PYROLIQ II - 2023: Pyrolysis and Liquefaction of Biomass and Wastes

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Monday, May 8, 2023

07:30 – 08:30	Breakfast	
08:30 – 08:45	Welcome and Conference Overview	
08:45 – 09:20	PLENARY1: 122- Production of cheap sustainable aviation fuels (SAFs): The role of Gasification and Pyrolysis Manuel Garcia-Perez, Washington State University, USA	1

FUNDAMENTALS

09:20 – 09:40	121- Reaction pathways of monomers and oligomers during hydrothermal liquefaction of lignin Maximilian Wörner, Karlsruhe Institute of Technology (KIT), Germany. Ursel Hornung, Karlsruhe Institute of Technology (KIT), Germany. Nicolaus Dahmen, Karlsruhe Institute of Technology (KIT), Germany.	2
09:40 – 10:00	126- Pyrolysis's Aqueous-Phase Liquid (APL) upgrade through Hydrothermal-Carbonization pre-treatment Andrea Facchin, University of Bologna, Italy. Cristian Torri, University of Bologna, Italy. Yusuf Kucukaga, University of Bologna, Italy. Daniele Fabbri, University of Bologna, Italy.	3
10:00 – 10:20	158- Anaerobic digestion of aqueous pyrolysis condensate enhanced by biochar: a circular economy approach Neha Batta, ICFAR/Western University, Canada. Tahereh Sarchami, ICFAR/Western University, Canada. Cesar Moreira, Escuela Politecnica del Litoral, Ecuador. Lars Rehmann, ICFAR/Western University, Canada. Franco Berruti, ICFAR/Western University, Canada.	4
10:20 – 10:50	Coffee Break	
10:50 – 11:10	107- Fast pyrolysis of contaminated biomass: The chemical and thermodynamic description of the intermediate liquid compound Saartjie Gouws, RAPSODEE, IMT Mines Albi, France. Marion Carrier, RAPSODEE, IMT Mines Albi, France. Jean-Jacques Letourneau, RAPSODEE, IMT Mines Albi, France. Laurent Cassayre, Laboratoire de Génie Chimique, Université de Toulouse, France. Julien Brocus, RAPSODEE, IMT Mines Albi, France.	5
11:10 – 11:30	138- Conversion of hazelnut/almond shells into de-oxygenated biofuels: bio-oil characterization and modeling of catalytic hydro-deoxygenation Lorenzo Bartolucci, University of Rome 'Tor Vergata', Italy. Stefano Cordiner, University of Rome 'Tor Vergata', Italy. Pietro Mele, University of Rome 'Tor Vergata', Italy. Vincenzo Mulone, University of Rome 'Tor Vergata', Italy.	6
11:30 – 11:50	132- Effects of mass transfers and heating rates during bark and wood hydrothermal treatment Saad Nader, CNRS ; Université de Lorraine, France. Yann Le Brech, CNRS ; Université de Lorraine, France. Cedric Paris, Université de Lorraine, France. Eric Masson, Crittbois, France. Sebastien Leclerc, CNRS ; Université de Lorraine, France. Robert Wojieszak, CNRS ; Université de Lorraine, France. Anthony Dufour, CNRS ; Université de Lorraine, France.	7

Monday, May 8, 2023 (continued)

