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"Nature makes polysaccharides, EPNOE turns them into products"

editorial

Jear Readers of the EPNOE Newsletter,

The activities of the EPNOE community in the next months will be centered around three main topics.

The first is the organization of the EPNOE 2017 conference which will take place in Jena, Germany, August 21-24, 2017. So far, more than 250 abstracts have been received and are under evaluation. There are many topics under considerations such as Resources, Isolation and Standardization; Physical and Chemical Characterization; Biotechnology; Chemistry; Solvents; Fibres, Films, Sponges, Particles and Composites; Nanotechnology and Applications.

We expect a very lively and interesting meeting.

A second activity is around health and controlled release. Polysaccharides are playing a major role in the area and several EPNOE members are involved in such activities. A specific task group will be established with the mission to build links with scientific and professional organisations in this sector.

The third activity will be the rebirth of the Dormant Idea initiative. End of 2013, 45 scientists from eleven EPNOE institutions from nine EU countries decided to share their "dormant ideas" or "un-identified knowledge" or "things you know but without realizing they could be useful" or "things you know that you don't know what to do with", in order to try transforming them into new research topics and/or projects of interest for industry. 165 such ideas were proposed. It was a success. This is re-started this year.

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



• At BOKU University, Austria :

Masters & PhD defenses:

- **Dr. Nora Odabas** "Chemical Mo dification and Utilization of Paper Grade Pulp and Fractions Thereof" (Supervisors: U. Henniges, A. Potthast, T. Rosenau).

- **Dr. Marco Beaumont** "Characterization and Modification of a Cellulose II Gel" (Supervisors: A. Potthast, T. Rosenau).

- DI Renate Kepplinger "Extraction and Modification of lignins isolated from hydrothermally pretreated biomass" (Supervisor: F. Liebner)

- DDI Urban Spitaler "Quantitative Analyse des Anthocyan- und Phenolgehaltes von Weizen (Triticum aestivum L.) mittels UV/ Vis-Spektroskopie und HPTLC" (joint supervision with Department of Crop Sciences; H. Grausgruber, S. Böhmdorfer)

New staff:

• At Armines-C2MA, France:

- **Marie Teixeira** is working on the radiation grafting of various flame retardants onto flax fabrics for textile and composite applications (FERIA project)

- Clément LACOSTE is working on the development of insulating bio-based materials for the building industry: plant fibres based composites and cements (CARNOT project)



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POLINTEGRA activity

On 6-7 October 2016, at Lodz, Poland has been organised the European Bioeconomy Congress. The fourth edition of the Bioeconomy Congress was a two day event, organised as part of the Bioeconomy Week, with an active participation of representatives of business circles, regional governments, academic communities, business environment organisations and institutions from Poland and from abroad, who support the development of bioeconomy. Institute of Biopolymers and Chemical Fibres was a partner of this event. In cooperation with the POLINTEGRA Centre, EPNOE Association (France), Cereales Vallee (France) and Bioeconomy Cluster (Germany) we conducted a Session on Biotechnology: Biopolymers in Regions.

SESSION C2: SESSION BIOTECHNOLOGIES: BIOPOLYMERS in Regions

(in cooperation with POLINTEGRA-EPNOE-CEREALES VALLEE-BIOECONOMY CLUSTER)

<u>Chairperson:</u> Andrzej Korneliusz Błędzki, POLINTEGRA Center, West Pomeranian University of Technology, Szczecin/University of Kassel

·Horst Mosler, BioEconomy Cluster: From Lignocellulosic Feedstock to a Value based

Bioeconomy

• **Danuta Ciechańska**, Director, Institute of Biopolymers and Chemical Fibres, POLINTEGRA Center: Biopolymers – new trends and markets

• **Marek Cieślak**, President of the Board, Bionanopark, Krzysztof Makowski, Head of Laboratory of Industrial Biotechnology, Bionanopark: Bionanopark Center – place for biotechnology research and development

• **Patrick Navard**, European Polysaccharide Network of Excellence: Research challenges in biomass-based polymers

