

## Programme & The Book of Abstracts

*Nineteenth Annual Conference*

# YUCOMAT 2017

Herceg Novi, Montenegro, September 4-8, 2017

*Organised by*

MATERIALS RESEARCH SOCIETY OF SERBIA

endorsed by



**NINETEENTH ANNUAL CONFERENCE**

# **YUCOMAT 2017**

Hunguest Hotel Sun Resort Herceg Novi, Montenegro,  
September 4-8, 2017  
<http://www.mrs-serbia.org.rs>

## **Programme and The Book of Abstracts**

Organised by:  
**Materials Research Society of Serbia**

Endorsed by:  
**Materials Research Society,  
European Materials Research Society  
and  
Federation of European Material Societies**

**Title:** THE NINETEENTH ANNUAL CONFERENCE  
**YUCOMAT 2017**  
Programme and The Book of Abstracts

**Publisher:** Materials Research Society of Serbia  
Knez Mihailova 35/IV, P.O.Box 433, 11000 Belgrade, Serbia  
Phone: +381 11 2185-437  
<http://www.mrs-serbia.org.rs>

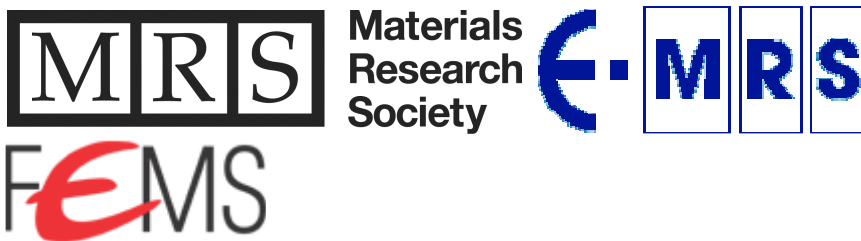
**Editors:** Prof. Dr. Dragan P. Uskoković and Prof. Dr. Velimir Radmilović

**Technical editor:** Aleksandra Stojičić

**Cover page:** Aleksandra Stojičić and Milica Ševkušić  
Front cover: Modified Photo by Mercy; Wikimedia Commons  
([https://commons.wikimedia.org/wiki/Category:Herceg\\_Novi#/media/File:Herceg\\_Novi,\\_Montenegro\\_-\\_harbour.jpg](https://commons.wikimedia.org/wiki/Category:Herceg_Novi#/media/File:Herceg_Novi,_Montenegro_-_harbour.jpg)); [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)  
Back cover: Modified photo by Anatoly Alekseyevich Ivanishin, Exploration 30 ISS Mission, NASA; Wikimedia Commons  
([https://commons.wikimedia.org/wiki/File:Warp\\_Belgrade\\_Nightscene\\_April\\_2012spatial\\_subset.jpg](https://commons.wikimedia.org/wiki/File:Warp_Belgrade_Nightscene_April_2012spatial_subset.jpg)); Public domain

**Copyright** © 2017 Materials Research Society of Serbia

**Acknowledgments:** This conference is celebrating 20 years of MRS-Serbia.



**Printed in:** Biro Konto  
Sutorina bb, Igalo – Herceg Novi, Montenegro  
Phones: +382-31-670123, 670025, E-mail: [bkonto@t-com.me](mailto:bkonto@t-com.me)  
Circulation: 220 copies. The end of printing: August 2017

O.S.II.6.

**Enhanced natural sunlight- and artificial UV-driven photocatalytic activity  
of mechanically activated ZnO/SnO<sub>2</sub> composite**

Smilja Marković<sup>1</sup>, Ana Stanković<sup>1</sup>, Jasmina Dostanić<sup>2</sup>, Lidija Mančić<sup>1</sup>,  
Srečo Davor Škapin<sup>3</sup>, Dragan Uskoković<sup>1</sup>

<sup>1</sup>Institute of Technical Sciences of SASA, Knez Mihailova 35/IV, 11000 Belgrade, Serbia,

<sup>2</sup>University of Belgrade, IChTM Center for Catalysis, Belgrade, Serbia, <sup>3</sup>Jožef Stefan Institute,  
Jamova 39, 1000 Ljubljana, Slovenia

Over the past four decades there is an increasing interest to develop highly efficient semiconductor photocatalysts for degradation of organic and biological pollutants in water under light irradiation. The semiconductor band gap determines which wavelength of light will be absorbed; precisely, semiconductors with a wide band gap ( $> 3$  eV) can absorb only UV light, while those with a narrow band gap ( $< 3$  eV) can be activated by visible light.

In this study we examined structural, morphological, textural and optical properties of ZnO/SnO<sub>2</sub> composite as potential photocatalyst. Mechanical activation of commercial ZnO and SnO<sub>2</sub> powders has been used to produce a composite with high density of surface defects. To investigate the influence of thermal treatment on the physical properties, and consequently on photoactivity, the composite has been additionally annealed at 400 and 700 °C. The phase purity, crystal structure and average crystallite size of pristine metal oxides and the composites were investigated by X-ray diffraction and Raman spectroscopy. The particles morphology and size distributions were studied by FE-SEM and laser diffraction particle size analyzer, respectively. The textural properties were determined from N<sub>2</sub> adsorption/desorption experiments, while the optical properties were studied using UV-Vis diffuse reflectance and photoluminescence spectroscopy. Photocatalytic activity of pristine ZnO and ZnO/SnO<sub>2</sub> composites were examined via de-colorization of methylene blue under: (1) direct natural sunlight, and (2) artificial UV irradiation. In both cases enhanced photocatalytic activity of ZnO/SnO<sub>2</sub> has been found. Enhanced photocatalytic activity can be attributed to the surface defects and to created ZnO/SnO<sub>2</sub> heterojunctions which reduced electron-hole recombination time.

CIP- Каталогизација у публикацији  
Народна библиотека Србије

66.017/.018(048)

**MATERIALS Research Society (Beograd). Conference (19 ; 2017 ; Herceg Novi)**

Programme ; and The Book of Abstracts / Nineteenth Annual Conference YUCOMAT 2017, Herceg Novi, September 4-8, 2017 ; organised by Materials Research Society of Serbia, [Belgrade ; editors Dragan P. Uskoković and Velimir Radmilović]. - Belgrade : Materials Research Society of Serbia, 2017 (Herceg Novi : Biro Konto). - XL, 124 str. ; 23 cm

Tiraž 220. - Registar.

ISBN 978-86-919111-2-6

1. Materials Research Society of Serbia (Beograd)

- a) Наука о материјалима - Апстракти
- b) Технички материјали - Апстракти

COBISS.SR-ID 241612044