11:50 – 12:10	129- Influence of feedstock particle size on the determination of pollutants in pyrolysis oils Borja Baltasar Perez-Martine, Adriana Serras-Malillos, Alexander Lopez-Urionabarrenechea, Esther Acha, Blanca Maria Caballero, University of the Basque Country (UPV/EHU), Spain.	8
12:10 – 12:30	CO_2 adsorption performance of pyrolized and activated waste streams Christoph Pfeifer and Gregor Tondl, University of Natural Resources and Life Sciences, Vienna, Austria	
12:30 – 12:50	146- Pyrolysis atmosphere effect on biochar properties and PTEs behaviour Corinna Maria Grottola, Paola Giudicianni, Davida Amato, Raffaele Ragucci, Institute of Sciences and Technologies for Sustainable Energy and Mobility (STEMS) of the National Research Council (CNR), Italy.	9
13:00 – 14:00	Lunch	
14:00 – 17:00	Networking/ *ad hoc* sessions	
17:00 – 17:20	Afternoon Refreshments	
17:20 – 17:40	142- Molecular-level interplays during co-pyrolysis of cellulose and thermoplastics Hsi-Wu Wong, University of Massachusetts Lowell, USA. Fuat Sakirler, University of Massachusetts Lowell, USA. Mihriye Tekbas, University of Massachusetts Lowell, USA.	10
17:40 – 18:00	144- Fate of lead and other heavy metals during pyrolysis of lignocellulosic biomass Davide Amato, STEMS-CNR; DICMaPI-UNINA, Italy. Paola Giudiciann, STEMS-CNR, Italy, Corinna Maria Grottola, STEMS-CNR, Italy, Renata Migliaccio, STEMS-CNR, Italy, Fernando Stanzione, STEMS-CNR, Italy, Frafffaele Ragucci, STEMS-CNR, Italy	11
18:00 – 18:20	150- Non-covalent catalytic and inhibitory interactions between cellulose and lignin during whole biomass fast pyrolysis Hsi-Wu Wong, University of Massachusetts Lowell, USA. Fuat Sakirler, University of Massachusetts Lowell, USA. Mihriye Tekbas, University of Massachusetts Lowell, USA.	12
18:20 – 18:40	162- Understanding the formation of primary volatiles during fast pyrolysis of waste tyre in a wire mesh reactor Md Maksudur Rahman, Curtin University, Australia. Yun Yu, Curtin University, Australia. Hongwei Wu, Curtin University, Australia.	13
18:40 – 19:00	161- Autothermal slow pyrolysis of poplar wood chips in an auger reactor Giacomo Lombardi, RE-CORD; University of Florence, Italy, Andrea Maria Rizzo, RE-CORD, Italy, David Chiaramonti, Polytechnic of Turin (DENERG), RE-CORD	14
19:00 – 19:20	Functionalized Pyrolysis Products for High Value Chemical Production Stephanie MacQuarrie, K Hawboldt, Ali Shafiee, Juliana Vidal, Cape Breton University, Canada	
19:30 – 21:00	Dinner	
21:00 – 22:30	Poster Session with Social Hour	

Tuesday, May 9, 2023

07:30 – 08:30	Breakfast	
08:30 – 09:05	PLENARY2: 116- Pilot-scale continuous flow hydrothermal liquefaction of mixed textile waste and subsequent bio-oil upgrading Aisha Matayeva, Aarhus University, Denmark. Patrick Biller, Aarhus University, Denmark.	15
09:05 – 09:25	137- Isoconversional and Distributed Activation Energy Models for the Kinetic Study of Biomass Fast Devolatilization Based on MS Data Manel Nasfi, IMT Mines Albi, France. Sylvain Salvador, IMT Mines Albi, France. Marion Carrier, CNRS, France.	16
09:25 – 09:45	151- Elucidating pyrolysis oil oligomeric chemical structures: Experimental studies and DFT calculations Manuel Garcia-Perez, Washington State University, USA	17
09:45 – 10:05	165- Validating the applicability of vapor-liquid phase equilibria models for fast pyrolysis bio-oils through Advanced Distillation Curves George Kofi Parku, Karlsruhe Institute of Technology (KIT), Germany	18
10:05 – 10:25	143- Changes in char's porosity and evolved vapours' composition – insights from a comprehensive study of single particle pyrolysis of beech wood cylinders Przemyslaw Maziarka, University of Ghent (UGent); University of Hohenheim (UHoH), Belgium. Peter Sommersacher, BEST GhmH, Austria. Xia Wang, Stockholm University, Sweden. Hernán Almuina-Villarr, TU Berlin, Germany. Norbert Kienzl, BEST GmbH, Austria. Alba Diéguez Alonso, Otto-von-Guericke-Universität Magdeburg, Germany. Vanessa Fierro, Université de Lorraine, CNRS, IJL, France. Niklas Hedin, Stockholm University, Sweden. Frederik Ronsse, University of Ghent (UGent), Belgium.	19
10:25 – 10:55	Coffee Break	
10:55 – 11:15	174- Prediction of Biocrude Yield in Hydrothermal Co-liquefaction of Different Biomass Feedstocks Quan Sophia He, Dalhousie University, Canada. Jie Yang, Minjiang, China.	20
11:15 – 11:35	127- Hydrothermal liquefaction of food waste: optimization and kinetic modelling Giulia Zoppi, Aarhus university, Denmark. Konstantinos Anastasakis, Aarhus university, Denmark. Patrick Biller, Aarhus University, Denmark.	21
11:35 – 11:55	170- On-line Photoionisation Mass Spectrometry: an Interesting Technique to Study Biomass Pyrolysis Liangyuan JIA, Hefei University of Technology, China. Anthony Dufour, CNRS; Université de Lorraine, France.	22

