1]; E. Kenig[1]; [1] Paderborn Universität, Paderborn/D

P 3.16 **Development of a measuring concept to investigate spray cooling of electric machines**
J. Bender[1]; K. Dubil[1]; F. Hoffmann[1]; B. Dietrich[1]; M. Doppelbauer[1]; T. Wetzel[1]; [1] Karlsruhe Insitute of Technology (KIT), Karlsruhe/D

P 3.17 **Controlling the wettability of titanium surfaces via femtosecond laser for plate heat exchangers**
M. Gümüskesen[1]; S. Wendt[2]; S. Kabelac[2]; T. Gimpel[1]; [1] TU Clausthal - Forschungszentrum Energiespeichertechnologien, Goslar/D; [2] Leibniz Universität Hannover / Institut für Thermodynamik, Hannover/D

P 3.18 **About the mass transport during drying of structural optimized Catalyst Coated Membrane for PEM water electrolysers**
N. Zimmerer[1]; P. Quarz[1]; P. Scharfer[1]; W. Schabel[1]; [1] Karlsruhe Institute of Technology (KIT), Karlsruhe/D

P 3.19 **Experimental investigation on influencing factors for microlayer and contact line evaporation within nucleate boiling**
Y. Xanthopoulou[1]; M. Zimmermann[1]; A. Sielaff[1]; P. Stephan[1]; [1] TU Darmstadt/D

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J. Zhang[1]; W. Ding[1]; U. Hampel[2]; [1] Helmholtz Zentrum Dresden Rossendorf (HZDR), Dresden/D; [2] Helmholtz Zentrum Dresden Rossendorf (HZDR)/TU- Dresden, Dresden/D

P 3.21 **About Mass Transfer of Multicomponent Electrolyte Solvent Mixtures during Recycling of Lithium-ion Batteries**
L. Lödige[1]; T. Heckmann[1]; J. Eser[1]; P. Scharfer[1]; W. Schabel[1]; [1]Karlsruher Institut für Technologie (KIT), Karlsruhe/D

P. 3.22 **Loop photoreactor to study mass transfer effect on photocatalytic hydrogen generation**
P. Li[1]; D. Kowalczyk[1]; D. Ziegenbalg[1]; [1] Universität Ulm, Ulm/D

P. 3.23 **Experimental Quantification of Thermal Contact Resistances in Automotive Brake Systems**
T. Helmig[1]; J. Westphalen[2]; R. Kneer[3]; B. Hillemacher[4]; [1] en2Aix - energy engineering Aachen GmbH, Aachen/D; [2] Ford Motor Company Ltd., Cologne/D; [3] WSA, RWTH Aachen, Aachen/D; [4] en2Aix - energy engineering Aachen GmbH, Würselen/D

P. 3.24 **Accurate determination of viscosity and interfacial tension by surface light scattering for non-transparent fluids**
J. Knorr[1]; J. Cui[2]; T. Koller[2]; A. Fröba[2]; [1] Erlangen Graduate School in Advanced Optical Technologies (SAOT), Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Erlangen/D; [2] Institute of Advanced Optical Technologies - Thermophysical Properties (AOT-TP), Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Erlangen/D

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S. Hirschfeld[1]; Y. Yildizlar[1]; M. Piper[1]; A. Munera Parra[1]; T. Westermann[1]; T. Frey[2]; M. Hoffmann[2]; M. Schlüter[2]; [1] Covestro Deutschland AG, Leverkusen/D; [2] Technical University Hamburg, Hamburg/D

P. 3.26 **Condensation of water on hydrophobic surfaces**
T. Pfeiffer[1]; M. Kappl[2]; H. Butt[2]; P. Stephan[1]; T. Gambaryan-Roisman[1]; [1] TU Darmstadt/D; [2] MPI für Polymerforschung, Mainz/D

P. 3.27 **On microlayer formation in nucleate boiling**
K. Schweikert[1]; K. Sinha[1]; M. Zimmermann[1]; A. Sielaff[1]; P. Stephan[1]; [1] TU Darmstadt/D

P. 3.28 **Experimental optimization of fluid flow through glass facades**
F. Wittmann[1]; T. Weith[1]; D. Brüggemann[1]; [1] Chair of Engineering Thermodynamics and Transport Processes (LTTT), Center of Energy Technology (ZET), University of Bayreuth/D

