



European Polysaccharide  
Network Of Excellence

N°37 - JANUARY 2017



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

## editorial

**D**ear Readers of the EPNOE Newsletter,

I wish you, your family and all the persons you love a very healthy, joyful and successful year 2017. I thank you for subscribing to the EPNOE Newsletter and hope you find it useful.

2017 will see several important events in the EPNOE community such as several meetings for preparing basic and applied research projects.

As you may know, EPNOE installed a Junior Scientist group with the objective of organizing a platform for young scientists willing to be personally involved in EPNOE life.

They organized several events in 2016 like the successful 2nd International EPNOE Junior Scientists Meeting “Future perspectives in polysaccharide research” in Sophia Antipolis (France), in October and an education course and mini symposium organized in Graz in June. This group is growing, showing the interest of being active in the EPNOE community. It is now composed of 15 scientists from 15 different EPNOE member institutions in 11 different countries. This group will have two main types of activities:

1- Participation to Executive Board work in order to understand how EPNOE works, bring suggestions and take care of management actions. Members will rotate by groups of six.

2- Junior scientist specific activities: Junior scientists will devise, push and conduct their own specific activities in order to develop EPNOE and their own career.

The EPNOE community will be enriched by the ideas, enthusiasm and activities of our junior colleagues.

Do not forget the 5th EPNOE International Polysaccharide Conference supported by EPNOE and the American Chemical Society. It will be held in the Friedrich Schiller University of Jena, Jena, Germany, August 20 – 24, 2017. See at the end of this Newsletter the necessary information to register.

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



#### Events:

- **BAMBOOst** "International Conference on Bamboo Utilisation", April 24-26, 2017, Wageningen (The Netherlands)

More information: <http://www.wur.nl/en/activity/Conference-Bamboost.htm>

- **Mini-symposium "Carbohydrates in food, pet food & feed"**, 27 March 2017, Utrecht (The Netherlands)

Contact: [carbohydratessymposium@eurofins.com](mailto:carbohydratessymposium@eurofins.com)

- **Call for nominations, Heinzl Mondi Sapi Award 2017**, will award 3 prizes for young researchers (€ 3333.- per award personally to the researcher) during the course of the Paper&Biorefinery Conference 2017, which will be held in May, in Graz, Austria.

Contact: [office@paper-biorefinery.com](mailto:office@paper-biorefinery.com)

- **5th EPNOE International Polysaccharide Conference "POLYSACCHARIDES AND POLYSACCHARIDE-BASED MATERIALS: FROM SCIENCE TO INDUSTRIAL APPLICATION"**, Friedrich Schiller University of Jena, Jena, Germany, August 20 – 24, 2017

Contact: [https://www.epnoe\\_2017.uni-jena.de](https://www.epnoe_2017.uni-jena.de)

#### Awards:

- At **Jena University, Germany**:

Dr. Michael Schöbitz won the 3rd place of the of the Young Scientist Competition sponsored by German Credit Bank (DKB) and Association of Innovative Enterprises (VIU e. V.) with his studies on dendronized cellulose and amino cellulose derivatives for sensor applications.

#### Masters & PhD defenses:

- At **Jena University, Germany**:

- **Konrad Hotzel** defended his PhD thesis "Novel dextran derivatives as non-viral vectors for gene delivery".



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## EPNOE News

### Main activities performed by EPNOE members in 2016

#### Preparation of a brochure describing the activities of Members

This brochure has been used for promoting member's activities as well as for organizing partnering meetings.

#### Research and innovation activities

- Meeting between EPNOE members (brain storming and face-to-face meetings) in February in Sophia Antipolis (France). The meeting was well attended and was useful according to participants.
- Meeting between EPNOE members and companies not members of EPNOE (face-to-face meetings) in July 2016 meeting in Paris. We made a wide communication about this event and it increased the awareness of EPNOE in the industrial community. Companies presented their vision of future of their experiences and we had many face-to-face meetings which are generating ideas for collaborations.
- Latest trends and opportunities in polysaccharide science & technology, December 2016 in Sophia Antipolis (France) with a comprehensive, one hour review of challenges and progress in seven key areas (plant fractionation & biorefinery, packaging & cellulose-water interaction, fibers derived from plants & polymer composites, lignin as a precursor for biobased polymers, medical applications for polysaccharides, aging, yellowing, and degradation of cellulosics, fatty acid cellulose derivatives).

