

Accepted Manuscript

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PII: S0167-577X(17)31596-3
DOI: <https://doi.org/10.1016/j.matlet.2017.10.120>
Reference: MLBLUE 23355

To appear in: *Materials Letters*

Received Date: 27 July 2017
Revised Date: 24 October 2017
Accepted Date: 30 October 2017

Please cite this article as: C. Hamciuc, E. Hamciuc, D. Popovici, A.I. Danaila, M. Butnaru, C. Rimbu, C. Carp-Carare, Y. Kalvachev, Biocompatible poly(ether-ether-ketone)/Ag-zeolite L composite films with antimicrobial properties, *Materials Letters* (2017), doi: <https://doi.org/10.1016/j.matlet.2017.10.120>

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Biocompatible poly(ether-ether-ketone)/Ag-zeolite L composite films with antimicrobial properties

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ABSTRACT

Aromatic poly(ether-ether-ketone)s (PEEKs) have received much attention to be used in biomedical field, due to their good physicochemical properties, processability and biocompatibility. Metal-exchanged zeolites have demonstrated to be good biomaterials in various applications, because of their low-toxicity, functional groups for grafting and high dispersability. In this study, new materials based on silver-containing zeolite L (Ag-ZL) and a PEEK containing phthalide units and pendant carboxylic groups were prepared. The films were characterized by FTIR spectroscopy, scanning electron microscopy and humidity absorption measurements. Their antimicrobial activity and cytotoxicity were investigated. The films having 12% Ag-ZL showed antimicrobial activity against Gram positive bacteria (*Staphylococcus aureus* 25923 ATCC and *Staphylococcus aureus* MRSA 43300 ATCC) and Gram negative bacteria (*Escherichia coli* 25922 ATCC) while those having 2% Ag-ZL were active only towards Gram positive bacteria. All the samples exhibited reduced cytotoxicity being thus potential candidates for biomedical applications.

Keywords: poly(ether ether ketone); silver; zeolite; thin films; antimicrobial; biomaterials

1. Introduction

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