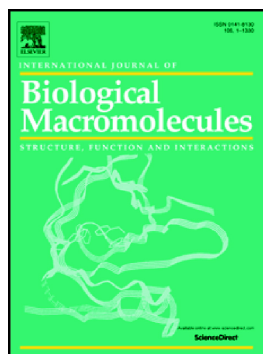


Accepted Manuscript

Enzyme treated CNF biofilms: Characterization

Bayram Poyraz



PII: S0141-8130(17)35142-5

DOI: doi:[10.1016/j.ijbiomac.2018.05.222](https://doi.org/10.1016/j.ijbiomac.2018.05.222)

Reference: BIOMAC 9827

To appear in: *International Journal of Biological Macromolecules*

Received date: 22 December 2017

Revised date: 29 April 2018

Accepted date: 29 May 2018

Please cite this article as: Bayram Poyraz , Enzyme treated CNF biofilms: Characterization. Biomac (2017), doi:[10.1016/j.ijbiomac.2018.05.222](https://doi.org/10.1016/j.ijbiomac.2018.05.222)

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.

## Enzyme Treated CNF Biofilms: Characterization

**Bayram POYRAZ**

Composite and Materials Laboratory, Department of Civil Engineering, Faculty of Technology, Düzce University, Turkey

### Abstract

The objective of this study was to characterize on the chemical, mechanical, electrical and thermal properties of nanofibrillated cellulose based polyvinyl alcohol (PCNF) and silica (SiCNF) films obtained from Pulpzyme HC 2500 enzyme treated and Celluclast 1.5 L enzyme treated kraft- $\text{NaBH}_4$  pulps. Morphological alterations were monitored with SEM. Thermal stability, chemical characterization and crystallization were determined using TGA and FT-IR. Young's and storage moduli of the films were determined via a universal testing machine and DTMA. Dielectric properties were evaluated using an impedance analyzer. In the PCNF films, new vibrations and chemical shifts were observed. The crystallinity values of the SiCNF films calculated from the FT-IR were in agreement with the TGA results, revealing that the lowest crystallinity value was in the SiCNF. The higher Young modulus and elongation at break value were obtained in the neat the CNF films while the lowest values were observed in the neat SiCNF films. However, the SiCNF films revealed higher thermo-mechanical property. The PCNF and SiCNF films exhibit more visible dielectric behavior than that of the neat CNF films. Higher thermal stability, thermo-mechanical and mechanical properties were determined in the Pulpzyme HC 2500 enzyme treated films.

**Keywords:** Nanofilms; enzyme effect; chemical properties; thermo-mechanical properties

Download English Version:

<https://daneshyari.com/en/article/8327057>

Download Persian Version:

<https://daneshyari.com/article/8327057>

[Daneshyari.com](https://daneshyari.com)