



ZELLCHEMING-CONFERENCE

CELLULOSE-BASED MATERIALS –
FROM SCIENCE TO TECHNOLOGY

Bo Pang¹, Hua Zhang² and Kai Zhang³

High internal phase Pickering emulsions stabilized by polymeric dialdehyde cellulose-based nanoparticles

1 Bo Pang, Wood Technology and Wood-based Composites, Georg-August-University of Goettingen, Büsgenweg 4, D-37077 Göttingen, Germany, e-Mail bpang1@uni-goettingen.de

2 Hua Zhang, Wood Technology and Wood-based Composites, Georg-August-University of Goettingen, Büsgenweg 4, D-37077 Göttingen, Germany, e-Mail hzhang1@uni-goettingen.de

3 Prof. Dr. Kai Zhang, Wood Technology and Wood-based Composites, Georg-August-University of Goettingen, Büsgenweg 4, D-37077 Göttingen, Germany, e-Mail kai.zhang@uni-goettingen.de

Abstract

Developing sustainable micro/nanoparticles that can be used to stabilize high internal phase Pickering emulsions (HIPPEs) via simple methods is of great significance. Herein, polymeric nanoparticles, fabricated via a facile interfacial reaction between dialdehyde cellulose (DAC) and aniline were successfully used to stabilize O/W HIPPEs. The ratio between aldehyde groups in DAC and aniline demonstrated great effect on the emulsifying performance of the resultant DAC-aniline nanoparticles (DANPs). DANPs prepared with suitable ratios of aldehyde groups to aniline (from 20/1 to 6/1) were able to stabilize HIPPEs with various oil types. In addition, HIPPEs stabilized by DANPs prepared with higher ratios of aldehyde groups to aniline have smaller droplets, higher storage modulus and better thermal stability. In particular, DANPs-stabilized HIPPEs had good stability at diverse environmental conditions (80 °C, 50 mM NaCl). Therefore, this study further advances the design of polysaccharides-based nanoparticles for HIPPEs and the potential of HIPPEs in practical applications.

References

- 1 Pang, B.; Zhang, H.; Zhang, K.: Robust High internal phase Pickering emulsions stabilized by polymeric dialdehyde cellulose-based nanoparticles. (Submitted)



ZELLCHEMING-CONFERENCE

CELLULOSE-BASED MATERIALS –
FROM SCIENCE TO TECHNOLOGY

KEYWORDS:

Dialdehyde cellulose

Nanoparticles

High internal phase Pickering emulsions

Biography

Bo Pang received his BE degree from Dalian Polytechnic University in 2013. Then he received MS degree (2016) from Qingdao Institute of Bioenergy and Bioprocess Technology (QIBEBT), Chinese Academy of Sciences (CAS). He is currently a PhD candidate at the department of Wood Technology and Wood-based Composites, Georg-August-University of Goettingen under the supervision of Prof. Dr. Kai Zhang. His current research interests lie in the design and fabrication of polysaccharides-based micro/nanoparticles for applications in Pickering emulsions.

