



# BOOK OF ABSTRACTS



**7th International  
Polysaccharide Conference**  
11-15 October 2021, Nantes, France



Dear colleagues and friends,

It is our great pleasure and honour to welcome you to the 7<sup>th</sup> International Polysaccharide Conference that is held in Nantes, France. The conference is the initiative of the European Polysaccharide Network of Excellence (EPNOE) Association in collaboration with the Cellulose Society of Japan and the Cellulose and Renewable Materials Division of the American Chemical Society. The organisers are from five French laboratories recognized for their research in polysaccharides and their commitments to EPNOE.

In the best traditions of the EPNOE Association, the conference is promoting a wide dissemination of research results and cross-fertilization of ideas in the field of polysaccharides. The scientific program is based on the advice of eminent scientists from the scientific committee and proposals of topics from session organisers. The program covers all fundamental and applied research involving polysaccharides, and the venue offers a friendly environment and excellent conditions for networking and exchange of ideas.

We hope that the conference is enjoyable and fruitful, fostering meeting colleagues and friends and building collaborations.

We wish you a very pleasant stay in Nantes.

On behalf of the organising committee:  
Bernard Cathala and Johnny Beaugrand (INRAE, France)  
Tatiana Budtova (CEMEF/Mines ParisTech, France)  
Nicolas Le Moigne (Mines Ales, France)

From EPNOE Association:  
Pedro Fardim (KU Leuven, Leuven, Belgium)  
Carmen Freire (university of Aveiro, Portugal)

From ACS:  
Kevin Edgar (Virginia Tech, USA)

From Cellulose Society of Japan:  
Junji Sugiyama (Kyoto University, Japan)

Our special thanks to sponsors who helped to make this conference possible:



## S05-P-11 - IMPREGNATION OF CELLULOSE ACETATE WITH NATURAL BIOACTIVE COMPOUNDS USING SUPERCRITICAL CARBON DIOXIDE

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Porous acetate cellulose (CA) beads were tested as carriers for thymol, eugenol and carvacrol, natural compounds well known for their biological activity. For this purpose, selected compounds were impregnated into CA using the environmentally friendly medium, supercritical carbon dioxide (scCO<sub>2</sub>). Firstly, impregnation of CA with thymol was tested in the pressure range of 10, 15, and 20 MPa for 2 and 24 h at a temperature of 50 °C. The pressure increase resulted in only slight increase in thymol loading. On the other hand, an increase in operating time at 10 MPa resulted in increase in thymol loading from 4.6 to 66.2%. Following the obtained results, subsequent experiments of CA beads impregnation with eugenol and carvacrol were performed at 10 MPa during 2 h, achieving amounts of loaded eugenol and carvacrol of 1.33 and 4.6%, respectively. The presence of thymol, eugenol and carvacrol on/in CA beads as well as its interaction with polymer was confirmed by the FTIR analysis. SEM images revealed that the porous structure of CA beads remained unchanged after its exposure to neat scCO<sub>2</sub>. However, loading of CA with thymol, eugenol and carvacrol at selected conditions led to the slight change in material texture and morphology. This observation was further examined using mercury intrusion porosimetry. While neat CA had an average pore diameter of 286 nm and porosity of 58%, loaded CA beds expressed an overall reduction in these values. The results were in line with the amounts of loaded active compounds. Namely, for the higher amount of loaded active substance, the higher decrease of specific surface area was observed. These results gave the guidelines for an effective functionalization of neat CA with compounds that have pronounced antimicrobial and antioxidant activity.

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