**Relations with other consortia** (Polish Innovation Centre, Poland; Céréales Vallée, Clermont-Ferrand, France; Bioeconomy Cluster, Leuna, Germany)

Interactions with other clusters took place during three meetings (July meeting in Paris where we had a presentation of Bioeconomy cluster, Halle in June where EPNOE was presented to Bioeconomy cluster and Lodz in October where all clusters met).

#### Junior scientist activities

- Organisation of the work between junior scientists
- Decision to prepare a COST action
- Meeting around education in Graz
- Organisation of the second Junior Scientists meeting in Sophia Antipolis in October 2016

#### **Continuing the EPNOE SpringerBrief series on Biobased Polymer Science and Technology**

Five books have been written and are in the editing or reviewing process. In total, 22 books are under contract with Springer.

#### Sponsoring meetings

- CIADICYP 2016 Espoo, Finland – 1000 €
- ACS meeting, San Diego, USA – No transfer requested
- International Carbohydrate Conference, New Orleans, USA – 500 USD (458,85 €)

#### Organisation of workshops and courses

Cellulose Technology in April 11-14 in Abo, Finland.

*(continued overleaf)*





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## EPNOE News

### Main activities performed by EPNOE members in 2016 *(continued)*

#### **Increase of the collaboration with ACS and start of increasing our relations with South America**

Agreements with ACS are now signed for every ACS Spring meeting. EPNOE scientists are active members of several ACS Cell committees.

Establishment of collaborates with South America is building, with the distribution of the newsletter and the participation of two meetings, one in Finland (CIADICYP) and one in Uruguay (I&S Workshop and Forum in Bioeconomy).

#### **Preparation of EPNOE 2017**

The preparation is on-going, with the first circular distributed.

#### **Newsletter**

Five Newsletters were published (January, March, May, July and November).

#### **Affiliated members**

Affiliation of ETH Zurich and Mid-Sweden University in 2016 and KU Leuven in 2016-2017.  
Decision to move several Affiliated members in the Regular member category

#### **Website**

Activation of the new EPNOE website (secure, simpler and up-dated).

Meetings Information, News and Newsletters updated on the website.

Several databases updated on the EPNOE website (toolbox, on-going Phd and Post-Docs).

#### **List of EPNOE meetings**

- 28 January 2016 Executive Board meeting
- 02 February 2016 General Assembly meeting, Sophia Antipolis  
Face to face meeting between EPNOE members
- 03 February 2016 Meeting of the Junior group
- 14-16 June 2016 Meeting with Bioeconomy Cluster, Halle, Germany
- 20-22 June 2016 Education course and mini symposium organized in Graz by the junior group
- 11 July 2016 Executive Board meeting (Paris)
- 11-12 July 2016 Meeting with companies outside EPNOE, Paris
- 05-07 October 2016 Meeting with clusters, Lodz, Poland
- 13-14 October 2016 Second EPNOE Junior meeting, Sophia Antipolis
- 14 October 2016 Meeting of the Junior group
- 08 December 2016 Governing Board meeting, Sophia Antipolis
- 08-09 December 2016 EPNOE events directed towards outside EPNOE
- 08-09 December 2016 Meeting of the Junior group



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## EPNOE News

### EPNOE members participated to the 7th Workshop on Cellulose, Regenerated Cellulose and Cellulose Derivatives International conference

Ninety cellulose researchers from twenty countries gathered in Örnsköldsvik on 15-16 November for presentations and discussions regarding the latest data within cellulose research. "The 7th Workshop on Cellulose, Regenerated Cellulose and Cellulose Derivatives" was organized by the universities in Umeå and Karlstad together with Domsjö Fabriker, SP Processum and MoRe Research. Karlstad University is an EPNOE member.

Nine EPNOE members were present, Karlstad University (Sweden), Armines/MinesParisTech (France), Boku Vienna (Austria), Lenzing AG (Austria), Södra (Sweden), VTT (Finland), KTH (Sweden), University of Jena (Germany) and Kiram/Telia (Sweden)



*Members of EPNOE in Örnsköldsvik*

"This was the seventh cellulose conference of this kind and this was the second time it was held in Örnsköldsvik", says Ola Sundman, Researcher at Department of Chemistry, Umeå University. "There is great interest in development of new products from cellulose and it is an important research field, not only here in the Nordic countries but in many parts of the world. The fact that as many as 90 researchers from universities and companies participated, also from non-European countries, shows that the conference programme was important as well as appealing. What really pleased us is that 45 % of the participants are industry scientists."

