

## *Program*

# ***CHEMREC I: 1<sup>st</sup> International Conference on Thermochemical Recycling of Plastics***

**April 28 – May 2, 2024  
NH Hotel Malaga, Malaga  
Spain**

### **Conference Co-Chairs:**

**Sascha Kersten**, University of Twente, The Netherlands  
**M. Pilar Ruiz**, Maastricht University, The Netherlands  
**Erik Heeres**, University of Groningen, The Netherlands



**Engineering Conferences International**  
32 Broadway, Suite 314 - New York, NY 10004, USA  
Phone: 1 - 212 - 514 - 6760, Fax: 1 - 212 - 514 - 6030  
[www.engconfintl.org](http://www.engconfintl.org) – [info@engconfintl.org](mailto:info@engconfintl.org)

**NH Málaga Hotel**

**Calle San Jacinto, 2, 29007 Malaga Spain  
Reservations +1 212 219 7607 Tel.: +34 95  
2071323**

**[nhmalaga@nh-hotels.com](mailto:nhmalaga@nh-hotels.com)**

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## **Sunday, April 28, 2024**

16:30 – 18:00	Registration
17:00 – 18:00	Organizing Committee Meeting
18:00 – 19:00	Welcome reception (Patio Ingles)
19:00 – 21:00	Dinner (Esperanza)

### **NOTES**

- *Technical Sessions will be in the Mena Room.*
- *Poster sessions will be in the Mediterraneo Room.*
- *The ECI Office is in the Biznaga Room.*
- *Lunches will be in Esperanza.*
- *The gala dinner on Wednesday will be in the Arlequin Room.*
- *Audiotaping, videotaping and photography of presentations are prohibited.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).*
- *Speakers – Please leave at least 3 minutes for questions. Extended discussion will take place at the poster session.*
- *Please do not smoke at any conference functions.*
- *Turn your cellular telephones to vibrate or off during technical sessions.*

## **Monday, April 29, 2024**

- 07:00 – 08:30 Breakfast
- 08:30 – 08:50 Welcome and Conference Opening  
M. Pilar Ruiz, Maastricht University, The Netherlands
- 08:50 – 09:25 PLENARY: Chemical recycling of plastics via hydrothermal depolymerisation  
Patrick Biller, Aarhus University, Denmark
- 09:25 – 10:00 PLENARY: Chemical Recycling R&D at scale  
Geoff Smith, Itero, UK

### **TOPIC: PYROLYSIS**

- 10:00 – 10:20 O122-Pyrolysis of Multilayer Plastics: A Promising Route to Resource Recovery and Environmental Sustainability.  
Joonas Lahtinen, VTT, Finland
- 10:20 – 10:40 O103-Single vs Double Stage Pyrolysis of Plastic Waste - Experiments, Characterization, and Techno-Economic Analysis  
Maddalena Laghezza, ICFAR/Western University, Canada
- 10:40 – 11:10 Coffee Break
- 11:10 – 11:30 O125- Pyrolysis of waste polypropylene plastics for energy recovery: Study comparisons between bench scale and a commissioned kilogram-scale rotary kiln reactor.  
George Kofi Parku, Karlsruhe Institute of Technology, Stellenbosch University, Germany
- 11:30 – 11:50 O139- Thermochemical Recycling of Household Plastic Waste.  
Run Ze Cao, University of Western Ontario, Canada
- 11:50 – 12:10 O143- Model and experimental assessment during pyrolysis of different polymers from the waste stream of a composting plant.  
Davide Sorino, University of Rome Tor Vergata, Italy

### **TOPIC: GASIFICATION**

- 12:10 – 12:30 O126- Experimental and modeling results of steam-oxygen gasification of plastic waste in a pilot scale fluidized bed reactor.  
Umberto Arena, University of Campania Luigi Vanvitelli, Italy
- 12:30 – 12:50 O133- Make waste a resource: Thermal cracking for the valorization of mixed plastic waste.  
Surika van Wyk, TNO, The Netherlands
- 13:00 – 14:00 Lunch

**Monday, April 29, 2024 (continued)**

**TOPIC: DEHYDROGENATION**

14:00 – 14:20 O149- Thermocatalytic dehydrogenation of plastic wastes assisted by ZnCl<sub>2</sub>-based molten salts  
Claudia Prestigiacomio, Engineering Department, University of Palermo, Italy

**TOPIC: HYDROTHERMAL / HYDROLYSIS**

14:20 – 14:40 O140- Validation of a flow system for hydrothermal processing of PET waste.  
Antonio Jaime-Azuara, Aalborg University, Denmark

14:40 – 15:00 O138- Hydrolysis of PET: Increasing the monomer recovery by recirculating the aqueous phase.  
Aiman Shabbir, Aalborg University, Denmark

