



November 5-6, 2024

COMPACT COURSE CHEMICAL RECYCLING: PYROLYSIS & GASIFICATION

COURSE DESCRIPTION

The compact course “Chemical Recycling: Pyrolysis & Gasification” will enable participants to obtain an overview of chemical recycling technologies, as well as opportunities and challenges for their integration into existing chemical value chains. The course is offered in two parts to be carried out on two separate days.

Part I – Introduction to Chemical Recycling: Participants will be introduced to the fundamentals of thermochemical conversion processes involving pyrolysis and gasification as well as typical key performance indicators used. Different feedstock materials for chemical recycling processes and typical methods to characterize their properties will be introduced and explained. An overview of chemical recycling principles will provide participants with an understanding of general chemical recycling pathways and associated representative technologies.

Part II – Industrial Chemical Recycling Technologies & Integration Possibilities: Participants will obtain in-depth insights into different pyrolysis and gasification processes, their industrial deployment as well as integration possibilities into existing chemical production value chains. An impression of the specialized laboratory, bench-scale and pilot-scale facilities for chemical recycling at the Institute of Energy Process Engineering & Chemical Engineering, TU Bergakademie Freiberg and the Fraunhofer Institute IKTS group for Circular Carbon Technologies in Freiberg rounds up the course.

TARGET GROUP

The course targets engineering, technical and management personnel who are interested in obtaining a general overview, first insights and/or to extend their knowledge on chemical recycling technologies involving gasification and pyrolysis, and to understand their strengths and limitations as well as opportunities and challenges associated with their implementation.

TRAINING LOCATION

Institute of Energy Process Engineering and Chemical Engineering
Fuchsmuehlenweg 9 D, Reiche Zeche, 09599 Freiberg

REGISTRATION FEE

2,500.00 € ⁽¹⁾ for two-day course.

REGISTRATION

For any questions and registration, please contact Dr. Sindy Bauersfeld
(Email: compact-course@iec.tu-freiberg.de; Telephone: +49 3731 39 4536)

CANCELLATION POLICY

Cancellations have to be sent to the IEC in text format. If you cancel your registration at least 20 days prior to the start date of the event, the full amount will be reimbursed (minus a handling fee of 200 €). After this deadline, no refunds will be given. If needed, the event registration can be changed to a substitute attendee. In this case, no cancellation fees or extra costs will be incurred.

(1) Excluding VAT on catering.

SCHEDULE

Time and Speaker	Topic
Tuesday, November 5, 2024	
08:30 – 08:45 Prof. Martin Gräbner	Welcome & Introduction Expectations of Participants
08:45 – 10:30 Prof. Martin Gräbner	Fundamentals of Pyrolysis and Gasification <ul style="list-style-type: none">- Terms and definitions of thermochemical conversion- Mechanism and reactions of pyrolysis and gasification- Thermodynamic and kinetic aspects- Conversion criteria and KPIs- Process classification
10:30 – 11:00	Short Break
11:00 – 12:30 Stefan Thiel	Fuels for Pyrolysis and Gasification Processes <ul style="list-style-type: none">- Classification and characterization of secondary feedstock- Feedstock sampling, preparation and analysis- Characterization and chemical analyses of solids, liquids and gases from technical plants- Impact of feedstock properties on pyrolysis and gasification processes
12:30 – 13:30	Lunch Break
13:30 – 15:00 Prof. Martin Gräbner	Overview of Chemical Recycling Processes <ul style="list-style-type: none">- General pathways of chemical recycling and representative technologies- Feedstock requirements, process complexity, carbon recycling rate, product yield and quality, latest developments and TRL
15:00 – 15:30	Short Break
15:30 – 17:00 Stefan Thiel, Dr. Jörg Kleeberg	Large-Scale Facilities for Chemical Recycling <ul style="list-style-type: none">- FlexiEntrained (GSP gasification process)- Fraunhofer pyrolysis platform (LTC/CTC processes)
19:00 – 21:00	Networking Dinner
Wednesday, November 6, 2024	
08:30 – 9:30 Antonia Helf	Industrial Pyrolysis Technologies <ul style="list-style-type: none">- Classification of pyrolysis technologies- Technology introduction (Batch, Rotary Kiln, Auger/Screw, Stirred Tank, Fluidized Bed)*- Industrial deployment for waste pyrolysis
09:30 – 10:00	Short Break
10:00 – 12:00 Prof. Martin Gräbner	Industrial Gasification Technologies <ul style="list-style-type: none">- Classification of gasification technologies- Technology introduction (Moving-Bed, Fluidized-Bed, Entrained-Flow)*- Industrial deployment of waste gasification- Key considerations & constraints for gasification of different types of waste
12:00 – 13:00	Lunch Break
13:00 – 14:30 Dr. Florian Keller	Pyrolysis and Gasification in Industrial Process Chains <ul style="list-style-type: none">- Pyrolysis products (quality, upgrading and utilization as alternative feedstock for cracker/POx)- Syngas treatment (typical contaminants, gas cleaning, CO shift, acid gas removal)- Syngas utilization (methanol, MtX, Fischer-Tropsch)- Alternative routes for integration in chemical production chain
14:30 – 16:00 Olaf Schulze, Stefan Thiel, Dr. Marcus Schreiner	Laboratory, Bench-Scale & Large-Scale Facilities for Chemical Recycling <ul style="list-style-type: none">- FlexiSlag – fixed-bed slagging pilot gasification plant for multiple solid feedstock- FlexiFluidized – entrained/fluidized bed pilot gasification plant for multiple solid feedstock- FlexiPox – high pressure partial oxidation pilot plant for gaseous and liquid hydrocarbons (e.g. oil residues, pyrolysis oils)- Bench-scale pyrolysis equipment- Specialized laboratory equipment for feedstock characterization & analysis
16:00 – 16:30	Round Up & Closing

*Upon request at course registration special technologies can be integrated into the lectures.