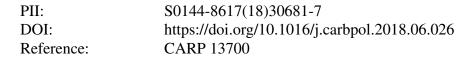
### Accepted Manuscript

Title: Enhancing bacterial cellulose production *via* adding mesoporous halloysite nanotubes in the culture medium

Authors: Dong Tian, Fei Shen, Jinguang Hu, Scott Renneckar, Jack N. Saddler



To appear in:

Received date:	4-3-2018
Revised date:	7-5-2018
Accepted date:	5-6-2018

Please cite this article as: Tian D, Shen F, Hu J, Renneckar S, Saddler JN, Enhancing bacterial cellulose production *via* adding mesoporous halloysite nanotubes in the culture medium, *Carbohydrate Polymers* (2018), https://doi.org/10.1016/j.carbpol.2018.06.026

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.



## ACCEPTED MANUSCRIPT

# Enhancing bacterial cellulose production *via* adding mesoporous halloysite nanotubes in the culture medium

Dong Tian,<sup>a,b,\*</sup> Fei Shen,<sup>a</sup> Jinguang Hu,<sup>b,\*</sup> Scott Renneckar,<sup>c</sup> and Jack N. Saddler<sup>b</sup>

a. Institute of Ecological and Environmental Sciences, Sichuan Agricultural University,

Chengdu, Sichuan 611130, PR China

b. Forest Products Biotechnology/Bioenergy Group, Department of Wood Science, Faculty of
Forestry, University of British Columbia, 2424 Main Mall, Vancouver, British Columbia V6T
1Z4, Canada

c. Advanced Renewable Materials Lab, Department of Wood Science, Faculty of Forestry, University of British Columbia, 2424 Main Mall, Vancouver, British Columbia V6T 1Z4, Canada

#### Highlights

- Enhanced bacterial cellulose productivity via adding mesoporous halloysite nanotube
- Cell immobilization of halloysite nanotube enhanced the activity of bacterial cells
- Oxygen release of halloysite nanotube overcome wall-effect of cellulose production
- Bacterial cellulose exhibited negligible content of halloysite after washing
- Bacterial cellulose synthesized with halloysite showed higher porosity

\* Authors for correspondence: E-mail: tiandong6020@gmail.com (D. Tian), jinguang@mail.ubc.ca (J. Hu).

#### Abstract

Although bacterial cellulose (BC) is a fascinating, highly pure cellulose material for various downstream applications, production has been challenged by its low productivity. This work reported a facile route to significantly enhance BC yield without compromising its structural advantages *via* adding mesoporous halloysite nanotubes (HNTs) in the culture medium at static cultivations. The BC productivity of *Gluconacetobacter xylinus* was increased from 2.2 to 5.9 g L<sup>-1</sup> after 15 days of cultivation when 2 wt% of HNTs was added into the standard fructose medium. It appeared that the dual functionality of cell immobilization and oxygen release of the HNTs were responsible for enhancing the BC productivity. Moreover, the HNTs-resulted BC pellicle exhibited negligible content of HNTs contamination (~2 wt%),

Download English Version:

## https://daneshyari.com/en/article/7781368

Download Persian Version:

https://daneshyari.com/article/7781368

Daneshyari.com