

## PRELIMINARY PROGRAM

### MONDAY 11 May 2020

08.45 Welcome

09.00 Opening Session

**Keynote 1:** The effective approach on the catalytic pyrolysis using tandem micro reactor-gas chromatography/mass spectrometry  
*Young-Min Kim, Daegu University, South-Korea*

10.10 Coffee Break

#### Session 1

*Progress in analysis and analytical instrumentation*

10.40 **Application of micro fluidized bed in gas-solid thermal reaction analysis**

*Guangwen Xu, Shenyang University of Technology, China*

11.00 **Determining microplastic content in environmental samples using a database software approach for identification and comparison of two different pyrolysis-GC/MS techniques**

*Eike Kleine-Benne, Gerstel, Germany*

11.20 **Analytical fast pyrolysis of microalgae in micropyrolyzer, pyroprobe and curie point pyrolyzer**

*Vinu Ravikrishnan, Indian Institute of Technology Madras, India*

11.40 **Weather-induced degradation studies of polymers using the photoprobe**

*Karen Sam, CDS Analytical, USA*

12.00 **Quantitation of styrene and acrylics monomers with the pyrolysis GC-MS technique in (styrene) acrylic resins**

*Stéphan Chavardès, Allnex, The Netherlands*

12.30 Lunch & Poster Session

14.00 **Keynote 2:** Thermochemical recycling of waste plastics

*Shogo Kumagai, Tohoku University, Japan*

#### Session 2A

*Analytical pyrolysis / environment, cultural heritage, food, medical*

#### Session 2B

*Applied pyrolysis for recycling of polymers and plastics*

14.40

**Identification of materials used in historical stringed instruments by analytical pyrolysis SPME with on-fiber silylation and GC-MS**

*Daniele Fabbri, University of Bologna, Italy*

14.40

**Suitability of biochar produced from co-pyrolysis of spent growing media and plastic grow bags in environmental applications**

*Dilani Chathurika Rathnayake Mudiyansele, Ghent University, Belgium*

<p>15.00  <b>Combination of Py-GC/MS and Py-GCxGC/MS for the detailed characterization of archaeological lacquer samples</b>  <i>Michel Sablier, Centre de Recherche sur la Conservation, Musée National d'Histoire Naturelle, France</i></p>	<p>15.00  <b>Optimisation of hydrogen production from the pyrolysis-reforming of polystyrene using different nickel based catalysts</b>  <i>Idris Aminu, University of Leeds, UK</i></p>
<p>15.20  <b>Analytical pyrolysis assisted by chemometrics: A convenient approach to study complex organic matrices</b>  <i>Nicasio Tomás Jiménez-Morillo, Hercules Laboratory University of Evora, Portugal</i></p>	<p>15.20  <b>Pyrolysis of waste plastic mixture from WEEE in a reactive distillation system</b>  <i>Bruna Rijo, CERENA – IST, Portugal</i></p>
<p>15.40  <b>Influence of UV light on the pyrolytic behaviour of wood using analytical pyrolysis</b>  <i>Marco Mattonai, University of Pisa, Italy</i></p>	<p>15.40  <b>Chemical recycling of PET and PU through neutral hydrolysis in hydrothermal conditions</b>  <i>Paolo De Filippis, Sapienza University of Rome, Italy</i></p>

**16.00 End of Day 1**

**16.00 Social Program: Guided Tour and Reception in the Town Hall**

## PRELIMINARY PROGRAM

### TUESDAY 12 May 2020

- 08.30 Keynote 3:** **Strategies based on analytical pyrolysis for the study of organics from archaeological findings**  
*Erika Ribechini, University of Pisa, Italy*

#### Session 3

*Analytical pyrolysis / environment, cultural heritage, food, medical*

- 09.10 Automated analysis of microplastics in environmental samples using Py-GC/MS with newly developed software**  
*Atsushi Watanabe, Frontier Laboratories, Japan*
- 09.30 Identification of polymer species in mixed microplastic model sample by pyrolysis-gas chromatography-atmospheric pressure chemical ionization quadrupole time-of-flight mass spectrometry (Py-APGC-MS)**  
*Hajime Ohtani, Nagoya institute of Technology, Japan*
- 09.50 Influence of inorganic matrices on the analytical pyrolysis of condensed polymers — Implications for microplastics analysis**  
*Tim Lauschke, German Federal Institute of Hydrology, Germany*
- 10.10 Direct identification and quantification of various types of microplastics in riverine sediments by pyrolysis-gas chromatography-mass spectrometry**  
*Sylvie Derenne, CNRS Sorbonne Université, France*