"In Örnsköldsvik, we also organized visits at Domsjö Fabriker, MoRe Research and SP Processum", says Karin Jonson, Research engineer, SP Processum.

The programme consisted of 25 oral presentations and a poster session. It was a great opportunity to meet colleagues and discuss hot issues in the field of cellulotics.

*This article was proposed by Patrick Navard, ARMINES-CEMEF, Sophia-Antipolis (France)*





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## EPNOE News

### EPNOE joined the "I&S WORKSHOP. Insights and strategies towards a bio-based economy" in Montevideo, Uruguay, on November 2016

The "I&S WORKSHOP" was organized by a multidisciplinary group of scientists working in the field of biobased materials, mainly from Uruguayan institutions. Its aim was to provide an opportunity for meeting key stakeholders engaged in the sustainable and efficient use of lignocellulosic biomass and create a framework for discussion on the latest developments regarding materials prepared from lignocellulosic biomass.

In this context, EPNOE was involved in the scientific meeting, including the delivery of the plenary lecture. Several EPNOE groups were present (VTT, Abo, Leuven, Graz, Vienna, Maribor and Armines-Mines Paristech) including the President and two vice-Presidents. It was the occasion to hold specific meetings aimed at building links between Europe and South America.

A set of actions were decided in order to increase links between EPNOE members and researchers from Uruguay including organizing exchange of students, bringing Uruguayan research groups into European actions like COST, organizing or co-participating to conferences and potentially trying to involve the Montevideo Group. Aside the scientific and the EPNOE-Uruguayan institutions meetings, the European delegation enjoyed the very friendly atmosphere of the conference and the beauty of the location. For many of us, it was our first visit to this nice country.

More information at [www.is2016.com](http://www.is2016.com) or <http://fliphtml5.com/qwkz/gxlm>



*This article was proposed by Patrick Navard, ARMINES-CEMEF, Sophia-Antipolis (France)*



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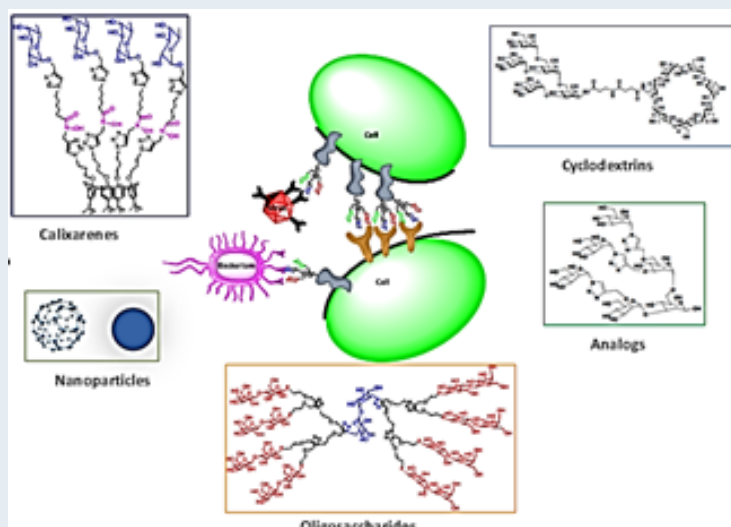
## EPNOE News

### Laboratoire de Glycochimie, des Antimicrobiens et des Agroressources (LG2A), Université de Picardie Jules Verne (Amiens, France)

The LG2A laboratory includes 29 permanent researchers, 7 engineers and technicians, 2 managers, and about 20 contractual staff (PhD, Post-doc). The LG2A produces each year ca. 3 patents and ca. 45 publications in peer-reviewed international journals. Our skills revolved around organic chemistry and characterization of saccharide derivatives. Our work is has two axes: Chemistry for Living Systems (antimicrobials, the study of molecular recognition and vectorisation) and Chemistry for Sustainable Development (use of applied methodologies on carbohydrate substrates and biomass promotion).

In the area of Chemistry for Living Systems, we are developing the production of anionic oligo-saccharides from polysaccharides and/or by chemical synthesis, and the selective modification of natural polysaccharides. We also develop glycoclusters to study interactions between sugars and lectins, as well as antibacterial molecules, in order to block the formation of biofilms, caused by bacteria, which create resistance to antibiotics as well as anti-viral molecules based on oligo-saccharides against Dengue fever. We are working on the modification of amphiphilic cyclodextrins through chemistry and enzymes, for vectorisation.

