

The background of the cover is a photograph of a bridge at dusk or night. The bridge's steel structure is illuminated with green lights, and its reflection is visible in the water below. The sky is a deep blue, and the water is dark with some light reflections. The text is overlaid on this image.

**FOURTEENTH YOUNG RESEARCHERS' CONFERENCE  
MATERIALS SCIENCE AND ENGINEERING**

December 9-11, 2015, Belgrade, Serbia  
Serbian Academy of Sciences and Arts, Knez Mihailova 36

**PROGRAMME &  
THE BOOK OF ABSTRACTS**

**MATERIALS RESEARCH SOCIETY OF SERBIA  
INSTITUTE OF TECHNICAL SCIENCES OF SASA**

December 2015, Belgrade, Serbia

**FOURTEENTH YOUNG RESEARCHERS' CONFERENCE  
MATERIALS SCIENCE AND ENGINEERING**

**December 9-11, 2015, Belgrade, Serbia  
Serbian Academy of Sciences and Arts, Knez Mihailova 36**

**Program and the Book of Abstracts**

**Materials Research Society of Serbia  
&  
Institute of Technical Sciences of SASA**

**December 2015, Belgrade, Serbia**

Book title:

Fourteenth Young Researchers' Conference - Materials Science and Engineering:  
Program and the Book of Abstracts

Publisher:

Institute of Technical Sciences of SASA  
Knez Mihailova 35/IV, 11000 Belgrade, Serbia  
Tel: +381-11-2636994, fax: 2185263  
<http://www.itn.sanu.ac.rs>

Editor:

Dr. Smilja Marković

Technical Editor:

Aleksandra Stojičić

Cover page: Aleksandra Stojičić and Milica Ševkušić

Cover: modified photo *Belgrade bridges* by mcveja; Flickr  
(<https://www.flickr.com/photos/mcveja/2428406067/>); CC-BY 2.0 Generic

Printer:

Gama digital centar  
Autoput No. 6, 11070 Belgrade, Serbia  
Tel: +381-11-6306992, 6306962  
<http://www.gdc.rs>

Edition:

100 copies

CIP - Каталогизacija у публикацији  
Народна библиотека Србије, Београд

66.017/.018(048)

YOUNG Researchers Conference Materials Sciences and Engineering (14th ;  
2015 ; Beograd)

Program ; and the Book of Abstracts / Fourteenth Young Researchers'  
Conference Materials Sciences and Engineering, December 9-11, 2015,  
Belgrade, Serbia ; [organized by] Materials Research Society of Serbia  
& Institute of Technical Sciences of SASA ; [editor Smilja Marković]. -  
Belgrade : Institute of Technical Sciences of SASA, 2015 (Beograd :  
Gama digital centar). - XVI, 58 str. ; 23 cm

Tiraž 100. - Registar.

ISBN 978-86-80321-31-8

1. Materials Research Society of Serbia (Beograd)

a) Наука о материјалима - Апстракти б) Технички материјали - Апстракти  
COBISS.SR-ID 219496972



5-1

### **Hybrid material based on polyoxometalate deposited on electrochemically exfoliated graphene**

Bojan Vidoeski,<sup>1</sup> Svetlana Jovanović,<sup>2</sup> Danica Bajuk-Bogdanović,<sup>1</sup> Milica Vujković,<sup>1</sup>  
Vladimir Pavlović,<sup>3</sup> Biljana Todorović-Marković,<sup>2</sup> Ivanka Holclajtner-Antunović<sup>1</sup>

<sup>1</sup>*Faculty of Physical Chemistry, University of Belgrade, Studentski trg 12–16, 11000  
Belgrade, Serbia,* <sup>2</sup>*Vinča Institute of Nuclear Sciences, University of Belgrade, P.O. Box 522,  
11000 Belgrade, Serbia,* <sup>3</sup>*Joint Laboratory for Advanced Materials, Serbian Academy of  
Sciences and Arts, 11000 Belgrade, Serbia*

In this paper we demonstrated successful synthesis of Keggin-type POM (MoPA)/exfoliated graphene (EG) nanocomposite. By different characterization techniques (micro-Raman spectroscopy, Fourier transform infrared spectroscopy, atomic force microscopy, scanning electron microscopy and cyclic voltammetry) we investigated structural and morphological properties of MoPA/exfoliated nanocomposite. Microscopy analysis showed the presence of MoPA clusters on the surface and edges of EG sheets. The strong electrostatic interaction between MoPA and EG sheets was confirmed by Raman, FTIR spectroscopy and cyclic voltammetry. Cyclic voltammetry has shown that capacitive characteristics of the obtained material may be improved by increased quantity of graphene.

5-2

### **Tailoring self-ordering TiO<sub>2</sub> nanotube arrays by oxidative anodization**

Jelena Vujančević,<sup>1</sup> Veljko Djokić,<sup>2</sup> Andjelika Bjelajac,<sup>2</sup> Jovana Ćirković,<sup>3</sup>  
Vera P. Pavlović,<sup>4</sup> Miodrag Mitrić,<sup>5</sup> Djordje Janačković,<sup>6</sup> Vladimir B. Pavlović<sup>1</sup>

<sup>1</sup>*Institute of Technical Sciences of SASA, Knez Mihailova 35/IV, 11000 Belgrade, Serbia,*  
<sup>2</sup>*Innovation Center of Faculty of Technology and Metallurgy, University of Belgrade,  
Karnegijeva 4, 11000 Belgrade, Serbia,* <sup>3</sup>*Institute for multidisciplinary research, University  
of Belgrade, Kneza Visaslava 1, 11030, Belgrade, Serbia,* <sup>4</sup>*Faculty of Mechanical  
Engineering, University of Belgrade, Kraljice Marije 16, 11000 Belgrade, Serbia,* <sup>5</sup>*Institute  
of Nuclear Sciences Vinca, Laboratory of Solid State Physics, 1101 Belgrade,* <sup>6</sup>*Faculty of  
Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11000 Belgrade, Serbia*

Having in mind that anodic oxidation method can be used for tailoring desired structure and morphology of TiO<sub>2</sub>, herein the synthesis of self-ordered TiO<sub>2</sub> nanotubes via electrochemical anodization of high purity Ti foil is reported. The influence of synthesis parameters such as oxidative voltage, different electrolyte, annealing temperature and annealing atmosphere were explored and correlate with obtained TiO<sub>2</sub> nanotube arrays. The results show that applied potential is the main factor that controls the diameter of the nanotubes, while annealing temperature influence on crystal type and morphology is related to different contents of electrolyte. Investigated method gives opportunity to enhanced performance of TiO<sub>2</sub> nanotubes, providing many applications in different field.