

Accepted Manuscript

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PII: S0960-8524(16)30456-4
DOI: <http://dx.doi.org/10.1016/j.biortech.2016.03.153>
Reference: BITE 16343

To appear in: *Bioresource Technology*

Received Date: 17 February 2016
Revised Date: 27 March 2016
Accepted Date: 28 March 2016

Please cite this article as: Dávila, I., Gordobil, O., Labidi, J., Gullón, P., Assessment of suitability of vine shoots for hemicellulosic oligosaccharides production through aqueous processing, *Bioresource Technology* (2016), doi: <http://dx.doi.org/10.1016/j.biortech.2016.03.153>

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Assessment of suitability of vine shoots for hemicellulosic oligosaccharides production through aqueous processing

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Abstract

Vine shoots were subjected to non-isothermal aqueous processing. A range of severities (S_0) from 3.20 to 4.65 was assayed and their effects in terms of solubilization, composition, molar mass distribution, structural characterization and thermal stability of the liquors were studied using HPLC, HPSEC, TGA and FTIR. The spent solids were characterized by HPLC and FTIR. When autohydrolysis was carried out at $S_0 = 4.01$, the substrate solubilization achieved a 38.7% of the raw material and 83.1% of the initial xylan was converted into xylooligosaccharides (XOS). The amount of TOS (total oligosaccharides) in the hydrolysates was 28.4 g/L while the other non volatile compounds (ONVC) were 0.08 g /g NVC. The spent solid from the treatment at $S_0 = 4.01$ was composed about 90% of cellulose and lignin. Therefore, it can be concluded that autohydrolysis is a suitable pretreatment of vine shoots such as a first stage of a biomass refinery.

Keywords: Vine shoots, Autohydrolysis, Hemicelluloses, Oligosaccharides, Biorefinery

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