### Accepted Manuscript

Microwave-assisted fast and efficient dissolution of silkworm silk for constructing fibroin-based biomaterials

Shouchuan Li, Chunyu Chen, Di Zhang, Xiaozhong Zhang, Baochang Sun, Shanshan Lv

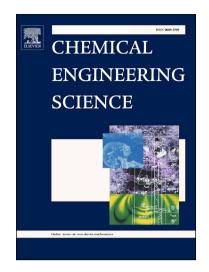
PII: S0009-2509(18)30365-8

DOI: https://doi.org/10.1016/j.ces.2018.06.003

Reference: CES 14277

To appear in: Chemical Engineering Science

Received Date: 29 March 2018 Revised Date: 31 May 2018 Accepted Date: 1 June 2018



Please cite this article as: S. Li, C. Chen, D. Zhang, X. Zhang, B. Sun, S. Lv, Microwave-assisted fast and efficient dissolution of silkworm silk for constructing fibroin-based biomaterials, *Chemical Engineering Science* (2018), doi: http://dx.doi.org/10.1016/j.ces.2018.06.003

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**

# Microwave-assisted fast and efficient dissolution of silkworm silk for constructing fibroin-based biomaterials

Shouchuan  $\operatorname{Li}^1$ , Chunyu Chen $^1$ , Di Zhang $^1$ , Xiaozhong Zhang $^1$ , Baochang Sun $^1$  and Shanshan  $\operatorname{Lv}^1*$ 

<sup>1</sup>State Key Laboratory of Organic-inorganic Composites, Beijing University of Chemical Technology, 15 Beisanhuan East Road, Chaoyang District, Beijing, China 100029

\*To whom correspondence should be addressed. Email: lvshanshan@mail.buct.edu.cn

#### **Abstract**

A microwave-assisted method was developed for extraction of water-soluble fibroin from silkworm silk. In order to explore enhancing effect of microwave, dissolution profiles of silk fibroin were monitored by protein concentration measurements, showing a faster extraction rate of the microwave-assisted method compared to the conventional methods. Meanwhile, characterization of the resultant silk fibroin regenerated by the microwave-assisted method indicated similarity to that by the conventional methods in that they exhibited similar molecular weight ranges, secondary structures and gelation capabilities. In contrast to traditional microwave-assisted methods, this study employed a laboratory microwave reactor equipped with a feedback temperature control system, which enabled easy control and maintenance of certain reaction temperature and temperature distribution. In this way, the present study, to an extent, resolved possible concerns that uncontrollable extreme

#### Download English Version:

# https://daneshyari.com/en/article/6588335

Download Persian Version:

https://daneshyari.com/article/6588335

<u>Daneshyari.com</u>