#### Synthetic tools for the study of sugar-protein interactions



(continued overleaf)



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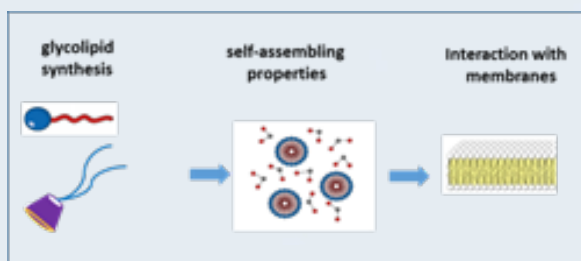


## EPNOE News

### Laboratoire de Glycochimie, des Antimicrobiens et des Agroressources (LG2A), Université de Picardie Jules Verne (Amiens, France)

(continued)

#### Synthesis and properties of sugar-based amphiphilic molecules



In the **Chemistry for Sustainable Development** domain, we are working on the synthesis of biodegradable polymers and biobased flame retardants, developing methods to oxidise oligosaccharides to be used in many applications in agriculture and health.

We have collaborations with industries, in the ITE PIVERT consortium, on the synthesis of glycolipids and lipidyl-cyclodextrins to study their properties and their interaction with biological membranes, and to establish predictive models of surfactants as a function of their chemical structure.

#### A few recent publications:

- Multivalent sialylation of  $\beta$ -thio-glycoclusters by *Trypanosoma cruzi* trans sialidase and analysis by High Performance Anion Exchange Chromatography. R Agustí et al., *Glycoconj. J.* **2016**, 33, 809-818.
- Radical Coupling Allows a Fast and Tuned Synthesis of Densely Packed Polyrotaxanes Involving  $\gamma$ -Cyclodextrins and Polydimethylsiloxane. F Blin et al., *Macromolecules*, **2016**, 49, 3232–3243.
- Physico-chemical properties and cytotoxic effects of sugar-based surfactants: impact of structural variations. B Lu et al., *Colloids Surf. B: Biointerfaces* **2016**, 145, 79-86.
- Glycochemical Applications of Diels-Alder Reaction. S Laclef et al., *Curr. Org. Chem.* **2016**, 20, 2379-2392.
- Improvement of gold-catalyzed oxidation of free carbohydrates to corresponding aldonates using microwaves. M Omri et al., *ACS Sustainable Chem. Eng.* 2016, 4, 2432-38.

#### Contacts:

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<http://www.u-picardie.fr/labo/LG/>

*This article was proposed by José Kovensky & Véronique Bonnet,  
Univ. de Picardie Jules Verne, Amiens (France)*





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## EPNOE News

### Two new Master Programs in the Field of the Biobased Industries

Marlene Kienberger(1), Maarten Arentsen(2), Wolfgang Bauer(1)

(1)Graz University of Technology, (2)University of Twente

The H2020 project BioEnergyTrain aims at closing the gap between available and needed qualified personnel in the field of the biobased industries - qualified personnel enabled to act along the whole value chain in terms of engineering as well as life cycle analysis, economics and management. The project brings together fifteen partners from six EU countries to create two new master curricula and to develop new cooperative teaching formats like pilot plant courses or student camps in collaboration with industry. A further target is to create teaching material aiming at modern teaching approaches encompassing the whole value chain from field/forest to integration to sustainable products and energy systems. The consortium consists of tertiary education institutions, research centers, professional associations and industry stakeholders. Within the project the two master programs, “BioRefinery Engineering (BRE)” and “BioResource Value chain management (BVM)” are developed, with the BRE curriculum to be implemented at Graz University of Technology (A) and the BVM curriculum at the University of Twente (NL).

The master program “Bioresource Value Chain Management” will provide the knowledge to manage, optimize and innovate bioresource supply chains to improve resource utilization within the framework of a bioeconomy. The aim of the program is to educate professionals to analyze, develop, manage and innovate existing and new bioresource value chains in a European context.

The master program “Biorefinery Engineering” has a chemical engineering focus and is practice oriented in content and approach. With respect to content, graduates obtain the knowledge and skills to plan, develop and optimize new technologies and processes in the field of the biobased industries by linking existing and new resources, industries and products.

