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

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

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 20-21. September 2021.

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

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

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 20-21. September 2021

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

Publisher:
Serbian Ceramic Society

Editors:
Prof.dr Vojislav Mitić
Dr Lidija Mančić
Dr Nina Obradović

Technical Editors:
Ivana Dinić
Marina Vuković

Printing:
Serbian Ceramic Society, Belgrade, 2021

Edition:
100 copies

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

666.3/.7(048)
66.017/.018(048)

SRPSKO KERAMIČKO DRUŠTVO. CONFERENCE ADVANCED CERAMICS AND APPLICATION : NEW FRONTIERS IN MULTIFUNCTIONAL MATERIAL SCIENCE AND PROCESSING (9 ;2021 ; BEOGRAD)
Program ; and the Book of abstracts / Serbian Ceramic Society Conference Advanced Ceramics and Application IX : New Frontiers in Multifunctional Material Science and Processing, Serbia, Belgrade, 20-21. September 2021 ; [organized by] Serbian Ceramic Society ... [et al.] ; [editors Vojislav Mitić, Lidija Mančić, Nina Obradović]. - Belgrade : Serbian Ceramic Society, 2021 (Belgrade : Serbian Ceramic Society). - 93 str. : ilustr. ; 30 cm

Tiraž 100.

ISBN 978-86-915627-8-6

а) Керамика -- Апстракти б) Наука о материјалима -- Апстракти в) Наноматеријали -- Апстракти

COBISS.SR-ID 45804553

Dear colleagues and friends,

We have great pleasure to welcome you to the Advanced Ceramic and Application IX Conference organized by the Serbian Ceramic Society in cooperation with the Institute of Technical Sciences of SASA, Institute of Chemistry Technology and Metallurgy, Institute for Technology of Nuclear and Other Raw Mineral Materials and Institute for Testing of Materials.

It is nice to host you here in Belgrade in person. As you probably know, Serbia launched a vaccination campaign at the beginning of this year, so up to date more than 50 percent of the adult population has been vaccinated. Since there is no one statistic to compare the COVID19 outbreaks and fears for loved ones in different countries, we believe that we all suffer similarly during this pandemic. That is why we appreciate even more your positive attitude and readiness to travel in this uncertain time. We understand that some of you had to cancel your lectures in the last minute due to the travel limitation in your countries, but we hope that you will come next year. We deeply hope that the ACA IX Conference will be worth remembering, that you will respect all COVID-19 safety measures at SASA building, that you will have a nice time here and that ultimately you will return to your home safely. We are very proud that we succeeded in bringing the scientific community together again and fostering the networking and social interactions around an interesting program on emerging advanced ceramic topics. The chosen topics cover contributions from fundamental theoretical research in advanced ceramics, computer-aided design and modeling of new ceramics products, manufacturing of nanoceramic devices, developing of multifunctional ceramic processing routes, etc.

Traditionally, ACA Conferences gather leading researchers, engineers, specialists, professors and PhD students trying to emphasize the key achievements which will enable the widespread use of the advanced ceramics products in the High-Tech industry, renewable energy utilization, environmental efficiency, security, space technology, cultural heritage, etc.

Serbian Ceramic Society was initiated in 1995/1996 and fully registered in 1997 as Yugoslav Ceramic Society, being strongly supported by American Ceramic Society. Since 2009, it has continued as the Serbian Ceramic Society in accordance with Serbian law procedure. Serbian Ceramic Society is almost the only one Ceramic Society in South-East Europe, with members from more than 20 Institutes and Universities, active in 16 sessions. Part of our members are also members of the Serbian Chapter of ACerS since 2019. Their activities in the organization of this conference is highly recognized. To them and all of you thanks for being with us here at ACA IX.

Prof. Dr Vojislav Mitić
President of the Serbian Ceramic Society
World Academy Ceramics Member
European Academy of Sciences & Arts Member

Prof. Dr Olivera Milošević,
President of the General Assembly of the
Serbian Ceramic Society
Academy of Engineering Sciences of Serbia Member

Conference Topics

- Basic Ceramic Science & Sintering
- Nano-, Opto- & Bio-ceramics
- Modeling & Simulation
- Glass and Electro Ceramics
- Electrochemistry & Catalysis
- Refractory, Cements & Clays
- Renewable Energy & Composites
- Amorphous & Magnetic Ceramics
- Heritage, Art & Design