P. 3.29 **Modeling of heat fluxes near the contact line in OpenFOAM**
J. Kind[1]; A. Sielaff[1]; P. Stephan[1]; [1] TU Darmstadt/D

P. 3.30 **Influence of chemical reactions on the convective dissolution of CO_2 in a Hele-Shaw cell**
A. Düll[1]; S. Rudolph[1]; M. Hettel[1]; M. Börnhorst[2]; [1] Karlsruhe Insitute of Technology (KIT), Karlsruhe/D; [2] TU Dortmund University, Dortmund/D

P. 3.31 **Polymer composite plate heat exchangers for application in corrosive environments**
H. Kiepfer[1]; H. Bart[1]; 1 TU Kaiserslautern, Kaiserslautern/D

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P. 3.32 **Experimental Setup for the Investigation of the Condensation Heat Transfer of Hydrocarbon Mixtures on Horizontal Single Tubes and Tube Bundles**
T. Klein[1]; J. Jander[1]; M. Piszko[1]; M. Rausch[1]; A. Fröba[1]; [1] Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen/D

P. 3.33 **Numerical and Experimental Investigation of flow optimized Plate-Fin Structures from Additive Manufacturing**
M. Fuchs[1]; N. Lubos[1]; X. Luo[1]; S. Kabelac[1]; [1] Leibniz University Hannover; Institute of Thermodynamics, Hannover/D

P. 3.34 **Heat and mass transfer in a fixed-bed reactor with metallic foam-pellets: Insights from experiments and particle-resolved CFD**
G. R. George[1]; M. Bockelmann[2]; L. Schmalhorst[3]; A. Gerstle[3]; D. Beton[3]; L. Torkuhl[3]; A. Lindermeir[2]; G. D. Wehinger[1]; [1] Institute of Chemical and Electrochemical Process Engineering, Clausthal University of Technology, Clausthal-Zellerfeld/D; [2] CUTEC Research Centre, Clausthal University of Technology, Clausthal-Zellerfeld/D; [3] Alantum Europe GmbH, Munich/D

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Future Circular Economy

P 4.01 **Methods of reaction and reactor engineering to adjust product ratios and increase efficiency of syngas fermentation with Clostridium ljungdahlii**
L. Perret[1]; N. Boukis[2]; J. Sauer[2]; [1] Karlsruhe Institute of Technology (KIT) / Institute of Catalysis Research and Technology, Eggenstein Leopoldshafen /D; [2] Karlsruhe Institute of Technology (KIT) / Institute of Catalysis Research and Technology, Eggenstein-Leopoldshafen/D

P 4.02 **Investigations on the alkaline depolymerization of poly(ethylene terephthalate) in a quasi solid-solid kneading reaction**
L. Biermann[1]; D. Quast[2]; S. Jantzen[2]; C. Eichert[3]; S. Scholl[2]; [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 4.04 **High temperature pyrolysis of polyethylene in an indirect heated fluidized bed reactor**
K. Matthiesen[1]; L. Plessing[1]; G. Luinstra[1]; [1] University of Hamburg/D

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L. Hüfner[1]; H. Marschall[2]; B. Etzold[1]; [1] Technische Universität Darmstadt - Ernst Berl Institute of Technical and Macromolecular Chemistry, Darmstadt/D; [2] Technische Universität Darmstadt - Center of Smart Interfaces, Darmstadt/D

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P 5.02 **Industrial relevant CO_2-Conversion to Syngas in Zero-Gap-Electrolyzers**
L. Hoof[1]; K. Pellumbi[1]; N. Thissen[1]; K. junge Puring[1]; D. Siegmund[1]; C. Doetsch[1]; U. Apfel[1]; [1] Fraunhofer UMSICHT / Ruhr University Bochum, Oberhausen/D

P 5.03 **Lattice Boltzmann simulation of the drainage of water by oxygen from anodic porous transport layer used for PEM water electrolysis**
S. Bhaskaran[1]; V. Kumar Surasani[2]; T. Vidakovic-Koch[3]; E. Tsotsas[1]; N. Vorhauer-Huget[1]; [1] Otto von Guericke Universität Magdeburg/D; [2] Birla Institute of Technology & Science, Pilani- Hyderabad Campus, hyderabad/IND; [3] Max Planck Institut für Dynamik komplexer technischer Systeme, Magdeburg/D

