Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION VIII
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, 23-25. September 2019.

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Prof.dr Vojislav Mitić
Dr Lidija Mančić
Dr Nina Obradović

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Dr Ivana Dinić
Dr Marina Vuković

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Dear Colleagues,

We have great pleasure to welcome you to the Advanced Ceramic and Application Conference VIII 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.

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 speared use of the advanced ceramics products in High-Tech industry, renewable energy utilization, environmental efficiency, security, space technology, cultural heritage, 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.

This year the conference is supported by the Serbian Chapter of American Ceramic Society and European Academy of Sciences and Arts.

Prof. Dr Vojislav Mitić
President of the Serbian Ceramic Society
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Prof. Dr Olivera Milošević,
President of the General Assembly of the
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Conference Topics

- Basic Ceramic Science & Sintering
- Nano-, Opto- & Bio-ceramics
- Modeling & Simulation
- Glass & Electro Ceramics
- Electrochemistry & Catalysis
- Magnetic & Refractory Ceramic
- Renewable Energy, Composites & Amorphous Ceramics
- Heritage, Art & Design

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Characterization of different bioactive phosphate glasses

Vladimir S. Topalović[1], Srđan D. Matijašević[1], Jelena D. Nikolić[1],
Marija S. Đošić[1], Veljko V. Savić[1], Sonja V. Smiljanić[2], Snežana R. Grujić[2]
[1]Institute for the Technology of Nuclear and Other Mineral Raw Materials,
86 Franchet d' Esperey St, 11000 Belgrade, Serbia
[2]Faculty of Technology and Metallurgy, University of Belgrade,
Karnegijeva 4, 11000 Belgrade, Serbia

Due to their potential bioactive properties, different types of phosphate based glasses have been considered for bone tissue engineering and drug delivery applications. In this experiment, four different compositions of glasses ($42P_2O_5{\cdot}40CaO{\cdot}5SrO{\cdot}10Na_2O{\cdot}3TiO_2$, $46P_2O_5{\cdot}40CaO{\cdot}SrO{\cdot}10Na_2O{\cdot}3TiO_2$, $42P_2O_5{\cdot}40CaO{\cdot}5La_2O_3{\cdot}10Na_2O{\cdot}3TiO_2$ and $46P_2O_5{\cdot}40CaO{\cdot}La_2O_3{\cdot}10Na_2O{\cdot}3TiO_2$ (mol %)) were obtained by standard melt-quenching method. The crystallization and sintering behavior of glasses have been studied by using DTA, HSM and XRD methods. For all of the glass compositions the sintered phosphate glass-ceramic samples contained certain bioactive phases (α-$Ca_3(PO_4)_2$, β-$Ca_3(PO_4)_2$, β-$Ca_2P_2O_7$, β-CaP_2O_6). Based on the glass properties, the use of these glasses in obtaining the bioactive glass scaffolds with a suitable interconnected porous structure is achievable. Bioactive scaffolds have potential to aid the bone regeneration process by giving cell a temporary template to grow into, provoking bone cell activity. Also, glasses with stable uniform porous structure and high surface area can be used as porous carriers for controlled drug delivery.

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Nanomaterials application in Dentistry

Pelemiš S [1], Mirjanić V.[2], Mirjanić Dj.[2], Vuković S.[1]
[1] Faculty of Technology, University of East Sarajevo, B&H
[2] Faculty of Medicine, Department of Dentistry, University of Banja Luka, B&H

Biomaterials in medicine and dentistry is a relatively new phenomenon dating back to the 1950's yet, today, an estimated 20 million individuals have an implanted medical device. Nanotechnology is matter at nanometer level and the application of the same to medicine is called nanomedicine. This technology, which deals with matter in nanodimensions, has widened our views of poorly understood health issues and provided novel means of diagnosis and treatment. Researchers in the field of dentistry have explored the potential of nanoparticles in existing therapeutic modalities with moderate success. In regards to biomaterials, nanotechnology has gained an increasing interest by researchers, particularly in case of dental implants. This is mainly due to the impact of nanoparticles on host responses at both cellular and tissue levels. The growing interest in the dental applications of nanotechnology is leading to the emergence of a new field called nanodentistry. Dentistry is frequently facing revolutions in order to provide a most reliable and comfortable therapeutic options for the patients. Recently nanotechnology has emerged as a new science exploiting specific phenomena and direct manipulation of materials on nanoscale. Application of nanotechnology in dentistry holds promise for the maintenance of comprehensive dental care by employing nanomaterials including tissue engineering and ultimately nanorobots.