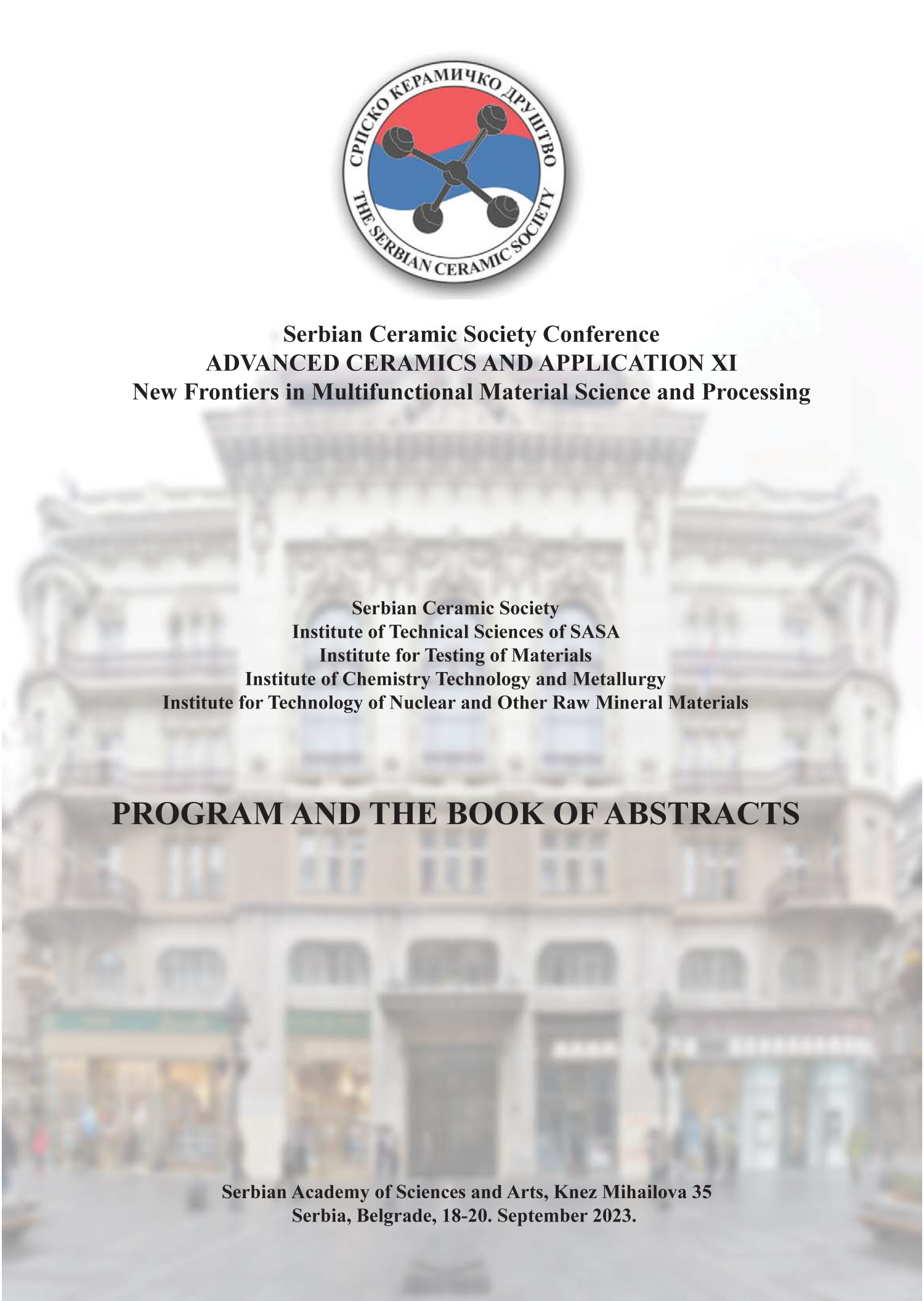

Serbian Ceramic Society Conference

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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МИНИСТАРСТВО НАУКЕ,
ТЕХНОЛОШКОГ РАЗВОЈА И
ИНОВАЦИЈА

ORL10

Electrochemical testing of iron phosphor tungsten bronzes as potential electrode material

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In this work, synthesized 12-tungstenphosphoric acid ($H_3PW_{12}O_{40} \cdot nH_2O$, PWA) was further ionically exchanged with Fe^{3+} ions, which led to the formation of the FePWA salt ($FePW_{12}O_{40}$ x nH_2O,). FePWA was then subjected to thermal analysis (TGA/DTA), which determined the phase transition temperature (i.e.. when the Keggin anion collapses). The temperature of collapsing the Keggin anion is about 600 °C, at which phosphate tungsten bronzes doped with iron (FePWB) are obtained. Obtained FePWB was further characterized by XRPD and FTIR, which confirmed the formation of the desired structure. FePWA and FePWB were examined as an electrode material for aqueous rechargeable batteries due to the channels and cavities present in their structure. Experiments were done in aqueous solutions of 6 M $LiNO_3$ by cyclic voltammetry. The differences in the redox processes of heteropoly acid salts and iron-doped bronze were discussed thoroughly and correlated with the XRPD and FTIR results. The catalytic activity is also investigated by Briggs-Rauscher method followed potentiometricaly.

ORL11

Why delamination cracks occur in ceramics manufactured via DLP, and how to eliminate them

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Institute for Manufacturing Technologies of Ceramic Components andComposites, University of Stuttgart, Germany

Digital Light Processing (DLP) of ceramics allows the creation of ceramic parts with unprecedented resolution for various applications, from medical tooling to archeological restoration. However, the manufacturing of a crack-free sintered ceramic part using DLP has been an arduous challenge in bothindustrial and academic research. Thus, as a result of numerous experimental and analytical studies, this contribution provides a guide for the elimination of delamination cracks in sintered ceramic parts manufactured via DLP. Photo-rheology, UV/Vis spectrophotometry and multiple microscopy techniques were used to critically analyze the formation of delamination cracks, their culprits and the possible methods to eliminate such cracks. It was found that proper particle dispersion, sufficient air extraction, optimized resin formulation, optimized printing parameters and sound design