

Accepted Manuscript

Title: Synthesis of full interpenetrating hemicellulose hydrogel networks

Authors: Laleh Maleki, Ulrica Edlund, Ann-Christine Albertsson



PII: S0144-8617(17)30490-3
DOI: <http://dx.doi.org/doi:10.1016/j.carbpol.2017.04.091>
Reference: CARP 12279

To appear in:

Received date: 17-11-2016
Revised date: 25-4-2017
Accepted date: 27-4-2017

Please cite this article as: Maleki, Laleh., Edlund, Ulrica., & Albertsson, Ann-Christine., Synthesis of full interpenetrating hemicellulose hydrogel networks. *Carbohydrate Polymers* <http://dx.doi.org/10.1016/j.carbpol.2017.04.091>

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.

Synthesis of full interpenetrating hemicellulose hydrogel networks

Laleh Maleki, Ulrica Edlund, Ann-Christine Albertsson*

Fiber and Polymer Technology, Royal Institute of Technology (KTH), Teknikringen 56, SE-100 44 Stockholm, Sweden

*aila@kth.se; +46-8-7908274

Highlights

- The hemicellulose AcGGM was converted to full interpenetrating networks by sequential syntheses.
- Maleate-functionalized softwood O-acetyl-galactoglucomannan (AcGGM) was used as a hydrogel precursor
- IPN formation led to an increase in the shear storage modulus (G') of hemicellulose hydrogels.

Abstract

Two methods with different cross-linking mechanisms for designing hemicellulose-based full interpenetrating polymer networks (IPNs) was developed through the sequential synthesis of full IPNs from *O*-acetyl-galactoglucomannan (AcGGM) utilizing free-radical polymerization and a thiol-ene click reaction. A faster swelling rate was observed for all IPN formulations compared with the single-network gels. The highly porous structure of the IPNs with small interconnected pores was verified using scanning electron microscopy. A rheological analysis revealed that the AcGGM IPNs fabricated by the free-radical polymerization of acrylamide and N-N'-methylenebisacrylamide (cross-linker) had shear storage modulus (G') values approximately 5 and 2.5 times higher than that of the corresponding precursor single networks of AcGGM. IPNs

Download English Version:

<https://daneshyari.com/en/article/5157640>

Download Persian Version:

<https://daneshyari.com/article/5157640>

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