Practice orientation in approach is reflected in collaboration with industry in several parts of the two curricula, as e.g. the integration of knowledge and skills in business oriented projects and in master thesis research. Participation in international summer schools, student camps or pilot plant courses, organized together with industry, are actively promoted and are rewarded by credits in the program.

BRE addresses particularly bachelor students from the fields of chemistry and environmental systems sciences. Bachelor degree students from other disciplines will also be admitted, but will have to take additional courses from an adjustment module, depending on their field of study. BVM is open for graduated students of science and engineering bachelor programs.

Both curricula will start in the winter semester 2017 and are looking forward working with students, interested in actively creating our future.

*For further information regarding the two curricula please contact:*

*BVM: Maarten Arentsen, University of Twente, Email: [m.j.arentsen@utwente.nl](mailto:m.j.arentsen@utwente.nl)*

*BRE: Marlene Kienberger, Graz University of Technology, Email: [marlene.kienberger@tugraz.at](mailto:marlene.kienberger@tugraz.at)*

*This article was proposed by Prof. Dr. Wolfgang Bauer, TU Graz, Austria*





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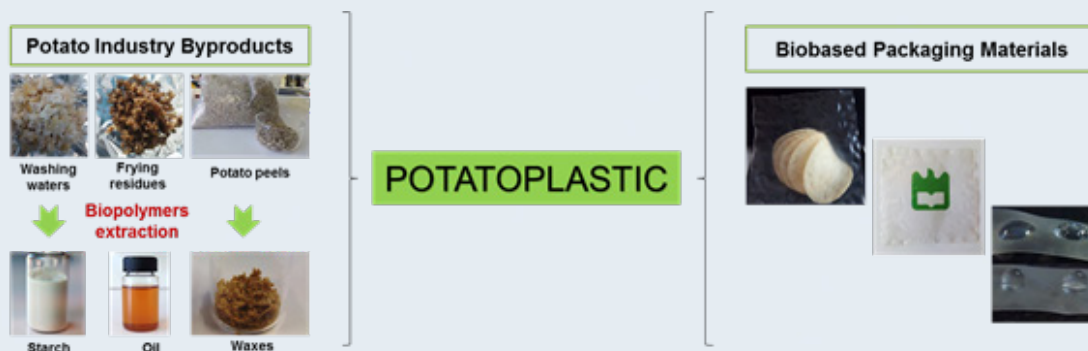
## EPNOE News

### “POTATOPLASTIC”: reusing potato industry byproducts on food packaging materials

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Packaging materials are essential to protect and preserve foodstuffs, from production until reaching the final consumer. Amongst the materials used to produce packaging, synthetic polymers, commonly called plastics, are widely applied due to their mechanical strength, easy processing and low production cost. However, their environmental impact has motivated the search for alternative solutions. Biopolymers, namely polysaccharides, have shown promising results in the development of new packaging materials. The large portion of food processing byproducts, often rejected as waste by industry, can be a source of raw materials for biobased packaging. In this context, “POTATOPLASTIC” project, funded by Portugal2020, intends to develop materials based on potato industry byproducts for multiple purposes as fresh food packaging. The first research revealed the feasibility using biopolymers extracted from potato industry byproducts, namely washing waters starch, potato peel waxes and frying oils to produce transparent, hydrophobic and flexible films able to be used in various applications. This strategy is a promising biodegradable and sustainable approach for the development of biobased packaging materials through a concomitant industrial waste valorization. Next experimental steps will involve the adjustment of physicochemical and mechanical properties as well as gas/water vapor permeability of potato-based films, always maintaining a bio-formulation. This project has been developed by QOPNA and CICECO at the University of Aveiro (Portugal) in collaboration with a materials producing company, “Isolago – Indústria de Plásticos, S. A.” (Pontével, Portugal), having the potato chips industry “A Saloinha” (Mafra, Portugal) as a biobased raw materials supplier.



#### Authors:

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QOPNA & CICECO  
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*This article was proposed by University of Aveiro, Portugal*



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## EPNOE News

### Textile fibres from wood and zero-value textiles

**There is a constantly growing demand for textile fibers in the world. Cellulose pulps as well as waste textiles and recycled wood fibers can be turned into fibers for the textile industry using various dissolution and processing technologies of cellulose. VTT Technical Research Centre of Finland Ltd is aiming at facilitating the commercial up-take of the most promising technologies.**

In order to produce textile fibers from cellulosic material such as wood pulp, cellulose is first activated, then dissolved into suitable solvent and regenerated to fibres that can be used to produce yarn that is suitable for textile production.