P 5.04 **3D Printed Microreactors for the Continuous (Non-)Kolbe Electrolysis**
N. Kurig[1]; J. Meyers[1]; E. Richter[1]; S. Palkovits[1]; R. Palkovits[1]; [1] RWTH Aachen University, Aachen/D

P 5.06 **Modelling a detailed kinetic mechanism for electrocatalytic reduction of CO_2**
S. Rihm[1]; J. Akroyd[2]; M. Kraft[3]; [1] University of Cambridge, Cambridge/UK; [2] University of Cambridge, Cambridge/UK; [3] University Of Cambridge, CARES, Singapore/SGP

P 5.07 **Investigating Current-controlled Formation of Surface Layers in Lithium-ion Batteries: An in-operando Gas Analysis Approach**
L. Schmidt[1]; M. Gerasimov[1]; L. Bläubaum[1]; U. Krewer[1]; [1] Karlsruhe Insitute of Technology (KIT), Karlsruhe/D

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D. Brummerloh[1]; H. Buchholz[1]; S. Benders[1]; A. Penn[1]; [1] Hamburg University of Technology (TUHH), Hamburg/D

P 6.02 **Critical analysis of the thermal stability of carbonaceous materials for application in direct NO decomposition catalysis**
M. Vennewald[1]; A. Iemhoff[1]; D. Ditz[1]; R. Palkovits[1]; [1] RWTH Aachen University, Aachen/D

P 6.03 **Measurement of gas/liquid mass transfer in reactors: a call and proposal for standardization and digitalization of mass transfer measurements in multiphase reactors**
J. Lefebvre[1]; [1] BASF SE, Ludwigshafen/D

P 6.04 **Applications for the Determination of Back-Mixing Characteristics of Mini-Plant Polymerization Reactors**
L. Ständecke[1]; L. Gockel[1]; L. Dietrich[1]; M. Busch[1]; [1] TU Darmstadt/D

P 6.05 **Adapting Analysing Method for a High-Pressure FT-NIR-Spectroscopy System**
S. Hintenlang[1]; M. Busch[1]; [1] TU Darmstadt, Darmstadt/D

P 6.06 **Study of the diazo acetonitrile generation in a spatially resolved flow calorimeter**
A. Mendl[1]; H. Wegner[1]; J. Antes[1]; D. Boskovic[1]; S. Löbbecke[1]; [1] Fraunhofer Institute for Chemical Technology, Pfinztal/D

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P 6.07 **Real Time Fouling Monitoring With Thermal Impedance Spectroscopy**
J. Antes[1]; F. Geiger[1]; M. Jaegle[2]; H.-F. Pernau[2]; [1] Fraunhofer Institut für Chemische Technologie ICT, Pfinztal/D; [2] Fraunhofer Institut für Physikalische Messtechnik, Freiburg/D

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F. Kornemann[1]; L. Stoltenberg[1]; A. Wiser[2]; C. Renk[3]; A. Drochner[1]; M. Votsmeier[1]; B. Etzold[1]; [1] TU Darmstadt, Darmstadt/D; [2] Umicore AG & Co. KG, Hanau-Wolfgang/D; [3] ThyssenKrupp Industrial Solutions AG, Dortmund/D

P 7.02 **Flow Calorimetry for Highly Exothermic Reactions**
T. Frede[1]; N. Link[1]; M. Greive[1]; N. Kockmann[1]; [1] TU Dortmund University - Department of Biochemical and Chemical Engineering, Equipment Design, Dortmund/D

P 7.03 **Assessment of concentration and temperature uniformity in a Berty reactor for an exothermic reaction via CFD simulations**
S. Anderson[1]; B. Kreitz[2]; T. Turek[1]; G. Wehinger[1]; S. Flaischlen[1]; [1] TU Clausthal, Clausthal-Zellerfeld/D; [2] Brown University, Providence, RI/USA

P 7.04 **Calibration free kinetic modeling in a pendula slug flow reactor for scale-up predictions**
L. Schulz[1]; T. Röder[1]; N. Kockmann[2]; [1] Mannheim University of Applied Sciences - Institute of Chemical Process Engineering, Mannheim/D; [2] TU Dortmund / BCI, Equipment Design, Dortmund/D

