

## Accepted Manuscript

The effect of alkaline and silane treatments on mechanical properties and breakage of sisal fibers and poly(lactic acid)/sisal fiber composites

A. Orue, A. Jauregi, U. Unsuain, J. Labidi, A. Eceiza, A. Arbelaiz

PII: S1359-835X(16)00036-1

DOI: <http://dx.doi.org/10.1016/j.compositesa.2016.01.021>

Reference: JCOMA 4195

To appear in: *Composites: Part A*

Received Date: 27 July 2015

Revised Date: 21 January 2016

Accepted Date: 24 January 2016

Please cite this article as: Orue, A., Jauregi, A., Unsuain, U., Labidi, J., Eceiza, A., Arbelaiz, A., The effect of alkaline and silane treatments on mechanical properties and breakage of sisal fibers and poly(lactic acid)/sisal fiber composites, *Composites: Part A* (2016), doi: <http://dx.doi.org/10.1016/j.compositesa.2016.01.021>

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.



**The effect of alkaline and silane treatments on mechanical properties and breakage of sisal fibers and poly(lactic acid)/sisal fiber composites**

**A. Orue, A. Jauregi, U. Unsuain, J. Labidi, A. Eceiza, A. Arbelaiz\***

‘Materials + Technologies’ Group, Chemical & Environmental Engineering Dep.,  
Polytechnic College of San Sebastian, University of the Basque Country UPV/EHU,  
Pza. Europa 1. 20018, Donostia-San Sebastián (Spain)

\*Corresponding author: Tel. +34 943018585, Fax: +34 943017200, E-mail address:  
[aitor.arbelaiz@ehu.eus](mailto:aitor.arbelaiz@ehu.eus)

**Abstract**

The main goals of this work were to study the effect of different chemical treatments on sisal fiber bundles tensile properties as well as on tensile properties of composites based on poly(lactic acid) (PLA) matrix and sisal fibers. For this purpose, sisal fibers were treated with different chemical treatments. After treating sisal fibers the tensile strength values decreased respect to untreated fiber ones, especially when the combination of NaOH+silane treatment was used. Taking into account fiber tensile properties and fiber/PLA adhesion values, composites based on silane treated fibers would show the highest tensile strength value. However, composites based on alkali treated and NaOH+silane treated fibers showed the highest tensile strength values. Finally, experimental tensile strength values of composites were compared with those values obtained using micromechanical models.

**Keywords:** A. Polymer-matrix composites (PMCs); A. Short-fiber composites; B. Mechanical properties; B. Surface treatments.

Download English Version:

<https://daneshyari.com/en/article/7891035>

Download Persian Version:

<https://daneshyari.com/article/7891035>

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