



**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.**

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EUROPEAN ACADEMY
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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

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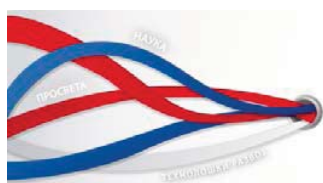
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P

Insights into the effect of aluminum oxyhydrates properties on their electrochemical behavior

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Alumina oxyhydrates have different structural and textural properties, as well as different density of surface functional groups. Three alumina oxyhydrates with different water content, 3mol H₂O/ mol Al₂O₃ (gibbsite), 1mol H₂O/ mol Al₂O₃ (boehmite) and 0.6 mol H₂O/ mol Al₂O₃ (α,γ -alumina phase), were used in this study. The samples were used as modifiers of carbon paste electrode. Their electrochemical behavior toward ferricyanide/ferrocyanide redox probe was evaluated by electrochemical impedance spectroscopy and cyclic voltammetry. Ferricyanide/ferrocyanide redox system has a well-known electrochemical behavior and is sensitive to the changes occurring at the electrode surface. The lowest charge transfer resistance was obtained for α,γ -alumina phase. The redox process of ferri/ferro redox probe on investigated electrodes exhibited a quasi-reversible behavior, since the obtained values of peak-to-peak separation are greater than 59 mV value expected for a reversible process. The response toward quinone/hydroquinone redox probe was evaluated by cyclic voltammetry in buffered solutions at various pH. Gibbsite and boehmite showed expected response, while the surface groups of α,γ -alumina phase enabled quinone oxidation to proceed through two pathways simultaneously. The surface chemistry of investigated samples influenced their electrochemical properties.

P

Characterization of Tamnavaclay by X-ray powder diffraction method

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The X-ray powder diffraction method on a polycrystalline sample is one of the basic methods used in the characterization of aluminosilicate minerals. The clay minerals represent a complex system, in which more than one phase is present. The main problems in analysis of clay minerals is weak crystallinity, preferential orientation, as well as the appearance of asymmetry. In this paper are presented the results of analysis of smectic type clay from Tamnava area. For investigation was use the method of X-ray powder diffraction and SEM analysis.