Conference Programme Chairs:
Dr. Lidija Mančić SRB
Dr. Nina Obradović SRB

Conference Co-chairs:
Prof. Dr. Vojislav Mitić SRB
Prof. Dr. Rainer Gadow GER

Scientific Committee

Academician Zoran Popović SRB
Academician Zoran Đurić SRB
Prof. Dr. Vojislav Mitić SRB
Prof. Dr. Rainer Gadow DEU
Prof. Dr. Marcel Van de Voorde EEZ
Prof. Dr. Wei Pan
Prof. Dr. Reuben Jin-Ru Hwu
Dr. Richard Todd GBR
Prof. Dr. Hans Fecht DEU
Prof.Dr. Olivera Milošević SRB
Prof. Dr. Vladimir Pavlović SRB
Dr. Nina Obradović SRB
Dr. Lidija Mančić SRB
Prof. Dr. Bojan Marinković BRA
Dr. Takashi Goto, Japan
Dr. Steven Tidrow, USA
Dr. Snežana Pašalić SRB
Prof. Dr. Zoran Nikolić SRB
Dr. Nebojša Romčević SRB
Dr. Zorica Lazarević SRB
Prof. Dr. Nebojša Mitrović SRB
Dr. Aleksandra Milutinović–Nikolić SRB
Dr. Predrag Banković SRB
Dr. Zorica Mojović SRB
Prof. Dr. Branislav Vlahović USA
Prof. Dr. Stevo Najman SRB
Prof. Dr. Vera Pavlović

Organizing Committee
Prof. Dr. Vojislav Mitić SRB
Dr. Lidija Mančić SRB
Dr. Nina Obradović SRB
Dr. Ivana Dinić SRB
Dr. Marina Vuković SRB
Dr. Suzana Filipović SRB
Dr. Maria Čebela
Dr. Nataša Jović Jovičević SRB
Dr. Vesna Paunović SRB
Dr. Vladimir Blagojević SRB
Dr. Darko Kosanović SRB
Dr. Vladimir Dodevski SRB
Dr. Ivana Radović SRB
Dr. Jelena Vujančević SRB
Dr. Jelena Živojinović SRB
Dr. Adriana Peleš Tadić SRB
Dr. Ana Radosavljević Mihajlović, SRB
Bojana Marković SRB

INV

Synthesis and characterization of ZnO nano/micro crystals with enhanced sunlight-induced photo-catalytic activity

Ana Stanković[1], Ljiljana Veselinović[1], Srečo Davor Škapin[2], Smilja Marković[1]

[1]Institute of Technical Sciences of SASA, 11000 Belgrade, Serbia
[2]Jožef Stefan Institute, 1000 Ljubljana, Slovenia

It is known that the functional properties of zinc oxide (ZnO) materials depend on their physico-chemical properties, such as optical properties and specific surface area.They are defined with structural characteristics, for example: the particle size and morphology, phase composition, crystallite size, crystallinity degree, as well as the crystal structure ordering, i.e., the presence of structural defects. The primary purpose of this study was to synthesize ZnO powders with various physico-chemical properties by optimizing the reaction conditionsin different processing methods. For example, reaction temperature or addition of various surfactants such as polyvinyl alcohol, polyvinyl pyrrolidone, or polyethylene oxide. In this study, to vary physico-chemical properties of ZnO particles, four different synthesis methods wereemployed: mechanochemical, hydrothermal, ultrasonicand microwave processing. Structural and morphological properties of prepared ZnO powders were characterized using a number of techniques such as: X-ray powder diffraction (XRPD), Raman and Fourier transform infrared (FTIR) spectroscopy, field emission scanning electron microscopy (FESEM), UV-Vis diffuse reflectance and photoluminescence (PL) spectroscopy. One of the functional properties of the synthesized ZnO powders that was particularly examined is photocatalytic activity. In order to examine ZnO as a photocatalyst, photodegradation of methylene blue (MB) dye was carried out under simulated and direct sunlight irradiation. The UV–Vis spectra showed that the modification of the particle size and morphology from nanospheres to micro-rods resulted in increased absorption, and a slight red-shift of the absorption edge. Besides, the band gap energy of the synthesized ZnO micro and nanocrystals showed the red shift compared to bulk ZnO. According to the results of a Raman spectroscopy, the enhanced visible light absorption of the ZnO micro and nanocrystals is related to two phenomena: the existence of lattice defects (oxygen vacancies and zinc interstitials), and the particle surface sensitization by different surfactants.