• **Gerd Unkelbach**, Fraunhofer-Zentrum für Chemisch Biotechnologische Prozesse CBP: Biotechnological processes of wood biomass processing

- Tomasz Kapela President of Biotechnika: White Biotechnology
- Artur Cavaco Paulo, University of Minho: Biosynthetic polymers
- Industrial Partners

Congress Programme:

http://www.ibwch.lodz.pl/pliki/IBWCh_(itxpmqw46p0jdr7i).pdf

Sattelite event of the Congress was Polish-German Workshop From Science to Business: "Circular Bioeconomy as a Source of Raw Materials of the Future" organised by two clusters: Polintegra Center (Poland) and Bioeconomy Cluster (Germany) on 5 October 2016.

Workshop:

http://www.ibwch.lodz.pl/pliki/IBWCh_(1a33cxn2k26rkj0n).pdf

This article was proposed by IBWCh Institute, Poland



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EPNOE News NEWLY AVAILABLE

GESIM Bioscaffolder 3.1 3D Prototyping, Cell Printing and More

- Available for external partners.
- Production of 3D scaffolds as support for cell culture and organoids.
- · Piezoelectic (ink-jet) microdispensing to coat scaffolds by e.g. matrix proteins.
- Printing of living cells ("Organ printing") either embedded in scaffold material or seeded by piezo spotting.
- Plotting of conductive polymers as sensor material or as coating for medical devices.
- Multi-Z-drives can print different materials at various pressures and temperatures, without changing cartridges.



Preparation of 3D scaffolds from selected materials and their combinations with cells





Green printing – microalgae can be immobilized in 3D alginate-based scaffolds.

Fabricated human ear.



Miniaturized PCL scaffolds (to get into the range of small organs like blood vessels).

Features:

- Up to three independant Z-drives (spindle) for cartridges, plus one for piezo dispenser and Z-sensor.
- Holders for different catridges, heatable to either 120 or over 200 °C.
- · Z-sensor for the measurement of substrate heights and XYZ tip measuring tool for automatic alignment of dispensers.
- Piezoelectric GESIM nanolitre pipettor (heatable and non-heatable), pick samples from a (heatable) microtitre plate, including
 wash and dry station.
- External electronic control unit (F-Box) with embedded computer, connects to sensor cables, compressed air and system liquid (water).
- Dossage pressure: 100 700 kPa (1 -7 bar); slight vacuum possible.
- Step width: 2μm in X/Y, 10 μm in Z, encoder-controlled.
- Target holder size: 31 cm x 20 cm, can hold two microtitre plates.
- Printable materials include hydrogels, biopolymers (e.g. collagen, alginate), bone cement paste, biocompatible silicones and melting polymers (polycaprolactone, polylactic acid).
- Works in sterile environment (filtered compressed air).

Applications:

- Production of multi-material scaffols with defined inner structure.
- Printing of 3D bodies from termoplastics.
- Development of implant replacements.
- Printing of live cells, either embedded in the scaffold material or seeded by piezoelectric microdispenser .
 - Deposition of coatings on surfaces.
- Applications of rare samples onto 3D structures during printing.

This article was proposed by Maribor University, Slovenia

Authors: R. Kargl, A. Dobaj Štiglic, T. Maver, U. Maver, K. Stana Kleinschek, M. Kurečič Contact: Prof. Karin STANA-KLEINSCHEK, Head of LCPP Tel: + 386 2 220 7881, karin.stana@um.si http://lcpp.um.si/ https://www.facebook.com/LCPP.UM



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EPNOE News

NEWLY AVAILABLE

7500 Atomic force microscope (AFM) Superior scanning in fluids, gases, and ambient conditions

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 New performance, versatility, and ease-of-use benchmarks for nanoscale measurement, characterization, and manipulation.

- Outstanding low noise performance.
- Atomic-resolution imaging.
- Superior scanning in fluids, gases, and ambient conditions.
- Excellent closed-loop resolution.
- Leading environmental and temperature control.
- Wide-range of electrochemistry capabilities.





