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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The influence of anion on properties of ion-exchange Cu-alumina

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Alumina can be obtained in several different phases depending on the synthesis parameters. All these phases have different morphology, crystal structure, water content, and surface chemistry that determines their application as catalysts or support for the (electro)catalyst.
In this paper, the influence of anion on the electrochemical properties of copper-modified alumina was investigated. Two types of alumina with different water content, 3 mol H_2O/ mol Al_2O_3 (designated as T) and 0.6 mol H_2O/ mol Al_2O_3 (designated as G), were used in this study. Copper-modified alumina samples were prepared by ion exchange with a solution of $CuSO_4$, $CuCl_2$, or $Cu(NO_3)_2$. The obtained samples were characterized by DR UV/Vis spectroscopy and cyclic voltammetry.
The DR UV/Vis results showed a broad band in the range of 300 – 600 nm corresponding to the ligand-to-metal charge transition band.
The results showed that copper-modified G alumina showed a higher current originating from copper after the ion exchange procedure, regardless of the anion used. The order of activity was $SO_4^{2-} > Cl^- \approx NO_3^-$ for G alumina and $SO_4^{2-} \approx Cl^- > NO_3^-$ for T alumina.

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The effect of the initial temperature and pH on textile dye catalytic oxidative degradation using cobalt-doped alumina catalysts

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Two cobalt-doped alumina catalysts were synthesized using the sol-gel method, calcined at 1000 °C and 1100 °C, and denoted CoA-1000 and CoA-1100, respectively. Catalysts were previously characterized using XRPD, TPR-H2, and N2 low-temperature physisorption methods. Both aluminas were tested as catalysts in the oxidative degradation of textile dye Orange G in the presence of Oxone® as a source of sulphate anion radicals. Degradation was monitored using UV-Vis spectroscopy at wavelength λ=478 nm, where the characteristic chromophore group has a peak maximum. The effect of temperature and initial pH on Orange G degradation efficiency was investigated. The influence of temperature was followed in the range from 30 ºC to 60 ºC, and the effect of the pH in the range from 2 to 9. In all experiments, CoA-1000 was found to be a more efficient catalyst than CoA-1100. With the temperature increase, the degradation rate increased for both catalysts. The reaction was the fastest at 6<pH<8. The differences in textural and structural characteristics between CoA-