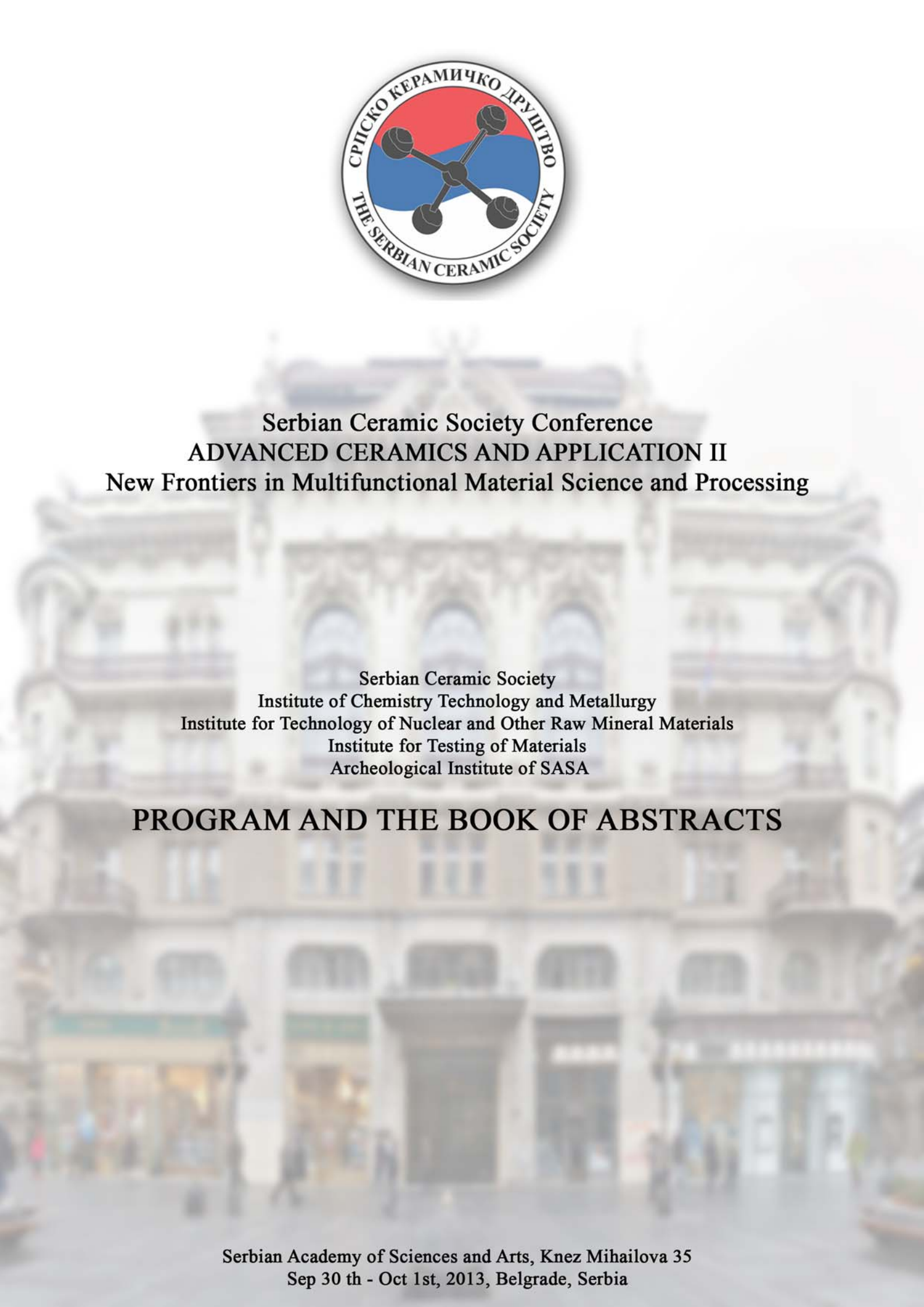

Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION II
New Frontiers in Multifunctional Material Science and Processing

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

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Sep 30 th - Oct 1st, 2013, Belgrade, Serbia

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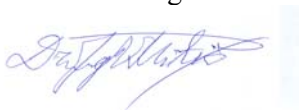
Dear Colleagues, dear friends, we have great pleasure to welcome you to the Advanced Ceramic and Application Conference II organized by the Serbian Ceramic Society in cooperation with the Institute of Chemistry Technology and Metallurgy**,** Institute for Technology of Nuclear and Other Raw Mineral Materials, Institute for Testing of Materials and Archeological Institute of SASA. This conference brings together researchers from academia and industry to present the latest advances in synthesis and characterization in the field on new ceramic structures. The chosen Conference topics opening the new frontiers in designing of advanced ceramic materials since they cover fundamental theoretical research, modeling and simulation, controlled nanostructured materials synthesis and optimization of the consolidation process, which all together should provide practical realization of the new ideas towards device miniaturization, energy-materials-information integration and preservation of cultural heritage.



