

Author's Accepted Manuscript

Improvement of the water resistance of soybean protein-based wood adhesive by a thermo-chemical treatment approach

Binghan Zhang, Bo Fan, Pengfei Huo, Zhen-Hua Gao



PII: S0143-7496(17)30142-2
DOI: <http://dx.doi.org/10.1016/j.ijadhadh.2017.08.002>
Reference: JAAD2044

To appear in: *International Journal of Adhesion and Adhesives*
Accepted date: 28 July 2017

Cite this article as: Binghan Zhang, Bo Fan, Pengfei Huo and Zhen-Hua Gao: Improvement of the water resistance of soybean protein-based wood adhesive by a thermo-chemical treatment approach, *International Journal of Adhesion and Adhesives*, <http://dx.doi.org/10.1016/j.ijadhadh.2017.08.002>

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 a review of the resulting galley proof before it is published in its final citable 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.

Improvement of the water resistance of soybean protein-based wood adhesive by a thermo-chemical treatment approach

Binghan Zhang, Bo Fan, Pengfei Huo, Zhen-Hua Gao*

College of Material Science and Engineering, Northeast Forestry University, Harbin, China 150040

*Corresponding author. Tel.: +86 451 8219 2860. gaozh1976@163.com

Abstract

In order to extend the applications of wood composites and products bonded by soybean protein adhesive from interior to exterior fields of application, this study proposes a novel approach for improving the water resistance of soybean protein-based wood adhesives using thermo-chemical treatment of soybean protein. The soybean protein formed stable three-dimensional networks due to repolymerization or self-crosslinking during thermo-chemical treatment, confirmed by both increases in the water-insoluble content of the treated soybean protein and the improved hydrothermal-aged wet bond strength of the resulting soybean protein adhesive. Thermo-chemical treatment in the presence of 1 wt% sodium sulfite (which cleaves disulfide bonds) and 1 wt% sodium dodecyl sulfate (which destroys the hydrophobic interactions of proteins) released active groups buried within the globular structure of soybean protein via unfolding. This release both promoted the repolymerization of the soybean protein molecules and

Download English Version:

<https://daneshyari.com/en/article/5014785>

Download Persian Version:

<https://daneshyari.com/article/5014785>

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