The Biocelsol process is a sustainable option to viscose process, as it uses no hazardous chemicals such as carbon disulfide (CS<sub>2</sub>). In this process, mechanical and enzymatic pre-treatment is used to activate cellulose pulp prior to dissolution. The pulp is dissolved with aqueous sodium zincate via cooling and thawing stages and regenerated by wet spinning to cellulose fibres suitable for textile production. Biocelsol was originally developed by Tampere University of Technology in collaboration with VTT.

VTT recently made a critical improvement to the mechano-enzymatic pre-treatment step enabling a faster and less enzyme consuming process (Grönqvist et al. 2015). Additionally, due to the improved pre-treatment, higher cellulose dope concentrations can be used in the dissolution stage. VTT is currently developing this technology towards mill-scale together with companies in a recently started BBI JU funded EU project entitled "Novel processes for sustainable cellulose based materials –NeoCel".

Another interesting approach is to turn old zero-value cotton waste textiles and recycled paper and cardboard fibres into new fibres for the textile industry. Cellulose carbamate technology developed by VTT, and Ioncel-F developed by Aalto University are two promising technologies for this.

High quality products are created from waste textiles and fibres in the on-going EU-project Trash-2-Cash. Furthermore, VTT aims to demonstrate the feasibility of carbamate fibre processing technology for waste textiles in an industrial scale in the ongoing national Circular Economy of Textiles (TEKI) project.

*For further information, please contact:*

*Ali Harlin, Research Professor, +358 40 533 2179, [ali.harlin@vtt.fi](mailto:ali.harlin@vtt.fi)*

*Anna Suurnäkki, Research manager, +358 40 5257 432, [anna.suurnakki@vtt.fi](mailto:anna.suurnakki@vtt.fi)*

*Publications*

*Grönqvist, S, Kamppuri, T, Maloney, T, Vehviläinen, M, Liitiä, T, Suurnäkki, A. (2015) Enhanced pre-treatment of cellulose pulp prior to dissolution into NaOH/ZnO. Cellulose 22:6, 3981-3990.*

*This article was proposed by Katri Kontturi, VTT, Finland*





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## EPNOE News

### Cellulosic Materials in Advanced Materials – Chemistry and Technology of Biobased Materials Group at TU Graz, Austria

The philosophy in our research group is to realize new applications for cellulose based materials. Together with our collaboration partners either directly at TU Graz or at closely located universities, we have been able to realize cellulose based photoresist materials, thin film transistors having a cellulose based dielectric layer, and nanocomposite thin film solar cells using cellulose materials as matrix. In all of these applications, trimethylsilyl cellulose (TMSC) plays a major role. TMSC is commercially available from an EPNOE member (TITK) and can be easily processed into thin films; a prerequisite for the above mentioned applications. Upon exposure to acids or vapors thereof, cellulose is created. We exploited this particular property in the frame of the European 'PhotoPattToCell' project to create photoresists for semiconductor industry on the basis of cellulose. The main idea was based on photoacid generators (PAGs) which were added to TMS solutions prior to processing (spin-coating). These PAGs release acids upon exposure to UV-light and allow for the creation of 2 and 3D patterns in a range from 800 nm to ten microns. In order to make smaller structures (70 nm and larger), electron beams have been very recently employed to convert TMSC to cellulose.

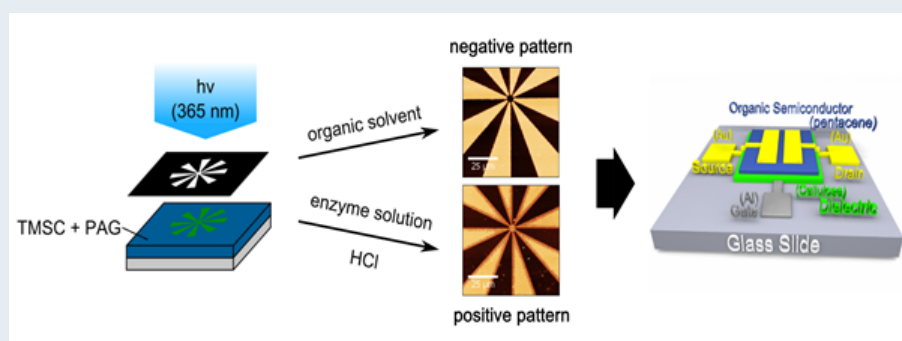


Figure - Formation of a cellulose based positive or negative type photoresist (left) and how these resists can be implemented in a thin film transistor (right).

