



European Polysaccharide
Network Of Excellence



**“Nature makes polysaccharides,
EPNOE turns them into products”**

editorial

Dear Readers of the EPNOE Newsletter,

The EPNOE community is large, with five research organisations, twenty-four academic members and eleven companies. This is the right size for having fruitful exchanges, developing new ideas and building projects. However, it is always important to go above boundaries. This is why we decided to organize a meeting between companies not belonging to the EPNOE community and the EPNOE members. This meeting will be the perfect occasion for the participants to find expertise able to solve their problems, to discover new research groups able to open their basic science contact portfolio, to find partners for building projects, to discover new application opportunities and to explore possibilities to interact with EPNOE industrial members.

This meeting will take place 11 and 12 July, 2016 in Paris (France).

Each non-EPNOE company participating to this event will select from a booklet describing EPNOE member's expertise the EPNOE members it wishes to meet in 30 mn face-to-face meetings. Aside these face-to-face meetings, several lectures will describe industrial views on biobased economy and funding opportunities at the European level.

If you wish to participate to the free event, visit www.epnoe.eu.

With my best wishes



Dr. Patrick Navard
Coordinator of EPNOE
Armines/Mines ParisTech/CNRS
CEMEF - Centre for Material
Forming
Sophia-Antipolis
(France)

news

Member's info



New staff:

- At **ARMINES-CEMEF**, France:
 - Otto Lintunen, Master dissertation "all cellulose derivative composites". Supervisors: P. Navard & T. Budtova.
 - Isadora De Souza Rufino, Master dissertation "Cellulose solution droplet formation". Supervisors: P. Navard & T. Budtova.
 - Gerrit Spiess, Master thesis "Wood-based aerogels". Supervisor: Tatiana Budtova.
 - Julien Jaxel, Master thesis "reinforcement of silica aerogels with natural fibres". Supervisor: Tatiana Budtova.
- At **ARMINES-C2MA**, France:
 - Post-doc Julie Bossu, on "Swelling behaviour of lignocellulosic biomass by mixed solvents: physical-chemical and mechanical aspects". Common project of ARMINES – C2MA, ICGM (Institut Charles Gerhardt Montpellier), IATE (Ingénierie des Agropolymères et Technologies Emergentes) and ICSM (Institut de Chimie Séparative de Marcoule) in the frame of LabEx Chemisyst.
 - Post-doc Simon Teinturier, on the development of biocomposites for automotive applications in the frame of ENAFILIA project. Work supervised by S. Corn, N. Le Moigne and A. Bergeret.
 - Master Andrew Konecki, on "Development and durability of sorghum based biocomposites : genotypic effect in relation with biochemical and structural features". Work supervised by L. Soccalingame, S. Corn and N. Le Moigne in the frame of BIOSORG project.
 - Master Erick Fassio Guimarães, on "Surface modification of natural fibres and rheological behavior of biocomposites" in the frame of BIOPLASMA (Capes-Cofecub) project. Common project of ARMINES – C2MA and ICGM. Work supervised by V. Lapinte, N. Le Moigne, J-J Robin and A. Bergeret.



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N°34 - MAY 2016



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Tatiana Budtova (Armines/CEMEF): a new Finland Distinguished Professor in Aalto University



Finland Distinguished Professor (FiDiPro) is a prestigious position financed either by TEKES or Finnish Academy for an external professor to work part time in Finland, develop new topics and boost collaborations between the home and host laboratories. The projects are competitive: in 2016 there are seven FiDiPro started in all Finland in all disciplines.

Supported by professor Herbert Sixta, head of the department of Forest Products Technology in Aalto university, Tatiana Budtova got this position for 4 years from the beginning of 2016. The project concerns the development of all-cellulose composites in which the adhesion between the fibres and the matrix should be perfect. The overall goal of the is to prepare all-cellulose composites using various types of cellulose fibres, from pulp and paper and textile waste to man-made cellulose fibres for making new mechanically strong biobased materials and also aerogels. Four Finnish companies are supporting the project. Two PhD students will work mainly in Aalto but also visit CEMEF.