15:00 – 15:20 O106- Valorization of Mixed Plastic Waste Using Subcritical Wet Oxidation for Feedstock Recycling into Carboxylic Acids: Assessment and Future Scale-up Perspectives.  
Niccoló Pezzati, RECORD, Italy

**TOPIC: FUNDAMENTALS**

15:20 – 15:40 O150- The behaviour of plastic particles in fluidized bed reactors during pyrolysis: a Monte Carlo approach  
Stefano Iannello, University College London, UK

15:40 – 16:00 O151- Validation and development of predictive modelling for pyrolysis of mixed plastics.  
Morten E. Simonsen, Aalborg University, Denmark

16:00 – 17:30 Poster session and social time

Dinner on your own

## **Tuesday, April 30, 2024**

- 07:00 – 08:30 Breakfast
- 08:30 – 09:05 PLENARY: Covestro will become fully circular  
Stefanie Eiden, Covestro, Germany
- 09:05 – 09:40 PLENARY: Effect of a reflux on the composition of liquids from plastic  
pyrolysis  
Anthony Dufour, CNRS, University of Lorraine, France

### **TOPIC: CATALYSIS**

- 09:40 – 10:00 O132- Selective Catalytic Conversion of Impurities in Multilayered Polymer  
Films.  
Steven Crossley, University of Oklahoma, USA
- 10:00 – 10:20 O111- Catalytic hydrothermal liquefaction of polystyrene: a subcritical  
approach for recovery of high-value products.  
Joshua Ruland, TU Delft, The Netherlands
- 10:20 – 10:40 O107- Microwave-assisted catalytic pyrolysis of polyethylene into carbon  
nanotube and hydrogen.  
Fatemeh Vatankhah, Polytechnique Montreal, Canada
- 10:40 – 11:10 Coffee Break
- 11:10 – 11:30 O144- From waste polyolefines to benzene, toluene and xylenes using  
catalytic pyrolysis: effects of impurities in the feed on catalytic aromatization.  
Hero Jan Heeres, University of Groningen, The Netherlands
- 11:30 – 11:50 O135- Hydrochemolytic technology for high-yield conversion of complex  
plastic waste to high-value saturated hydrocarbon  
Eric Appelman, Aduro Clean Technologies, Canada
- 11:50 – 12:10 O118- pH-modulated metal-support interactions for polypropylene  
hydrogenolysis using Ni/Al<sub>2</sub>O<sub>3</sub> catalysts  
Xiyang Huang, University of Groningen, The Netherlands
- 12:10 – 12:30 O130- Size and Structure Effects of carbon-supported Ruthenium  
nanoparticles on waste Polypropylene Hydrogenolysis.  
Jessie Sun, University of Delaware, USA
- 12:30 – 12:50 O110- Chemical recycling of hard to recycle mixed waste plastics.  
Matthijs van Akker, BioBTX, The Netherlands
- 13:00 – 14:00 Lunch

**Tuesday, April 30, 2024 (continued)**

**TOPIC: PUBLIC PRIVATE PARTNERSHIPS**

14:00 – 14:20            The power of value chain driven collaborative research  
Ronald Korstanje, Circular Plastics Initiative, The Netherlands

**TOPIC: FUNDAMENTALS**

14:20 – 14:40            O114- Mass Transfer Effects on the Intrinsic Kinetics in Polyethylene  
Pyrolysis.  
Dwiputra Muhammad Zairin, University of Twente, The Netherlands

14:40 – 15:00            O131- Reaction Pathways in the Catalytic Hydroconversion of Poly(ethylene-  
co-vinyl alcohol) Multilayer Films into Lubricants and Fuels.  
Christine Oberhausen, University of Delaware, USA

15:00 – 15:20            O145- Kinetic boost of the PET glycolysis reaction.  
Maria Schlüter, TU Dortmund University, Germany

15:20 – 15:40            Developing a comprehensive sampling and analytical strategy for steam  
cracking of plastic waste using GC-VUV  
Chahat Mandviwala, Chalmers University, Sweden

15:40 – 17:10            Poster session and social time

Dinner on your own



### **Wednesday, May 1, 2024**

- 07:00 – 08:30 Breakfast
- 08:30 – 09:05 PLENARY: Plastic recycling stripped naked – from circular product to circular industry with recycling cascade  
Sascha Kersten, University of Twente, The Netherlands
- 09:05 – 09:40 PLENARY: BlueAlp technology  
Valentijn de Neve, BlueAlp

#### **TOPIC: PRE-TREATMENT / POST-TREATMENT**

- 09:40 – 10:00 O128- Upwash: a Pre-treatment of sorted plastic wastes to bridge the gap between waste logistics and (chemical) recycling.  
Rinke Altink, TNO, The Netherlands
- 10:00 – 10:20 O124- The importance of post treatment in thermochemical recycling of plastic waste.  
Farah Siddiq, VTT, Finland
- 10:20 – 10:40 O108- Revalorization of the heavy oil fraction from the pyrolysis of plastic wastes.  
Danais Peña Rodriguez, Unit for Sustainable Thermochemical Valorization, CIEMAT, Spain
- 10:40 – 11:10 Coffee Break

