

# HTC 2019

14 – 16  
MAY 2019  
BERLIN

## 2<sup>nd</sup> INTERNATIONAL SYMPOSIUM ON HYDROTHERMAL CARBONIZATION

# PROGRAM

## 1<sup>st</sup> DAY

2019-05-14

**08:00**  
Registration

**09:00**  
**Conference opening / welcome**  
*Benjamin Wirth, DBFZ Leipzig, Germany*  
*Judy Libra, Leibniz Institute for Agricultural  
Engineering and Bioeconomy Potsdam, Germany*  
*Daniela Thrän, DBFZ Leipzig, Germany*

**Session A.1**  
Fundamental insights into the HTC-  
processes

**09:30 – 10:45**

**Keynote:**  
1. *Andrea Kruse, University of Hohenheim, Germany*  
Hydrothermal Carbonization: Elimination reaction  
of water in water as solvent

**Speakers:**  
2. *Jillian Goldfarb, Cornell University, USA*  
Looking beyond routine characterizations to  
understand opportunities and limitations of HTC  
for carbon-based products and applications  
3. *Benjamin Keiller, University of Adelaide, Australia*  
Compositional analysis and kinetic modeling of the  
breakdown of lignocellulose during HTC  
4. *Luca Fiori, University of Trento, Italy*  
Hydrothermal carbonization kinetics of lignocellulo-  
sic agro-wastes: Experimental data and modeling

**10:45 – 11:00**  
Coffee break

**Session A.2**  
Fundamental insights into the HTC-  
processes

**11:00 – 11:45**

**Speakers:**  
1. *Luke Higgins, University of Leeds, UK*  
Studying the fundamental properties of  
hydrochars using synchrotron radiation  
2. *Lynn Hansen, TU Munich, Germany*  
Influence of hydrothermal carbonization  
on combustion properties of biomass  
3. *Toufiq Reza, Ohio University, USA*  
Fate of oxygen functional groups upon  
thermal activation of hydrochars



Download the program

## Poster Session I

Fundamentals / material & energetic use

### 11:45 – 12:15

I.1 *Andrés Álvarez-Murillo, University of Extremadura, Spain*

Good practices for a proper characterization of HTC liquid phase

I.2 *Gözde Duman Tac, Ege University, Turkey*  
Comparative evaluation of hydrothermal carbonization and pyrolysis of olive wastes

I.3 *Iskender Gökalp, CNRS, France*  
Characterization of solid and aqueous phase products from hydrothermal carbonization of orange pomace

I.4 *Jakob Köchermann, DBFZ Leipzig, Germany*  
Hydrothermal conversion of D-xylose and organosolv hemicellulose catalyzed by a Keggin-type heteropoly acid under N<sub>2</sub> and CO<sub>2</sub> atmosphere

I.5 *Ivan Kozyatnyk (presented by Kenneth Latham), Umeå University, Sweden*  
Hydrothermal carbonization of humic acids: Physical and functional properties

I.6 *Nader Marzban, Leibniz Institute for Agricultural Engineering and Bioeconomy Potsdam, Germany*  
Reaction kinetic modelling of the hydrothermal carbonization of plant-based feedstocks: Identification of reaction mechanisms

I.7 *Eduardo Sabio, University of Extremadura, Spain*  
Kinetics of the hydrothermal carbonization of safflower cane

I.8 *Charles Coronella, University of Nevada, USA*  
Nutrient solubilization by hydrothermal carbonization

I.9 *Pierpaolo Modugno, Queen Mary University of London, UK*

Influence of reaction conditions on hydrothermal conversion of biomass

I.10 *Daniela Moloeznik Paniagua, TU Berlin, Germany*

Partitioning of inorganics in the HTC process: The effect of process parameters

### 12:15 – 13:45

Lunch break & poster exhibition / discussion

## Session A.3

Fundamental insights into the HTC-process

### 13:45 – 14:45

#### Speakers:

1. *Matteo Pecchi, Free University of Bolzano, Italy*  
Liquid-phase continuous analysis during hydrothermal carbonization (HTC) of model compounds

2. *Sunyoung Bae, Seoul Women's University, Korea*  
Is molecularly imprinted polymer effective to extract 5-HMF from heterogeneous bio-liquid?