news

Member's info



- At **ARMINES-C2MA**, France:
 - Master Wadii Mtawaa, on “Processing and physical characterization of biodegradable geotextile”. Work supervised by M. Longerey, M. Semega and N. Le Moigne in collaboration with Geco and Géochanvre F.
 - Master Charlie Mathiot, on “Development of specific microalgal biomass for their processing in materials applications”. Work supervised by F. Delrue, N. Le Moigne, G. Arrachart and J-F Sassi in the frame of LabEx Chemisyst.
 - At **Jena University**, Germany:
 - Dr. Kerstin Jedvert joined the group as Postdoc working in the field of biodegradable nonwovens from forest resources.
 - M. Sc. Catharina Fechter joined the group as PhD Student working in the field of pulp modification.
 - B. Sc. Agnes Sitterli joined the group as Master Student working in the field of polysaccharide derivatives for antibody immobilization.
 - At **Graz Univ. of Technology**, Austria:
 - BSc. Michael Weissl started his master's thesis on spinning of functional viscose fibers.
 - BSc. Mathias Hobisch started his master's thesis on polysaccharides as electrochemical storage systems.
 - BSc. Magdalena Tendl started her master's thesis on polyoxazoline PHB composites for medical applications.
- Masters & PhD defenses:**
- At **Graz Univ. of Technology**, Austria:
 - DI Romana Schmiedt finished her master's thesis on chitosan-silica based chitosans and their biological performance.

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EPNOE News

Fake scientific meetings Be careful

The organization of scientific meetings can be a very profitable business. You are surely invited, sometimes in an aggressive way, to numerous "scientific meetings", where you are supposed to propose session topics. These meetings, pushed by organisations not linked to science, have the only purpose to attract you and to pay high fees for meetings taking place in countries with low costs of living.

The next step in attracting scientists is not to create a conference without the backing of scientific of scientific organisations, but to use existing conferences and to create a false identical conference, with the hope that bona fide scientists will be fooled and will pay fees, obviously to the wrong place.

A recent example of such fake web site is concerning the International Conference on Bio-based Materials and Composites (ICBMC). The next meeting will take place in Nantes (France) 29-31 March, 2017. But it is possible to find a fake web site advertising the same meeting supposedly organized in Paris in April 2016!!! There was no meeting in the hotel supposed to house this conference (I checked).

If you are curious, look at this site: <https://www.waset.org/conference/2016/04/paris/ICBMC>.

You will find many strange things as the program of session 1 with talks like:

- *Analysis of the Homogeneous Turbulence Structure in Uniformly Sheared Bubbly Flow Using First and Second Order Turbulence Closures*
- *Implementation and Modeling of a Quadrotor*
- *Flow Characteristic Analysis for Hatch Type Air Vent Head of Bulk Cargo Ship by Computational Fluid Dynamics*
- *A Paradigm Shift towards Personalized and Scalable Product Development and Lifecycle Management Systems in the Aerospace Industry*

It was probably so profitable that these hooligans are organizing three such meetings (same title, same presentation, same text):

- 23-24 February 2017 in Rio (<https://www.waset.org/conference/2017/02/rio-de-janeiro/ICBMC>)
- 18-19 May 2017 again in the same hotel in Paris (<https://www.waset.org/conference/2017/05/paris/ICBMC>)
- 24-25 Nov 2017 in Cuba (<https://www.waset.org/conference/2017/11/havana/ICBMC>)

So, be careful.

Patrick Navard



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EPNOE News

EPNOE Brokerage Event 2016 11 and 12 July 2016 - Paris

EPNOE will organize in Paris 11-12 July a brokerage event open to companies not members of EPNOE.

The main purpose of the meeting is to offer to companies not members of EPNOE the opportunity to interact with academic, research and industrial EPNOE members for:

- finding expertise able to solve their problems
- discovering new research groups able to open their basic science contact portfolio.
- finding partners for building projects
- discovering new application opportunities
- exploring possibilities to interact with EPNOE industrial members.

The meeting will also be the opportunity for learning how SME's and large companies are using bioeconomy to create business and for hearing officers describing funding schemes at the European level.

Organisation of the face-to face pre-arranged meetings

On the event web site (<http://www.epnoe.eu/?q=content/epnoe-borkerage-event-2016>), there is a leaflet describing the expertise of the 40 EPNOE members. Each company participating must select on the registration form the EPNOE members it wishes to meet in 30 mn face-to-face meetings. These meetings will be organized in the several rooms reserved in Mines ParisTech. Each participant will receive in advance its own, personalized schedule. The absolute deadline for registering is June 25.