#### 10.30 Coffee Break

#### Session 4

*Analytical pyrolysis of coal, biomass, waste, polymers and plastics*

- 11.00 The use of boron-based additives for the prevention of char agglomerating and the preparation of boron-doped carbon microspheres during lignin pyrolysis**  
*Zhiguo Dong, Huazhong University of Science and Technology, China*
- 11.20 Manipulation of reaction pathways in biomass fast pyrolysis using molten polymers**  
*His-Hu Wong, University of Massachusetts Lowell, USA*
- 11.40 Pyrolysis of residual lignocellulosic biomass in molten chloride salts: A Py-GC-MS study**  
*Adriana Elena Estrada Leon, Ghent University, Belgium*
- 12.00 Analytical pyrolysis of Chilean oak using natural and synthetic zeolites: A Py-GC/MS study**  
*Serguei Alejandro-Martin, Chile*
- 12.20 Fast pyrolysis of p-coumaryl aldehyde model compound found in genetically modified plants**  
*Liang Li, Ghent University, Belgium*
- 12.40 Lunch & Poster Session**

- 14.00 Keynote 4:** **Pyrolysis of hydrocarbons and methane pyrolysis**  
*Earl Goetheer, TNO, The Netherlands*

**Session 5A**

*Analytical pyrolysis of coal, biomass, waste, polymers and plastics*

14.40  
**Shale gas reserve estimation for the UK Bowland shale using high pressure water pyrolysis**

*Colin Snape, University of Nottingham, UK*

15.00  
**The mechanism of hydrocarbon gas generation from kerogen—Evidences from kerogen closed-system pyrolysis and quantitative Py-GC-FID on kerogen residues**

*Yuhong Liao, Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, China*

15.20  
**The effect of pressure on product formation during the co-pyrolysis of coal and torrefied biomass**

*Hein Neomagnus, North-West University, South Africa*

15.40  
**Py-GC/MS can provide a wealth of useful information on the degradation of microplastics**

*Francesca Modugno, University of Pisa, Italy*

**Session 5B**

*Hydrothermal and solvent liquefaction; hydrothermal carbonization*

14.40  
**Catalytic depolymerisation of lignin: UV fluorescence as a fast analysis method of monomers and oligomers**

*Anthony Dufour, CNRS, France*

15.00  
**Valorization of aqueous fraction from hydrothermal liquefaction: Biological conversion through anaerobic-aerobic processes**

*Cristian Torri, Dipartimento di Chimica 'Giacomo Ciamician', Italy*

15.20  
**Economic sustainability of hydrothermal liquefaction of sewage sludge: From a conceptual analysis to a practical verification**

*Claudia Prestigiacomo, University of Palermo, Italy*

15.40  
**Hydrothermal conversion of biomass derived pentose to furfural in ionic liquid-butanone-water reaction system**

*Kaifeng Lu, Zhejiang University, China*

**16.00 Coffee Break**
**Session 6A**

*Analytical pyrolysis of coal, biomass, waste, polymers and plastics*

16.30  
**Producing chemicals from waste tires via catalytic fast pyrolysis over SiO<sub>2</sub>-supported metals**

*Luis Arteaga, University of Bio-Bio, Chile*

16.50  
**Improved characterisation of olefins, sulfur and nitrogen containing components in plastic waste pyrolysis oils by comprehensive two-dimensional gas-chromatography coupled to multiple detectors**

*Hang Dao Thi, Ghent University, Belgium*

17.10  
**Experimental and kinetic modelling study of the fast pyrolysis of polyurethane waste by Py-GC×GC/TOF-MS/FID**

*Haoran Liu, Ghent University, Belgium*

**Session 6B**

*Product stabilization, separation, purification and (catalytic) upgrading*

16.30  
**Continuous co-hydrodeoxygenation of hydrothermal liquefaction bio-oil and renewable feed blends to drop-in transport fuels**

