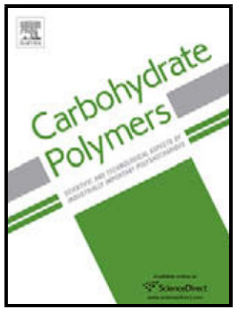

Title: Surface Modification of Cellulose Nanowhisker throughout Graft Polymerization of 2-ethyle -2-oxazoline

Author: Abbas Dadkhah Tehrani Elham Neysi

PII: S0144-8617(13)00446-3
DOI: http://dx.doi.org/doi:10.1016/j.carbpol.2013.04.082
Reference: CARP 7700

To appear in:

Received date: 2-3-2013
Revised date: 10-4-2013
Accepted date: 27-4-2013

Please cite this article as: Tehrani, A. D., & Neysi, E., Surface Modification of Cellulose Nanowhisker throughout Graft Polymerization of 2-ethyle -2-oxazoline, *Carbohydrate Polymers* (2013), http://dx.doi.org/10.1016/j.carbpol.2013.04.082

Surface Modification of Cellulose Nanowhisker throughout Graft Polymerization of 2-ethyle -2-oxazoline

Abbas Dadkhah Tehrani[1], Elham Neysi

Department of Chemistry, Faculty of science, Lorestan University, Khoramabad, Iran.

A_dadkhahtehrani@yahoo.com

A b s t r a c t

The cellulose nanocrystals, prepared by acid hydrolysis of cotton linter, consisted of slender rods with an average length of 173 nm and diameter of 80 nm, respectively. The surface of obtained cellulose nanocrystals were chemically modified using tosyl chloride and then tosylated cellulose nanowhisker was used as macroinitiator for cationic ring opening graft polymerization of 2-ethyle 2-oxazolin monomer. The occurrence of chemical modification was evaluated by FTIR and ^{1}H NMR spectroscopies. Finally cellulose-g-POX was hydrolysed in acidic condition and therefore cellulose nanowhisker-g-PEI was prepared. X-ray diffraction measurements showed that the initial crystalline structure of CNW (Type I_{β}) was changed during graft polymerization and grafted POX in the surface of CNW was in amorphous form and DLS measurements showed that the hydrodynamic dimensions of the resulted product is about 135 nm.

Key Words: cellulose nanowhisker, poly (2-ethyl-2-oxazoline), cellulose nanowhisker-graft-polyethylenimine, biopolymer, graft copolymerization.

[1] To whom correspondence should be addressed. E-mail: A_dadkhahtehrani@yahoo.com
Phone: (+98) 9132323706, fax: (+98) 6616200612