

Accepted Manuscript

Title: Effect of autohydrolysis on *Pinus radiata* wood for hemicellulose extraction

Authors: Tamara M. Santos, M.Virginia Alonso, Mercedes Oliet, Juan C. Domínguez, Victoria Rigual, Francisco Rodriguez



PII: S0144-8617(18)30378-3
DOI: <https://doi.org/10.1016/j.carbpol.2018.04.010>
Reference: CARP 13464

To appear in:

Received date: 14-12-2017
Revised date: 11-3-2018
Accepted date: 1-4-2018

Please cite this article as: Santos, Tamara M., Alonso, MVirginia., Oliet, Mercedes., Domínguez, Juan C., Rigual, Victoria., & Rodriguez, Francisco., Effect of autohydrolysis on *Pinus radiata* wood for hemicellulose extraction. *Carbohydrate Polymers* <https://doi.org/10.1016/j.carbpol.2018.04.010>

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.

Effect of autohydrolysis on *Pinus radiata* wood for hemicellulose extraction

Tamara M. Santos*, M. Virginia Alonso, Mercedes Oliet, Juan C. Domínguez, Victoria Rigual, and Francisco Rodriguez

Chemical Engineering Department, Complutense University of Madrid, Avda. Complutense s/n, 28040, Madrid (Spain).

*E-mail: tmsantos@ucm.es

Highlights

- Hemicellulose-derived compounds were obtained from *Pinus radiata* autohydrolysis.
- This treatment produces autohydrolyzed woods with high thermal stability.
- The primary compounds in the liquid phase are presented in oligomeric form.

The extraction of hemicellulose from pine wood was studied by applying autohydrolysis treatment. A central composite experimental design was carried out using different temperatures (150-190 °C) and times (30-90 min) to select the most favorable operating conditions for maximizing the extraction of hemicellulose and minimizing its degradation. This liquid phase was analyzed by HPLC to quantify oligosaccharides, monosaccharides and degradation products. The composition of the autohydrolyzed wood was determined and characterized, employing FTIR and TGA. Herein, 60% of the hemicelluloses were extracted under a temperature of 170 °C in 60 min, presenting primarily in an oligomeric form in the liquid phase, with the solid phase remaining enriched in cellulose and lignin.

Keywords: Hemicellulose; softwood; central composite design; autohydrolysis

1. Introduction

According to the definition of International Energy Agency, biorefining is the sustainable processing of biomass into a spectrum of bio-based products (food, feed, chemicals, and materials) and bioenergy (biofuels, power and/or heat)

Download English Version:

<https://daneshyari.com/en/article/7782387>

Download Persian Version:

<https://daneshyari.com/article/7782387>

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