P 7.05 **Application and limitation of thermodynamic rate approaches to hydroformylation: A case study for predicting solvent effects on reaction kinetics for gas/liquid reactions**
M. Gerlach[1]; F. Huxoll[2]; A. Seidel-Morgenstern[3]; G. Sadowski[2]; C. Hamel[4]; [1] Otto von Guericke University Magdeburg, Magdeburg/D; [2] TU Dortmund University, Dortmund/D; [3] Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg/D; [4] Anhalt University of Applied Sciences Köthen, Köthen/D

P 7.06 **Model-Based Design of Experiments as an Efficient Method for Kinetic Modeling in a Milli-structured Plate Reactor**
L. Schaare[1]; R. Kuwertz[2]; J. Heck[2]; M. Skiborowski[3]; [1] Ehrfeld Mikrotechnik GmbH / Technical University of Hamburg, Institute of Process Systems Engineering, Hamburg/D; [2] Ehrfeld Mikrotechnik GmbH, Wendelsheim/D; [3] Technical University of Hamburg/D

P 7.07 **CFD-DNN-based hybrid model developed for biomass gasification in a fluidized bed reactor**
I. K. Faridi[1]; A. Kharaghani[1]; [1] Otto von Guericke Universität Magdeburg/D

P 7.08 **Influence of Local Fixed Bed Structure on Pressure Drop and Residence Time Distribution (RTD)**
S. Flaischlen[1]; J. Martin[1]; J. Kersebaum[1]; G. Wehinger[1]; [1] TU Clausthal - Institute of Chemical and Electrochemical Process Engineering, Clausthal-Zellerfeld/D

P 7.09 **CFD-based compartment modeling of static mixing elements for continuous polymer reactors by means of the Mean-Age theory**
S. Schwarz[1]; M. Grünewald[1]; P. Biessey[1]; T. Frey[2]; M. Schlüter[2]; M. Hoffmann[2]; [1] Ruhr University Bochum, Laboratory of Fluid Separations, Bochum/D; [2] Hamburg University of Technology, Institute of Multiphase Flows, Hamburg/D

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P 7.10 **Kinetic modeling and optimization of the methanol and dimethyl ether synthesis**
B. Lacerda de Oliveira Campos[1]; G. Rodrigues Niquini[2]; S. Wild[1]; S. Pitter[1]; J. Sauer[1]; K. Herrera Delgado[1]; [1] Karlsruhe Insitute of Technology (KIT), Eggenstein-Leopoldshafen/D; [2] Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D

P 7.12 **Transient two-dimensional heterogeneous reactor model for highly exothermic reactions**
W. Callewaert[1]; J. Ibáñez[1]; J. Poissonnier[1]; J. Thybaut[1]; [1] Ghent University, Ghent/B

P 7.13 **Close-to-Practice Performance Investigations of Methanol Synthesis with Steel-Mill-Gases**
K. Girod[1]; H. Lohmann[1]; S. Kaluza[2]; S. Schlüter[1]; [1] Fraunhofer UMSICHT, Oberhausen/D; [2] Hochschule Düsseldorf - University of Applied Sciences, Düsseldorf/D

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M. Feigel[1]; J. Breitsameter[1]; B. Rieger[1]; O. Hinrichsen[1]; [1] TU München, Garching/D

P 7.15 **Comparison of Reactive CFD Modelling with Experimental Data for CO_2 Methanation in Single Pellet String Reactors**
C. Bauer[1]; H. Bui[1]; T. Gros[1]; O. Hinrichsen[1]; [1] TU München, Garching bei München/D

P 7.16 **Simulation of Kinetics and Heat Balance of Anionic Polymerization in Batch Reactors**
F. Kandelhard[1]; P. Georgopanos[2]; [1] Helmoltz-Zentrum Hereon, Geesthacht/D; [2] Helmholtz-Zentrum Hereon, Geesthacht/D

P 7.17 **2D model for CO_2 methanation in a microchannel reactor**
V. Danilov[1]; M. Wichert[1]; G. Kolb[1]; [1] Fraunhofer Institute for Microengineering and Microsystems IMM, Mainz/D