Programme of the event

11 July 2016

13h00 - 15h00

Perspectives of biobased economy

Patrick Navard (President of EPNOE): Networking or how to multiply opportunities.

Novamont: Title to come

Jürgen Engelhardt (Dow): History and strategies of Dow Wolff cellulose: 200 years of bio-based business at Bomlitz

Herman Höfte (Coordinator of Biomass for the Future project): Construction of an agro-industrial value chain in France. The case of miscanthus.

Two other talks planned

15h00 - 18h00

Parallel face-to-face pre-arranged meetings

12 July 2016

09h00 - 10h00

Financing options of R&I projects

Rainer Bush (EU Renewable Raw Materials Group): Current aspects of the Bioeconomy in Europe

Two other talks planned

10h00 - 13h00

Parallel face-to-face pre-arranged meetings

Venue

The meetings will take place in Mines Paristech, 60 boulevard Saint Michel, Paris, 6th arrondissement (district). It is ideally located, on the RER line from airports. Stop "Luxembourg".

Registration

Registration is free, but compulsory for logistic reasons. To register, collect on the web site the registration form and follows instructions.

<http://www.epnoe.eu/?q=content/epnoe-borkerage-event-2016>



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EPNOE News

Radiation grafting of natural fibers for composite applications

French project called BIONICOMP was launched by a consortium gathering academic and industrial partners in order to improve the performances of thermoset composites reinforced by natural flax fabrics. The main objective is to graft molecules onto the fiber surface in order to compatibilize the reinforcement and the matrix. Indeed, despite the high specific properties of natural fibers, the mechanical properties of biocomposites are limited due to the weak fiber-matrix interface. The method chosen to graft molecules onto fiber surface was ionizing radiation (e-beam or gamma-rays). Even if ionizing radiation deteriorates ligno-cellulosic substrates, efficient grafting can be achieved at low radiation dose with limited degradation of reinforcement properties.

Another objective was to provide new properties to flax fabrics. In particular C2MA attempted to prepare flame retarded fabrics by radiation-grafting phosphorus compounds onto flax (1). Fabric is first dipped into a solution containing the phosphorus molecules. Fiber porosity allows the diffusion of phosphorus molecules through the bulk of the fibers (Figure 1). Subsequent ionizing irradiation at low dose allows grafting covalently these molecules to fiber. The whole treatment is carried out at room temperature. High phosphorus contents can be reached and self-extinguishing fabrics are achieved. When treated flax fabric is incorporated into unsaturated polyester, the flame retardancy of the composite is improved due to the charring of the fabric. The use of fiber as a "tank" releasing flame inhibitor during the burning can be considered.

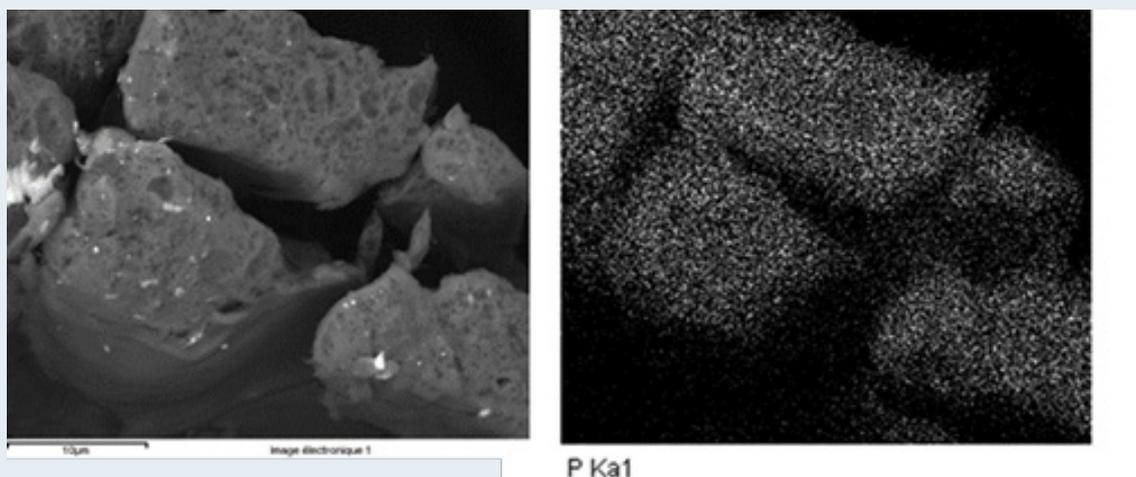


Figure 1 – (A) SEM observations of flax fibers grafted by MVP and (B) phosphorus imaging using EDX analysis

Further work is planned with a project called FERIA funded by Ecole des Mines d'Alès. This project will explore in detail the radiation grafting of natural fibers. The objective is to study the influence of treatment conditions (choice of grafted molecules, radiation dose, solvent used) on the grafting efficiency in order to propose functionalized reinforcements for composite applications.