TMSC nanocomposite thin films where CuInS<sub>2</sub> nanocrystals were incorporated have been exploited as active layer to manufacture solar cells with a photocurrent efficiency of ca 1%. The preparation of the active layer was performed using soluble xanthate precursors which were added to TMSC prior to processing and after a heat treatment they decomposed to form CuInS<sub>2</sub> nanocrystals with a size of ca 5 nm.

**Contact:** Assist: Prof. Dr. Stefan Spirk ([stefan.spirk@tugraz.at](mailto:stefan.spirk@tugraz.at)), Institute of Paper, Pulp and Fiber Technology, TU Graz, Austria.

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This article was proposed by Stefan Spirk, TU Graz, Austria



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## EPNOE Member's Scientific Publications

### At Jena University, Germany:

Synthesis and film formation of furfuryl- and maleimido carbonic acid derivatives of dextran Th. Elschner, F. Obst, K. Stana-Kleinschek, R. Kargl, Th. Heinze *Carbohydrate Polymers* (2016) DOI:10.1016/j.carbpol.2016.12.038

Melttable magnetic biocomposites for controlled release R. Müller, M. Zhou, A. Dellith, T. Liebert, T. Heinze *Journal of Magnetism and Magnetic Materials* (2016), DOI: 10.1016/j.jmmm.2016.09.031

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## News from outside the EPNOE Network

### **CHEMWOOD "Chemical Engineering and Mechanics in Wood: X-ray and neutron scattering, microscopy and modelling"**

23-24 March 2017, Institute Laue Langevin, Grenoble (France)

*Wood swelling and related mechanical property variations are crucial problems for the durability and usage in construction and furniture and for the preservation of cultural heritage. There are several established methods for wood impregnation and chemical modification but none of them can be predictively modeled. A robust and comprehensive microstructural characterization preliminary to the modelling is based on combined real and indirect space studies. This joint ILL and ESRF workshop will present experimental possibilities to follow adsorption of water, salts or reactivities in cellulose-based materials (techniques, sample-environments: humidity, temperature, pressure, mechanical stress) in link with open questions from theoreticians (success and failure of predictive models) to current limitations in commercial applications (process, properties enhancement, preservation).*

**More information:** <https://indico.ill.fr/indico/event/63/>

**Contact:** [chemwood@ill.fr](mailto:chemwood@ill.fr)

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### **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>

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### **European Bioplastics' annual market data update**

*The results of European Bioplastics' annual market data update, presented today at the 11th European Bioplastics Conference in Berlin, confirm a stable growth of the global bioplastics industry. The market is predicted to grow by 50 percent over the coming years despite the low oil price.*

**More information at** <http://www.european-bioplastics.org/market-data-update-2016/>

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### **Market for technical plant fibers in France (in French)**

*Description of the market for technical fibers (flax ; hemp, ...) in France.*

*To have a copy of this report, contact [pierre.bono@f-r-d.fr](mailto:pierre.bono@f-r-d.fr) - [www.f-r-d.fr](http://www.f-r-d.fr)*

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### **ICBMC 2017 - International Conference on Biobased Materials and Composites**

Nantes (France) 29-31 March 2017

*The conference aims to emphasize interdisciplinary research on processing, morphology, structure and properties of natural polymers, biomaterials, biopolymers, their blends, composites, IPNS and gels from macro to nano scales and their various applications.*

*Call for abstracts is opened until december,15, 2016.*

**More information and registrations:** <https://symposium.inra.fr/icbmc2017>



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## News from outside the EPNOE Network

### **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.*

**More information on [www.eubce.com](http://www.eubce.com)**

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### **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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### **1st IWA Conference on Algal Technologies for Wastewater Treatment and Resource Recovery**

*16 and 17 March 2017 - Delft, The Netherlands*

**For more information about the conference visit [www.unesco-ihe.org/algaltechnologies](http://www.unesco-ihe.org/algaltechnologies)**

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### **7th Nordic Wood Biorefinery Conference**

*Stockholm 28-30 March 2017.*

*The leading event where research and industry meet to discuss recent wood-based biorefinery developments.*

**Read more about the conference here: <http://www.innventia.com/nwbc2017>**

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