P 7.18 **Investigation of methanol synthesis on Cu/ZnO/ZrO_2 catalyst at rich-CO_2 syngas feeds**
G. Rodrigues Niquini[1]; B. Lacerda de Oliveira Campos[1]; K. Herrera Delgado[1]; S. Pitter[1]; J. Sauer[1]; [1] Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D

P 7.19 **Kinetic Analysis of CO_2 Hydrogenation to Long-Chain Hydrocarbons on a Supported Iron Catalyst**
L. Brübach[1]; D. Hodonj[1]; P. Pfeifer[1]; [1] Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D

P 7.20 **Kinetic description of the selective oxidation of methanol on a VO_x/TiO_2 catalyst**
J. Walter[1]; T. Wolff[2]; C. Hamel[3]; [1] Otto von Guericke Universität Magdeburg/D; [2] Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg/D; [3] Anhalt University of Applied Sciences and Otto von Guericke University Magdeburg, Köthen, Magdeburg/D

P 7.21 **Chemical Reaction Engineering Simulations Accounting for Gas/Liquid Phase Separation During CO_x hydrogenation to Methanol Conversion**
T. Nowak[1]; J. Reisch[1]; K. Herrera Delgado[2]; J. Sauer[2]; A. Drochner[1]; B. Etzold[1]; [1] TU Darmstadt, Ernst-Berl-Institut für Technische und Makromolekulare Chemie, Darmstadt/D; [2] Karlsruhe Institute of Technology (KIT), Institute of Catalysis Research and Technology (IKFT), Karlsruhe/D

P 7.22 **Modeling Mixing Processes in LDPE-Reactors by Computational Fluid Dynamics**
L. Gockel[1]; L. Ständecke[1]; L. Schmidt[1]; M. Busch[1]; [1] TU Darmstadt/D

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J. Kirsch[1]; A. Weber[1]; M. Busch[1]; [1] TU Darmstadt/D

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P 7.24 **Defossilizing the aviation sector with synthetic fuels – High Temperature Fischer-Tropsch Synthesis**
D. Dhamo[1]; J. Kühn[1]; M. Rubin[1]; R. Dittmeyer[1]; [1] Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D

P 7.25 **Crucial influence of mass transfer on the kinetics of hydroaminomethylation**
W. Kortuz[1]; S. Kirschtowski[2]; A. Seidel-Morgenstern[1]; C. Hamel[3]; [1] Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg/D; [2] Otto von Guericke University, Magdeburg/D; [3] Otto von Guericke University / Anhalt University of Applied Sciences, Magdeburg/D

P 7.26 **Novel three-dimensional approach for the simulation of the hydrogen-based direct reduction process**
T. Overbeck[1]; G. Wehinger[2]; [1] VDEh Betriebsforschungsinstitut GmbH, Düsseldorf/D; [2] Clausthal University of Technology - Institute of Chemical and Electrochemical Process Engineering, Clausthal-Zellerfeld/D

P 7.27 **Model reactor for investigations on CO_2 methanation under dynamic reaction conditions**
T. Engl[1]; [1] Karlsruhe Insitute of Technology (KIT), Eggenstein-Leopoldshafen/D

P 7.28 **Influence of the Process Parameters on the Boundary Layer in LDPE Mini-Plant Tubular Reactors**
J. Degenkolb[1]; M. Busch[1]; [1] TU Darmstadt/D

P 7.29 **Dynamics of Iron-based Catalysts for CO_2 Hydrogenation: Fundamental Study using Core@Shell Model Materials**
T. Heinz[1]; C. Zambrzycki[1]; R. Güttel[1]; [1] University Ulm/D

P 7.30 **Investigations of runaway reactions using micro reaction technology**
P. Desel[1]; L. Mahler[1]; M. Jäger[1]; A. Roppertz[1]; [1] Hochschule Niederrhein - University of Applied Science, Krefeld/D

P 7.31 **Heterogeneously catalyzed extractive dehydration of Xylose to Furfural**
F. Lali[1]; [1] Universität Ulm - Institut für Chemieingenieurwesen, Ulm/D

P 7.32 **Group Contribution Method for Transfer Activity in the LDPE Process**
A. Klimeck[1]; J. Berning[1]; M. Busch[1]; [1] TU Darmstadt/D

