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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Book title: Serbian Ceramic Society Conference - ADVANCED CERAMICS AND APPLICATION X Program and the Book of Abstracts

Publisher:
Serbian Ceramic Society

Editors:
Dr. Nina Obradović
Dr. Lidija Mančić

Technical Editors:
Dr. Suzana Filipović
Dr. Adriana Peleš Tadić
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Printing:
Serbian Ceramic Society, Belgrade, 2022.

Edition:
120 copies

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

666.3/.7(048)
66.017/.018(048)

SRPSKO keramičko društvo. Conference Advanced Ceramics and Application : New Frontiers in Multifunctional Material Science and Processing (10 ; 2022 ; Beograd)
Program ; and the Book of abstracts / Serbian Ceramic Society Conference Advanced Ceramics and Application X New Frontiers in Multifunctional Material Science and Processing, Serbia, Belgrade, 26-27. September 2022. ; [editors Nina Obradović, Lidija Mančić]. - Belgrade : Serbian Ceramic Society, 2022 (Belgrade : Serbian Ceramic Society). - 96 str. : ilustr. ; 30 cm

Tiraž 120.

ISBN 978-86-915627-9-3

а) Керамика -- Апстракти б) Наука о материјалима -- Апстракти в) Наноматеријали -- Апстракти

COBISS.SR-ID 74827529

Conference Topics

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INV4

Synthesis and characterization of high-temperature strontium doped monazite ceramics

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This work aims to obtain a simple pathway for the synthesis of a series of $Ce_{1-x}Sr_xPO_4$ ceramic materials using acetate solutions of Ce and Sr instead of nitrate which were used so far. The preparation method was simple mixing of solutions of $Ce(C_2H_3O_2)_3 \cdot xH_2O$), $Sr(C_2H_3O_2)_2$ and NaH_2PO_4 as precursors at room temperature and the studied compositions were $Ce_{1-x}Sr_xPO_4$ (where x = 0, 0.1, 0.2, 0.3, 0.4, 0.5). Also, the disintegration of Sr in monazite structures in different sintering temperature ranges from 600 °C to 1200 °C was investigated. The evolution of the phase composition with thermal treatment was investigated by X-ray powder diffraction (XRPD). Morphology of sintered ceramics and semi-quantitative chemical analysis were obtained by scanning electron microscopy (SEM/EDS) Rietveld refinement was employed to get the structural information of the synthesized materials. Densification and microstructure evolution was determined using relative geometric density and scanning electron microscopy (SEM). The most favorable conditions for obtaining high-temperature Ce, Sr phosphate-based ceramic material are reported.

INV5

Physicochemical and electrochemical characterization of carbon derived from Al- based metal organic framework

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Carbon materials derived from metal organic frameworks (MOF) have shown promising applications including energy storage and conversion, adsorption, gas storage and separation, catalysis, chemical sensing, and solid phase extraction. Here we present carbon materials derived from Al-based MOFs for use as electrodes in multivalent ion supercapacitors. Al MOFs were synthesized through complexation of fumaric acid with aluminum salts. Carbonization process of Al MOFs was followed by removal of Al_2O_3 via dissolving in NaOH solution. The properties of carbon materials were examined by X-ray diffraction (XRD), Thermogravimetric and Differential thermal analysis (TG/DTA), Fourier Infrared (FTIR) and Raman Spectroscopy, Particle Size Analysis (PSA), Scanning Electron Microscopy (SEM). The charge storage ability of carbon materials were examined in acidic and neutral aqueous solution using Cyclic Voltammetry at scan rates ranging from 5-500 mVs^{-1}.