DEMONSTRATION, SCALE-UP, COMMERCIALIZATION

11:55 – 12:15	108- Biofuels in the transition of Maersk Jacob Hjerrild Zeuthen, Maersk, Denmark	23
12:15 – 12:35	130- Biowaste to biochar: hydrothermal carbonisation & high temperature torrefaction of food waste anaerobic digestate Will Meredith, University of Nottingham, United Kingdom. Colin Snape, University of Nottingham, United Kingdom.	24

Tuesday, May 9, 2023 (continued)

13:00 – 14:00	Lunch	
14:00 – 17:30	Networking /ad hoc sessions	
17:30 – 17:50	Afternoon Refreshments	

REACTOR DEVELOPMENT

17:50 – 18:10	167- A novel free-fall reactor for (catalytic) pyrolysis of biomass and plastics Hero Jan Heeres, University of Groningen, Netherlands.	25
18:10 – 18:30	131- Two-stage hydrothermal liquefaction for multilayer plastic valorization Edoardo Tito, Politecnico di Torino, Italy. Juliano Souza Dos Passoss, Aarhus University, Denmark. Samir Bensaid, Politecnico di Torino, Italy. Raffaele Pirone, Politecnico di Torino, Italy. Patrick Biller, Aarhus University, Denmark.	26
18:30 – 18:50	136- Modelling fast pyrolysis in a fluidized bed reactor: the role of heterogeneous secondary reactions and char loading Maurizio Troiano, DICMaPI University Federico II Naples, Italy. Roberto Solimene, STEMS - CNR Naples, Italy. Piero Salatino, DICMaPI University Federico II Naples, Italy.	27
18:50 – 19:10	169- State of the art auger reactor design and scale up for biomass fast pyrolysis Eugen Aschenbrenner, KIT/IKFT, Germany.	28
19:30 – 21:00	Dinner	
21:00 – 22:30	Poster Session with Social Hour	

Wednesday, May 10, 2023

07:30 – 08:30	Breakfast	
08:30 – 09:05	PLENARY3: Current markets and business opportunities for pyrolysis liquids Jamie Bakos, Titan Clean Energy Projects, Canada	

PRODUCTS CHARACTERIZATION, SEPARATION, UPGRADING

09:05 – 09:25	104- Chemical Speciation of constituents in pyrolytic liquid from cassava harvest residues by APPI-Orbitrap MS Wenes Ramos Silva, Federal University of Sergipe, Brazil. Polyana Santos Rabelo, Federal University of Sergipe, Brazil. Alberto Wisniewski Jr, Federal University of Sergipe, Brazil.	29
09:25 – 09:45	110- Valorisation of municipal and tannery sludge via hydrothermal liquefaction: Effect of the substrate chemical composition on yield and quality of bio-crude Francesca Di Lauro, Università degli studi di Napoli Federico II, Italy. Marco Balsamo, Università degli studi di Napoli Federico II. Roberto Solimene, National Research Council, Italy. Maria Laura Alfieri, Università degli studi di Napoli Federico II, Italy. Paola Manini, Università degli studi di Napoli Federico II, Italy. Piero Salatino, Università degli studi di Napoli Federico II, Italy. Fabio Montagnaro, Università degli studi di Napoli Federico II, Italy.	30
09:45 – 10:05	112- Catalytic upgrading of microalgal hydrothermal oil: Impact of algae species and catalyst for biofuel production Bruno da Costa Magalhaes, Institut de Recherche sur la Catalyse et l'Environnement, France. Dorothée Laurenti, Institut de Recherche sur la Catalyse et l'Environnement, France. Ruben Checa, Institut de Recherche sur la Catalyse et l'Environnement, France. Chantal Lorentz, Institut de Recherche sur la Catalyse et l'Environnement, France. Pavel Afanasiev, Institut de Recherche sur la Catalyse et l'Environnement, France. Christophe Geantet, Institut de Recherche sur la Catalyse et l'Environnement, France.	31
10:05 – 10:25	118- Energetic and material valorization of digestate via hydrothermal liquefaction Christian Klüpfel, Deutsches Biomasseforschungszentrum, Germany. Patrick Biller, Aarhus University, Denmark. Benjamin Herklotz, Deutsches Biomasseforschungszentrum, Germany.	32
10:25 – 10:55	Coffee Break	
10:55 – 11:15	154- Thermodynamic-based Solvent Selection for the Separation of Lignin-derived Molecules Amir Jalalinejad, Institute of Catalysis Research and Technology (IKFT), Karlsruhe Institute of Technology, Germany. Jaber Yousefi Seyf, Hamedan University of Technology, Iran. Axel Funke, Institute of Catalysis Research and Technology (IKFT), Karlsruhe Institute of Technology, Germany. Nicolaus Dahmen, Institute of Catalysis Research and Technology (IKFT), Karlsruhe Institute of Technology, Germany.	33
11:15 – 11:35	176- The co-pyrolysis and kinetic behaviour of extrudates produced from discard coal fines and recycled plastic binders Carel Marais, John Bunt, Nthabiseng Leokaoke, Hein Neomagus, Romanus Uwaoma, North-West University, South Africa	34