P 7.33 **Influence of catalyst dynamics on fixed bed methanation reactor design and operation**
M. Langer[1]; H. Freund[1]; [1] TU Dortmund University, Dortmund/D

P 7.34 **Improvement of plasma reactor for methane pyrolysis by simulation**
A. Magazova[1]; D. Agar[1]; [1] TU Dortmund, BCI, Dortmund/D

P 7.35 **Evaluating the shape of input pertubation for forced periodic operation**
L. Kaps[1], C. Seidel[2], D. Marinkovic[3], A. Kienle[1 2], A. Seidel-Morgenstern[1], D. Nikolic[3], M. Petkovska[3]; [1]Max-Planck Institut for Dynamics of Complex Technical Systems, Magdeburg/D, [2]Otto-von-Guericke Universität Magdeburg/D, [3]University of Belgrade, Institute of Chemistry, Technology and Metallurgy/SRB

P 7.36 **Representing detailed surface kinetics by neural networks**
F. A. Döppela[1]; M. Votsmeier[1,2]; [1] Technische Universität Darmstadt/D; [2] Umicore AG & Co. KG, Hanau/D

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P 7.37 **Hybrid modeling approach for Multi-tubular reactors**
S. K. Danda[1,2]; M. Kutscherauer[1,3], G. D. Wehinger[1,2]; T. Turek[1,2]; [1] Institute of Chemical and Electrochemical Process Engineering, TU Clausthal/D; [2] Research Center Energy Storage Technologies (EST), TU Clausthal/D; [3] Clariant AG, Bruckmühl/D

Reaction Engineering of Catalyzed Reactions

P 8.02 **Impact of different reaction parameters on the formation of acetylene via autothermal OCM over Pt/Al_2O_3 and Pt/ZrO_2 catalysts**
S. Schardt[1]; A. Celik[1]; S. Bastian[1]; J. Chawla[1]; S. Schunk[2]; P. Lott[1]; O. Deutschmann[1]; [1] Karlsruhe Institute of Technology (KIT), Karlsruhe/D; [2] hte GmbH, Heidelberg/D

P 8.03 **Experimental Analysis and Modeling Autothermal Reactor Concepts for the Oxidative Coupling of Methane at Mini-plant Scale**
A. Perez Ortiz[1]; L. Gottheil[1]; A. Penteado[1]; T. Karsten[1]; M. Illner[1]; E. Esche[1]; R. Schomäcker[2]; J. Repke[1]; [1] Technische Universität Berlin / Fachgebiet Dynamik und Betrieb technischer Anlagen, Berlin/D; [2] Technische Universität Berlin / Institut für Chemie, Berlin/D

P 8.04 **Effects of feed composition and pressure on the production of sustainable fuels by heterogeneously catalyzed oligomerization of C_2-C_4 olefins**
C. Fuchs[1]; U. Arnold[1]; J. Sauer[1]; [1] Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D

P 8.05 **Fixed-bed Reactor for Operando Structure-Activity Profiling**
B. Wollak[1]; T. Sheppard[2]; D. Espinoza[1]; D. Doronkin[2]; M. Sturm[3]; A. Dippel[3]; O. Gutowski[3]; O. Korup[1]; M. Schmidt[4]; R. Horn[1]; [1] Hamburg University of Technology (TUHH), Hamburg/D; [2] Karlsruhe Insitute of Technology (KIT), Karlsruhe/D; [3] Deutsches Elektronen Synchrotron DESY, Hamburg/D; [4] REACNOSTICS GmbH, Hamburg/D

P 8.06 **Development of Sodium Catalyst Dosing Method for Water-Free Formaldehyde Production**
M. Kamienowska[1]; K. Niedermeier[2]; M. Daubner[2]; L. Stoppel[2]; M. Bender[3]; T. Wetzel[2]; [1] BASF SE/Karlsruhe Institute of Technology (KIT), Ludwigshafen am Rhein/Karlsruhe/D; [2] Karlsruhe Institute of Technology (KIT), Karlsruhe/D; [3] BASF SE, Ludwigshafen/D