Prof. Dr Vojislav Mitić
President of the Serbian Ceramic Society
World Academy Ceramics Member

General Conference topics included:

- Basic Ceramics Science
- Nano-, Bio- and Opto-ceramic Nanotechnologies
- Multifunctional Materials
- Magnetic and Amorphous Materials
- Construction and Eco-ceramic
- Composites, Catalysis, Electro-catalysis
- Artistic Ceramic and Design, Archeological Heritage
- Young Researchers
- **Sintering processes**
  - kinetics
  - thermodinamics
  - microstructure
  - modeling

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and 120 minutes. The isothermal sintering of compacted powders was conducted at 1100^{o}C during 30, 60 and 180 minutes. For specimens synthesized in such a manner, microwave dielectric properties were measured, quality factor (Q,) specific electrical resistivity (ρ) and the dielectric constant (ε_r).

P21

Novel organo-inorganic clay based catalyst for catalytic wet peroxide oxidation

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This work presents results of a preliminary study of a novel organoinorganic material based on bentonite clay (Mečji Do, Serbia) that was investigated as catalyst in the Catalytic Wet Peroxide Oxidation (CWPO) of Tartrazine dye. The material was obtained by supporting Fe^{3+} ions on organobentonite with hexadecyltrimethylammonium loading (HDTMA-MD), according to analogy with strong binding of toxic metal cations from water by adsorption on HDTMA-MD. The purpose of organic loading was to assure that the majority of Fe^{3+} is supported on the clay particle surface instead of clay interlamellar region.

XRD analysis showed the incorporation of HDTMA in the interlamellar region, while there was no indication of the presence of Fe^{3+} between the smectite lamellae; XRF analysis confirmed increased Fe content of the organo-inorganic clay material. Fe-HDTMA-MD showed good performance in the catalytic degradation at different initial concentrations of the dye; increased temperature had beneficial effect on the decolonization of Tartrazine solutions.

P22

p-Nitrophenol electro-oxidation on carbon glass electrode modified with organoclays

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A glassy carbon electrode (GCE) was modified with a thin layer of modified clay obtained from insufficiently investigated locality Mečji Do in Serbia. The clay is very rich in smectite with only traces of other minerals like crystoballite. Na-enriched smectite and a series of tetramethylammonium smectites (TMA-S) with different TMA/S ratios were tested as constituents of GCE based working electrode in the electro–oxidation of *p*-nitrophenol (*p*-NP) in H_2SO_4 as support electrolyte. The modified clays were characterized by XRF, X-ray diffraction and FTIR

spectroscopy and the incorporation of TMA in the smectite structure was confirmed. Cyclic voltammetry was used for electrochemical investigation. The presence of TMA increased the current density of the *p*-NP oxidation wave in comparison with the oxidation signals obtained using a Na-enriched based electrode. It can be assumed that the increased electrochemical activity of TMA-S based electrodes toward *p*–NP oxidation was achieved due to the adsorption of *p*–NP on the electrode surface, since the adsorption commonly precedes the electro-oxidation process. The adsorption of *p*–NP was favored by the presence of TMA.

P23

Characterization of mechanochemically synthesized $CaO{\cdot}ZnO{\cdot}K_2CO_3$

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The mixed oxide of $CaO{\cdot}ZnO$ and K_2CO_3 were prepared by ball milling of CaO and ZnO powders and water, with addition of K_2CO_3 and afterward by calcination at 700 ^oC. Influence of different molar ratio of K_2CO_3 and CaO (x=1, 2 and 4 moles of K_2CO_3 per 10 moles of CaO) was studied . The prepared samples were characterized by X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), thermogravimetric analysis (TGA), infrared spectroscopy (FTIR), scanning electron microscopy/energy-dispersive spectroscopy (SEM/EDS) and the particle size laser diffraction (PSLD) distribution. The addition of smaller amount of K_2CO_3 at the beginning of ball miling ($x \leq 2$), favors the formation of calcium zinc hydroxide hydrate, while it is not the case when K_2CO_3 larger addition was used ($x > 2$). A larger amount of potassium carbonate in the initial composition of powder mixture negatively affected formation of $CaZn_2(OH)_6{\cdot}2H_2O$. Bimodal distribution were detected for all samples after calcination at 700 ^oC and the results showed that the distribution of elements in the bulk is not homogeneous and that surface of formed mixed oxide $CaO{\cdot}ZnO$ (XPS analysis) after calcination is mainly covered by potassium species. That evidence indicate that the K_2CO_3 was not fully incorporated into the matrix. Prepared samples could be used for methanolysis of vegetable oil and fatty acid methyl esters (FAME, i.e. biodiesel) synthesis.