24th Congress of Chemists and Technologists of Macedonia

BOOK of ABSTRACTS

11-14 September 2016

Ohrid, Republic of Macedonia

Сојуз на хемичарите и технолозите на Македонија
Society of Chemists and Technologists of Macedonia

XXIV Congress
with international participation

BOOK OF ABSTRACTS

11-14 September 2016

Ohrid, R. Macedonia

Metropol Lake Resort

n.b.: Manuscripts submitted to this Congress were not subjected to language or other corrections, except in some extreme cases. Authors are fully responsible for the content of their Abstracts.

CIP - Каталогизација во публикација
Национална и универзитетска библиотека "Св. Климент Охридски", Скопје

54(062)(048.3)
66(062)(048.3)

CONGRESS of the society of chemists and tecnologists of Macedonia (24 ; 2016 ; Ohrid)

Book of abstracts / XXIVth Congress of the society of chemists and technologists of Macedonia (with international participation) 11-14 September 2016 Ohrid, R. Macedonia, Metropol Lake Resort ; edited by Svetomir Hadzi Jordanov and Elena Tomovska. - Skopje : Society of chemists and technologists of Macedonia, 2016. - 340 стр. : илустр. ; 21 см

Регистар

ISBN 978-9989-760-13-6
1. Гл. ств. насл.
а) Хемија - Собири - Апстракти б) Технологија - Собири - Апстракти
COBISS.MK-ID 101625866

MST 009

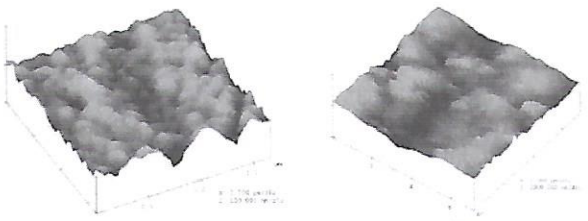
SURFACE CHARACTERIZATION OF CONDUCTIVE LIGNOCELLULOSE COMPOSITES

Marijana Pantović, Miroslav M. Pavlović, Milana Zarić, Vladimir Panić, Jasmina Stevnović, Miomir G. Pavlović

e-mail: m.pantovic@ihtm.bg.ac.rs

University of Belgrade, ICTM-CEH, Njegoševa 12, Belgrade, Serbia,

This paper is concerned with surface characterization of composite materials based on lignocellulosic (LC) matrix filled with electrolytic copper powder and chemically obtained silver powder. Volume fractions of metal fillers in composite materials and tested samples were varied in the range of 1.6-29.8% (v/v). Characterization included examination of the influence of particle size and morphology on the conductivity and percolation threshold of the composites using IS and AFM. The packaging effect and more pronounced interpartical contact with dendritic copper powder particles lead to "movement" of percolation threshold, which for the particles <45 μm and highest processing pressure of 27 MPa was 7.2% (v/v). IS response of the composites showed existence of electrical conductive layers, each having different resistivity that increases towards interior of the composite.



a) b)

Figure 1. 3D AFM images of a) LC-Cu and b) LC-Ag composites surfaces.

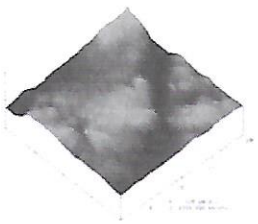


Figure 2. 3D AFM image of LC surface.

AFM measurements (Figure 1) show the existence of silver and copper conductive pathways throughout the composites volumes. Copper powder has more developed surface area than chemically obtained silver powder. Hence, the end of dendritic arms is more pronounced on the surface. This feature can be observed on Figure 1a, where roughness of the sample is greater than on Figure 1b. Figure 1b presents AFM image of the LC-Ag composite surface after breaking. Figure 2 presents Surface of LC matrix without the presence of conductive filler. It can be observed that the surface and its roughness differs from the composite ones.All of the conductive pathways are formed in 3D in a pure random order.

Keywords: lignocellulosic (LC) matrix, copper powder, silver powder

Acknowledgements: This work was supported by projects ON 172037 and ON 172046 financed by the Ministry of Education and Science of Republic of Serbia.