Schematic representation of different AFM modes. a) the contact mode, b) the non-contact mode, c) and d) lateral force microscopy (LFM), where the frictional forces appear on the cantilever due to different materials and different surface shapes, respectively.



Features:

- Atomic-resolution imaging with closed-loop 90µm scanner.
- Exceptional environmental and temperature control; system allow heating and cooling of sample).
- Standard nose cone supports expanded set of imaging modes.
- Superior scanning in fluids, gases, and ambient conditions.
- Allows/Supports atmosphere control and imaging of live cells "Environmental Chamber" for different gases.
- Supports concurrent or sequential measurements at the same sample spot and combining results in layers.
- Works in sterile environment (filtered compressed air).
- Unprecedented electrochemistry (EC) capabilities.

Applications:

Material science	Life science	Polymer science
Electrochemistry	Electrical	Nanolithography
	characterization	applications

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This article was proposed by Maribor University, Slovenia Authors: Tina Maver, Karin Stana Kleinschek, Manja Kurečič, Uroš Maver Contact: Ass. Prof. dr. UROŠ MAVER, Head of IBS Tel: + 386 2 234 5823; uros.maver@um.si



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EPNOE News

Functional Polysaccharide Nanoparticles – From Polymer Chemistry to Materials Design and Advanced Applications

by Martin Gericke and Thomas Heinze

Centre of Excellence for Polysaccharide Research, Institute of Organic Chemistry and Macromolecular Chemistry, Friedrich Schiller University of Jena, , Humboldtstraße 10, D-07743 Jena, Germany

Nanoparticles (NP) have received enormous scientific interest in the past decades in a wide variety of fields ranging from materials science and physics to biomedicine and biotechnology. In addition to inorganic NP, polymeric NP are intensively studied for various applications, including drug-delivery and sensing. NP on the basis of polysaccharides (PS) offer at least two preeminent advantages especially for targeting life-sciences: facile preparation and inherent biocompatibility.

Different strategies have been used for obtaining PS-based nanomaterials; ionic gelation of chitosan with tripolyphosphate and controlled chemical and/or mechanical treatment of cellulose to obtain "nanocellulose" are just two of the most prominent examples. In the frame of different research projects, the Friedrich-Schiller-University of Jena (FSU) focusses on another approach in which natural PS are chemically modified in such a way that they (i) form PS-NP by self-assembling processes in aqueous environment and (ii) incorporate functionalities that are required for using PS-NP in specific applications.

Hydrophobic derivatives of cellulose, dextran, xylan, and other PS have been prepared by introducing different types of substituents such as esters including fatty acid esters and carbamates. NP formation is achieved by a controlled transition from the dissolved state (in organic solvents such as DMA, acetone, chloroform) to the non-dissolved state (in aqueous media), which can be achieved by using facile experimental procedures such as dialysis of a PS solution against water or dropping the non-solvent into the PS solution (or vice versa). PS-NP obtained by this approach were demonstrated to be non-cytotoxic and biocompatible, i.e., they are highly suited for biomedical applications. They are taken up by cells and can fulfil specific task such as drug-delivery and pH-monitoring within a living cell. The structure design of PS-NP, which can be achieved by three different approaches:

- (i) by chemical derivatization prior particle formation or
- (ii) by chemical derivatization the NP fomred or
- (iii) by physical surface modification or entrapment of active compounds.

(Continued overleaf)



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EPNOE News

Functional Polysaccharide Nanoparticles – From Polymer Chemistry to Materials Design and Advanced Applications (continued)

By applying tools of advanced PS chemistry, mixed derivatives with a hydrophobic group (e.g., acetate-, propionate-, or furoate ester) and the desired functional moiety (e.g., pH-sensitive fluorescent dyes, or drugs) can be prepared that self-assemble into functional PS-NP. Functionalization subsequent to the particle formation is of particular interest for immobilization of larger biomolecules. PS-NP with either carboxy- or amino groups have been employed in this context for covalent or electrostatic coupling with dyes and antibodies. Even hydrophobic compounds could be incorporated within PS-NP by a facile co-self-assembling process. These techniques can also be combined to create innovative materials for advanced applications as recently shown by the development of sensitive lateral flow immunoassay test based on composite PS-NP containing reactive groups (for coupling with an antibody) and a physically entrapped dye (for optical detection).