(1) R. Sonnier, B. Otazaghine, A. Viretto, G. Apolinario, P. Lenny, Improving the flame retardancy of flax fabrics by radiation grafting of phosphorus compounds, *European Polymer Journal* 68, 2015, 313-325

*This article was proposed by Dr. Rodolphe Sonnier (rodolphe.sonnier@mines-ales.fr),
Armines-C2MA, France*



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EPNOE News

Nanotechnological Restauration of Cellulose Based Cultural Assets

A considerable part of our cultural heritage from the period between 1840 and 1960 encompasses various documents (books, writings, scriptures, contracts, etc.) and innumerable pieces of art which have one feature in common: They are printed or painted on paper. Notably, the cellulose fibers of paper produced during that time gets destroyed/degraded due to the generation of sulfuric acid originating from alum used as sizing agent. As a consequence, the concerned documents literally decay, causing an enormous threat for libraries and archives all over the world. This problem becomes specifically evident by taking into account that a myriad of these documents and artworks are unique with inestimable value for society and science.

Provoked by the fact that not even a single of the contemporarily applied techniques for paper mass deacidification in practice delivers satisfying results, combined with the result of a survey of professional restorers which underlined the urgent need for efficient mass deacidification techniques to preserve paper based cultural heritage, rapid action is needed. Therefore, a new process was developed by an interdisciplinary team from University of Graz and Danube University Krems.

This innovative technological process for mass deacidification, is based on the application of core-shell alkaline nanoparticles (with a size around 100 nm) stabilized by polysaccharide derivatives in an apolar solvent. The mass deacidification process is performed using an apolar solvent (hexamethyl-disiloxane, HMDSO) which shows a low surface tension. This allows easy wettability of the paper material, the printing ink, pictures and any written documents are not dissolved/destroyed. It is an additional benefit that the paper does not swell in this solvent and the solvent is easily removed after the process at reduced pressure.

A key point is the creation of a stable dispersion of the nanoparticles in this apolar solvent. We used trimethylsilylcellulose (TMSC), soluble in HMDSO, to build a hydrophobic shell around the alkaline nanoparticle core. This cellulose derivative has also a high affinity to cellulose causing deposition of the core-shell nanoparticles on the paper cellulose fibers. The trimethylsilyl (TMS) groups are easily cleaved in an acid environment leading to regenerated cellulose. Both the alkaline nanoparticle as well as the TMSC neutralize the existing acids. The nanoparticles provide also the necessary alkaline reserve to neutralize sulfuric acid set free in the future and the regenerated cellulose increased the papers deteriorated mechanical properties depending on the TMSC's molecular weight. For technological simplification, this process, based on functionalized alkaline core-shell nanoparticles is operated in only one stage.

The major technological progresses of this new approach are identified in the possibility to not only treat single sheets of paper but, in the contrary, whole staples of complete books under reduced pressure (1 – 10 bar). The nanoparticles are able to penetrate into the books and are even distributed if a mild pressure is applied. The books get additionally furnished with a depot of coated nanoparticles in their interior acting as an alkaline reserve, the mechanical properties are improved by 60 to 70 % and the process intrinsically purifies the materials and reduces cellulose degradation, bacteria and fungi, another well-known factor strongly contributing to paper disintegration. **Our results show that the process does not deteriorate printing ink or typography and is scaled up at the moment.**

This article was proposed by Volker Ribitsch, University of Graz, Austria



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EPNOE News

CD Laboratory for Fiber Swelling and Paper Performance

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At TU Graz recently a Christian Doppler Laboratory for Fiber Swelling and Paper Performance has opened. It is a research cooperation between several academic partners (TU Graz, KTH Stockholm, MU Leoben) and industrial partners. The research is addressing swelling of cellulosic fibers with current focus on native fibers, i.e. chemical pulp.

