

Editorial

This special issue of *Journal of Renewable Materials* contains the contributions of authors in attendance at the 4th International Conference on Biobased Materials and Composites (ICBMC'17) held at the INRA-BIA unit in Nantes, France. This conference is one of the most successful scientific events in the field of biobased materials and composites. The goal of the ICBMC conferences is to foster an understanding of scientific and technical progress, and knowledge of the field of natural polymers extraction, biopolymers, biomaterials and their blends, composites, and biobased materials for energy conversion and IPNs. The conference was attended by many participants from more than 20 countries all over the world, including chemists, physicists, biologists, technologists, doctors and engineers. This conference was an opportunity to provide a discussion forum for the worldwide community of scientists and engineers in the field of biobased materials and composites. Many contributions from interdisciplinary research were presented on processing, morphology, structure and properties of natural polymers, biomaterials, biopolymers, their blends, composites, IPNs and gels from macro- to nanoscale and their various applications. Contributions on biocomposites and bionanocomposites were numerous and of very good scientific quality, as determined by the scientific committee of the ICBMC conference.

It's worth noting that the ICBMC conference organizers have decided to dedicate each ICBMC conference to eminent professors and researchers as a small acknowledgment of their contributions to polymer science in general and polymers from renewable resources in particular. ICBMC'17 was dedicated to professor Hans R. Kricheldorf, who has provided a globally recognized scientific contribution.

All 13 papers in this special issue were accepted with due process developed by the editorial board of *Journal of Renewable Materials*. The topics covered in these research articles revolve around new concerns in the field of biomaterials and biocomposites, namely self-assembled materials, nanocelluloses and their aerogels, biocomposites, biosourced monomers and their polymers, encapsulation of biopolymers, etc.

Self-assembled biomaterials are topical and in this special issue three papers dealing with this subject have been published. Christophe Olivier *et al.* prepared conducting thin films of hybrid materials of cellulose nanocrystals (CNCs) single-walled carbon

nanotubes (SWNTs) using layer-by-layer technique. A kinetic model has been used to describe and predict the dispersion of these nanoparticles. An example of the use of biobased materials for tissue engineering was studied by David Azria *et al.* using chitosan and collagen. In this study, chitosan/collagen microspheres were prepared using microfluidics technology and assembled to elaborate materials exhibiting functionalization gradients. The control of properties of blends and hybrid materials pass through the control of the interactions between all the components. To find out how to enhance the interaction between carbon nanotubes and organosolv lignin, Jan Badorrek *et al.* investigated intermolecular interaction potential using experimental (Hansen solubility parameters calculation) and theoretical (dispersion-corrected density functional theory simulations) approaches. The studied materials could be used to replace PAN for the production of carbon fibers.

Cellulose-based nanostructured hybrid aerogels are increasingly becoming attractive materials owing to the interesting properties they could offer in thermal insulation, light and conducting materials, biomedical scaffolding, etc. In this special issue, three papers dealing with this family of materials are published. Dounia Bendahou *et al.* studied nanoporous hybrid aerogels based on cellulose nanofibers and silica (SBA-15) particles to achieve lower thermal conductivity of these materials. On the other hand, Rajendran Muthuraj *et al.* investigated the use of cellulose nanofibers and carbon nanotube to prepare cellulose-based aerogels for vapor and pressure sensor applications. Lars Helmlinger *et al.* investigated amine-functionalized cellulose foams for CO₂ capture and storage. The authors succeeded in optimizing the amount of polyethylenimine to reach a high capacity yield of captured CO₂.

The use of cellulose as a base material for advanced functional materials is a smart and high-added-value research subject. One selected paper concerns the development of cellulose-based drug sensors. In this study, Maxime Pontie *et al.* clearly demonstrate the interest in cellulose-based sensors for electrochemical determination of paracetamol.

Investigations on biosourced polymers and their new applications always take priority in international research. In this context, three original papers have been selected for this special issue. Noé Navarro-Guajardo *et al.* studied the performance of Candelilla

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wax as a biodegradable matrix for microencapsulation of a phosphate fertilizer using a modified spray chilling process. A new ionogel based on thermoset polymer derived from natural rubber and ionic liquid was investigated by T.K.N. Tran *et al.* The authors adjusted the properties of the ionogel by adjusting the thermoset structure. The third selected paper concerns the investigations of G. El hajj Sleiman *et al.*, who provided a better understanding of crystallization under injection molding conditions by inline measurements taken during the process. The authors analyzed the influence of two injection molding key parameters (holding pressure and mold temperature) on the crystallization of PHBV during the cooling step.

In addition to the abovementioned papers, we have selected three other interesting papers, one on wood modification in which Charlotte Grosse *et al.* reported and evaluated three different approaches to modify beech wood by lactic acid oligomers. The second on the in-soil biodegradation of *Stipa tenacissima* leaves, in which Zakia Khelifi *et al.* evaluated the evolution of crystallinity and mechanical properties with biodegradation time. In the third paper, Kahina Iggui *et al.* investigated the effects of accelerated photooxidation on the molecular structure, thermal and mechanical properties of Cast PHBV and PHBV/Cloisite 30B (3 wt%) bionanocomposites.

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We look forward to other special issues of the *Journal of Renewable Materials* being published in conjunction with the next session of the ICBMC conference.

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