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Conference Program (GPE 2016)

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5th International Congress on Green Process Engineering (GPE 2016)



June 19 - 24, 2016

Fairmont Tremblant Hotel, Mont Tremblant, Quebec, Canada

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ICFAR, Western University, Canada

Cedric Briens

ICFAR, Western University, Canada

Chairpersons of GPE Congress Series:

Martine Poux and Patrick Cognet, University of Toulouse, France

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Jean-Claude Charpentier, University of Lorraine, Nancy, France



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processes

Sunday, June 19, 2016

16:00 – 18:00	Conference check-in
18:00 – 19:00	Welcome Reception
19:00 – 21:30	Dinner

NOTES

- Technical Sessions will be held in Mali I and II.
- Poster Sessions will be held in the Charivari/Sauteux/Corriveau rooms.
- Breakfasts and lunches will be in the Windigo Restaurant. Dinners will be the Soutana Room.
- Audiotaping, videotaping and photography of presentations are prohibited.
- Speakers – Please leave at least 5 minutes for questions and discussion.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
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Monday, June 20, 2016

07:30 - 08:30 Breakfast Buffet

08:30 - 08:45 Welcome and Conference Overview
Conference Chairs, ECI Technical Liaison

INTEGRATED BIOREFINERIES

08:45 - 09:15 **Plenary 1 - Enerkem - Marketable bioproducts and biomaterials from research to commercial manufacture for sustainability, Greenhouse gas emission reductions and a circular economy**
Richard Jewell – Enerkem - Canada

09:15 - 09:30 27 - **Extraction of products from algae using green solvents**
Philip Jessop - Queen's University - Canada; Roland Lee, Pascale Champagne - Queen's University - Canada

09:30 - 09:45 102 – **Adhesives from biomass pyrolysis**
Dongbing Li - ICFAR, Western University – Canada; Franco Berruti, Cedric Briens – ICFAR, Western University – Canada

09:45 - 10:00 26 - **Hydrothermal treatment of bio-oil for the production of biodiesel antioxidants**
Jesus Arauzo - Universidad de Zaragoza - Spain; Noemí Gil-Lalaguna, Ana Bautista, Lucía Botella, Alberto Gonzalo, José Luis Sánchez - Universidad de Zaragoza – Spain

10:00 - 10:15 81 - **Pyrolysis of residues from well-established biochemical processes for biomass conversion into liquid fuel**
Devon Barry – ICFAR, Western University – Canada; Cedric Briens, Franco Berruti – ICFAR, Western University – Canada

10:15 - 10:45 Coffee break/Networking

10:45 - 11:00 98 – **Using the jigged bed reactor to develop activated carbons from biomass residues**
Franco Berruti - ICFAR, Western University – Canada; Franco Berruti, Cedric Briens - ICFAR, Western University – Canada

11:00 - 11:15 85 - **Influence of pre-treatment on grass pyrolysis for high value products**
Chiara Barbiero - ICFAR, Western University – Canada; Cedric Briens, Franco Berruti - ICFAR, Western University – Canada

11:15 - 11:30 10 - **Selective production of sugars and glycolaldehyde from agricultural biomass using supercritical water as reaction medium**
Celia M. Martínez - University of Valladolid – Spain; Danilo A. Cantero - University of Cornell – USA; Francesc Recasens - Universitat Politècnica de Catalunya – Spain; MJ Cocero - University of Valladolid - Spain

11:30 - 11:45 13 - **Process for removal and recovery of phenolic compounds from switch grass -**
Robert Counce - University of Tennessee – USA; Michelle L. Lehmann, Jack S. Watson, Nikki Labbé, Jingming Tao - University of Tennessee – USA

11:45 - 12:00 1 - **The integrated forest biorefinery, an example of green engineering**
Jean Paris - Polytechnique Montreal, Canada; Miyuru Kannangara, Mariya Marinova, Michel Perrier - Polytechnique Montreal, Canada

Monday, June 20, 2016 (continued)