<u>Contact</u>: For further information regarding the development of innovative PS-NP or their application in specific areas please contact the FSU (thomas.heinze@uni-jena.de; martin.gericke@uni-jena.de) or visit their website (http://www.agheinze.uni-jena.de).

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This article was proposed by Jena University, Germany



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EPNOE News

Cellulose: to depolymerize... or not to? Sergiu Coseri

"Petru Poni" Institute of Macromolecular Chemistry of Romanian Academy, 41A Grigore Ghica Voda Alley, Iasi, 700487, Romania E-mail: coseris@icmpp.ro Fax: +40 232 211299

The global economy in the 20th century has been centered on the use of petroleum resources as a readily available raw material at low cost. The increased awareness on the petroleum depletion and, more importantly the unceasing accretion concern on the tremendous damaging effects of the CO2 emissions have on quality of live, lead to new challenges shifted toward searching for new environmental friendly processes suitable to replace the petroleum. This is why studies are focused on the use of biomass as fountainhead of alternative carbon resource for the production of chemicals and fuels.



Figure 1. Schematization of the TEMPO-mediated oxidation to achieve cellulose depolymerization

Cellulose, is a polymer of glucose, linked with a linear B-1,4-glycosidic bond. Oxidation of the primary OH groups in cellulose is a pivotal reaction, the introduction of carboxyl moieties creates prerequisites for further cellulose functionalization through covalent attachment or electrostatic interactions. A major impediment is related with the severe depolymerization occurred during the TEMPO-mediated conversion of -CH2-OH into COOH groups. This disadvantage - the cellulose depolymerization - represents actually a key step in the strategies to develop new renewable, carbon-neutral energy sources. The work published very recently in Biotechnology Advances, (*Biotechnology Advances, 2017, 35(2), 251-266*) is focused on the parallelism between these two apparently antagonist processes involving cellulose, building a necessary bridge between them, thinking how the reported drawbacks of the TEMPO-mediated oxidation of cellulose are heading towards to the biomass valorisation. The undesired side reactions could be turned into beneficial processes if they are correlated with the existing achievements of particular significance in the field of cellulose conversion into small organic compounds.

This article was proposed by "Petru Poni" Institute of Macromolecular Chemistry, Romania



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Sustainable proteins can partially replace latex in caret coatings

In the transition to a circular economy, more and more companies are looking for sustainable alternatives to components made from fossil raw materials. One such company is EOC Belgium NV, which produces products including compounds for the carpet industry. Together with Wageningen Food & Biobased Research, EOC studied the properties of specific proteins and how they could be adapted to make them suitable for carpet coating applications.

The goal of the joint project between EOC and Wageningen Food & Biobased Research was to show that latex in carpet coatings, currently made from petroleum, can be partially replaced by protein fragments. This goal was achieved: the research proved that up to twenty per cent can be replaced. During the project Wageningen Food & Biobased Research focused on the chemical conversion process of the protein fragments in relation to the desired behaviour (adhesive strength and binding) of the coating. The study used food-grade protein to determine the proof of principle, but the eventual goal is to work with proteins from residual streams such as grass and leaves.

Reducing production process costs

Protein fragments were shown to have considerable potential as raw material for compounds produced by EOC, says Dirk Hoorne from the Belgian company: "EOC is specifically seeking ways of using biobased raw materials such as proteins and other sustainable streams. But we are realistic: the production process must become much cheaper to enable an economically profitable business case." The project used relatively expensive food-grade proteins. Taking a next sustainable step will require proof that results can be achieved with proteins from residual streams.

