

Accepted Manuscript

Title: Mineralized agar-based nanocomposite films: Potential food packaging materials with antimicrobial properties

Authors: Ivana Malagurski, Steva Levic, Aleksandra Nestic, Miodrag Mitric, Vladimir Pavlovic, Suzana Dimitrijevic-Brankovic



PII: S0144-8617(17)30840-8
DOI: <http://dx.doi.org/doi:10.1016/j.carbpol.2017.07.064>
Reference: CARP 12581

To appear in:

Received date: 13-4-2017
Revised date: 18-7-2017
Accepted date: 21-7-2017

Please cite this article as: Malagurski, Ivana., Levic, Steva., Nestic, Aleksandra., Mitric, Miodrag., Pavlovic, Vladimir., & Dimitrijevic-Brankovic, Suzana., Mineralized agar-based nanocomposite films: Potential food packaging materials with antimicrobial properties. *Carbohydrate Polymers* <http://dx.doi.org/10.1016/j.carbpol.2017.07.064>

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.

Mineralized agar-based nanocomposite films: Potential food packaging materials with antimicrobial properties

Ivana Malagurski^{a,*}, Steva Levic^b, Aleksandra Nestic^c, Miodrag Mitric^c, Vladimir Pavlovic^b, Suzana Dimitrijevic-Brankovic^a

^a University of Belgrade, Faculty of Technology and Metallurgy, 11000 Belgrade, Serbia

^b University of Belgrade, Faculty of Agriculture, 11081 Belgrade, Serbia

^c University of Belgrade, Vinca Institute of Nuclear Science, Mike Petrovica Alasa 12-14, P.O. Box 522, 11001 Belgrade, Serbia

Corresponding author: Ivana Malagurski

Tel: +381(0)11 3303788

Fax: +381(0)11 3370387

E-mail: madzovska@tmf.bg.ac.rs

Highlights

- Agar was impregnated with Zn-minerals to produce nanocomposite films
- Nanocomposites exhibited different morphologies, properties and functionality
- Reinforcing with minerals improved mechanical, optical and thermal properties
- Nanocomposite films release Zn(II) inducing antimicrobial effect

Abstract

New mineralized, agar-based nanocomposite films (Zn-carbonate and Zn-phosphate/agar) were produced by a combination of *in situ* precipitation and a casting method. The presence of minerals significantly influenced the morphology, properties and functionality of the obtained nanocomposites. Reinforcement with the Zn-mineral phase improved the mechanical properties of the carbonate-mineralized films, but had a negligible effect on the phosphate-mineralized samples. Both nanocomposites showed improved optical and thermal properties, better Zn(II) release potential in a slightly acidic environment and exhibited antimicrobial activity against *S. aureus*. These results suggest that Zn-mineralized agar nanocomposite films could be potentially used as affordable, eco-friendly and active food packaging materials.

Download English Version:

<https://daneshyari.com/en/article/5156594>

Download Persian Version:

<https://daneshyari.com/article/5156594>

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