

Accepted Manuscript

Cross-linking of gelatin by chlorine dioxide steam

Shengbin He, Doctor Ting Yin, Jinwang Zhen, Xiaoping Xu, Professor

PII: S0268-005X(14)00347-6

DOI: [10.1016/j.foodhyd.2014.10.003](https://doi.org/10.1016/j.foodhyd.2014.10.003)

Reference: FOOHYD 2746

To appear in: *Food Hydrocolloids*

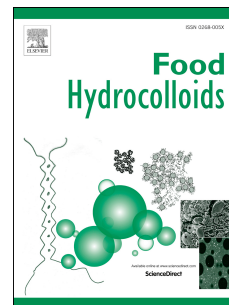
Received Date: 3 July 2014

Revised Date: 19 September 2014

Accepted Date: 8 October 2014

Please cite this article as: He, S., Yin, T., Zhen, J., Xu, X., Cross-linking of gelatin by chlorine dioxide steam, *Food Hydrocolloids* (2014), doi: 10.1016/j.foodhyd.2014.10.003.

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.



1 **Cross-linking of Gelatin by Chlorine Dioxide Steam**

2 Shengbin He^{1,*}, Ting Yin², Jinwang Zhen³ and Xiaoping Xu^{1,*}

3 ¹ College of Chemistry, Fuzhou University, Fuzhou 350108, China

4 ² Forestry College, Guangxi University, Nanning 530004, China

5 ³ Shanghai Tofflon Scienc & Technology Co., Ltd.

6

7 Correspondence authors: Professor Xiaoping Xu, E-mail: Xu@fzu.edu.cn phone:
8 +8613067237982; Doctor Shengbin He, E-mail: comhsb@163.com

9

10

11 Abstract: There is a great potential of gelatin to be applied in food packaging, tissue
12 engineering, and drug delivery due to its biocompatibility, edibility and
13 biodegradability. However, the main issue with use of native gelatin based materials
14 in practical application is their water solubility and poor **thermostability** as they are
15 rapidly dissolved in warm solution. In order to improve their water-resistant ability
16 and thermomechanical performance, the gelatin bars or membranes were **cross linked**
17 **by** chlorine dioxide (ClO₂) vapor at room temperature. An exposure of the gelatin
18 materials in ClO₂ vapor for 12 hours generated a cross-linking extent sufficient to
19 preserve their morphology in 37°C warm water for above 5 days. The cross-linking
20 also led to improved thermostability and enhancement in mechanical properties.
21 Energy dispersion X-ray analysis indicated that no halogen substitution reaction
22 happened in the cross linking reaction, and the residual Cl could be removed
23 thoroughly by pretreatment. Cytotoxicity was evaluated based on a cell proliferation
24 study. It was found cell expansion took place and linearly increased during the course
25 of whole period of the cell culture. Thus the cross-linked material showed no toxicity
26 to the cells.

27

28 **Keywords:** Cross-linking; Gelatin; Chlorine Dioxide; water-resistant

29

30

31

32

33

34

35

36

37

38

* Correspondence author, professor Xiaoping Xu, E-mail: Xu@fzu.edu.cn phone: +8613067237982;
Shengbin He, E-mail: comhsb@163.com

Download English Version:

<https://daneshyari.com/en/article/6987826>

Download Persian Version:

<https://daneshyari.com/article/6987826>

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