Chemical pulp is highly hygroscopic, swelling of the fiber bulk and the fiber surface is affecting several key performance parameters of pulp and paper products like e.g. the liquid uptake, the strength of paper produced from the pulp and the printing performance of paper. In the Christian Doppler Laboratory for Fiber Swelling and Paper Performance the academic partners have teamed up with Mondi **Kraft & Business Paper AG** (Austria), a major international player in the field of printing and packaging papers, and with **Océ Technologies BV** (Netherlands) a leading producer of high-speed inkjet printing machinery.

Key aim of the CD Laboratory is tailoring of the fiber swelling and liquid absorption properties of papermaking pulps via chemical and physical treatments of the fibers. Furthermore the interrelation between fiber swelling and the mechanical performance of the fiber network in paper is studied with experimental- and simulation techniques. The results of this basic research work will be transferred to improving the paper and the high-speed inkjet printing process.

The Christian Doppler Research Association promotes the cooperation between science and business. Christian Doppler Laboratories are conducting application oriented basic research in cooperation between universities and industrial partners.

This article was proposed by Assoc. Prof. Ulrich Hirn, Institute for Paper-, Pulp- and Fiber Technology, Graz University of Technology, Austria



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The first edition of “**I&S WORKSHOP. Insights and strategies towards a bio-based economy**” will be held in Montevideo, Uruguay, on November 22th to 25th, 2016.

The bio-based economy encompasses the sustainable and inclusive production of renewable resources and their conversion into food, feed, bio-based products and energy. The concept of bio-economy brings together the agriculture, forestry, fisheries, food production, as well as parts of chemical, biotechnological and energy industries. With emphasis in the development of knowledge as a source for innovative ideas, bio-economy encourages the integration of a wide range of scientific and technologic fields, as well as the use of practical and tacit knowledge. In this context of growing demand for biomass as source of materials and energy with an increasingly competitive market, innovation is essential and lignocellulosic materials play a fundamental role.

The “I&S WORKSHOP” aims to:

- Provide an opportunity for meeting key stakeholders engaged in the sustainable and efficient use of lignocellulosic biomass
- Create a framework for discussion on the latest developments regarding materials prepared from lignocellulosic biomass.
- Facilitate the update on the activities in the area of lignocellulosic materials being developed worldwide with the participation of major players in the sector.
- Provide thematic panel discussions with the proper environment for pondering the needs and opportunities that foster future collaborations.

Among the key note speakers are: Prof. Mira Aranguren (Institute of Research in Materials Science and Technology (INTEMA), Argentina), Prof. Monica Ek (School of Chemical Science and Engineering. KTH, Sweden), Prof. Pedro Fardim (Åbo Akademi University, Finland and University of Leuven, Belgium), Prof. Ronalds Gonzalez (Department of Forest Biomaterials. NCSU, USA), Man. Dir. Thomas Holmbom (Separation Research Ltd., Finland), Prof. Jaime Rodriguez (University of Concepcion, Chile), Prof. Orlando Rojas (School of Chemical Technology. Aalto University, Finland), Dr. Robin Rogers (Canada Excellence Research Chair in Green Chemistry and Green Chemicals, Department of Chemistry McGill University, Canada), Prof. Thomas Rosenau (University of Natural Resources and Life Sciences. BOKU. Austria) and Prof. Karin Stana Kleinschek (Institute of Engineering Materials and Design, University of Maribor, Slovenia).

Within the framework of the workshop, the PROVALOR Network (CYTED) will sponsor a Forum on Bioeconomy on 24th of Nov. that will be opened by a Key Note speech by the President of EPNOE, Dr. Patrick Navard (Center for Materials Forming (CEMEF), MinesParisTech/CNRS, France. President of EPNOE Association)

Visit the Workshop website <http://is2016.com/> for more information or send your enquires to contact@is2016.com

<p>biofuels functional fibres biocomposites nanocellulose sustainability bio-economy breakthroughs biosensors</p>		<p>biopolymers hemicelluloses xylan oligomers cellulose carbohydrates extractives biomass lignin sugars wood cooperation development</p>	
<p>Workshop on Insights and Strategies Towards a Bio-Based Economy</p>			<p>22-25 Nov 2016 URUGUAY</p>