P 8.07 **Lab Scale Studies of Platinum Catalysed Ammonia Oxidation at Industrial Conditions**
L. Stoltenberg[1]; F. Kornemann[1]; A. Wiser[2]; C. Renk[3]; A. Drochner[1]; M. Votsmeier[1]; B. Etzold[1]; [1] Technische Universität Darmstadt - Ernst Berl Institute of Technical and Macromolecular Chemistry, Darmstadt/D; [2] Umicore AG & Co KG, Hanau-Wolfgang/D; [3] Thyssenkrupp Industrial Solution AG, Dortmund/D

P 8.08 **The impact of Support Material of Cobalt-Based Catalysts Prepared by Double Flame Spray Pyrolysis on CO_2 Methanation Dynamics**
M. Gäßler[1]; J. Stahl[2]; M. Schowalter[2]; S. Pokhrel[2]; A. Rosenauer[2]; L. Mädler[2]; R. Güttel[1]; [1] University of Ulm/D; [2] University of Bremen/D

P 8.09 **Synthesis of NiO/SiO_2 and $NiO@SiO_2$ catalysts for CO_x methanation - Comparison of activity and deactivation behavior**
K. Wein[1]; M. Gäßler[1]; R. Güttel[1]; [1] University of Ulm, Ulm/D

P 8.10 **Thermographic investigation of solid photocatalysts for CO_2 conversion**
H. Becker[1]; D. Ziegenbalg[1]; R. Güttel[1]; [1] Ulm University, Ulm/D

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P 8.11 **Continuous selective oxidative delpolymerization of lignin to monoaromatics**
M. Papajewski[1]; S. Wesinger[1]; J. Albert[1]; [1] Universität Hamburg, Institut für Technische und Makromolekulare Chemie, Hamburg/D

P 8.12 **Catalytic CO_2 methanation: Providing optimal test conditions for kinetic investigations**
L. Failing[1]; P. Strucks[1]; S. Kaluza[1]; [1] Hochschule Düsseldorf - University of Applied Sciences, Düsseldorf/D

P 8.13 **Semi-Batch Solution Polymerization Mini-Plant: A Tool for Estimating Kinetic Parameters**
I. Kronshorst[1]; L. Ständecke[1]; M. Busch[1]; [1] TU Darmstadt, Darmstadt/D

P 8.14 **Influence of natural gas impurities and minor components on the catalytic CO_2 methanation**
M. Kansy[1]; S. Bajohr[1]; F. Mörs[2]; T. Kolb[1]; [1] Karlsruhe Institute of Technology (KIT), Karlsruhe/D; [2] DVGW Research Center at the Engler-Bunte Institute, Karlsruhe Institute of Technology (KIT), Karlsruhe/D

P 8.15 **Kinetic investigation of the influence of water on ruthenium as a hydrogenation catalyst using in-situ ATR spectroscopy**
T. Schäfer[1]; M. Rose[1]; [1] TU Darmstadt/D

P 8.16 **Novel Multiplicity and Stability Criteria for Polytropic Fixed-Bed Reactors**
J. Bremer[1]; K. Sundmacher[2]; [1] Clausthal University of Technology, Clausthal-Zellerfeld/D; [2] Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg/D

New Reactor Concepts

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V. Thanda[1]; [1] Deutsches Zentrum für Luft- und Raumfahrt (DLR) / German Aerospace Center, Cologne/D

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E. Moioli[1]; T. Schildhauer[1]; [1] Paul Scherrer Institut, Villigen/CH

P 9.03 **Intensification of exhaust gas abatement systems by means of alternative catalyst supports and reactor radial-flow configuration**
C. Ferroni[1]; M. Bracconi[1]; M. Ambrosetti[1]; M. Maestri[1]; G. Groppi[1]; E. Tronconi[1]; [1] Politecnico di Milano, Milan/I

P 9.04 **Lattice materials for the intensification of heat and mass transfer limited processes**
C. Ferroni[1]; F. Franchi[1]; M. Ambrosetti[1]; M. Bracconi[1]; M. Maestri[1]; G. Groppi[1]; E. Tronconi[1]; [1] Politecnico di Milano, Milan/I

P 9.05 **Evaluation of the Potential of Integrating Semi-continuous Fermentation and Filtration Process for Efficiency Enhancement**
K. Hofmann[1]; C. Maharaj[1]; C. Hamel[2]; [1] Anhalt University of Applied Sciences, Köthen/D; [2] Anhalt University of Applied Sciences, Köthen, and Otto von Guericke University, Magdeburg/D

