

Accepted Manuscript

Title: Controlled biosynthesis of silver nanoparticles using sugar industry waste, and its antimicrobial activity

Authors: Nery M. Aguilar, F. Arteaga-Cardona, J.O. Estévez, N.R. Silva-González, J.C. Benítez-Serrano, U. Salazar-Kuri



PII: S2213-3437(18)30600-6
DOI: <https://doi.org/10.1016/j.jece.2018.09.056>
Reference: JECE 2677

To appear in:

Received date: 16-8-2018
Revised date: 25-9-2018
Accepted date: 28-9-2018

Please cite this article as: Aguilar NM, Arteaga-Cardona F, Estévez JO, Silva-González NR, Benítez-Serrano JC, Salazar-Kuri U, Controlled biosynthesis of silver nanoparticles using sugar industry waste, and its antimicrobial activity, *Journal of Environmental Chemical Engineering* (2018), <https://doi.org/10.1016/j.jece.2018.09.056>

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.

Controlled biosynthesis of silver nanoparticles using sugar industry waste, and its antimicrobial activity

Nery M. Aguilar^{a*}, F. Arteaga-Cardona^a, J. O. Estévez^b, N. R. Silva-González[†], J. C. Benítez-Serrano^c, U. Salazar-Kuri^a.

^a*Instituto de Física, Benemérita Universidad Autónoma de Puebla, Apdo. Postal J-48, Puebla, Pue. 72570, México.*

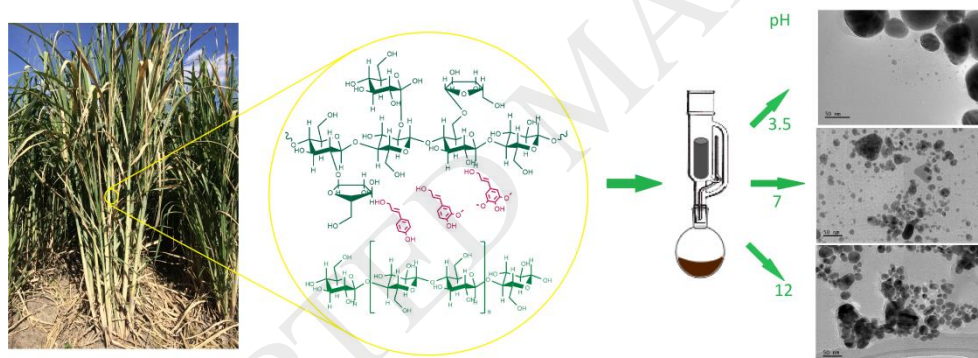
^b*Departamento de Materia Condensada/Instituto de Física UNAM, Circuito de la Investigación Científica Ciudad Universitaria, C.P. 04510, México.*

^c*Departamento de Microbiología de la Facultad de Ciencias Químicas, Benemérita Universidad Autónoma de Puebla, Puebla, Pue. 72570, México.*

*Corresponding Author

Tel.: +52 222 2295610 ext. 2065. Fax: +52 222 2295611. E-mail: neryma3195@gmail.com.

Graphical abstract



ABSTRACT

The synthesis of silver nanoparticles (AgNPs) using natural extracts is a process that has already been studied due to their excellent antimicrobial activity. However, in most cases, it has been found that the preparation of these nanoparticles leads to the formation of silver chloride (AgCl) as an undesirable side product, which is difficult to remove. In this paper, the AgNPs were prepared using the extract of the sugar industry waste, sugar cane bagasse, as a reducing and capping agent, by a soxhlet extraction system. It was observed that varying the pH of the reaction medium it was possible to avoid the formation of AgCl and in addition, the pH has an important role in controlling the particle size and dispersion. Uv-Vis absorption, FTIR, DRX, SEM, TEM and DLS techniques were used to characterize these particles. In addition, a good antimicrobial activity was observed when AgNPs were used against *Escherichia coli*, *Pseudomonas aeruginosa* (both Gram negative bacteria) and

Download English Version:

<https://daneshyari.com/en/article/11028985>

Download Persian Version:

<https://daneshyari.com/article/11028985>

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