

Accepted Manuscript

Novel Micronized Woody Biomass Process for Production of Cost-Effective Clean Fermentable Sugars

Yu Fu, Bon-Jae Gu, Jinwu Wang, Johnway Gao, Girish M. Ganjyal, Michael P. Wolcott

PII: S0960-8524(18)30458-9
DOI: <https://doi.org/10.1016/j.biortech.2018.03.096>
Reference: BITE 19735

To appear in: *Bioresource Technology*

Received Date: 28 February 2018
Revised Date: 18 March 2018
Accepted Date: 19 March 2018

Please cite this article as: Fu, Y., Gu, B.-J., Wang, J., Gao, J., Ganjyal, G.M., Wolcott, M.P., Novel Micronized Woody Biomass Process for Production of Cost-Effective Clean Fermentable Sugars, *Bioresource Technology* (2018), doi: <https://doi.org/10.1016/j.biortech.2018.03.096>

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.



Novel Micronized Woody Biomass Process for Production of Cost-Effective Clean Fermentable Sugars

Yu Fu^{a,b}, Bon-Jae Gu^c, Jinwu Wang^d, Johnway Gao^e, Girish M Ganjyal^c, Michael P. Wolcott^b

^aCollege of Materials Science and Engineering, Nanjing Forestry University, Nanjing, China

^bComposite Materials and Engineering Center, Washington State University, Pullman, WA, 99164, USA

^cSchool of Food Science, Washington State University, Pullman, WA, 99164, USA

^dForest Products Laboratory, United States Department of Agriculture Forest Service, Madison, WI 53706, USA

^eGlobal Cellulose Fibers, International Paper, Federal Way, WA 98001, USA

Abstract

Thermo-chemical pretreatments of biomass typically result in environmental impacts from water use and emission. The degradation byproducts in the resulting sugars can be inhibitory to the activities of enzymes and yeasts. The results of this study showed that combining existing commercial comminution technology can reduce total energy consumption with improved saccharification yield while eliminating chemical use. Impact mill was found to be the most efficient milling for size reduction of forest residual chips from ca. 2 mm to a specific value below 100 μm . The further micronization effectively disrupted the recalcitrance of the woody biomass and produced the highly saccharifiable substrates for downstream processing. In addition, extrusion can be integrated into a clean cellulosic sugar process for further fibrillation in place of the conventional mixing processing. The highest energy efficiency was observed on the impact-milled samples with 0.515 kg sugars kWh^{-1} .

Download English Version:

<https://daneshyari.com/en/article/7067261>

Download Persian Version:

<https://daneshyari.com/article/7067261>

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