

XXI B-MRS Meeting

- Home
- Symposia
- Registration
- Submission
- Program
- Student Awards
- Accommodation & Travel
- Sponsors & Exhibitors
- B-MRS Meetings
- Contact



Maceió-AL, Brazil  
October 1<sup>st</sup> to 5<sup>th</sup>, 2023

- Booklet
- Presentation Schedule
- Mobile App

until April 17 <sup>th</sup> May 1 <sup>st</sup>	June 06 <sup>th</sup> June 25 <sup>th</sup>	until June 19 <sup>th</sup> June 29 <sup>nd</sup>	June 26 <sup>th</sup> July 07 <sup>th</sup>	until July 26 <sup>th</sup>
Submission of Abstracts	Abstract status notification	Submission of Revised Abstract	Final Abstract Notification	Submission for Student Awards

Poster Printing Service

Do you want to print your poster at the Conference?

Conexão Montagens e Eventos can do it!

Before the conference: the file (in pdf format) should be sent by email until September, 28th to - [sinalizacaoconexao@gmail.com](mailto:sinalizacaoconexao@gmail.com)

Amount R\$ 70.00 - payment via PIX. The poster will be available at the Poster Help Desk at the Conference on Monday morning, 2nd - 9am.

### Request for resources from FAPESP

Researchers from the State of São Paulo (BR) might be eligible for financial support from FAPESP. More information in the link below.

[Click here to access](#)

[Home](#)

[Symposia](#)

[Registration](#)

[Submission](#)

[Program](#)

[Student Awards](#)

[Accommodation & Travel](#)

[Sponsors & Exhibitors](#)

[B-MRS Meetings](#)

[Contact](#)

## Welcome

The **Brazilian Materials Research Society (B-MRS)** and the **Committee of the XXI B-MRS Meeting** invite the worldwide community of materials research to attend the 2023 Meeting to be held at the Ruth Cardoso Cultural and Exhibition Center **Maceió-Alagoas, Brazil, October 1st to 5th, 2023.**

This traditional forum is dedicated to recent advances and perspectives in materials science and related technologies. It will be an excellent opportunity to bring together scientists, engineers and students from academy and industry to discuss the state of the art of Materials Science discoveries and perspectives.

Maceió is one of the main Brazilian capitals that has received many tourists mainly due to the receptivity of its inhabitants, the beaches with warm waters and extraordinary gastronomy. We very well welcome to Maceió. Do not miss this opportunity.

## Organizing Committee



**Carlos Jacinto da Silva**  
Chair

Institute of Physics,  
Universidade Federal de Alagoas



**Mário Roberto Meneghetti**  
Chair

Institute of Chemistry and  
Biotechnology, Universidade  
Federal de Alagoas

# Influence of acid treatment on the properties of beta-chitin nanoparticles

Filipe Biagioni Habitzreuter<sup>1</sup>, Sérgio Paulo Campana-Filho<sup>2</sup>

<sup>1</sup>Instituto de Química de São Carlos Universidade de São Paulo (*Departamento de Físico-Química*) , <sup>2</sup>Instituto de Química de São Carlos Universidade de São Paulo (*Físico Química*)

*e-mail: filipeh@usp.br*

Chitin nanoparticles, often called whiskers, are usually obtained through acidolysis. This work describes the production of beta-chitin whiskers by acidolysis with HCl, H<sub>2</sub>SO<sub>4</sub> and H<sub>3</sub>PO<sub>4</sub> along with their structural and physicochemical properties. The starting beta-chitin had very high average degree of acetylation GA≈96% as determined by <sup>13</sup>C NMR spectroscopy, as well as high viscosity average molecular weight M<sub>v</sub>≈413,000 g/mol. Characterization of whiskers revealed that N-deacetylation did not occur and that acidolysis predominantly promoted the breakdown of glycosidic bonds, leading to M<sub>v</sub>≈10,000 g/mol. The morphology of beta-chitin whiskers was characterized by TEM and AFM. The images indicate that whiskers produced by HCl and H<sub>2</sub>SO<sub>4</sub> resemble needles, while those produced by with H<sub>3</sub>PO<sub>4</sub> exhibited a spherical shape and reduced size. Structural differences were also observed by NMR and FTIR spectroscopy, especially in the case of the H<sub>3</sub>PO<sub>4</sub> sample. It was found that there was a conversion of beta-chitin to alpha-chitin in this case, evidenced by the presence of characteristic resonance peaks, i.e. the splitting of signals referring to C3-C5 (≈ 75 ppm) and C6 (≈ 65 ppm) and splitting of the bands of amide I (≈ 1610 cm<sup>-1</sup>) in the FTIR spectrum and also higher indexes of short-range crystallinity (≈ 89%) calculated by <sup>13</sup>C NMR. Different behaviours were also observed in the thermal degradation profiles, in which beta-chitin whiskers produced with H<sub>3</sub>PO<sub>4</sub> showed higher degradation temperatures (≈ 300 °C), whereas the other samples had peak degradation at ≈ 250°C. None spectroscopic evidence of the presence of sulfate and phosphate groups on the beta-chitin whisker surfaces was observed. These results indicate that the nature of the acid used for acidolysis plays an important role on the properties of beta-chitin nanoparticles, especially leading to the conversion of beta-chitin into alpha-chitin in the case of using H<sub>3</sub>PO<sub>4</sub>.

Aknowledgements:

CNPq - Process no 141800/2017-18