'Successful partnership'

"We enjoy working with Wageningen Food & Biobased Research," says Hoorne. "They combine in-depth academic knowledge of substances such as proteins and how to adapt their properties to application requirements with an understanding of the economic reality. Our strength lies in having the expertise to formulate compounds for industrial applications. The blend of these assets has resulted in a very successful partnership in which we speak the same language and can easily make the required decisions."

Methaform is an example of a project in which the two partners have achieved joint success. It focused on the further development of itaconic acid and methacrylic acid as building blocks for high-quality materials such as coatings, textile and glass.

More information: https://www.wur.nl/nl/nieuws/Sustainable-proteins-can-partially-replace-latex-in-carpet-coatings-.htm

This article was proposed by Wageningen University and Research - WUR, The Netherlands

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EPNOE News

Low velocity impact damage assessment in natural fibre biocomposites

Plant fibres have been studied as potential replacement to traditional composite reinforcements due to their low density, high specific mechanical properties, relative abundance, and positive environmental impact. For example, flax fibres exhibit superior strength and elastic modulus due to their high cellulose content and low microfibrillar angle. The aim of this work is to study the impact resistance of woven flax fibre reinforced composites with epoxy and polypropylene (PP) matrices. The study of the impact behaviour of natural fibre based composites is of great importance as the internal damages produced by impact loads can severely reduce the residual mechanical properties of the composite. Impact loading can occur during the service life of composite parts due to dropped tools, collisions with loading and unloading fixtures, ballast or cargo.

The research group at C2MA laboratory of Ecole des Mines d'Alès has studied the mechanical properties of flax fibre composites with thermoset and thermoplastic matrices. Woven dry flax fabric and flax PP commingled fabric were supplied by Composites Evolution as Biotex. The low velocity impact tests were conducted using a CEAST instrumented drop tower and the progression of damages within the composite was observed using a Phantom V2512 high speed camera coupled with long distance macrozoom lens (Figure 1).



Figure 1: Drop tower setup for impact testing of natural fibre composites

(continued overleaf)

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EPNOE News

Low velocity impact damage assessment in natural fibre biocomposites

(continued)

The force-displacement curves were correlated to the high speed tracking of the macro-cracks (Figure 2). The experimental results are compared with a multi-scale finite element model that takes into account the local microstructure and anisotropic, nonlinear stress-strain behaviour of the composite material. The macroscopic modelling is done using Explicit Finite Element software LS-Dyna, while Digimat software was used for the modelling of the microstructure. The model is validated by comparison of the experimental force-displacement response and the evolution of damage observed by the Digital Image correlation of the high speed images.



Figure 2: (a) Force –time history correlated with measured crack length for 6 J impact on Flax-PP composite; (b) real time high speed image of the plate at maximum displacement; (c) skeletonised image to track the crack propagation

Video Link on Figure (c): https://partage.mines-telecom.fr/index.php/s/IQce6gi2wuNWwIR

For more information regarding this project, contact Karthik Ram Ramakrishnan and Stéphane Corn by email:

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This article was proposed by Armines-C2MA (Mines d'Alès), France



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EPNOE News

Innovation Award "Imagin'Mais" for starch aerogels

ARMINES/CEMEF, France, got an Innovation Award Imagin'Mais for thermal super-insulating starch aerogels from French professional organisations dealing with corn. The objective of the competition was to promote new applications of starches in association with students of different universities.

The work was performed by Master students Richard Bardl and Lucile Druel under the supervision of Tatiana Budtova and with help of Waltraud Vorwerg (Fraunhofer IAP, Potsdam, Germany). The first thermal super-insulating aerogels based on starch were synthesised by Richard Bardl who was doing his internship in CEMEF in the frame of his Master degree in Aachen University. The work was successfully developed by Lucile Druel also during her internship. Lucile is now doing her PhD on cellulose aerogels in CEMEF in the frame of the European project "Nanohybrids".

