### Accepted Manuscript

Title: 3D Printing Using Plant-derived Cellulose and Its

Derivatives: A Review

Authors: Lei Dai, Ting Cheng, Chao Duan, Wei Zhao, Weipeng Zhang, Xuejun Zou, Joseph Aspler, Yonghao Ni

PII: S0144-8617(18)31091-9

DOI: https://doi.org/10.1016/j.carbpol.2018.09.027

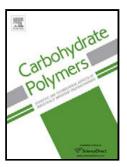
Reference: CARP 14070

To appear in:

Received date: 25-3-2018 Revised date: 9-9-2018 Accepted date: 14-9-2018

Please cite this article as: Dai L, Cheng T, Duan C, Zhao W, Zhang W, Zou X, Aspler J, Ni Y, 3D Printing Using Plant-derived Cellulose and Its Derivatives: A Review, *Carbohydrate Polymers* (2018), https://doi.org/10.1016/j.carbpol.2018.09.027

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

# 3D Printing Using Plant-derived Cellulose and Its Derivatives: A Review

Lei Dai<sup>\*1,2</sup>, Ting Cheng<sup>1</sup>, Chao Duan<sup>1</sup>, Wei Zhao<sup>1</sup>, Weipeng Zhang<sup>2</sup>, Xuejun Zou<sup>3</sup>, Joseph Aspler<sup>3</sup>, Yonghao Ni<sup>\*1,2</sup>

<sup>1</sup>College of Bioresources Chemical and Materials Engineering, Shaanxi University of Science and Technology, Xi'an 710021, China

<sup>2</sup>Department of Chemical Engineering, University of New Brunswick, Fredericton, New Brunswick E3B 5A3, Canada

<sup>3</sup>FPInnovations, 570 boul. St-Jean, Pointe-Claire, Quebec, H9R3J9, Canada

□ Corresponding author. E-mail address: dailei\_ju@hotmail.com (L. Dai); yonghao@unb.ca (Y. Ni).

#### Highlights

- Up-to-date usage of cellulose and its derivatives for 3D printing.
- Summary of different functions of cellulose and its derivatives in 3D printing.
- The shear-thinning feature imparts cellulose/its derivatives with good printability.
- Water-soluble/water-dispersible cellulose derivatives preferred for 3D printing.
- Various examples of cellulose/its derivatives in 3D printing discussed.

Abstract. Three-dimensional (3D) printing is classified as a revolutionary, disruptive manufacturing technology. Cellulose (the most abundant natural polymer) and its many derivatives have been widely studied for many applications. The combination of 3D printing with cellulose-based feedstocks is therefore of critical interest. This review highlights many studies on 3D printing applications of plant-derived cellulose and its derivatives. Potential materials include cellulose ethers/esters, microcrystalline cellulose, nanocellulosic materials, and other products. It focuses on their roles and functions in 3D printing processes and the

#### Download English Version:

# https://daneshyari.com/en/article/10154864

Download Persian Version:

https://daneshyari.com/article/10154864

<u>Daneshyari.com</u>