P 9.06 **Control of Light-Driven Catalytic Processes Within Soft Matter Matrices**
D. Kowalczyk[1]; D. Ziegenbalg[1]; [1] Ulm University - Institute of Chemical Engineering, Ulm/D

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P 9.07 **Imposed dynamic irradiation as a key to highly efficient photoreactors and photochemical processes**
F. Guba[1]; F. Gaulhofer[1]; D. Ziegenbalg[1]; [1] Universität Ulm/D

P 9.08 **Experimental Investigation of Gas-Liquid Mass Transfer in Periodic Open Cellular Structures (POCS)**
H. Held[1]; H. Freund[1]; [1] TU Dortmund, Lehrstuhl Reaction Engineering and Catalysis, Dortmund/D

P 9.09 **High-Pressure Polymerization of Ethylene: First steps Towards the Realization of a Multi-Zone Autoclave on a Laboratory Scale**
N. Schreiner[1]; L. Gockel[1]; M. Busch[1]; [1] TU Darmstadt/D

P 9.10 **Dynamic operation of a slurry bubble column reactor for CO_2 methanation in the Energy Lab 2.0**
S. Sauerschell[1]; M. Held[1]; S. Bajohr[1]; T. Kolb[1]; [1] KIT, Engler-Bunte-Institut, Karlsruhe/D

P 9.11 **Thermochemical Energy Storage in a Suspension Reactor**
H. Bürgmayr[1]; L. Schmieder[1]; F. Winter[1]; [1] TU Wien, Institute of Chemical, Environmental and Bioscience Engineering, Vienna/A

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C. Schmidt[1]; S. Kureti[1]; [1] TU Bergakademie Freiberg/D

P 10.02 **Experimental insights in the development of a new chemical conversion process with non-thermal plasma**
T. Nitsche[1]; J. Kostrzewa[1]; M. Budt[1]; [1] Fraunhofer UMSICHT, Oberhausen/D

P 10.03 **Nonoxidative dehydrogenation of methanol to dimethoxymethane over Cu/Hβ-zeolite bifunctional catalysts with tailored acidic sites**
C. Asmelash[1]; R. Sun[1]; C. Gierlich[1]; R. Palkovits[1]; [1] RWTH Aachen University - Institut für Technische und Makromolekulare Chemie (ITMC), Aachen/D

P 10.04 **CO_2 Emission Reduction in Steel Industry: Dry Reforming of Coke Oven Gas and Blast Furnace Gas**
S. Angeli[1]; S. Gossler[1]; S. Lichtenberg[1]; G. Kass[2]; A. Agrawal[2]; M. Valerius[2]; K. Kinzel[2]; O. Deutschmann[1]; [1] Karlsruhe Institute of Technology (KIT) / Institute for Chemical Technology and Polymer Chemistry, Karlsruhe/D; [2] Paul Wurth S. A., Luxembourg/L

P 10.05 **Characterization of gas bubble evolution on femtosecond laser functionalized catalysts**
L. Lentz[1]; M. Lederle-Flamm[1]; L. Hoffmann[1]; T. Gimpel[1]; [1] Clausthal University of Technology, Goslar/D

P 10.06 **Flow field simulation and measurement in packed beds based on 4D-X-ray Computed Tomography**
J. Martinez-Garcia[1]; B. Fenk[1]; D. Gwerder[1]; D. Schiffmann[1]; W. Delgado-Diaz[1]; A. Stamatiou[1]; L. J. Fischer[1]; P. Schuetz[1]; [1] Lucerne University of Applied Science and Arts, School for Engineering and Architecture, Lucerne/CH

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Miscellaneous

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I. Müller[1]; I. Pottratz[1]; N. Moebus[1]; C. Hamel[2]; [1] Hochschule Anhalt, Köthen/D; [2] Hochschule Anhalt / Otto-von-Guericke-Universität, Köthen /Magdeburg/D

P 11.02 **Investigation and further development of models for determining the micromixing time by iodide-iodate reaction system**
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P 11.03 **Application of the quasi-continuous pulse chemisorption method for combined NH_3 chemisorption and TPD measurements**
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