



Programme

# Chemical Recycling - Beyond Thermal Use of Plastic and other Waste

Petrochemistry Division

Conversion of Carbon Carriers Division

6<sup>th</sup> -7<sup>th</sup> October 2021, Online Conference



Società Chimica Italiana





# WELCOME

This international scientific conference provides a perfect forum for exchange, discussion and networking between academia and industry, this time especially focusing on special aspects of the transition to a circular economy. Chemists and Engineers with interests in refinery, petrochemistry and the chemical and energy industry in general will find a platform for exchange.

8 Keynote Lectures and 15 Lectures will be presented at the conference.

For the first time, the conference is jointly organized by "Petrochemistry" and "Conversion of Carbon Carriers", two divisions of the DGMK, in association with the Società Chimica Italiana (SCI) and the Austrian ÖGEW (Österreichische Gesellschaft für Energiewissenschaften).

Scientific Committee:

Tilman Bechthold, RWE Power AG, Essen

Dr. Michael Bender, BASF SE, Ludwigshafen

Dr. Holger Blanke, BP Europa SE, Bochum

JProf. Alba Diéguez-Alonso, Universität Magdeburg

Dr. Harald Häger, Evonik Performance Materials GmbH, Marl

Prof. Dr.-Ing. Bernd Epple, Technische Universität Darmstadt

Dr.-Ing. Steffen Krzack, TU Bergakademie Freiberg

Prof. Dr. Dieter Vogt, Technische Universität Dortmund

## PROGRAMME OVERVIEW

Wednesday, 6 October 2021		Thursday, 7 October 2021	
09.00 - 09.15	Opening	09.00 - 10.45	Session Pyrolysis & Gasification (cont.)
09.15 - 10.30	Session Overview		
10.30 - 10.45	Coffee Break	10.45 - 11.00	Coffee Break
10.45 - 11.45	Session Overview (cont.)	11.00 - 12.45	Session Fluid Catalytic Cracking (FCC)
11.45 - 12.45	Lunch Break	12.45 - 13.45	Lunch Break
12.45 - 14.00	Session Biomass	13.45 - 16.00	Session Selective Depolymerization
14.00 - 14.05	Short Break		
14.05 - 14.50	Session Industrial Projects		
14.50 - 15.00	Coffee Break	16.00 - 16.15	Coffee Break
15.00 - 17.05	Session Pyrolysis & Gasification	16.15 - 17.15	Session Selective Depolymerization (cont.)
		17.15 - 17.30	Closing

WEDNESDAY, OCTOBER 6, 2021

## OPENING AND WELCOME ADDRESS

09.00 h Dieter Vogt & Tilman Bechthold

## SESSION OVERVIEW

Chairperson: Dieter Vogt

09.15 h **Keynote Lecture**

E. Chesnel

BASF Belgium Coordination Center

10.00 h **Innovative Sustainable Solutions to Optimize  
Plastic Waste Management**

M. Marchionna

Saipem, Technology Innovation

10.30 h **Coffee Break**

10.45 h **OMV's Holistic Approach to Close the Circular  
Loop**

S. Pirker

OMV Downstream GmbH, Chemicals &

Materials/Renewables and Circular Chemicals/Plastic-to-  
Oil Innovation and Technology Management

11.15 h **Chemical Recycling of Plastic Waste -  
Opportunity for a Better Circular Economy**

M. Seitz<sup>1</sup>, V. Cepus<sup>1</sup>, M. Klätte<sup>2</sup>, D. Thamm<sup>1</sup>

<sup>1</sup>University of Applied Science Merseburg, Merseburg,

<sup>2</sup>Steinbeis R.T.M., Halle

11.45 h **Lunch Break**

WEDNESDAY, OCTOBER 6, 2021

## SESSION BIOMASS

Chairperson: Michael Bender

**12.45 h**     **Keynote Lecture: Processing of Lignocellulosic Biomass to Chemicals**

N. Dahmen, J. Sauer  
Karlsruhe Institute of Technology

**13.30 h**     **Synthesis of Surfactants from Renewable Raw Materials**

R. Vitiello, R. Turco, R. Tesser, A. Iadonisi,  
M. Di Serio  
University of Naples Federico II, Department of Chemical Sciences, Naples, Italy

