Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION XI
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, 18-20. September 2023.

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Dear colleagues and friends,

We have great pleasure to welcome you to the Advanced Ceramic and Application XI 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. 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 nano-ceramic 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 9 sessions..

Dr. Nina Obradović
President of the Serbian Ceramic Society

Dr. Suzana Filipović
President of the General Assembly of the Serbian Ceramic Society

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

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Република Србија
МИНИСТАРСТВО НАУКЕ,
ТЕХНОЛОШКОГ РАЗВОЈА И
ИНОВАЦИЈА

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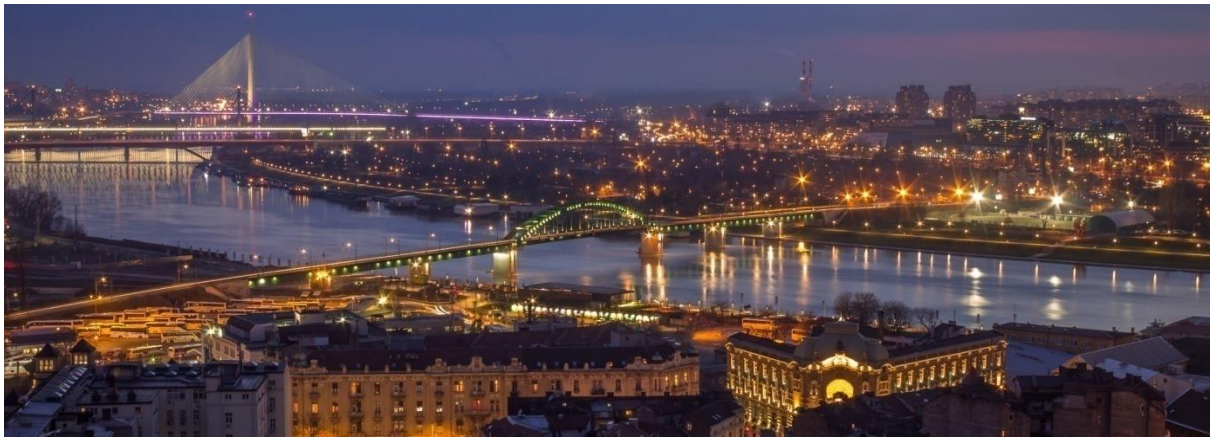
The Eleventh Serbian Ceramic Conference Advanced Ceramics and Application



oscillation time. In this work, the influence of different sizes of bentonite particles from the Bogovina deposit on the Briggs-Rauscer oscillatory reaction in the conditions of a closed reactor was investigated. Five particle sizes of bentonite, (< 25 μm, < 50 μm, < 75 μm, < 150 μm and < 300 μm) having identical mass of 0.15 g, were tested. The addition of different particle sizes of Bogovina clay does not significantly influence the basic BR oscillogram.
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P20
Synthesis and characterization of luminescent Pr^{3+}–doped hydroxyapatite nanopowder as a potential biomaterial for bioimaging applications

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Praseodymium doped calcium hydroxyapatite (PrHAP) nanopowder was synthesized by the co-precipitation method and characterized by X-Ray Diffraction, Fourier Transform Infrared, and Fluorescence Spectroscopy. Characterization studies from XRD and FTIR spectra showed that obtained crystals are monophase hydroxyapatites and that the sample particles are of nano size. A fluorescence study has shown that PrHAP particles have fluorescent emission under UV- Visible excitation. These results may open new avenues for developing bioactive materials for bone regeneration and fluorescent probes for bio-imaging applications

P21
Vertically aligned TiO_2 nanorod array as an electron transport layer in perovskite photodiode

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The development of metal oxide-based electron transport layers in perovskite solar cells (PSCs) is being intensively researched to achieve highly efficient PSCs. They offer the advantage of higher charge carrier mobility and stability compared to typical organic materials. To reduce the recombination of charge carriers, methylammonium lead bromide ($MAPbBr_3$) perovskite was coupled with vertically aligned TiO_2 nanorods (NRs) as an

electron transport layer in this study. The TiO_2 NRs were grown on commercial FTO glass in hydrothermal conditions. Titanium (IV) isopropoxide (TTIP) was added in drops, slowly, in the diluted solution of HCl. The obtained precursor solution was transferred into a Teflon-lined stainless steel autoclave which contained FTO substrates and heated at 150 °C for 2 h. Then, the substrates were cleaned using DI water and ethanol and annealed at 500 °C for 30 min. The solution of $MAPbBr_3$ in dimethylformamide (DMF) was deposited on TiO_2 NRs by spin coating technique. FESEM results showed that TiO_2 NRs were porous and oriented vertically upwards to the substrate and that the perovskite material filled the space between TiO_2 NRs. Diffuse reflectance spectroscopy measurement of the sample proved that the absorption edge of the prepared TiO_2 NRs/$MAPbBr_3$ was extended into the visible range. By measuring the *I-V* characteristics of the sample in the dark and under visible light, a hysteresis curve was obtained. Prepared TiO_2 NRs/$MAPbBr_3$ photodiode will be the basis for the construction of solar cells.

P22

Carbonized chitosan-bentonite as electrode material

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Bentonite clay has shown to be a versatile material that can be easily modified and applied as an adsorbent, (electro)catalyst, or as a support for (electro)catalyst. The carbon-clay composites combine a relatively high specific surface area of the clay with a good electrical conductivity of carbon.In this paper, the effect of the applied carbonization procedure on the electrochemical properties of bentonite-carbon composite was investigated. Chitosan-modified bentonite was carbonized by conventional thermal degradation and by the hydrothermal procedure. The electrochemical characterization was performed by cyclic voltammetry and electrochemical impedance spectroscopy. The response to $Fe(CN)_6^{3-/4-}$ and $Ru(NH_3)_6^{2+/3+}$ redox probe showed that the thermally treated sample shows somewhat higher electrochemical activity and lower charge-transfer resistance. However, an investigation of composites activity toward aminophenazone, performed in the pH range 3-9 showed that the hydrothermally obtained sample shows higher activity at pH above 5, while the thermally obtained sample was more active at pH below 5.

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