3. *Pablo J. Arauzo Gimeno, University of Hohenheim, Germany*  
Recirculation of process water during hydrothermal carbonization (HTC) influences secondary char formation

4. *Kenneth Latham, Umeå University, Sweden*  
Hydrothermal carbonization of organosolv and kraft lignin's: Physicochemical properties and water contaminate adsorption

## **Poster Session II**

Fundamentals / material & energetic use

### **14:45 – 15:15**

II.1 *Hande Alptekin, Imperial College London, UK*  
Structure-performance correlations in hard carbons for Na-ion batteries

II.2 *Heather Au, Imperial College London, UK*  
Development of hard carbon anodes for sodium-ion batteries

II.3 *Daniele Basso, Free University of Bolzano, Italy*  
Preliminary tests on the thermochemical conversion of hydrochar produced from AD digestate and sewage sludge

II.4 *Richard Lobo, Imperial College London, UK*  
Properties and applications of size controlled HTC-derived carbon dots

II.5 *Zhenyu Guo, Queen Mary University of London, UK*  
Amorphous carbons as anodes for batteries

II.6 *Beatriz Ledesma (presented by Silvia Román Suero), University of Extremadura, Spain*  
Effect of aluminum alloy shavings scraps on physical-chemical properties of hydrochars derived from several biomass wastes

II.7 *Sabina Alexandra Nicolae, Queen Mary University of London, UK*  
Biomass based carbon materials for gas storage and separation

II.8 *Mo Qiao, Imperial College London, UK*  
Engineering the Interface of Carbon Electrocatalysts at the Triple Point for Enhanced Oxygen Reduction Reaction

II.9 *Yahaya Balarabe Umar, (presented by Andrew Ross), University of Leeds, UK*  
Hydrothermal carbonization of waste textile: Effect of reaction temperature and residence time

II.10 *Zhen Xu, Queen Mary University of London, UK*  
Carbon materials inspired by hierarchical forms of cellulose as electrodes for sodium-ion hybrid capacitors

### **15:15 – 16.15**

**Coffee break & poster exhibition / discussion**

### Session B.1

Innovative applications of HTC-  
technology

**16:15 – 18:00**

#### Speakers:

1. *Animesh Dutta, University of Guelph, Canada*  
A life cycle assessment (LCA) of integrated hydrothermal carbonization and anaerobic digestion systems for power generation from biomass

2. *Stéphane Bostyn, CNRS, France*  
Assessment of the global energy performances of hydrothermal carbonization of wet biomass

3. *José Daniel Marín Batista, Autonomous University of Madrid, Spain*  
Energetic potential and nutrient recovery throughout hydrothermal carbonization of digested sewage sludge

4. *Kristian Melin, VTT Technical Research Centre of Finland, Finland*  
Techno-economic analysis of treatment of HTC effluent by wet oxidation

5. *Andrés Fullana, University of Alicante, Spain*  
Hydrothermal carbonization of marine plastic debris

6. *Yuriy Budyk, University of Alicante, Spain*  
Hydrothermal carbonization of disposable diapers

7. *Erik Marklund, Luleå University of Technology, Sweden*  
Influence of HTC process parameters on the fate of elements

**19:30 – 23:00**

#### Networking dinner

**Brauhaus Lemke** am Hackeschen Markt  
Dircksenstraße, S-Bahnbogen 143, 10178 Berlin-Mitte

The 'Brauhaus Lemke am Hackeschen Markt' is situated within only 3 min walking distance from Alexanderplatz, 20 min from venue



#### Your way to the dinner:



# 2<sup>nd</sup> DAY

2019-05-15

# HTC 2019

**09:00**

## Welcome

*Judy Libra, Leibniz Institute for Agricultural Engineering and Bioeconomy Potsdam, Germany*

## Session B.2

Innovative applications of HTC-technology

**09:05 – 10:05**

### Keynote:

1. *Kyoung S. Ro, USDA-ARS Coastal Plain Soil, Water and Plant Conservation Research, USA*  
Innovative agro-environmental applications of HTC

### Speakers:

2. *Jürgen Kern, Leibniz Institute for Agricultural Engineering and Bioeconomy Potsdam, Germany*  
Post-treatments of HTC chars for use in agriculture
3. *Taina Lühmann, DBFZ Leipzig, Germany*  
Hydrothermal conversion of landscape conservation material for the production of peat substitutes

## Poster Session III

Material & energetic use / applications

**10:05 – 10:35**

III.1 *Chinnathan Areeprasert, Kasetsart University, Thailand*  
Possibility of MSW and EFB pellets produced from hydrothermal carbonization in biomass pellet market