Wednesday, May 10, 2023 (continued)

11:35 – 11:55	120- Co-hydrotreatment of bio-oil and yellow greases using NiMo catalyst Melba Denson, Washington State University; Central Luzon State University, Philippines, USA. Mariefel Olarte, Pacific Northwest National Laboratory, USA. Manuel Garcia-Perez, Washington State University, USA.	35
11:55 – 12:15	155- PyroMar - Marine fuel blendstock from biobased waste Tim Schulzke, Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT, Germany.	36
13:00 – 14:00	Lunch	
14:00 – 17:00	Networking / *ad hoc* sessions	
17:00 – 17:20	Afternoon Refreshments	
17:20 – 17:40	124- Co-pyrolysis of beech wood and polyamide-6: Effect of HZSM-5 catalyst and of plastic concentration on the properties of pyrolysis oils Nolven Guilhaume, Univ Lyon, CNRS, France.	37
17:40 – 18:00	163- Methodology of isoprene quantification from oil obtained from ex-situ pyrolysis of waste tyre in a wire mesh reactor Md Maksudur Rahman, Curtin University, Australia. Yun Yu, Curtin University, Australia. Hongwei Wu, Curtin University, Australia.	38
18:00 – 18:20	152- Trickle bed co-processing of yellow greases and pyrolytic lignin Mariefel Olarte, Pacific Northwest National Laboratory, USA. Manuel Garcia-Perez, Washington State University, USA. Daniel Santosa, Pacific Northwest National Laboratory, USA. Gary Neuenschwander, Pacific Northwest National Laboratory, USA. Igor Kutnyakov, Pacific Northwest National Laboratory, USA.	39
18:20 – 18:40	175- Potential value of pyrolysis oil derived from shellfish processing by-product Kelly Hawboldt, Memorial University of Newfoundland and Labrador. Stephanie MacQuarrie, Cape Breton University. Haley Oliver, Cape Breton University. Daniel Kelly, Memorial University of Newfoundland and Labrador, Canada	40

TECHNICAL, ECONOMICAL AND ENVIRONMENTAL FEASIBILITY

18:40 – 19:00	171- Liquid and gas products from lead acid battery (LAB) derived plastics via pyrolysis: a techno-economic assessment to maximize the value Maddalena Laghezza, ICFAR/Western University, Canada. Silvia Fiore, Politecnico di Torino, Italy. Franco Berruti, ICFAR/Western University, Canada.	41
19:30 – 21:00	Dinner	
21:00 – 22:30	Poster Session with Social Hour	

Thursday, May 11. 2023

07:30 – 08:30	Breakfast	
08:30 – 09:05	PLENARY 4: 102- Pyrolysis of plastic waste: effect of feedstock pretreatment and fate of contaminants M. Pilar Ruiz, University of Twente, Netherlands. Homer Genuino, University of Twente, Netherlands. Hero Jan Heeres, University of Groningen, Netherlands. Sascha Kersten, University of Twente, Netherlands.	42