*Kamaldeep Sharma, Aalborg University, Denmark*

16.50  
**Electrooxidation of the pyrolysis aqueous phase on boron-doped diamond electrodes**

*Christopher Kick, Fraunhofer Institut für Umwelt, Germany*

17.10  
**Catalytic hydrotreatment of pyrolytic lignins from biomass fast pyrolysis liquids in a continuous stirred tank reactor**

*Wang Yin, University of Groningen, The Netherlands*

17.30

**Description of polymers and composite materials with thermal analysis hyphenated to photoionization mass spectrometry**

*Christopher Rüger, University of Rostock, Germany*

17.30

**Coproducts from catalytic fast pyrolysis enable cost-effective biofuels**

*Mark Nimlos, National Renewable Energy Laboratory, USA*

**18.00 Poster Session and Happy Hour**

**20.00 End of Day 2**

**PRELIMINARY PROGRAM**

**WEDNESDAY 13 May 2020**

**08.30 Keynote 5:** **Catalytic hydropyrolysis of biomass for green fuels**  
*Magnus Zingler Stummann, Haldor Topsoe, Denmark*

**09.10 Session 7**  
*Analytical pyrolysis of coal, biomass, waste, polymers and plastics & Analytical and applied catalytic (hydro) pyrolysis*

**09.10 Fast pyrolysis of lignocellulosic biomass: Analysis of the cellulose/lignin primary interactions**  
*Pilar Ruiz, University of Twente, The Netherlands*

**09.30 Effect of chitosan incorporation on the pyrolysis of cellulose fiber for carbon fiber production**  
*Hilda Rizkia Zahra, Aalto University, Finland*

**09.50 Catalytic upgrading of pyrolysis vapors from lignite over HZSM-5 modified by aluminum fluoride**  
*Jingpei Cao, China University of Mining & Technology, China*

**10.10 Biomass catalytic pyrolysis and activation mechanism with KOH additive: An experimental and modeling study**  
*Wei Chen, Huazhong University of Science and Technology, China*

**10.30 Coffee Break**

**Session 8**  
*Reaction mechanisms and kinetics / modelling and experimentation*

**11.00 Investigation on the pyrolytic behavior of wood at particle level with the application of spectroscopic techniques: Influence of inorganics and transport limitations**  
*Alba Dieguez-Alonso, Technische Universität Berlin, Germany*

**11.20 On the interplay between chemistry and transfer processes during the pyrolysis of biomass**  
*Sascha Kersten, University of Twente, The Netherlands*

**11.40 International round robin for assessing the reliability of kinetics in biomass pyrolysis TGA**  
*Andres Anca-Couce, TU Graz, Austria*

**12.00 The mechanism on co-pyrolysis of cellulose components and amino acids with photoionization time-of-flight mass spectrometry and DFT calculation**  
*Meng Gong, University of Science and Technology, China*

**12.20 Experimental study of the influence of temperature and particle's aspect ratio on the products of single beech wood cylinder pyrolysis**  
*Przemyslaw Maziarka, Ghent University, Belgium*

**12.40 Lunch & Poster Session**

**14.00 Keynote 6:** **How can quantum chemistry and complex chemical kinetic models help us understand and improve pyrolysis?**  
*William 'Bill' Green, Massachusetts Institute of Technology, USA*

**Session 9A**

*Reaction mechanisms and kinetics / modelling and experimentation*

**Session 9B**

*Product characterization and utilization*

14.40  
**Thermal decomposition of furans with oxygenated substituents: A combined experimental and quantum chemical study**  
*Florence Vermeire, Ghent University, Belgium*

15.00  
**Benzene-ring formation via 5-HMF as a key intermediate in cellulose carbonization**  
*Nomura Takashi, Kyoto University, Japan*

15.20  
**Single event microkinetic modeling of butane and isobutane steam cracking: Maximizing propylene production**  
*Syam Ukkandath Aravindakshan, Ghent University, Belgium*

15.40  
**Experimental and theoretical study on ethylnorbornane pyrolysis under atmospheric and high pressure**  
*Hongyan Wang, Tianjin University, China*

14.40  
**In-depth analysis of biomass and pyrolysis oils using high-resolution mass spectrometry**  
*Evan Terrell, Washington State University, USA*