**14.00 h**     **Short Break**

## SESSION INDUSTRIAL PROJECTS

Chairperson: Michael Bender

**14.05 h**     **Keynote Lecture: Carbon2Chem<sup>®</sup> - Converting Steel Mill Gases into Chemicals**

K. Büker, R. Kleinschmidt  
thyssenkrupp Industrial Solutions AG

**14.50 h**     **Coffee Break**

## SESSION PYROLYSIS & GASIFICATION

Chairperson: Bernd Epple

**15.00 h**      **Keynote Lecture: Managing Challenges in the Production and Use of Pyrolysis Oil**

P. James  
Evonik

**15.45 h**      **Keynote Lecture: Overview of Pyrolysis and Gasification Technologies for Chemical Recycling of Mixed Plastic and other Waste**

L.G. Seidl<sup>1</sup>, R.P. Lee<sup>1,2</sup>, M. Gräbner<sup>1,2</sup>, B. Meyer<sup>1,3</sup>  
<sup>1</sup>Institute of Energy Process Engineering and Chemical Engineering, TU Bergakademie Freiberg, <sup>2</sup>Fraunhofer IMWS Branch Lab Freiberg "Circular Carbon Technologies", <sup>3</sup>Center for Efficient High Temperature Processes & Materials Conversion, TU Bergakademie Freiberg

**16.30 h**      **Coffee Break**

**16.35 h**      **Full-Chain Demonstration of Methanol Synthesis from Co-Gasification of Plastic Waste in a Pilot Scale HTW-Gasifier**

C. Heinze, J. May, E. Langner, D. Schmidt,  
J. Kaltenmorgen, J. Ströhle, B. Epple  
Institut für Energiesysteme und Energietechnik,  
TU Darmstadt

WEDNESDAY, OCTOBER 6, 2021

**17.05 h      Conceptual Design of the Gasification of Plastic Waste for the Production of Syngas or Naphta: A Circular Approach from Plastic Waste to Renewed Polymers**

I. Rossetti<sup>1</sup>, A. Tripodi<sup>1</sup>, F. Conte<sup>1</sup>, G. Ramis<sup>2</sup>

<sup>1</sup>Università degli Studi di Milano, <sup>2</sup>Università degli Studi di Genova



## PERSPECTIVES OF WASTE MANAGEMENT

Chairperson: Harald Häger

- 09.00 h **Keynote Lecture: Why Mechanical Versus Chemical Recycling? Alternatives and Innovations are Needed! Can't the Processes Complement Each Other?**

T. Obermeier<sup>1</sup>, I. Henkel<sup>2</sup>

<sup>1</sup>CEO TOMM+C, DGAW, EEW Energy from Waste GmbH,

<sup>2</sup>TOMM+C

## SESSION PYROLYSIS & GASIFICATION (CONT.)

Chairperson: Harald Häger

- 09.45 h **Concept Development for Plasma-assisted Chemical Recycling of Problematic Wastes**

F. Baitalow<sup>1</sup>, W. Fu<sup>1,2</sup>, F. Mehlhose<sup>1,2</sup>,

M. Reinmüller<sup>1</sup>, B. Meyer<sup>1</sup>, M. Gräbner<sup>1,2</sup>,

O. Schulze<sup>3</sup>, R. Merget<sup>4</sup>

<sup>1</sup>TU Bergakademie Freiberg, Institute of Energy Process

Engineering and Chemical Engineering, <sup>2</sup>Fraunhofer-

Institute for Microstructure of Materials and Systems

IMWS, Branch Lab of Fraunhofer IMWS, <sup>3</sup>DBI-Virtuhcon

GmbH, <sup>4</sup>Oerlikon AM Europe GmbH

- 10.15 h **Investigation of the Pyrolysis of Rigid Polyurethane Foam as a Possibility for Chemical Recycling**