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EPNOE Member's Scientific Publications

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Armines-C2MA, France:

- S. Kennouche, N. Le Moigne, M. Kaci, J-C. Quantin, A-S Caro-Bretelle, C. Delaite, J-M. Lopez-Cuesta, Morphological characterization and thermal properties of compatibilized poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV)/poly(butylene succinate) (PBS)/halloysite ternary nanocomposites, *European Polymer Journal*, 75, 142-162, 2016.
- Acera Fernandez J., Le Moigne N., Caro-Bretelle A.S., El Hage R., Le Duc A., Lozachmeur M., Bono P., Bergeret A., Role of flax cell wall components on the microstructure and transverse mechanical behaviour of flax fabrics reinforced epoxy biocomposites, *Industrial Crops and Products*, 85, 93–108, 2016.
- A. Regazzi, S. Corn, P. Ienny, J.-C. Bénézet, A. Bergeret, Reversible and irreversible changes in physical and mechanical properties of biocomposites during hydrothermal aging, *Industrial Crops and Products*, 84, 358–365, 2016.
- Zembouai I., Kaci M., Bruzard S., Dumazert L., Bourmaud A., Mahlous M., Lopez-Cuesta J-M., Grohens Y., Gamma irradiation effects on morphology and properties of phbv/pla blends in presence of compatibilizer and cloisite 30b, *Polymer Testing*, 49, 29–37, 2016.

University of Natural Resources and Life Sciences Vienna (BOKU), Austria, Di-vision of Chemistry of Renewable Resources:

- Beaumont, M; Nypelo, T; Konig, J; Zirbs, R; Opietnik, M; Potthast, A; Rosenau, T (2016): Synthesis of redispersible spherical cellulose II nanoparticles decorated with carboxylate groups. *GREEN CHEM.* 2016; 18(6): 1465-1468.
- Carrillo, CA; Nypelo, T; Rojas, OJ (2016): Double emulsions for the compatibilization of hydrophilic nanocellulose with non-polar polymers and validation in the synthesis of composite fibers. *SOFT MATTER.* 2016; 12(10): 2721-2728.
- Nypelö, T. E.; Laine, C.; Aoki, M.; Tammelin, T.; Henniges, U., Etherification of wood-based hemicelluloses for interfacial activity. *Biomacromolecules* 2016, Article in Press, DOI: 10.1021/acs.biomac.6b00355
- Koprivica, S., Siller, M., Hosoya, T., Roggenstein, W., Rosenau, T., Potthast, A. Regeneration of Aqueous Periodate Solutions by Ozone Treatment: A Sustainable Approach for Dialdehyde Cellulose Production (2016) *ChemSusChem*, Article in Press. DOI: 10.1002/cssc.201501639.
- Pircher, N.; Carbajal, L.; Schimper, C.; Bacher, M.; Rennhofer, H.; Nedelec, J.-M.; Lichtenegger, H. C.; Rosenau, T.; Liebner, F., Impact of selected solvent systems on the pore and solid structure of cellulose aerogels. *Cellulose* 2016, Ahead of Print. DOI: 10.1007/s10570-016-0896-z.
- Odabas, N.; Amer, H.; Bacher, M.; Henniges, U.; Potthast, A.; Rosenau, T., Properties of cellulosic material after cationization in different solvents. *ACS Sustainable Chem. Eng.* 2016, Ahead of Print. DOI: 10.1021/acssuschemeng.5b01752.
- Yan, Y.; Amer, H.; Rosenau, T.; Zollfrank, C.; Dorrstein, J.; Jobst, C.; Zimmermann, T.; Keckes, J.; Veigel, S.; Gindl-Altmatter, W.; Li, J., Dry, hydrophobic microfibrillated cellulose powder obtained in a simple procedure using alkyl ketene dimer. *Cellulose* 2016, Ahead of Print. DOI: 10.1007/s10570-016-0887-0.



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News from outside the EPNOE Network

XXVIII International Carbohydrate Symposium in New Orleans, Louisiana. 17-21 July 2016

To know more, see: www.ics-2016.org

Exploring lignocellulosic biomass, Reims, France 23-24 June 2016

FARE (Fractionation of AgroResources and Environment) is a joint lab between the French National Research Institute for Agricultural Research (INRA) and the Reims Champagne-Ardenne University (URCA).