- 12:00 - 12:15 **7 - Biomass gasification in a fluidized bed reactor: effect of temperature on properties and oxidative reactivity of chars**
Mathieu Morin - CNRS LGC Toulouse – France; Sébastien Pécate, Mehrdji Hémati - CNRS LGC Toulouse – France; Olivier Marsan - Centre Inter-universitaire de Recherche et d'Ingénierie des Matériaux - France
- 12:30 – 13:30 Lunch
- 13:30 - 17:30 Networking/*ad hoc* sessions/free time
- 17:30 – 17:45 **93 - Characterization of fluidized bed pyrolysis of sewage sludge by time-resolved pressure measurements**
Piero Salatino - Università di Napoli Federico II – Italy; Mirco Della Volpe - Università di Napoli Federico II – Italy; Roberto Solimene - Istituto di Ricerche sulla Combustione - Italy
- 17:45 – 18:00 **97 - Two-stage thermochemical valorization of sugar-derived humins**
Raghavendra Sumbharaju - Energy Research Centre of the Netherlands ECN) – The Netherlands
- 18:00 – 18:15 **99 – Fundamental study and applications to biomass pyrolysis of the mechanically fluidized reactor**
Valentina Lago: Devon Barry - ICFAR, Western University – Canada; Cedric Briens, Franco Berruti - ICFAR, Western University – Canada
- 18:15 - 18:30 **29 - Performance and emissions of a diesel engine fueled with biodiesel dopen with a renewable antioxidant additive**
Alberto Gonzalo - Universidad de Zaragoza – Spain; Jorge Arroyo, Francisco Moreno, Mariano Muñoz, Carlos Monné, Ana Bautista, Noemí Gil-Lalaguna, Cristina Dueso, José Luis Sánchez - Universidad de Zaragoza – Spain
- 18:30 – 18:45 **103 - Impact of TGA measurements on activation energy (E_a) determination: case study applied to biomasses by means of isoconversional methods**
Marco Brighenti - Università' di Trento – Italy, Mauro Grigiaante, D. Antolini - Università' di Trento – Italy
- 19:30 – 21:00 Dinner
- 21:00 - 22:30 Poster Session and Social Hour

Tuesday, June 21, 2016

- 07:30 - 08:30 Breakfast Buffet
- 08:30 - 08:45 Announcements
- 08:45 - 09:15 **Plenary 2 - Improving resource efficiency to address climate change by observing Nature**
Jocelyn Doucet and Jamal Chaouki – Ecole Polytechnique, Montréal - Canada
- NOVEL CATALYTIC AND BIO-CATALYTIC PROCESSES II**
- 09:15 - 09:30 94 - **Butanol production by Clostridium acetobutylicum in a series of packed biofilm bed reactors**
Piero Salatino - Università di Napoli Federico II – Italy; Francesca Raganati, Alessandra Procentese, Giuseppe Olivieri, Antonio Marzocchella - Università di Napoli Federico II – Italy; Maria Elena Russo - Istituto di Ricerche sulla Combustione – CNR - Italy
- 09:30 - 09:45 79 - **Steam reforming of pyrolysis oil using nickel-spinel based catalysis**
Jasmin Blanchard - Université de Sherbrooke - Canada; Nicolas Abatzoglou - Université de Sherbrooke - Canada
- 09:45 - 10:00 89 - **TiO₂ – Photocatalysts with doped platinum for hydrogen production via water dissociation**
Hugo de Lasa - Western University - Canada; Benito Serrano Rosales, Alan Ruben Calzada Hernandez - Universidad Autonoma de Zacatecas – Mexico; Jesus Fabricio Guayaquil, Salvador Escobedo Salas - Western University - Canada
- 10:00 - 10:15 38 - **Development of Ni-Co bimetallic catalyst for hydrogen generation via supercritical water gasification of lignin and waste biomass**
Kang; Mohsen Shakouri, Ramin Azargohar, Ajay K. Dalai - University of Saskatchewan – Canada; Hui Wang – University of Saskatchewan – Canada
- 10:15 - 10:45 Coffee break/Networking
- 10:45 - 11:00 41 - **Ammoxidation of acrolein to acrylonitrile over bismuth molybdate catalysts**
Nguyen Thanh-Binh – Laval University – Canada; Serge Kaliaguine – Laval University – Canada; Jean-Luc Dubois – Arkema - France
- 11:00 - 11:15 14 – **Catalytic property of olivine for bio-oil gasification**
Mohammad Latifi - Ecole Polytechnique de Montreal - Canada; Franco Berruti, Cedric Briens - ICFAR, Western University – Canada
- 11:15 - 11:30 31 - **Heterogeneous catalysis for the extraction of arabinoxylans from wheat bran**
Nuria Sánchez-Bastardo - University of Valladolid - Spain; María José Cocero, Esther Alonso - University of Valladolid - Spain
- 11:30 - 11:45 36 - **Production of glycerol 1,2-carbonate from glycerol with aid of ionic liquid as catalyst**
Nor Asrina Sairi - University of Malaya - Malaysia; Zati Ismah Ishak, Yatimah Alias, Rozita Yusoff, Mohamed KheireddineTaieb Aroua - University of Malaya - Malaysia

