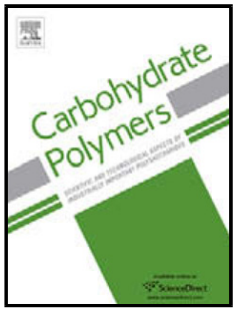
Accepted Manuscript



Title: Photoresponsive Cellulose Fibers by Surface Modification with Multifunctional Cellulose Derivatives

Author: Olga Grigoray Holger Wondraczek Elina Heikkilä Pedro Fardim Thomas Heinze

PII: S0144-8617(14)00446-9
DOI: http://dx.doi.org/doi:10.1016/j.carbpol.2014.04.089
Reference: CARP 8850

To appear in:

Received date: 11-8-2013
Revised date: 4-12-2013
Accepted date: 22-4-2014

Please cite this article as: Grigoray, O., Wondraczek, H., Heikkilä, E., Fardim, P., & Heinze, T.,Photoresponsive Cellulose Fibers by Surface Modification with Multifunctional Cellulose Derivatives, *Carbohydrate Polymers* (2014), http://dx.doi.org/10.1016/j.carbpol.2014.04.089

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Photoresponsive Cellulose Fibers by Surface Modification with Multifunctional Cellulose Derivatives

Olga Grigoray[a], *Holger Wondraczek*[a], *Elina Heikkilä*[a], *Pedro Fardim*[a,b,*], *Thomas Heinze*[a,c]

[a]Laboratory of Fiber and Cellulose Technology, Åbo Akademi University, Porthansgatan 3, FI-20500, Åbo, Finland; [b]Center of Excellence for Advanced Materials Research (CEAMR)-King Abdulaziz University -Jeddah 21589, Saudi Arabia; [c]Center of Excellence for Polysaccharide Research, Institute of Organic Chemistry and Macromolecular Chemistry, Friedrich Schiller University of Jena, Humboldtstraße 10, 07743 Jena, Germany. [*]Corresponding author.
Telephone: +358504096424. E-mail address: pfardim@abo.fi

ABSTRACT: Eucalyptus bleached kraft pulp fibers were modified by adsorption of novel bio-based multifunctional cellulose derivatives in order to generate light responsive surfaces. The cellulose derivatives used were decorated with both cationic groups (degree of substitution, DS of 0.34) and photoactive groups (DS of 0.11 and 0.37). The adsorption was studied by UV-Vis spectroscopy, surface plasmon resonance (SPR) and time-of-flight secondary ion mass spectroscopy (ToF-SIMS). The adsorption isotherms followed the Freundlich model and it turned out that the main driving force for the adsorption was electrostatic interaction. Moreover, strong indications for hydrophobic interactions between the fibers and the derivatives and the derivatives themselves were found. ToF-SIMS imaging revealed an even

Download English Version:

https://daneshyari.com/en/article/7791459

Download Persian Version:

https://daneshyari.com/article/7791459

Daneshyari.com