

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 006

CONDUCTIVE PATHWAYS IN ELECTROCONDUCTIVE BIODEGRADABLE POLYMER MATRIX COMPOSITES

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

e-mail: mpavlovic@tmf.bg.ac.rs

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

The results of experimental studies of the properties of composite materials based on lignocellulosic (LC) and poly(methylmetacrylate) matrices filled with electrolytic copper powder are presented. Volume fractions of metal fillers in composite materials and tested samples were varied in the range of 0.5-29.8%(v/v). Characterization included examination of the influence of particle size and morphology on the conductivity and percolation threshold of the composites using SEM and AFM. Presence of three dimensional conductive pathways was confirmed.

EDS measurements (Figure 1) show the existence of copper conductive pathways throughout the composites volumes. Due to the packaging effect and more pronounced interparticle contact with smaller, highly porous, highly dendritic particles with high values of specific area lead to "movement" of percolation threshold towards lower filler content. This feature can be observed on both on Figure 1 and Figure 2. Figure 2 presents AFM image of the PMMA and LC composite surfaces after breaking. These pathways are formed in 3D in a pure random order.

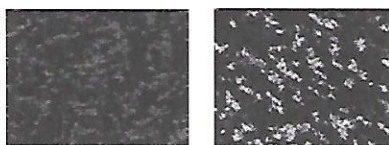


Figure 1. EDS images of the composite sample prepared at percolation threshold. White dots represent Cu. (left) LC-Cu and (right) PMMA-Cu composite



Figure 2. 3D AFM images of the PMMA (left) and LC (right) composite filled with copper powder at percolation threshold

The results showed that the shape and morphology of the copper powder, and filler at all, play a significant role in the phenomenon of electrical conductivity of the prepared samples and the appearance percolation threshold. The particles with highly developed free surface and dendritic and highly branched structure, such as galvanostatically obtained copper powder particles can easier form interparticle contacts at lower filler volume fractions than particles with more regular surface.

When two different matrices are compared, slight advantage can be given to PMMA since the percolation threshold is at lower value. However, lignocellulose is biodegradable, green matrix, and it comes from abundant, sustainable resource, and it can be used for green composite production.

Key words: lignocellulosic (LC) matrix, poly(methylmetacrylate) matrix,

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

EFFECT OF THE CHEMICAL BATH THIN F

Violeta Kol

- 1- Institute of General and Inorga
- 2- Institute of Chemistry, Faculty Univer
- 3- Research Center for Environn

It is well known that xerogels, are highly dependent on crystallinity and morphology deposition parameters (kind of material, temperature, pressure, etc.). This is a powerful tool for control and

In the present contribution on the formation and electrochromic xerogels $(\text{NH}_4)_x\text{V}_2\text{O}_5 \cdot n\text{H}_2\text{O}$ deposition method based on explored two synthetic approaches: acidification *via* hydrolysis system single phase of $(\text{NH}_4)_x\text{V}_2\text{O}_5$ concentration of NH_4VO_3 and $(\text{C}_2\text{H}_5)_2\text{SO}_4$, however, single phase of NH_4VO_3 solution, whereas at $(\text{NH}_4)_{0.15}\text{V}_2\text{O}_5 \cdot \text{H}_2\text{O}$ and NH_4VO_3 transmittance variance (ΔT) same deposition time in the same and degree of coverage $(\text{NH}_4)_x\text{V}_2\text{O}_5 \cdot n\text{H}_2\text{O}$ exhibit values of ΔT up to 50 % application in electrochromic

Key words: electrochromic

Acknowledgement: The financial support of the Ministry of Science and Arts