Tuesday, June 21, 2016 (continued)

- 11:45 – 12:00 58 - **Batch fermentation of D-glucose/cellobiose mixtures by Clostridium Acetobutylicum Atcc 824: Energetic and carbon source regulation**
Felipe Buendia-Kandia - LRGP-CNRS, Lorraine University, Nancy –France; Emmanuel Rondags, Anthony Dufour, Guillain Mauviel, Emmanuel Guedon - LRGP-CNRS, Lorraine University, Nancy –France
- 12:00 – 12:15 107 - **ABE fermentation from microalgae-derived carbohydrates after lipid extraction**
Kai Gao - Western University – Canada; Lars Rehmann – Western University – Canada
- 12:15 – 12:30 113 - **Development and industrial application of novel non-Cr passivity for electrolytic manganese**
Siming Chen - Institute of Process Engineering, CAS, China; Dongping Duan, Qinghai Institute of Salt Lakes, Chinese Academy of Sciences, Xining 810008, Qinghai, China; E Zhou, Key Laboratory of Green Process and Engineering, Institute of Process Engineering, CAS, China; Ting Li - Institute of Process Engineering, CAS – China
- 12:30 – 13:30 Lunch
- 13:30 - 17:30 Networking/*ad hoc* sessions/free time
- SAFETY, RISK MANAGEMENT AND ENVIRONMENTAL PROTECTION**
- 17:30 - 17:45 11 - **Improving EIA and LUP practice in India: challenges and approaches**
Sandip Roy – IIT Bombay – India
- 17:45 – 18:00 9 - **A new CO₂ concentration process integrated into cement plants** - Sébastien Wahl - Laboratoire de Génie Chimique (LGC) – France; Mehrdji Hemati - Laboratoire de Génie Chimique (LGC) – France; Michel Gimenez – LafargeHolcim - France
- 18:00 – 18:15 44 - **A comparative study of two processes for indoor VOCs treatment: Biofiltration vs. hybrid system (biological process + adsorption)**
Angela Tatiana Luengas - Université de Pau et des Pays de l'Adour - France; Cécile Hort, Vincent Platel - Université de Pau et des Pays de l'Adour – France; Ana Elias, Astrid Barona - University of the Basque Country - Spain
- 18:15 - 18:30 3 - **Erythromycin degradation by an esterase in enzymatic membrane reactors**
Jose Sanchez-Marcano - Institut Européen des Membranes - France; Matthias de Cazes, Marie Pierre Belleville, Eddy Petit - Institut Européen des Membranes – France; Mathias Salomo, Sally Bayer, Rico Czaja - c-LEcta, Germany; Jean De Gunzburg - Da Volterra – France
- 18:30 – 19:00 24 - **SO_x trapping performances of CuO based silica mesoporous adsorbent for desulfurization of industrial flue gas stream**
Sophie DORGE - Université de Haute-Alsace - France; Pierrick Gaudin, Marc Berger, Habiba Nouali, Laure Michelin, Ludovic Josien, Joël Patarin - Université de Poitiers – France; David Habermacher, Jean-François Brilhac - Université de Haute-Alsace – France; Matthieu Vierling - GE Energy – France; Michel Molière - Université de Technologie de Belfort-Montbéliard – France; Emmanuel Fiani – ADEME - France
- 19:00 – 19:15 104 - **Co-combustion of coal and a reengineered feedstock for emissions reduction**
Mohammad Latifi - Ecole Polytechnique de Montreal - Canada, Abdelmajid Rakib, Pierre Sauriol, Jean-Philippe Laviolette, Jamal Chaouki - Ecole Polytechnique de Montreal - Canada