FARE will celebrate its 15th anniversary in 2016, so we organize the next 23-24 June a scientific seminar for presenting the state-of-the-art in the field of lignocellulosic biomass transformation.

We thus invite you to join us in the superb city of Reims, which hosts three exceptional UNESCO World Heritage sites and Champagne Houses.

<https://colloque.inra.fr/explorebiomass>

From Nano to Macrostructures Design and Characterisation of Soft Materials, Strömstad, Sweden, 24 - 26 August 2016

Organized by SuMo Biomaterials and Chalmers University of Technology

The conference will cover topics related to basic fundamentals of soft materials as well as specific questions related to tailored transport (e.g. controlled release) and water management within soft materials.

See: <http://www.chalmers.se/en/conference/SoftMaterialsConf/Pages/default.aspx>

13th International Conference of the European Industrial Hemp Association 1-2 June 2016, Wesseling near Cologne, Germany

The EIHA Conference is now established as the largest meeting of experts on industrial hemp in Europe and indeed worldwide. Specialists from all over the world will meet in order to exchange information regarding the latest developments in hemp and in other natural fibres and moreover on the applications for fibres, shivs, seeds and oil as well as pharmaceutical applications. We are expecting again 250 international participants from more than 35 countries.

For more information please visit: www.eiha-conference.org/programme

The 7th Workshop on Cellulose, Regenerated Cellulose and Cellulose derivatives, Örnsköldsvik, Sweden, November 15-16, 2016

This 7th semi-annual workshop is for the third time arranged in cooperation between Umeå University and Karlstad University and it is focused on basic and applied studies in the field of dissolving pulps, cellulose, nanocellulose, regenerated cellulose and cellulose derivatives. The workshop is sponsored by leading suppliers of dissolving pulps and machinery which guarantees that the workshop will have a mix of academic and applied presentations.

See: www.cellworkshop.se



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News from outside the EPNOE Network (continued)

2nd International EPNOE Junior Scientists Meeting

FUTURE PERSPECTIVES IN POLYSACCHARIDE RESEARCH, Sophia Antipolis (France), October 13-14, 2016

The call for abstracts is explicitly addressed to PhD students, Post-Doctoral scientists and junior Assistant Professors (or equivalent) in an early stage of their scientific career. The participants are invited to present recent results of their individual research, as well as to share their ideas on how polysaccharide research will or should advance in the near future. Likewise, senior scientist as well as industrial researchers are explicitly invited to join the auditorium in order to participate in fruitful discussions.

Contacts

General issues and abstract submission: Martin Gericke (martin.gericke@uni-jena.de)

Registration: Sylvie Massol (sylvie.massol@mines-paristech.fr)

5th EPNOE International Polysaccharide Conference

POLYSACCHARIDES AND POLYSACCHARIDE-BASED

MATERIALS: FROM SCIENCE TO INDUSTRIAL APPLICATION

Erfurt, Germany, September 04 - 07, 2017

EPNOE International Polysaccharide Conferences are now key features of the calendar of European scientific events. The conference has been organized biannually since 2009. The conference aim is to bring together students, scientists and specialists working in industry, universities and research institutes to exchange experiences, present research results, develop a platform for mutual scientific contacts and intensify academic/industry cooperation.

Since 2013, the EPNOE International Polysaccharide Conference has been promoted and organised jointly by the European Polysaccharide Network of Excellence (EPNOE) and the Cellulose and Renewable Materials Division of the American Chemical Society (ACS). On behalf of EPNOE and ACS, we have the pleasure to invite you to participate.

A pre-conference course on "Cellulose solvents for shaping and homogeneous phase chemistry" will be organised on Sunday September 03, 2017.

Contact: epnoe2017@messe-erfurt.de

4th symposium "Fibres naturelles et polymères"

Troyes (France), September 15, 2016

See: <http://www.npc.inra.fr/Evenements/4eme-colloque-fibres-naturelles-et-polymeres>

14 th edition of the Summer Course Glycosciences, Groningen (the Netherlands), 12-16 June 2016.

More information: <http://www.vlaggraduateschool.nl/glycosciences/index.htm>

CIADICYP 2016 - theme "Building bridges in research and innovation for a sustainable bioeconomy", Sept. 4-9, 2016, Espoo (Finland)

More information: <https://app.box.com/s/1bleql556snbe7f1blrxk3h8264nnwjz>