III.2 *Huyen Chau Dang, TU Dresden, Germany*  
Reuse of spent coffee grounds to produce charcoal briquettes by using hydrothermal carbonization process

III.3 *Elisabeth Kleiber, Leibniz Institute for Agricultural Engineering and Bioeconomy Potsdam, Germany*  
Experimental investigation of the drying kinetics of hydrochar derived from coffee grounds on the laboratory scale

III.4 *James Hammerton, University of Leeds, UK*  
Utilization of hydrochar slurries as a fuel

III.5 *Jackie Massaya, University of Bath, UK*  
Developing a biorefinery from spent coffee grounds: Using subcritical water and hydrothermal carbonization to derive value from a major by-product of the coffee processing industry

III.6 *Carla Pérez, Umeå University, Sweden*  
Hydrothermal carbonization of biosludge from the pulp and paper industry

III.7 *Gabriel Gerner, Zurich University of Applied Sciences, Switzerland*  
HTC-Innovation Campus in Switzerland

III.8 *Fabian Gievers, University of Applied Sciences and Arts Hildesheim, Germany*  
Environmental impacts of sewage sludge treatment by hydrothermal carbonization

III.9 *Giulia Ischia, University of Trento, Italy*  
Realization of a solar hydrothermal reactor: A hybrid solution to develop a zero-energy technology

III.10 *Vicky Shettigondahalli Ekanthalu, University of Rostock, Germany*  
Hydrothermal carbonization: An emerging technology to effectively manage sewage sludge – Review

**10:35 – 11.15**

**Coffee break & poster exhibition / discussion**

## Session B.3

### Innovative applications of HTC-technology

**11:15 – 12:00**

#### Speakers:

1. *Thomas F. Ducey, USDA-ARS Coastal Plain Soil, Water and Plant Conservation Research, USA*

The use of hydrothermal carbonization for the removal of pathogens and antibiotic resistance genes from animal waste

2. *Virpi Siipola, VTT Technical Research Centre of Finland, Finland*

Utilization of hydrothermally carbonized brewery residues in high-value electrochemical applications

3. *Monika Bosilj, Fraunhofer Institute for Solar Energy Systems, Germany*

Sustainable hydrothermal carbons for biorefinery-related catalysis

**12:00 – 13.30**

**Lunch break**

## Session C.1

### Material and energetic use of HTC-products

**13:30 – 15:00**

#### Keynote:

1. *Maria-Magdalena Titirici, Imperial College London, UK*

Black is the new green: Sustainable carbon energy materials

#### Speakers:

2. *Viola Hoffmann, University of Hohenheim, Germany*

In-situ functionalizing of HTC chars for the production of biobased electrode materials for electromobility

3. *Kenneth Latham, Umeå University, Sweden*

Ability of different nitrogen sources to dope hydrothermally carbonized pulp and paper mill black liquor: Physicochemical properties and supercapacitor performance

4. *Jingyu Feng, Imperial College London, UK*

Biomass derived freestanding electrode for oxygen reduction reaction applications

5. *Saskia Heumann, Max Planck Institute for Chemical Energy Conversion, Germany*

Hydrothermal carbon as sacrificial electrode for solar fuel production

## Poster Session IV

### Material & energetic use / applications

**15:00 – 15:30**

IV.1 *Avery Brown, Worcester Polytechnic Institute, USA*

Changes in the adsorption capacity of hydrothermal chars after thermal, chemical and mechanical activation

IV.2 *Gareth Davies, University of Sheffield, UK*

Effect of alcohol / water mixtures on hydrochar formation for use as adsorbents and catalysts

IV.3 *Elena Diaz, Autonomous University of Madrid, Spain*

Application of activated hydrochar from grape seeds and olive stones for removal of emerging pollutants in aqueous phase

IV.4 *Changyoon Jeong, Louisiana State University, USA*

Effect of hydrochar amendment on tylosin adsorption-desorption and transport in agricultural soils

IV.5 Mikko Mäkelä, Aalto University, Finland  
Hydrothermal carbonization in producing wood-based activated carbons for organic chlorine removal

IV.6 Manuel Nowotny, Carl-von-Ossietzky-University Oldenburg, Germany  
Activated biochar made from liquid-solid biomass mixtures