Tuesday, June 21, 2016 (continued)

19:30 - 21:00

Dinner

21:00 - 22:30

Poster Session and Social Hour

Wednesday, June 22, 2016

07:30 - 08:30 Breakfast Buffet

PROCESS INTENSIFICATION

- 08:30- 08:45 **74 - Intensified post-combustion CO₂ capture: Potential of hollow fiber membrane contactors for absorption and stripping steps**
David Albarracin Zaidiza – LRGP – France; Bouchra Belaissaoui, Sabine Rode, Denis Roizard, Eric Favre – LRGP – France
- 08:45 – 09:00 **100 – Development of a mobile, 100 kg/h plant for pyrolysis, using a mechanically fluidized reactor**
Stefano Tacchino; Dhiraj Kankariya - ICFAR, Western University – Canada; Franco Berruti, Cedric Briens - ICFAR, Western University – Canada
- 09:00 – 09:15 **101 – Integrating batch pyrolysis and fractional condensation (2D MFR) to get high-value products from biomass**
Chiara Barbiero - ICFAR, Western University - Canada; Mohammad Hossain, Franco Berruti, Cedric Briens - ICFAR, Western University – Canada; Ian Scott - Agriculture and Agri-Food - Canada
- 09:15 - 09:30 **105 - Microwave assisted pyrolysis of kraft lignin at reduce pressure in a multimode oven**
Mattia Bartoli - University of Florence - Italy, Marco Frediani, Luca Rosi, Piero Frediani - University of Florence -Italy
- 09:30 - 09:45 **52 - The potentiality of reactive membranes for post combustion CO₂ capture**
Marc Pfister - LRGP (Laboratory of Reaction and Process Engineering) - France
- 09:45 - 10:00 **54 - Polymeric membranes for treatment of produced water on offshore platform**
King Wo Li - Institut Europeen des Membranes (IEM) – France; Amira Hanafia, Jean-Pierre Mericq, Catherine Faur, Damien Quemener, Andre Deratani, Denis Bouyer - Institut Europeen des Membranes (IEM) - France
- 10:00 - 10:15 **91 - Ageing of reverse osmosis membranes under gamma irradiation**
Emilie Carretier - Aix Marseille University – France; Nicolas Combernoux, Luc Schrive, Véronique Labeled – CEA – France; Yvan Wyart, Philippe Moulin - Aix Marseille University - France
- 10:15 - 10:45 Coffee break/Networking
- 10:45 - 11:00 **70 - Continuous flow intensification of ortho-lithiation at ambient conditions**
Ruili Feng - School of Chemical Engineering and Advanced Materials, Newcastle University - Singapore; Sushil Rajan Ramchandani, Balamurugan Ramalingam, Song Wei Benjamin TAN, Soo Khean TEOH, Paul Sharratt – Institute of Chemical and Engineering Sciences – Singapore; Chuanzhao LI, Kamelia Boodhoo - Newcastle University - Singapore
- 11:00 - 11:15 **40 - Technological breakthrough and innovation in the production of whey powders, with 30 – 40% reduction in energy costs**
Pierre Schuck – Inra – France; Anne Dolivet, Serge Méjean, Gaëlle Tanguy, Romain Jeantet – Inra – France; Daniel Garreau – Commer – France; Corrado Vezzani – Vomm – Italy

Wednesday, June 22, 2016 (continued)