Aerogels are lightweight materials (density < 0.2 g/cm3) with open porosity; they are usually mesoporous with small macropores and with very high specific surface area up to 800 – 1000 m2/g. Classical aerogels are synthesized via sol-gel route either from inorganic (for example, silica) or organic (for example, resorcinol-formaldehyde) systems. One of the most extraordinary properties of silica aerogels is their thermal conductivity which can be as low as 0.012 - 0.015 W/ (m.K) in ambient conditions, much lower than that of air (0.025 W/(m.K)).

A new generation of aerogels was developed in the 21st century: they are biomass based and thus can be called bio-aerogels. Practically nothing is known about thermal conductivity of bio-aerogels, with only few publications reporting the conductivity below 0.02 W/m.K of pectin /1/, nanofibrillated cellulose /2, 3/ and alginate /4/ aerogels. We used five types of starches with amylose content varying from 0 to 100 % and prepared aerogels via dissolution-retrogradation-coagulation-super-critical drying route. We performed a detailed analysis of aerogels' density, morphology, thermal conductivity and mechanical properties, and showed that aerogels have a wide range of properties depending on starch origin and processing conditions. Pea starch aerogels possess thermal conductivity below that of air, around 0.021 – 0.022 W/m.K. The work was performed in collaboration with PERSEE center of MINES ParisTech.



On left : Lucile Druel getting award from Yves Bélegaud, jury member and President of USIPA, the Union of trade unions of starch and starch derivatives' industries.

On Right: Richard Bardl presents the results of his internship in March 2015 together with supervisor Tatiana Budtova.



Photo of pea starch aerogel and its morphology seen by SEM

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 This article was proposed by Armines-CEMEF, France

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EPNOE Member's Scientific Publications

At ARMINES-CEMEF, France:

- R. CASTELLANI, E. DI GIUSEPPE, J. BEAUGRAND, S. DOBOSZ, F. BERZIN, B. VERGNES, T. BUDTOVA

« Lignocellulosic fiber breakage in a molten polymer. Part 1. Qualitative analysis using rheo-optical observations". Composites: Part A 91 229–237 (2016)

- S. COSERI, M. BERCEA, V. HARABAGIU, T. BUDTOVA "Oxidation vs. degradation in polysaccharides: Pullulan – A case study". European Polymer Journal 85, 82–91 (2016).

- G. MARKEVICIUS, R. LADJ, P. NIEMEYER, T. BUDTOVA, A. RIGACCI "Ambient-dried thermal superinsulating monolithic silica-based aerogels with short cellulosic fibers" J. Material Science, 52, 2210–2221 (2017)

At ARMINES-C2MA, France:

- C. Badji, L. Soccalingame, H. Garay, A. Bergeret, J.C. Benezet (2017) Influence of weathering on visual and surface aspect of wood plastic composites: Correlation approach with mechanical properties and microstructure, Polymer Degradation and Stability, *137, 162-172- DOI* : 10.1016/j.polymdegrads-tab.2017.01.010

 - C. Paul, L. Le Pluart, N. Le Moigne, A. Bergeret (2017) Traitements de préparation et de fonctionnalisation des fibres végétales : Stratégies et conséquences sur les propriétés des fibres et composites. In : F Berzin (ed) Composites polymères et fibres lignocellulosiques : Propriétés, transformation et caractérisation pp 39-88

- A. Le Duigou, A. Bourmaud, A. Bergeret, J. Beigbeder, C. Baley (2017) Analyse de cycle de vie des biocomposites et gestion de leur fin de vie. In : F Berzin (ed) Composites polymères et fibres lignocellulosiques : Propriétés, transformation et caractérisation pp 263-309

- DEMEY H.; TRIA S.; SOLERI R.; GUISEPPI-ELIE A.; BAZIN I. (2017) Sorption of his-tagged Protein G and Protein G onto chitosan/divalent metal ion sorbent used for detection of microcystin-LR. Environmental Science and Pollution Research, 24(1), 15-24, http://dx.doi.org/10.1007/s11356-015-5758-y

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EPNOE Member's Scientific Publications

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- Edwards, V., Fontenot, K., Prevost, N., Pircher, N., Liebner, F., Condon, B., Preparation, Characterization, and Activity of Peptide-Cellulosic Aerogel Protease Sensor from Cotton. Sensors 16 (2016) 1789.

