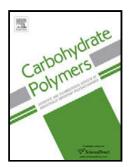
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Title: Improved Mechanical Properties of Polylactide Nanocomposites-Reinforced with Cellulose Nanofibrils through Interfacial Engineering via Amine-Functionalization



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## ACCEPTED MANUSCRIPT

1	Improved Mechanical Properties of Polylactide Nanocomposites-
2	Reinforced with Cellulose Nanofibrils through Interfacial Engineering
3	via Amine-Functionalization
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## 13 ABSTRACT

One of the main factors responsible for the mechanical and physical properties of 14 nanocomposites is the effectiveness of the interfacial region to transfer loads and mechanical 15 16 vibrations between the nano-reinforcements and the matrix. Surface functionalization has been the preferred approach to engineer the interfaces in polymer nanocomposites in order to 17 maximize their potential in structural and functional applications. In this study, amine-18 functionalized cellulose nanofibrils (mCNF-G1) were synthesized via silvlation of the hydroxyl 19 groups on the CNF surface using 3-aminopropyltrimethoxysilane (APTMS). To further increase 20 21 the amine density (mCNF-G2), dendritic polyamidoamine (PAMAM) was grafted onto mCNF-G1 by the Michael addition of methacrylate onto mCNF-G1, followed by the transamidation of 22 the ester groups of methacrylate using ethylenediamine. Compared to native CNF-reinforced, 23 24 poly(L-lactide) (PLLA) nanocomposites, amine-functionalized CNF exhibited significantly

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