

Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION III
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute of Technical Sciences of SASA
Institute of Chemistry Technology and Metallurgy
Institute of Physics
Institute for Technology of Nuclear and Other Raw Mineral Materials
Institute for Testing of Materials
Archeological Institute of SASA

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Sep 29th - Oct 1st, 2014, Belgrade, Serbia

Book title: Serbian Ceramic Society Conference - ADVANCED CERAMICS AND APPLICATION III: Program and the Book of Abstracts

Publisher:

Serbian Ceramic Society

Editors:

Prof.dr Vojislav Mitić

Prof. dr Olivera Milošević

Dr Nina Obradovic

Dr Lidija Mančić

Technical Editor:

Prof. dr Olivera Milošević

Printing:

Serbian Academy of Sciences and Arts,

Knez Mihailova 35, Belgrade

Format

Pop Lukina 15, Belgrade

Edition:

150 copies

Sculptural Concretes: Rajko D. Blažić, High School-Academy for Arts and Conservation, Serbian Orthodox Church, Belgrade, Serbia

CIP - Каталогизacija у публикацији

Народна библиотека Србије, Београд

666.3/.7(048)

66.017/.018(048)

SERBIAN Ceramic Society (Belgrade). Conference (3rd ; 2014 ; Beograd) Advanced Ceramics and Application : new frontiers in multifunctional material science and processing : program and the book of abstracts / III Serbian Ceramic Society Conference, 29th September - 1st October, Belgrade, 2014 ; [organized by] Serbian Ceramic Society ... [et al.] ; [editors Vojislav Mitić ... et al.]. - Belgrade : Serbian Ceramic Society, 2014 (Belgrade : Serbian Academy of Sciences and Arts). - 139 str. ; 30 cm

Tiraž 150.

ISBN 978-86-915627-2-4

1. Serbian Ceramic Society (Belgrade)

a) Керамика - Апстракти b) Наука о

материјалима - Апстракти c) Наноматеријали

- Апстракти

COBISS.SR-ID 209985036

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Synthesis and Characterization of Nanostructured Hybrid Systems of Ag&ZnO Obtained by Solvothermal Method for Photocatalytic Applications

L. Muñoz¹, A. Sierra-Fernandez^{1,2}, L.S.Gomez-Villalba², O.Milosevic³, M.E.Rabanal¹

¹*University Carlos III of Madrid and IAAB, Department of Materials Science and Engineering and Chemical Engineering, Avda.Universidad 30, 28911 Leganes, Madrid, Spain*

²*Instituto de Geociencias (CSIC, UCM), C/ José Antonio Novais 2, 28040 Madrid, Spain*

³*Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Knez Mihailova 35/IV, 11000 Belgrade, Serbia*

In this work is reported the solvothermal synthesis of hybrid nanostructured ZnO&Ag systems starting from zinc nitrate hexahydrate ($\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$) and silver nitrate ($\text{Ag}(\text{NO}_3)_2$) as precursors. The structural and morphological properties of the obtained hybrid materials were characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM) and transmission electron microscopy (TEM). Subsequently, the photocatalytic behavior of prepared systems was evaluated. The results verify the viability of as-synthesized ZnO&Ag nanocomposites for its application in the removal of contaminants in water. The best results (percentage of pollutant removal > 99 %) are obtained for samples synthesized at low temperature, intermediate times, higher ratios $\text{Ag}^+/\text{Zn}^{2+}$ and in the presence of CTAB, which controls the final morphology of nanostructures and the dispersion thereof. These results prove that the system morphology is critical to the properties of the obtained material.