15.00  
**Development and comparison of two online viscosity measurement systems for fast pyrolysis bio-oil**  
*Axel Funke, Karlsruhe Institute of Technology, Germany*

15.20  
**Charcoal composite pellets for the use in ferroalloy industries**  
*Gerrit Surup, Trondheim University, Norway*

15.40  
**Characterisation of microalgal HTL bio-crudes and fast pyrolysis liquids by NMR spectroscopy**  
*Daniel Nowakowski, Aston University, UK*

**16.00 Coffee Break**

**Session 10A**

*Applied pyrolysis of coal, biomass and waste: bench scale testing*

**Session 10B**

*Product characterization and utilization  
Techno-economic and environmental assessments*

16.30  
**Cracking of glucose for selective production of glycolaldehyde**  
*Christian Schandel, Technical University, Denmark*

16.50  
**Enhanced methane production from waste biomass using a novel 3-stage pyrolysis-catalytic steam reforming-catalytic hydrogenation reactor**  
*Mohammad Musaab Jaffar, University of Leeds, UK*

17.10  
**Ex-situ catalytic pyrolysis of glycerol to bio-based BTX over a H-ZSM-5(23) zeolite catalyst**  
*Songbo He, University of Groningen, The Netherlands*

17.30  
**Pyrolytic conversion of forestry residues and bark into value-added liquids and solid products**  
*Sadegh Papari, Western University, Canada*

16.30  
**Societal techno-economic assessment of biochar production and use in targeted applications**  
*Luca Campion, Hasselt University, Belgium*

16.50  
**Feasibility of fast pyrolysis bio-oil distillation**  
*Anke Krutof, KIT Karlsruhe, Germany*

17.10  
**Partial pyrolysis of surplus logging residues – A feasibility assessment for northern Sweden**  
*David Agar, Swedish University of Agricultural Sciences, Sweden*

17.30  
**Methodologies for biogenic carbon determination when co-Processing fast pyrolysis bio-oil**  
*Tijs Lammens, BTG Bioliquids, The Netherlands*

**17.50 End of Day 3**

**19.30 Conference Dinner at Oude Vismijn**

**PRELIMINARY PROGRAM**

**THURSDAY 14 May 2020**

**08.30 Keynote 7:** **Pyrolysis of biomass to valuable compounds**  
*Qiang Lu, North China Electric Power University, China*

**09.10 Invited talk**  
*Erik Heeres, Groningen University, The Netherlands*

**Session 11A**  
*Applied pyrolysis of coal, biomass and waste: Bench scale testing*

**Session 11B**  
*Analytical and applied catalytic (hydro) pyrolysis*

09.40  
**Fuel suitability of fast pyrolysis bio-oils from citric acid-leached sugarcane residues**  
*Lizet Rodriguez-Machin, CEETA Central University "Marta Abreu" of Las Villas, Cuba*

09.40  
**Thermal conversion of inedible vegetable oils to aromatics**  
*Sarah Asplin, Aston University, UK*

10.00  
**Fast pyrolysis of pine biomass in a gas-solid vortex reactor**  
*Manuel Nunez Manzano, Ghent University, Belgium*

10.00  
**Molten salt pyrolysis: Efficient conversion of lignocellulosic biomass to fuels and chemicals**  
*Homer Genuino, University of Groningen, The Netherlands*

10.20  
**On high-pressure pyrolysis and heat sinks of C8-C16 hydrocarbons with different molecular structures**  
*Liu Yuij, Tianjin University, China*

10.20  
**Activated carbons from fast pyrolysis biochar as novel catalysts for the post-treatment of pyrolysis vapors, studied by analytical pyrolysis**  
*Taina Ohra-aho, VTT Technical Research Centre, Finland*

**10.40 Coffee Break**

**Session 12A**  
*Applied pyrolysis of coal, biomass and waste: Bench scale testing*

**Session 12B**  
*Reaction mechanisms and kinetics/modelling and experimentation*

11.00  
**Determination of the conditions that enhance a gas phase oxidative desulfurization of a model scrap tires rubber oil**  
*Karol Vanessa, Universidad Industrial de Santander, Colombia*

11.00  
**Pyrolysis and oxidation of ethylamine, dimethylamine and diethylamine: Theoretical and kinetic modeling study**  
*Cato Pappijn, Ghent University, Belgium*

