



SIMPOSIO INTERNACIONAL SOBRE MATERIALES LIGNOCELULOSICOS

Hydroxyalkylated xylans in coatings for packaging and paper

Christiane Laine, Ali Harlin *, Jonas Hartman, Sari Hyvärinen, Kari Kammiovirta, Björn Krogerus, Heikki Pajari, Hille Rautkoski, Harri Setälä, Jenni Sievänen, Johanna Uotila, Mika Vähä-Nissi ^{(1)*}

(1) VTT Technical Research Centre of Finland, Biologinkuja 7, P.O. Box 1000, FI-02044 VTT, Finland,

* Corresponding author. Tel.: +358 40 5332179; fax: +358 20 722 7026, ali.harlin@vtt.fi,

RESUMEN

Hemicellulose; xylan; birch kraft pulp; modification; barrier coating; pigment coating.

ABSTRACT

The growth of 'added-value' celluloses such as dissolving pulp or nanocellulose will lead to a possible increase in availability of hemicelluloses. Therefore high molar weight xylan is a well-motivated option for added-value application. This paper demonstrates opportunities for wood-based xylan derivatives to be used in coating applications. A route for extraction and purification of white and pure xylan from bleached birch kraft pulp is described as a part of the production of high adsorption and high crystalline pulp. Derivatization of the xylan during the extraction step was also demonstrated. Efficient derivatization of xylan to water soluble derivatives was achieved and promising results were obtained in primary application tests as a coating component in barrier coatings on board and as a binder component in pigment coating of offset paper. With the best xylan derivate coating, the barrier properties were better than with a commercial biopolymer coating, while oxygen permeability was roughly one third of that for a polyethylene terephthalate coating. Likewise, surface strength close to the reference latex as a binder in pigment coatings was achieved by a xylan derivative. This work is part of a platform of hemicellulose derivatives enabling novel application for this medium to high molar mass hemicellulose of high purity.