Accepted Manuscript

Title: Hemocompatibility and cytocompatibility of pristine and plasma-treated silver-zeolite-chitosan composites

Author: Kathrina Lois M. Taaca Magdaleno R. Vasquez Jr.

PII: S0169-4332(17)31051-6

DOI: http://dx.doi.org/doi:10.1016/j.apsusc.2017.04.034

Reference: APSUSC 35709

To appear in: APSUSC

Received date: 13-10-2016 Revised date: 22-3-2017 Accepted date: 5-4-2017

Please cite this article as: Kathrina Lois M. Taaca, Magdaleno R. Vasquez<ce:suffix>Jr.</ce:suffix>, Hemocompatibility and cytocompatibility of pristine and plasma-treated silver-zeolite-chitosan composites, <![CDATA[Applied Surface Science]]> (2017), http://dx.doi.org/10.1016/j.apsusc.2017.04.034

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.



ACCEPTED MANUSCRIPT

Hemocompatibility and cytocompatibility of pristine and plasma-treated silver-zeolite-chitosan composites

Kathrina Lois M. Taaca and Magdaleno R. Vasquez Jr.

Department of Mining, Metallurgical, and Materials Engineering, College of Engineering, University of the Philippines, Diliman, Quezon City 1101 Philippines

Abstract

Silver-exchanged zeolite-chitosan (AgZ-Ch) composites with varying AgZ content were prepared by solvent casting and modified under argon (Ar) plasma excited by a 13.56 MHz radio frequency (RF) power source. Silver (Ag) as successfully incorporated in a natural zeolite host without losing its antimicrobial activity against E. coli and S. aureus. The AgZ particles were incorporated into a chitosan matrix without making significant changes in the matrix structure. The composites also exhibited antibacterial sensitivity due to the inclusion of AgZ. Plasma treatment enhanced the surface wettability of polar and nonpolar test liquids of the composites. The average increase in total surface free energy after treatment was around 49% with the polar component having a significant change. Cytocompatibility tests showed at least 87% cell viability for pristine and plasma-treated composites comparable with supplemented RPMI as positive control. Hemocompatibility tests revealed that pristine composites does not promote hemolysis and the blood clotting ability is less than 10 mins. Coupled with the antibacterial property of the composites, the fabricated composites have promising biomedical applications.

Keywords: zeolite, chitosan, silver, composites, plasma treatment

Preprint submitted to Applied Surface Science

March 22, 2017

 $^{^* \\} Corresponding author$

Email address: mrvasquez2@up.edu.ph (Kathrina Lois M. Taaca and Magdaleno R. Vasquez Jr.)

Download English Version:

https://daneshyari.com/en/article/7836457

Download Persian Version:

https://daneshyari.com/article/7836457

<u>Daneshyari.com</u>