IV.7 Silvia Román Suero, University of Extremadura, Spain  
Magnetic porous carbon materials from almond shells by Fe assisted hydrothermal carbonization

IV.8 Andrew Ross, University of Leeds, UK  
Co-processing of digestate with lignocellulosic biomass: Influence of blending on bio-coal properties and biochemical methane potential

IV.9 John A. Villamil Martínez, Autonomous University of Madrid, Spain  
Integral management of waste sludge by hydrothermal carbonization and anaerobic co-digestion of the process water with primary sewage sludge

IV.10 Jale Yanik, Ege University, Turkey  
Hydrothermal carbonization of food waste and its digestate

## 15:30 – 16.30

**Coffee break & poster exhibition / discussion**

## Session C.2

Material and energetic use of HTC-products

## 16:30 – 18:00

### Speakers:

1. Vivian Mau, Ben Gurion University of the Negev, Israel

Recirculation of HTC aqueous phase and use as fertilizer

2. Reza Khoshbouy, Tokyo Institute of Technology, Japan

Cd adsorption from aqueous solution by modified hydrochar: Effect of in-situ modification using HTC with acid and alkaline additive

3. Aaron Brown, University of Leeds, UK  
Hydrothermal treatment of aquatic biomass: Potential for biomethane and biohydrogen generation from process waters

4. Hui Luo, Queen Mary University of London, UK  
Platinum doped carbon dots and its hybridization with TiO<sub>2</sub> for enhanced visible light photocatalytic hydrogen evolution

5. Yuxiao Ding, Max Planck Institute for Chemical Energy Conversion, Germany  
Hydrothermal carbon as support for water splitting

6. Veronica Benavente, University of Alicante, Spain  
Additives for ash related problems prevention in HTC fuels

**09:00**

**Welcome**

*Benjamin Wirth, DBFZ Leipzig, Germany*

### **Session D.1**

State-of-the-art in upscaling and commercialization

**09:05 – 10:05**

**Speakers:**

1. *Stepan Kusche, HTCycle, Germany*  
Presentation of the federal association „HTC“ and activities of HTCycle GmbH
2. *Marc Buttman, TerraNova Energy GmbH, Germany*  
Industrial scale plant for sewage sludge treatment by hydrothermal carbonization in Jining/China and phosphate recovery by TerraNova® Ultra HTC process
3. *Alfons Kuhles, GRENOL GmbH, Germany*  
Hydrothermal carbonization and biogas - synergy effects. Example of the HTC Innovation Campus Rheinmühle, Switzerland
4. *Peter Axegård, C-Green Technology AB, Sweden*  
C-Green's HTC-solution for conversion of biosludge to hydrochar

**10:05 – 10:30**

**Coffee break**

### **Session D.2**

State-of-the-art in upscaling and commercialization

**10:30 – 11:30**

**Speakers:**

1. *Kunio Yoshikawa, Tokyo Institute of Technology, Japan*  
Commercial demonstration of solid fuel production from municipal solid waste employing the hydrothermal treatment
2. *Bryan Gooch Redd, ThermChem Corporation, USA*  
Combining HTC and gasifier systems for small scale to large scale deployments to convert complex wastes into valuable products
3. *Enrico Gribaudo, (presented by Daniele Basso), HBI Srl, Italy*  
Opportunities and limits regarding the diffusion of the HTC technology worldwide
4. *Kathleen Meisel, DBFZ Leipzig, Germany*  
CARBOWERT: Life cycle assessment of different hydrothermal carbonization concepts producing hydrochar for energetic and material use

### **Farewell**

**11:30 – 11:45**

1. *Judy Libra, Leibniz Institute for Agricultural Engineering and Bioeconomy Potsdam, Germany*
2. *Benjamin Wirth, DBFZ Leipzig, Germany*
3. *Sunyoung Bae, Seoul Women's University, Korea*

**11:45 – 13.15**

**Lunch break**



# 3<sup>rd</sup> DAY

2019-05-16

# HTC 2019

## Field Trip Registration required!

**14:00 – 17:30**

The afternoon of the last day of the symposium will feature a field trip to a German-based HTC plant at demonstration scale. SunCoal Industries GmbH will open its doors for the symposium attendees!

### Schedule:

14:00-14:45

Bus transfer to SunCoal Industries

15:00-16:30

Guided tour in 3 groups à 15 people

16:45-17:30

Bus transfer to Berlin main station

The tour will be held in English.

