

SERBIAN CERAMIC SOCIETY CONFERENCE
ADVANCED CERAMICS AND APPLICATION V
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute of Technical Science of SASA
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials
School of Electrical Engineering and Computer Science of Applied Studies

PROGRAM AND THE BOOK OF ABSTRACTS

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Dear Colleagues,

We have great pleasure to welcome you to the Advanced Ceramic and Application Conference V organized by the Serbian Ceramic Society in cooperation with the Institute for Testing of Materials, Institute of Technical Sciences of SASA, Institute of Chemistry Technology and Metallurgy, Institute for Technology of Nuclear and Other Raw Mineral Materials and School of Electrical Engineering and Computer Science of Applied Studies.


Advanced Ceramics today include many old-known ceramic materials produced through newly available processing techniques as well as broad range of the innovative compounds and composites, particularly with plastics and metals. Such developed new materials with improved performances already bring a new quality in the everyday life. The chosen Conference topics cover contributions from a fundamental theoretical research in advanced ceramics, computer-aided design and modeling of a new ceramics products, manufacturing of nanoceramic devices, developing of multifunctional ceramic processing routes, etc. Traditionally, ACA Conferences gather leading researchers, engineers, specialist, professors and PhD students trying to emphasizes the key achievements which will enable the wide spread use of the advanced ceramics products in High-Tech industry, renewable energy utilization, environmental efficiency, security, space technology, cultural heritage, prosthesis, etc.

Serbian Ceramic Society has been 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 Serbian Ceramic Society in accordance to the Serbian law procedure. Serbian Ceramic Society is almost the only one Ceramic Society in the South-East Europe, with members from more than 20 Institutes and Universities, active in 16 sessions, by program and the frames which are defined by the American Ceramic Society activities.

Advanced Ceramic & Application Conference V is dedicated to Academician Momčilo Ristić.



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
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General Conference Topics

- Basic Ceramics Science
- Nanostructural, Bio- and Opto-Ceramic Materials and Technologies
- Multifunctional Materials
- Magnetic and Amorphous Materials
- Construction Materials and Eco-ceramics
- Composite Materials, Catalysis and Electrocatalysis
- Artistic Ceramics and Design, Archaeology and Heritage
- Young Researches
- Sintering processes
 - kinetics
 - microstructure
 - thermodynamics
 - modeling

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Synthesis and properties of the MgTiO₃ system

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Important role among ceramic materials have those that are applied in electronics. Most common way of obtaining those materials is by using the process of sintering. During mechanical activation of the inorganic materials, they are subjected to grinding and the grain size is being reduced. Crystal structure is distorted and changed, which, in some systems, leads to chemical reaction and formation of new compound. In this paper we explain mechanical activation influence on sintering kinetics in systems MgTiO₃.

Mechanical activation of the starting powder mixture was performed by milling during different time intervals within 120 minutes in a planetary ball mill device with ZrO balls and vessels and ball to powder mass ratio 40:1. Powders were compacted and sintered non-isothermally up to 1000°C. Differential thermal analysis was performed with the purpose of determining characteristic temperatures where a solid state reaction occurs. X-ray powder diffraction is used for observing the evolution of magnesium-titanate phases during milling. For specimens synthesized in such manner, microwave dielectric properties were measured, namely dielectric losses ($\tan \delta$), specific electric resistance (ρ) and dielectric constant (ϵ_r).

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Electrochemical response of hemoglobin

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Electron transfer between heme protein and electrode surface can be enhanced by electrode modifiers such as clays. Using hemoglobin as sensor relays on its possibility to retain native structure that enables hemoglobin to shift conformation. Therefore, electrochemical investigation of hemoglobin response at extreme pH did not take attention. At extreme pH values protein denaturation occurs resulting in conformation loss. The aim of this paper was to investigate electrochemical behavior of hemoglobin supported on smectite in alkaline media. Hemoglobin was immobilized on acid activated clay, bare and modified by SDS. The adsorption of hemoglobin was slightly increased by the presence of SDS on the electrode surface. All samples showed peak at -0.45 V ascribed to reduction pair of heme Fe(III)/Fe(II). Denaturation of hemoglobin imparted chemically by SDS or electrochemically by cycling in cathodic potential range, led to development of new peak at potential around -0.7 V in alkaline media. This feature might be useful for studying and determination of different hemoglobin types.