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News from outside the EPNOE Network

American Chemical Society National meeting

San Francisco, California, April 2-6, 2017.

The Cellulose and Renewable Materials division received 522 submissions, largely exceeding the previous years, showing how active is research interest in biobased materials. Among the 14 symposia organized by the Cellulose and Renewable Materials division, five symposia are co-organized by EPNOE members.

More information at: https://www.acs.org/content/acs/en/meetings/spring-2017.html

Position of Assistant/Associate Professor – Biopolymer Materials at Virginia Tech

Dept. of Sustainable Biomaterials at Virginia Tech (VT) seeks applications for the position of assistant/associate professor in the area of biopolymer materials. Tenure-track position will be at the Assistant/Associate Professor level, academic year (9 mo.) appointment. Position split ca. 50% fundamental or applied research and 50% teaching. Successful candidate is expected to develop internationally recognized research program in biomaterials from renewable resources, with major focus on biopolymers.

Candidates must have a Ph.D. in chemistry, polymer science, wood science, chemical engineering, biomaterials, materials science engineering, macromolecular science and engineering, or closely allied fields, with demonstrated experience in biomaterial science.

Candidate file review begins March 21, 2017, continuing until suitable candidate is identified. More information at: https://listings.jobs.vt.edu/postings/73978. Posting number TR0170016 Enquiries: contact Dr. Kevin Edgar at kjedgar@vt.edu

Cellulose fibres in concrete

For increasing the crack resistance of concrete, Cemex France is now substituting polypropylene fibres in concrete. One advantage is that it decrezases the amount of fibers by two compared to polypropylene fibres (600 à 300g/M3 instead of 600)

More information at : http://batijournal.com/cemex-france-integre-fibres-de-cellulose-100-recyclees-100-recyclables-betons-fibres/95446

European Biomass Conference and Exhibition

Stockholm (Sweden) 12-15 June 2017

The European Biomass Conference and Exhibition will be held in Stockholm, Sweden at Stockholmsmässan (Stockholm International Fairs and Congress Centre) from 12 to 15 June 2017.

1000 abstracts have been received from 78 countries all over the world. More than 50% of the abstracts were submitted on biomass conversion and more than 10% were addressing industry topics, which show the large interest in technological development and industrial application. Biomass resources and biomass policies, markets and sustainability were also in focus with 19% and16% of the abstracts received. More information on www.eubce.com

10th International Conference on Bio-based Materials

10 – 11 May 2017, Maternushaus, Cologne, Germany

The 10th International Conference on Bio-based Materials is aimed at providing international major players from the bio-based building blocks, polymers and industrial biotechnology industries with an opportunity to present and discuss their latest developments and strategies.

http://news.bio-based.eu/save-the-date-10th-international-conference-on-bio-based-materials



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News from outside the EPNOE Network

A forest project will benefit from the Investment Plan for Europe

The European Investment Bank and Irish Strategic Investment Fund have agreed to back a new initiative expected to support EUR 200 million of new investments in the Irish forestry sector. This represents the first Irish agricultural project to be backed by the European Fund for Strategic Investments, the heart of the Investment Plan for Europe.

The European Investment Bank (EIB) is the long-term lending institution of the European Union owned by its Member States. It makes long-term finance available for sound investment in order to contribute towards EU policy goals.