#### **TOPIC: PYROLYSIS / GASIFICATION**

- 11:10 – 11:30 O112- Pyrolysis of packaging plastic waste (DKR350): from lab-scale to pilot plant studies.  
M. Pilar Ruiz, University of Twente, The Netherlands
- 11:30 – 11:50 O142- Effect of gasifying agent on textile waste gasification process.  
Jesus Arauzo, University of Zaragoza, Spain
- 11:50 – 12:10 O109- From plastic waste to refinery - turning plastic waste into a suitable feedstock for the production of new materials.  
Julian Strien, University of Groningen, The Netherlands
- 12:10 – 12:30 O123- Can chemical recycling rescue challenging plastic waste streams? WEEE plastics case study.  
Muhammad Saad Qureshi, Neste, Finland
- 12:30 – 12:50 O127- Integrating Pyrolysis and Chemical Leaching Process for Pulper Waste Conversion into Liquid, Coal, Hydrogen and Chemical Flocculating Agent.  
Andrea Salimbeni, RECORD, Italy
- 13:00 – 14:00 Lunch

**Wednesday, May 1, 2024 (continued)**

14:00 – 15:40            **Roundtable: What are the industrial needs for chemical recycling?**

**Chair:** Sascha Kersten

**Participants:**

Stefanie Eiden (Covestro)

Guus Van Rossum (Shell)

Ronald Korstanje (CPI, The Netherlands)

Christoph Dittrich and Sabriye Frediksson (Sabic)

Muhammad Saad Qureshi (Neste)

Valentijn de Neve (BlueAlp)

15:45 – 16:30            Afternoon refreshment/Networking

16:30 – 20:00            Free time

20:00 – 22:00            Gala dinner (Arlequin)

## **Thursday, May 2, 2024**

- 07:00 – 08:30 Breakfast
- 08:30 – 09:05 PLENARY: Catalytic solutions for the chemical recycling of waste plastics via pyrolysis  
Peter Deuss, University of Groningen, The Netherlands

### **TOPIC: NON-TYPICAL FEEDS**

- 09:05 – 09:25 O104- Pyrolysis of Lead Acid Battery Polymeric Cases: Technical Challenges and Innovative Solutions for Hydrogen Production.  
Maddalena Laghezza, ICFAR/Western University, Canada
- 09:25 – 09:45 Effect of biochar on the pyrolysis behaviors of poly(L-lactide).  
Qian Zhou, Avans University of Applied Science, The Netherlands

### **TOPIC: PROCESS DEVELOPMENT**

- 09:45 – 10:05 Consequences of heat transfer limitations on plastic waste pyrolysis reactor scale-up.  
Sabriye Fredriksson, Sabic, The Netherlands
- 10:05 – 10:25 O121- Upcycling of Polyethylene Waste into Thermoplastic Elastomer with Superior Mechanical Properties.  
Yinlong Chang, Zhejiang University, Institute of Zhejiang University - Quzhou, China
- 10:25 – 10:55 Coffee Break
- 10:55 – 11:15 Thermochemical recycling of mixed plastic wastes through pyrolysis and steam cracking – assessment of centralized vs. decentralized approaches.  
Ivan Gogolev, Chalmers University, Sweden
- 11:15 – 11:35 O146- Developing an integrated and environmentally friendly downstream of the PET glycolysis process.  
Maria Schlüter, TU Dortmund University, Germany
- 11:35 – 11:55 Design of Experiment for HDPE pyrolysis towards light olefins in a conical spouted bed reactor  
Toon Van Vaerenbergh
- 11:55 – 12:15 Closing remarks
- 12:30 – 14:00 Lunch and departures

## POSTERS

\*It is expected that most of the speakers will also contribute with a poster.

1. Pyrolysis of multilayer plastics: Promising route to resource recovery and environmental sustainability  
Joona Lahtinen, VTT, Finland
2. Heterogeneous Catalytic Oxidation of Polyethylene Waste for the Production of Fatty Diacids.  
Yinlong Chang, Zhejiang University, China
3. Catalytic depolymerization of plastic waste to obtain hydrogen and fossil fuels using  $\beta$ -Si-Al, ZSM-5-Si-Al and  $\gamma$ -alumina-fluoride  
Ikram Belhadj Mohamed, Universitat Rovira i Virgili, Spain
4. Analytical pyrolysis of different plastic wastes: Investigating the distribution of pyro-oil products  
Danais Peña, CIEMAT, Spain
5. Plastic and plastic-blend recovery potential via catalytic and non-catalytic pyrolysis and comparison of an analytical pyrolyzer techniques  
Khizar Shaikh, Indian Institute of Technology, Madras, India