- 11:15 - 11:30 43 - **Bio-oils from microwave assisted pyrolysis of cellulose using a multi-mode batch reactor**
Marco Frediani - University of Florence - Italy; Piero Frediani, Luca Rosi, Mattia Bartoli - University of Florence - Italy
- 11:30 - 11:45 45 - **Dry fractionation of plant material powders using an electrostatic corona separator: a model study**
Claire Mayer - INRA/UMR IATE - France; Andy Cadin, Xavier Rouau - INRA/UMR IATE - France; Sara Messal, Lucian Dascalescou - Institut PPRIME - France
- 11:45 - 12:00 50 - **Integration of nanofiltration in the production of succinic acid from fermentation of lignocellulosic material**
Hélène Roux-de Balmann - University of Toulouse - France; Panwana Khunnonkwao, Sylvain Galier - University of Toulouse – France; Kaemwich Jantama, Sunthorn Kanchanatawee - Suranaree University of Technology
- 12:30 – 13:30 Lunch
- 13:30 – 19:30 Networking/*ad hoc* sessions/free time
- 19:30 – 21:00 Dinner
- 21:00 - 22:30 Poster Session and Social Hour

Thursday, June 23, 2016

07:30 - 08:30 Breakfast Buffet

08:30 - 08:45 Announcements

PROCESS DESIGN AND DEVELOPMENT

08:45 - 09:00 **6 - Selective fractionation and depolymerization of lignocellulosic biomass using subcritical and supercritical water to produce hemicellulose, cellulose and lignin**
Gianluca Gallina - University of Valladolid – Spain; Juan Garcia-Serna, Maria Jose Cocero - University of Valladolid – Spain; Pierdomenico Biasi - Åbo Akademi - Spain

09:00 – 09:15 **25 - Oxygen/steam charcoal gasification in a fluidized alumina bed**
Jose Luis Sanchez - Universidad de Zaragoza - Spain; Noemí Gil-Lalaguna, Fernando Bimbela - Universidad de Zaragoza – Spain; Rui Moreira, Rui Vaz, António Portugal - University of Coimbra - Portugal

09:15 - 09:30 **2 - A comparative experimental study on the impact of standard and torrefied wood pellets on the drive parameters of a stratified batch gasifier**
Maurizio Grigante – Università' di Trento – Italy; Daniele Antolini, Marco Brighenti – Università' di Trento – Italy

09:30 - 09:45 **59 - Wet air oxidation for industrial wastewater and sludge treatment: First results of a new research program in Quebec**
Jean-Francois Vermette - Centre de transfert technologique en écologie industrielle – Canada; Sophie Girard - Centre de transfert technologique en écologie industrielle – Canada; Patrick Desjardins - Cégep de Sorel-Tracy

09:45 - 10:00 **84 - Development of treatment train based on green technologies for removal and recovery of naphthenic acids from oil-sand process affected wastewater**
Madhumita Ray – Western University - Canada; Hojatallah Seyedy Niasar, Jing Wan, Sreejon Das, Chunbao Xua – Western University - Canada

10:00 - 10:15 **82 - Scale-up of a novel non-enzymatic cellulose-to-glucose hydrolysis process**
Xavier Duret - Université de Sherbrooke - Canada; James Kong Win Chang, Jean-Michel Lavoie - Université de Sherbrooke - Canada

10:15 - 10:45 Coffee break/Networking

ECONOMIC AND ENVIRONMENTAL EVALUATION OF GREEN PROCESSES

10:45 – 11:00 **39 - How to reduce the energy costs of food and dairy products to spray drying? -**
Pierre Schuck – Inra - France; Anne Dolivet, Serge Méjean, Romain Jeantet - Inra – France

11:00 – 11:15 **80 - Secondary metabolites a potential improvement for the economy of second generation biofuel production -** Thierry Ghislain - Université de Sherbrooke - Canada;
Emmanuel Eysseric, Pedro A. Segura, Jean-Michel Lavoie - Université de Sherbrooke – Canada; Olivier Lalonde – CEROM - Canada

12:00 – 13:00 Lunch

Thursday, June 23, 2016 (continued)

