Program

CHEMREC I: 1st 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

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Engineering Conferences International (ECI) is a not-for-profit global engineering conferences program, originally established in 1962, that provides opportunities for the exploration of problems and issues of concern to engineers and scientists from many disciplines.

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. Joona 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

<u>Monday, April 29, 2024</u> (continued)

TOPIC: DEHYDROGENATION

14:00 – 14:20	O149- Thermocatalytic dehydrogenation of plastic wastes assisted by $ZnCl_2$-based molten salts Claudia Prestigiacomo, 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 Subcrititcal 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. Jesper Thygesen, 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_2O_3 catalysts Xiyan 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

<u>Tuesday, April 30, 2024</u> (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 - turing 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 Fredriksson (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- Upcylcing 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 β-Si-Al, ZSM-5-Si-Al and γ-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