The Investment Plan for Europe focuses on strengthening European investments to create jobs and growth. It does so by making smarter use of new and existing financial resources, removing obstacles to investment, providing visibility and technical assistance to investment projects.

https://ec.europa.eu/ireland/news/eu-investment-plan-in-ireland-multi-million-support-to-irish-fo-restry_en

6th Biobased Performance Materials symposium

15 June 2017, Wageningen, the Netherlands

The 2017 edition of the BPM symposium will focus on the topic "How R&D on biobased materials leads to market entry". Key industry players from the entire value chain- ranging from agrifood to polymer processing companies, end application producers and users, will reflect on their R&D strategies. In the Biobased Performance Materials (BPM) research programme, companies and knowledge institutes from across the value chain are working together in developing high-quality materials based on biomass; materials that are being increasingly applied in practice. The research focuses on two types of materials: polymers produced by plants, and polymers from biobased building blocks produced via biotechnology or chemical catalysis. The BPM programme is partly financed by the Dutch Top Sector Chemistry and is led by Wageningen University & Research Food & Biobased Research.

For more information, contact BPM Project Office T: +31 317 480229 E: bpm.projectoffice@wur.nl I : www.biobasedperformancematerials.nl

9th European Symposium on Biopolymers: ESBP 2017

5-7 July 2017, Toulouse, France

ESBP 2017 will focus on recent developments in the area of biopolymers production, characterization and processing but also on the numerous applications of biopolymeric materials in a variety of fields, including medicine and medical devices, smart materials, coatings, personal care products, structural materials, agro food and agriculture, and many other areas.

The main spotlight of ESBP will be on Biopolymers like polyhydroxyalkanoates (PHA), cellulose, alginates, cyanophicin, poly phosphate, rubber (polyisoprene), etc.

3 April 2017: Abstract submission deadline https://esbp2017.sciencesconf.org/



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News from outside the EPNOE Network

2nd International Bioeconomy Congress

12-13 September 2017 in Stuttgart, Germany

The congress will be an interdisciplinary meeting dedicated to systemic approaches of bioeconomy for experts from research and industry and stakeholders. Basic research will be covered in addition to implementation strategies for markets and society in order to develop future bioeconomy scenarios.

www.bioeconomy-congress.de

Plant Based Summit

25-27 April 2017, Lille, France

International event dedicated to plant-based, green and sustainable chemistry. 30 high level conferences dedicated to biobased innovation and co-development with 100 international key speakers. 75 exhibitors. 700 top managers, key actors of the development of tomorrow's chemistry (downstream markets, chemical intermediates...) http://www.plantbasedsummit.com/

Confederation of European Paper Industries 2016 Preliminary Statistics Report

Confederation of European Paper Industries member countries paper and board production has decreased by 0.1% in 2016 compared to the previous year, according to preliminary figures. Total production in 2016 was around 91 million tonnes. Machine closures in Europe in 2016 were compensated by new capacities or upgrading of existing ones. The picture by sector maintains the situation witnessed in recent years with a continuation of the decline in the production of graphic grades and further growth in the output of packaging grades. Based on the cumulative data up to the end of the third quarter of 2016 it is expected that total paper and board deliveries for the year were down by 0.7% compared to 2015, whilst internal deliveries were stable. It would appear that the overall consumption of paper and board in CEPI countries in 2016 increased by 1% compared to 2015, based on the latest data available. It is estimated that the production of pulp (integrated + market) has increased by 0.7% compared to the previous year, with total output of approximately 35.6 million tonnes, and the output of market pulp increased by around 2.5%. It is estimated that utilisation of paper for recycling by CEPI members, at 43.2 million tonnes, decreased by around 0.3% compared to 2015.

The 2016 Preliminary Statistics Report is now available on the CEPI website athttp://www.cepi.org/ node/21116

www.cepi.org/topics/statistics

New trend report on Asian bio-based polymer markets

New nova-Institut GmbH trend report "Asian markets for bio-based chemical building blocks and polymers" shows latest data and development in China, Japan, Malaysia, South Korea, Taiwan and Thailand. A global capacity of 2.4 million tonnes bio-based polymers was established in 2016, from which more than 45% of the most important bio-based polymers are produced in Asia.

http://news.bio-based.eu/increase-on-asian-production-capacities-for-bio-based-chemicals-building-blocks-and-polymers/