

Preparation and characterization of branched chitin

著者	OBAMA Yu, YAMAMOTO Kazuya, KADOKAWA Jun-ichi
journal or publication title	The Research Reports of the Faculty of Engineering, Kagoshima University
volume	61
page range	23-23
year	2019
URL	http://hdl.handle.net/10232/00030884

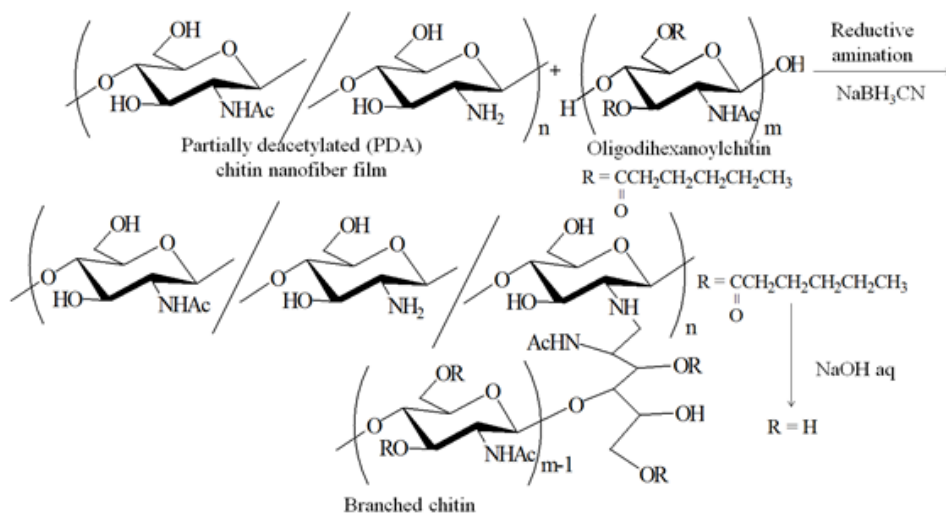
Preparation and characterization of branched chitin

Yu Obama, Kazuya Yamamoto, Jun-ichi Kadokawa

Abstract

Chitin is a natural polysaccharide composed of $\beta(1\rightarrow4)$ -linked N-acetyl-D-glucosamine units. Although chitin is one of the most abundant polysaccharides on the earth, it is mostly poor in processability and solubility due to highly crystalline structure by numerous hydrogen bonds. On the other hands, branched polysaccharide structures are often appeared in nature and such complicated structures contribute to exhibiting their important in vivo functions. Therefore, synthesis of artificial branched polysaccharides is interesting research topic to prepare to new biobased functional polymers.

In this study, we attempted to prepare a branched chitin composed only of pure chitin chain structure (Scheme 1). We first prepared a partially deacetylated (PDA) chitin having amino groups [1,2] and oligodihexanoylchitin having a free anomeric form [3] as main chain and branching chain components, respectively. Reductive amination of the materials was then carried out in the presence of NaBH_3CN . Finally, deprotection was carried out under alkaline conditions to give the branched chitin. The XRD result of the reductive amination product did not observe crystalline pattern of chitin, whereas that was detected after deprotection.



Scheme 1. Preparation of branched chitin.

References

- 1) J. Kadokawa, A. Takegawa, S. Mine, K. Prasad, *Carbohydr. Polym.*, **84**, 1408 (2011).
- 2) S. Phougying, S. Aiba, S. Chirachanchai, *Polymer*, **48**, 393 (2007).
- 3) K. Chiba, J. Kadokawa, K. Yamashita, H. Tagaya, M. Karasu, *J. Polym. Sci., Part A: Polym. Chem.*, **32**, 2619 (1994).