Accepted Manuscript

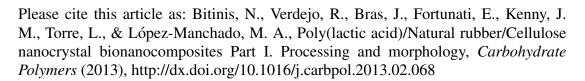
PII:

DOI:

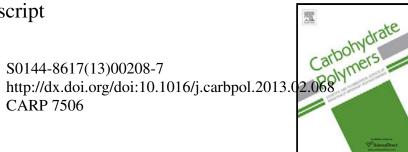
Reference:

To appear in:

Received date: 15-12-2012 Revised date: 21-1-2013 21-2-2013 Accepted date:



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

Poly(lactic acid)/Natural rubber/Cellulose nanocrystal bionanocomposites

Part I. Processing and morphology

Natacha Bitinis^a, Raquel Verdejo^a, Julien Bras^b, Elena Fortunati^c, Jose Maria Kenny^{a,c}, Luigi Torre^c, Miguel Angel López-Manchado^{a*}

^aInstitute of Polymer Science and Technology, ICTP-CSIC, C/ Juan de la Cierva 3, 28006 Madrid, Spain

^bLab Pulp & Paper Sci, LGP2, F-38402 St Martin Dheres, France

^cUniv. Perugia, UdR INSTM, Dept. Civil & Environm. Eng., I-05100 Terni, Italy

*Corresponding author: *lmanchado@ictp.csic.es*, Tel: (+34) 915 622 900 Fax: (+34) 915 644 853

Abstract

PLA/NR/cellulose nanowhisker composites were prepared using three types of cellulose nanocrystals (CNC), i.e. unmodified CNC obtained from acid hydrolysis of microcrystalline cellulose and two surface modified CNC. The two modification reactions, consisting on the grafting of long alkyl chains and of PLA chains onto the cellulose nanocrystals were carried out in order to facilitate the incorporation of the nanocrystals in the PLA/NR blend. A novel processing method was optimized combining solvent casting and extrusion in order to obtain a homogeneous dispersion of the nanofillers in the blend. The CNC modifications determined their location in the PLA/NR blend and influenced its morphology.

Keywords:

Cellulose nanocrystal, surface modification, bionanocomposite, poly(lactic acid), melt blending, morphology.

Download English Version:

https://daneshyari.com/en/article/10601540

Download Persian Version:

https://daneshyari.com/article/10601540

<u>Daneshyari.com</u>