PYROLYSIS OF PLASTICS AND WASTE FROM FOSSIL ORIGIN

09:05 – 09:25	141- Hydrothermal liquefaction of three types of polyurethane wastes; effect of ethanol on decomposition and chemical recovery Sogand Musivand, Sapienza University of Rome, Italy. Paolo De Filippis, Sapienza University of Rome, Italy. Martina Damizia, Sapienza University of Rome, Italy. Maria Paola Bracciale, Sapienza University of Rome, Italy. Benedetta De Caprariis, Sapienza University of Rome, Italy.	43
09:25 – 09:45	109- Characterization of sulfur and chlorine behavior during pyrolysis of biomass and waste Hala Braidy, Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA) – Grenoble, France.	44
09:45 – 10:05	157- Hydrothermal liquefaction of ocean plastics from the Great Pacific Garbage Patch Juliano Souza dos Passos, Aarhus University, Denmark. Patrick Biller, Aarhus University, Denmark.	45
10:05 – 10:25	135- Continuous coprocessing of biomass with waste plastic by fast and catalytic pyrolysis Charles Mullen, USDA-ARS, USA. Candice Ellison, USDA-ARS, USA. Manuel Garcia-Perez, Washington State University, USA.	46
10:25 – 10:55	Coffee Break	
10:55 – 11:15	117- Studying pyrolysis products of bottom-of-the-barrel fuel with Py-GCxGC-TOF/CSD/FID Elia Colleoni, KAUST, Saudi Arabia.	47
11:15 – 11:35	123- Integral recycling of end-of-life fibre reinforced epoxy and polyester plastic waste: thermal upgrading of pyrolysis oils Adriana Serras Malillos, University of the Basque Country (UPV/EHU), Spain. Borja B. Perez Martinez, University of the Basque Country (UPV/EHU), Spain. Esther Acha, University of the Basque Country (UPV/EHU), Spain. Alexander López Urionabarrenechea, University of the Basque Country (UPV/EHU), Spain. Blanca María Caballero, University of the Basque Country (UPV/EHU), Spain.	48
11:35 – 11:55	125- Recycling of spent solid CO_2 adsorbents via catalytic pyrolysis for the recovery of mesoporous silica and valuable heteroaromatic chemicals Stylianos Stefanidis, Chemical Process and Energy Resources Institute, Centre for Research and Technology Hellas, Greece. Lee Stevens, University of Nottingham, United Kingdom. Colin Snape, University of Nottingham, United Kingdom. Daniele Fabbri, University of Bologna, Italy. Angelos Lappas, Chemical Process and Energy Resources Institute, Centre for Research and Technology Hellas, Greece.	49

Thursday, May 11. 2023 (continued)

11:55 – 12:15	168- Pyrolysis of plastics: highlighting the potential interest of a reflux to control liquid products Richard Lainé, CNRS; Université de Lorraine, France. Yann Le Brech, CNRS; Université de Lorraine, France. Nabil Hassibi, CNRS; Université de Lorraine, France. Guillain Mauviel, CNRS; Université de Lorraine, France. Valérie Burkle-Vitzthum, CNRS; Université de Lorraine, France. Anthony Dufour, CNRS; Université de Lorraine, France.	50
12:15 – 12:30	140- Hydrothermal liquefaction of mixed plastic waste to obtain bio-crude and a residue composed by pure poly-olefins Benedetta de Caprariis, Sapienza University of Rome, Italy. Martina Damizia, Sapienza University of Rome, Italy. Maria Paola Bracciale, Sapienza University of Rome, Italy. Sogand Musivand, Sapienza University of Rome, Italy. Paolo De Filippis, Sapienza University of Rome, Italy.	51
12:30 – 12:50	Pick up boxed lunches in hotel reception area	
13:00	Buses depart for excursion to Vienna	
17:45	Board buses for return to Hernstein	
20:00	Conference Banquet	

Friday, May 12, 2023

07:30 – 08:30	Breakfast	
08:30 – 09:05	PLENARY5: 139- Hydrotreating of waste plastic pyrolysis oil with increased chlorine and nitrogen content Miloš Auersvald, UCT Prague, Czech Republic.	52
NOVELTIES		
09:05 – 09:25	128- Valorization of CO_2-Riched Gaseous to Formic Acid via Electrochemical Routes: Current Status and Perspectives Federica Proietto, University di Palermo, Italy. Claudia Prestigiacomo, University di Palermo, Italy. Alessandro Galia, University di Palermo, Italy. Onofrio Scialdone, University di Palermo, Italy.	53
09:25 – 09:45	133- Municipal solid waste valorization through catalytic fast hydropyrolysis over natural zeolites Alejandro Márquez, Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, Spain. Jose Mª Sánchez, Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, Spain. Isabel Ortiz, Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, Spain. Luis Arteaga-Perez, Universidad del Bío-Bío, Chile. Serguei Alejandro-Martín, Universidad del Bío-Bío, Chile.	54
09:45 – 10:05	134- Stand-alone slurry hydroprocessing of lignocellulosic bio-oils with unsupported catalysts – catalyst and process development Tyko Viertiö, VTT Technical Research Center of Finland, Finland. Niko Vuorio, VTT Technical Research Center of Finland, Finland. Juha Lehtonen, VTT Technical Research Center of Finland, Finland	55
10:05 – 11:30	Coffee Break and Poster Session for Thursday and Friday	
12:00	Lunch and Departure	

ADDITIONAL POSTERS