

[Available Issues](#) | [Instructions to Authors](#) | [Japanese](#) >> [Publisher Site](#)

 Author:  [ADVANCED](#) | Volume  Page   
 Keyword:   |   

[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1880-1986

PRINT ISSN : 1346-8235

**Journal of Textile Engineering**

Vol. 53 (2007) , No. 3 95-100


[\[PDF \(3032K\)\]](#) [\[References\]](#)

## Analysis of Fine Structure of Subtropical Plant Fibers Treated with Sodium Hydroxide or Liquid Ammonia by Microscope Observation and X-ray Diffraction Measurement

[Kazuaki SUGIURA](#)<sup>1)</sup>, [Dongseok JEONG](#)<sup>2)</sup>, [Muncheul LEE](#)<sup>2)</sup>, [Tetsutoshi NAKAJIMA](#)<sup>3)</sup>, [Kenji NISHI](#)<sup>4)</sup>, [Takako TOKUYAMA](#)<sup>5)</sup>, [Tomiji WAKIDA](#)<sup>5)</sup> and [Susumu OKADA](#)<sup>6)</sup>

- 1) *Textile Technology Center, Kyoto Municipal Industrial Research Institute*  
 2) *Department of Textile Engineering, Pusan National University*  
 3) *Okinawa Prefecture Art University*  
 4) *Meisei Chemical Works Co. Ltd.*  
 5) *Department of Home Economics, Gifu Women's University*  
 6) *Nisshinbo Industry Inc.*

(Received December 15, 2006)

(Accepted for publication March 13, 2007)

**Abstract:** Six kinds of subtropical plant fibers taken from the Hibiscus, Pineapple, Okra, Plantain, Banana and Agave were treated with sodium hydroxide aqueous solution and liquid ammonia using a commercial plant. Cross section of the fibers were observed with microscope. Furthermore, in order to investigate the internal structure, X-ray diffraction measurement was carried out and the crystallinity of the treated fibers was obtained. From the observation of the cross section, it is clear that every fiber forms honey comb structure which consists of several to many cells, and each cell has a void in the cell. The void is comparably larger than that of the cotton lumen, and the void generally became smaller by the NaOH treatment. Furthermore, X-ray diffraction profile was measured for each fiber. Most of the fibers were changed from cellulose I to cellulose II by the NaOH treatment, whereas the fibers unchanged to cellulose III by the NH<sub>3</sub> treatment. After the three times

NH<sub>3</sub> treatment, the cellulose III intensity increased comparably, although the cellulose I remains not a little for all samples. On the other hand, cotton fiber completely changed to the cellulose III structure by the NH<sub>3</sub> treatment. Hereafter, it is necessary to investigate the void structure including the effect of lignin and cell-wall as a multicellular plant fiber.

**Key Words:** [Subtropical plant fibers](#), [Sodium hydroxide](#), [Liquid ammonia](#), [Microscope](#), [X-ray diffraction](#)

[\[PDF \(3032K\)\]](#) [\[References\]](#)



Download Meta of Article [\[Help\]](#)

[RIS](#)

[BibTeX](#)

To cite this article:

Kazuaki SUGIURA, Dongseok JEONG, Muncheul LEE, Tetsutoshi NAKAJIMA, Kenji NISHI, Takako TOKUYAMA, Tomiji WAKIDA and Susumu OKADA, J. Text. Eng., Vol. **53**, p.95 (2007) .

---

JOI JST.JSTAGE/jte/53.95

Copyright (c) 2007 by The Textile Machinery Society of Japan

---



---

[Japan Science and Technology Information Aggregator, Electronic](#)