P. Rathsack<sup>1</sup>, A. Herrmann<sup>2</sup>, S. Eiden<sup>3</sup>

<sup>1</sup>Fraunhofer Institute for Microstructure of Materials and

Systems IMWS, <sup>2</sup>DBI Virtuhcon GmbH, <sup>3</sup>Covestro

Deutschland AG

- 10.45 h **Coffee Break**

THURSDAY, OCTOBER 7, 2021

## SESSION FLUID CATALYTIC CRACKING (FCC)

Chairperson: Alba Diéguez-Alonso

- 11.00 h**      **Keynote Lecture: Maximizing Olefin Yields: Fluid Catalytic Cracking as Conversion Technology for Pyrolysis-Oils from Plastic Waste**  
S. A. Schunk<sup>1,2</sup>, S. Hanf<sup>1,3</sup>, CP Kelkar<sup>2</sup>, D. Köpke<sup>2</sup>, K.-E. Finger<sup>1</sup>, S. Wodarz<sup>1</sup>, M. Paul<sup>1</sup>, K. Friese<sup>2</sup>  
<sup>1</sup>hte GmbH, Heidelberg, <sup>2</sup>BASF SE, Ludwigshafen am Rhein, Germany / BASF Corporation, Iselin, USA, <sup>3</sup>Karlsruhe Institute of Technology, Institute for Inorganic Chemistry, Karlsruhe
- 11.45 h**      **Plastic to Petrochemicals - Recycling of Pyrolyzed Municipal Plastic Waste by FCC Co-Processing**  
F. Knaus<sup>1,2</sup>, A. Reichhold<sup>1</sup>, W. Tesch<sup>2</sup>, A. Pazos Costa<sup>2</sup>, H. Lutz<sup>1</sup>, M. Büchele<sup>1</sup>  
<sup>1</sup>Technische Universität Wien, <sup>2</sup>ILF Consulting Engineers
- 12.15 h**      **Redefining Catalyst and Process Development in Fluidized Bed Reactors for Chemical Recycling and Renewable Feedstock Integration**  
M. Kirchmann, S. Wodarz, A. Haas  
hte GmbH
- 12.45 h**      **Lunch Break**

THURSDAY, OCTOBER 7, 2021

## SESSION SELECTIVE DEPOLYMERIZATION

Chairperson: Steffen Krzack

- 13.45 h**      **Incorporation of Predetermined Breaking Points as a Pathway for Chemically Recycling Polyurethanes and other Plastics Materials**  
T.E. Müller  
Ruhr-Universität Bochum
- 14.15 h**      **everwave - A Holistic Solution to Combat Riverine and Marine Litter**  
T. Flöhr  
Everwave GmbH, Aachen
- 14.45 h**      **Depolymerization of Technical Grade Polyamide 66 and Polyurethane Materials via Hydrogenation**  
V. Zubar  
Catalysis Research Laboratory (CaRLa)
- 15.15 h**      **Chemical Depolymerization of PET Waste Using Sodium Ethoxide as Catalyst: Five-factor Optimization Using Response Surface Methodology**  
S. Javed, D. Ropel, D. Vogt  
TU Dortmund University
- 15.45 h**      **Coffee Break**

THURSDAY, OCTOBER 7, 2021

## SESSION SELECTIVE DEPOLYMERIZATION (CONT.)

Chairperson: Holger Blanke

- 16.00 h**     **Keynote Lecture: Closed-Loop Recycling of Polyethylene-Like Materials**  
S. Mecking  
Department of Chemistry, University of Konstanz
- 16.45 h**     **Recycling Process by Dissolution/Polymerization: Giving New Life to Waste Expanded Polystyrene**  
R. Turco<sup>1,2</sup>, S. Mallardo<sup>2</sup>, R. Tesser<sup>1</sup>,  
M. Malinconico<sup>2</sup>, M. Di Serio<sup>1</sup>  
<sup>1</sup>University of Naples Federico II, Department of Chemical Sciences, Naples, Italy, <sup>2</sup>Institute for Polymers, Composites and Biomaterials, National Council of Research, Pozzuoli, Italy
- 17.15 h**     **Concluding Remarks and Conference Summary**  
Dieter Vogt & Tilman Bechthold

Subject to change

## Registration

Registration is available until October 1, 2021 on our website:  
[www.dgmk.de/veranstaltungen](http://www.dgmk.de/veranstaltungen).

### Registration Fees:

	by 13.09.2021	after 13.09. 2021
Individual Member of DGMK, ÖGEW, SCI	150,00 €	190,00 €
Non-Member	250,00 €	310,00 €
Student <sup>1</sup>	Free	Free

<sup>1</sup>Up to the age of 30; Copy of student card requested.

# GENERAL INFORMATION

## Digital Conference Office

Opening Hours

Wednesday, October 6, 2021

08.30 h - 17.30 h

Thursday, October 7, 2021

08.30 h - 17.30 h

Phone +49 40 639004 71

## Conference Preprints

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

## Organiser

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