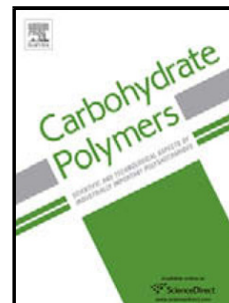


Accepted Manuscript

Title: SULFONATED AND SULFATED CHITOSAN DERIVATIVES FOR BIOMEDICAL APPLICATIONS: A REVIEW

Authors: Syrine Dimassi, Nicolas Tabary, Feng Chai, Nicolas Blanchemain, Bernard Martel



PII: S0144-8617(18)31075-0
DOI: <https://doi.org/10.1016/j.carbpol.2018.09.011>
Reference: CARP 14052

To appear in:

Received date: 24-4-2018
Revised date: 29-8-2018
Accepted date: 5-9-2018

Please cite this article as: Dimassi S, Tabary N, Chai F, Blanchemain N, Martel B, SULFONATED AND SULFATED CHITOSAN DERIVATIVES FOR BIOMEDICAL APPLICATIONS: A REVIEW, *Carbohydrate Polymers* (2018), <https://doi.org/10.1016/j.carbpol.2018.09.011>

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.

SULFONATED AND SULFATED CHITOSAN DERIVATIVES FOR BIOMEDICAL APPLICATIONS: A REVIEW

Syrine Dimassi^{a*}, Nicolas Tabary^{a*}, Feng Chai^b, Nicolas Blanchemain^b and Bernard Martel^a

^a Univ. Lille, CNRS, INRA, ENSCL UMR8207, UMET – Unité Matériaux et Transformations, F-59000 Lille, France

^b Univ. Lille, Inserm, CHU Lille, U1008 – Controlled Drug Delivery Systems and Biomaterials, Lille, France

*Corresponding authors:

Syrine Dimassi; E-mail address: dimassi.syrine@outlook.com

Nicolas Tabary; E-mail address: Nicolas.Tabary@univ-lille1.fr

Highlights

- Review of strategies used to chemically modify chitosan
- Overview of different sulfonating reagents and substitution regioselectivity
- Current biomedical applications of sulfonated and sulphated chitosan derivatives

Abstract

From 20th century, chitosan, a natural polysaccharide, has received much attention for use in biomedical applications thanks to its remarkable properties, such as biodegradability, biocompatibility, hemostasis and antibacterial activity. Over the last decades, many researchers have attempted to generate new chitosan derivatives-based biomaterials through chemical modifications, especially through sulfonation or sulfation reactions in order to tailor the physicochemical and biochemical properties. Due to the presence of residual amino groups, the generated polyampholytic derivatives are characterized by convenient biological properties, such as antioxidation, antiviral activity, anticoagulation and bone regeneration, expanding their application scope. This paper provides an overview of the strategies used to chemically modify chitosan by introduction of sulfonate groups on chitosan backbone, focusing on various sulfonating or sulfating agents used and substitution regioselectivity, and highlights their applications in biomedical field.

Abbreviation list

CS: chitosan, GAG: glycosaminoglycan, DDA: degree of deacetylation, ECM: extracellular matrix, FFSA: 5-formyl-2-furansulfonic acid, BZ1S: 2-formylbenzene sulfonic acid, BZ2S: 4-formyl-1,3-benzenedisulfonic acid, APTT: activated partial thromboplastin time, PT: prothrombin time, TT: thrombin time, MW: molecular weight, LMW: low molecular weight, LPL: lipoprotein lipase, BSA: bovine serum albumin, BFG: bovine serum fibrinogen, LMWH: low

Download English Version:

<https://daneshyari.com/en/article/10141274>

Download Persian Version:

<https://daneshyari.com/article/10141274>

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