13:00 – 16:30 Networking/*ad hoc* sessions/free time

MODELLING AND OPTIMIZATION I

- 16:30 – 16:45 90 - **Costa Rica coffee pulp (broza) Gasification: A stoichiometric- chemical equilibrium model**
Hugo de Lasa - University of Western Ontario – Canada; Cindy Torres, Luis Urvina, Natalia Hernandez - Universidad de Costa Rica - Costa Rica
- 16:45 – 17:00 37 - **Energy integration of high pressure processes using gas turbines and internal combustion engines**
Yoana García - University of Valladolid - Spain; Fidel A. Mato, M. Dolores Bermejo, Juan García, M. José Cocero - University of Valladolid - Spain
- 17:00 – 17:15 30 - **Kinetic modeling of carbon dioxide valorization with epoxides**
Lionel Estel - Normandie Université, LSPC, INSA de Rouen - France; Viviana Contreras Moreno, Alain Ledoux - Normandie Université, LSPC, INSA de Rouen – France; Rabah Azzouz, Vincent Levacher, Laurent Bischoff - Normandie Université COBRA – France; Salim Derrouiche - Veolia Recherche & Innovation - France
- 17:15 – 17:30 28 - **Production of lactic acid and glycolic acid in one-pot electrochemical cell**
Ching Shya Lee - University of Toulouse - France; Mohamed Kheireddine Aroua, Wan Mohd Ashri Wan Daud - University of Malaya – Malaysia; Patrick Cognet, Yolande Pérès - University of Toulouse - France
- 17:30 – 18:45 Poster Session and Social Hour
- 19:00 - 23:00 Conference Banquet

Friday, June 24, 2016

07:30 - 08:30 Breakfast

08:30 - 08:45 Announcements

NEW REACTION MEDIA AND CLEAN SOLVENTS

08:45 - 09:00 114 - **Converting softwood to hardwood with supercritical fluids and gas-expanded liquids** - Paul Charpentier – Western University – Canada; L. Yang, William, Xu, Converting – Western University – Canada.

09:00 – 09:15 69 - **Study of chitosan enzymatic gelation kinetics for membrane preparation**
Jean-Pierre Mericq - Institut Européen des Membranes - France; Damien Wlodarczyk, Laurence Soussan, Denis Bouyer, Catherine Faur - Institut Européen des Membranes – France

09:15 – 09:30 115 - **Decarboxylating Free Fatty Acids into Fuels Using Subcritical Water**
Zakir Hossain, Anil Jhavar, M. Chowdhury, Paul Charpentier – Western University – Canada

09:30 - 09:45 34 - **Efficient production of soy-bean lecithin - Pluronic L64® encapsulated quercetin particles in nanometric scale using SFEE and PGSS drying processes** - György Lévai - University of Valladolid – Spain; Ángel Martín, Soraya Rodríguez-Rojo, María José Cocero - University of Valladolid – Spain

09:45 – 10:00 106 - **Extraction of Algae Oil in Supercritical CO₂ using a Soybean Surfactant**
Osariemen Ogbeide – Western University – Canada, Madhumita Ray, Paul Charpentier – Western University - Canada

10:00 – 10:30 **Closing Remarks: What is next? Future directions in Green Process Engineering**

10:30 – 11:30 Coffee break and Poster Session

12:00 – 13:30 Lunch and departures

Green Process Engineering
Poster Presentation List

1. **Microwave assisted pyrolysis of waste from short rotation coppice of poplar**
Mattia Bartoli, University of Florence, Italy ; Marco Frediani, University of Florence, Italy ;
Piero Frediani, University of Florence, Italy ; Luca Rosi, University of Florence, Italy

2. **Natural cellulose coated dispersions: new opportunities in green process engineering and applications**
Dmitry M. Rein, Technion, Israel; Sofia Napso, Technion, Israel ; Gilad Alfassi, Technion, Israel ; Hitomi Miyamoto Hitomi Miyamoto, Technion, Israel ; Yachin Cohen, Technion, Israel

3. **Green nanotechnology enabling waterproofing, repair and reuse of consumer electronics**
Simon McElrea, Semblant, USA

4. **Conception and optimisation of heat integrated distillation column (HIDiC)**
Omar YALA, chemical engineering laboratory / ENSIACET, France; David Rouzineau, LGC/ENSIACET ; Michel Meyer, LGC/ENSIACET