



**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**  
of Sciences and Arts

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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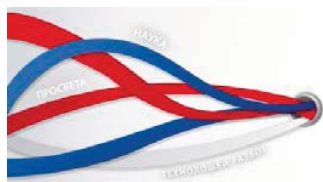
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hydroxyapatite, in order to induce a specific biological response after implementation, such as osteogenesis, angiogenesis, improved cell attachment and proliferation. However, the presence of the cations leads to the lattice distortion of the calcium-hydroxyapatite, resulting in different physico-chemical and mechanical properties. The hydrothermal synthesis of calcium hydroxyapatite leads to nanosized rod-like particles, which were found to possess properties close to those of the biological HAP. The aim of this study was to investigate the effect of hydrothermal synthesis parameters on physico-chemical and mechanical properties of mono- and binary cation-doped calcium hydroxyapatite by employing XRD, SEM and Hardness by Vickers tests. The temperature applied during the hydrothermal synthesis (150-180 °C) was found to influence the hardness of the HAP based compacts sintered at 1200 °C.

## P

### **Electrochemical characterization of cobalt phases onto alumina supported cobalt catalysts**

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Aleksandra Milutinović Nikolić, Predrag Banković

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This work describes the possible application of cyclic voltammetry (CV) for obtaining information about cobalt phases onto alumina supported cobalt catalysts. Starting from the same amount of ingredients, two catalysts with different phases of cobalt were prepared:  $\text{Co}_3\text{O}_4\text{-A}$  obtained by manual grinding of  $\text{Co}_3\text{O}_4$  and alumina in an agate mortar and  $\text{CoAl}_2\text{O}_4\text{-A}$  obtained mechanochemically using a planetary ball mill. The final products were characterized by the temperature-programmed reduction (TPR) and CV. The TPR profile of  $\text{Co}_3\text{O}_4\text{-A}$  showed peaks between 200–500 °C characteristic of  $\text{Co}_3\text{O}_4$  reduction, while the profile of  $\text{CoAl}_2\text{O}_4\text{-A}$  was altered in the whole temperature region and especially by the appearance of new peaks in the region of temperatures of 600–900 °C. This result indicated that a certain amount of hard-to-reduce cobalt aluminate is generated during milling. CV in alkaline solution revealed that the oxidation/reduction of cobalt in  $\text{CoAl}_2\text{O}_4\text{-A}$  occurred at more negative potentials compared with cobalt in  $\text{Co}_3\text{O}_4\text{-A}$ . Negative shift of peak potential well correlated with the appearance of high-temperature TPR peak and could be ascribed to the cobalt phase which has lower tendency to get reduced. These findings encourage the idea of using the CV as low cost and rapid assay for distinguishing the cobalt phases onto alumina.