



Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION X
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, 26-27. September 2022.

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Dear colleagues and friends,

We have great pleasure to welcome you to the Advanced Ceramic and Application X 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. This Conference is dedicated to Prof. Dr. Vojislav Mitić, president of Serbian ceramic society, who passed away in September 2021.

It is nice to host you here in Belgrade in person. As you probably know, Serbia launched a vaccination campaign at the beginning of last year, so up to date more than 70 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 deeply hope that the ACA X 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 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. 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 X.

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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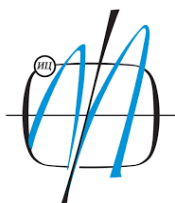
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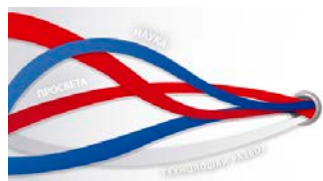
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Book of Abstracts

followed in the mass range from 10 mg to 50 mg at 30 °C. It was found that mass increase was beneficial for the decolorization rate. The effect of temperature was investigated from 30 °C to 60 °C. The decolorization was over 90% after only 10 minutes for the temperature of 60 °C, while with the temperature decrease, the decolorization rate decreased. Co-AlFePILC was found to be an efficient catalyst in degradation of tartrazine in the presence of Oxone®.

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Chemical analysis of historical mortars from the Roman period in Serbia

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This work is part of the MoDeCo2000 project research concerning the historical mortars from the Roman period in today's Serbia. It is focused on the chemical analysis of mortar samples selected from archaeological sites along the Danube River. The main compositional and technological features of the mortars were determined by chemical analyses with energy-dispersive x-ray fluorescence (EDXRF) and inductively coupled plasma optical emission spectrometry (ICP-OES) with an HF resistant introductory system. The aim of this study is to present the analytical chemistry strategy used for the rapid and reliable characterisation of the relevant features of historical mortars.

It is concluded that the EDXRF technique can be directly applied to solid samples, but ICP-OES still requires sample decomposition and dissolution to make full use of its analytical capabilities. However, in many cases, ICP-OES includes a quartz introductory system, and hydrofluoric acid removal by treatment with borates must be applied before measurement. Replacing the quartz introductory system with an HF resistant introductory system is achieved to eliminate the neutralisation step with borates, and still get very accurate boron and silicon results.

After detailed research, standard reference certified materials of selected rocks, clays, and limestone (CRM NIST 688 (basalt rock), NCS DC CRM 60102 (clay), NCS DC CRM 60104 (clay), NCS DC CRM 60105 (clay), NCS DC CRM 60106 (clay), BCS-CRM 512 (dolomite), BCS-CRM 513 (limestone)) were analyzed with the same chemical techniques, sighting the identification of potential types of raw materials employed for the production of mortars. Data analysis as a tool of statistics was applied to evaluate the characteristics of mortars, mutually differentiating mortars from different sites, as well as typify updated samples.

The analytical results showed that the EDXRF technique can be used together with other well-established techniques (ICP-OES) and presents a good potential as a reliable, cheap, and fast chemistry strategy to carry out the study of historical building materials. Elaboration of cheap and quick analytical methodology is an important aspect in the development of advanced steps in the research of historical mortars' production technology.

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