11.20  
**Effect of biomass type on the pyrolysis and in line catalytic steam reforming for hydrogen production**  
*Enara Fernandez Saenz, University of the Basque Country, Spain*

11.20  
**Pyrolysis mechanism of lipid, protein and carbohydrate extracted from microalgae**  
*Qi Niu, Ghent University, Belgium*



11.40  
**Energetic and exergetic analysis of pyrolysis of cellulose, hemicellulose and lignin**  
*Luis Reyes, INSA Rouen, France*

11.40  
**Radical chain reaction initiated by side-chains group of  $\beta$ -aryl ether linkage during lignin pyrolysis: A further mechanistic insight**  
*Ming Lei, Southeast University, China*

12.00  
**A comparative study on the effect of slow pyrolysis temperature on softwood and hardwood pyrolysis products yields and biochar properties**  
*Liang Wang, SINTEF Energy Research, Norway*

12.00  
**Kinetic effect of acetyl substituents on thermal decomposition of xylose**  
*Matieyendou Goussougli, Laboratoire des réactions et génie des Procédés, France*

**12.20 Lunch**

**13.30 Keynote 8: History of biomass fast pyrolysis**  
*Robbie Venderbosch, BTG Biomass Technology Group, The Netherlands*

**Session 13**

*Applied pyrolysis of coal, biomass and waste: PDU and large scale operation*

14.00 **A critical review of catalytic fast pyrolysis of woody biomass in continuously operated units**  
*Güray Yildiz, Izmir institute of Technology, Turkey*

14.20 **The production and characterization of biochar for targeted (agricultural) applications**  
*Amine Lataf, University of Hasselt, Belgium*

14.40 **Scaling up in Iowa: Autothermal pyrolysis of corn stover at 50 TPD**  
*Lysle Whitmer, Bioeconomy Institute Iowa State University, USA*

15.00 **Pilot and demo plants for biochemicals and biofuels processes: Scaling up step by step**  
*Thomas Ladrak, Zeton, The Netherlands*

15.25 **From biomass to bioliquids – Fast pyrolysis bio-oil**  
*Gerhard Muggen, BTG, The Netherlands*

**15.50 Closing Session – Presentation of the next conference - Farewell**

**16.10 End of Day 4, Bus Transfer to Enschede (NL) for Technical Tour on Friday**

## PRELIMINARY PROGRAM

FRIDAY 15 May 2020

### TECHNICAL TOUR

*Visits to Zeton and Empyro – transport by bus from Ghent to Enschede (NL) on Thursday after the Conference. \*\*\* hotel in Enschede and dinner are included. Back in Ghent on Friday around 16.00 h. Full program and detailed schedule will follow.*

#### ZETON (Enschede NL)

[www.zeton.com](http://www.zeton.com)



As world's leading Designer and Builder of innovative lab-scale systems, pilot plants, demonstration plants and small modular production plants, Zeton helps its customers bring their processes from lab to market.

The full suite of pilot plant and engineering solutions allows them to deliver scale-specific projects in a vast range of industries (amongst which Biobased Fuels and Chemicals, Pharma, (Fine)Chemicals, Petrochemicals, Oil&Gas, Food, CO<sub>2</sub>Utilisation, Paper&Pulp) with design, procurement and fabrication executed in parallel – compressing the overall project schedule and maximizing cost-efficiency with a unique project methodology.

At Zeton, we will visit their design-built facilities. In the construction hall, you will be able to see the commercial plant for BTG-BTL in construction at an advanced stage. The modular construction will be clearly visible.

#### EMPYRO (Hengelo NL)

Since 2015 the Empyro plant produces 20 million litres/year of sustainable oil using the pyrolysis process developed by BTG and BTG Bioliquids BV. The plant produces, apart from the oil, also electricity - to cover its own use - and steam. The steam is supplied to the neighbouring salt factory of Nouryon. The pyrolysis oil is sold to the dairy company Royal FrieslandCampina in Borculo, The Netherlands. They use the pyrolysis oil for steam generation in their boilers. It replaces a part of natural gas that is equivalent to the annual use of 8,000 households. The plant operates 24/7, is very innovative, and the first of its kind in Europe on a commercial scale."

