The Serbian Society for Ceramic Materials
Institute for Multidisciplinary Research (IMSI), University of Belgrade
Institute of Physics, University of Belgrade
Center of Excellence for the Synthesis, Processing and Characterization of Materials for use in Extreme Conditions "CEXTREME LAB" - Institute of Nuclear Sciences "Vinča", University of Belgrade
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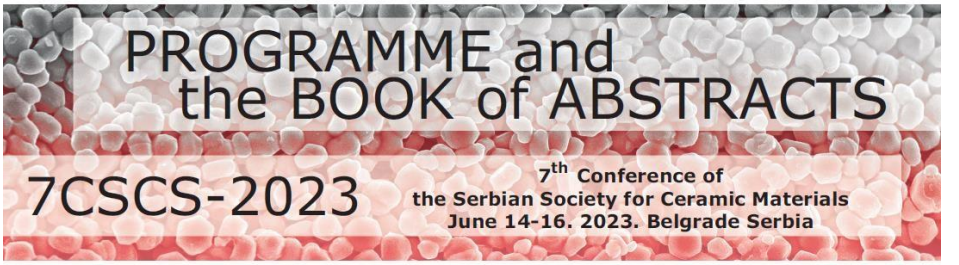

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Branko Matović
Jelena Maletaškić
Vladimir V. Srdić

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PROGRAMME AND THE BOOK OF ABSTRACTS

7th Conference of The Serbian Society for Ceramic Materials

June 14-16, 2023
Belgrade, Serbia
7CSCS-2023

Edited by:
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Jelena Maletaškić
Vladimir V. Srdić

SPECIAL THANKS TO

Република Србија
МИНИСТАРСТВО НАУКЕ,
ТЕХНОЛОШКОГ РАЗВОЈА И ИНОВАЦИЈА

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WELCOME MESSAGE

On behalf of the organizers and organizing committee of the 7th Conference of the Serbian Society for Ceramic Materials (7CSCS-2023), I would like to extend my warmest welcome to all of you for attending the 7CSCS-2023. The conference is hosted and organized by the Serbian Society for Ceramic Materials, and co-organized by Institute for Multidisciplinary Research - University of Belgrade, Institute of Physics - University of Belgrade, Center of excellence for the synthesis, processing and characterization of materials for use in extreme conditions "CEXTREME LAB", Institute of Nuclear Sciences "Vinča" - University of Belgrade, Faculty of Mechanical Engineering - University of Belgrade, Center of excellence for green technologies, Institute for Multidisciplinary Research - University of Belgrade, and Faculty of Technology and Metallurgy - University of Belgrade.

The goal of the Conference is to provide a platform for academic exchange among participants from universities, institutes, companies around the region in the field of ceramics research as well as to explore new direction for future development. 7CSCS-2023 aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of ceramic materials. It also provides the premier inter-multi-trans-disciplinary forum for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns, practical challenges encountered and the solutions adopted in the field of ceramic materials. We have received 102 abstracts with researchers from 15 countries.

The Conference will feature three plenary lectures, 30 invited talks and 64 oral and poster presentations as well as exhibitions of some new ceramic materials and devices. 7CSCS-2023 includes Ceramic Powders, Characterization and Processing, High Temperature Phenomena, Sintering, Microstructure Design and Mechanical Properties, Advanced Materials For Energy-Related Applications, Traditional Ceramics and Engineering Materials, Computing In Materials Science, Materials for Environmental Technology, Catalytic Materials, Materials for Sensing Devices, Ceramic Composites, Membranes And Multimaterials and Electro And Magnetic Ceramics. Exhibitions from company sponsors will be held at the Conference as well.

We are grateful for the support from the Ministry of Science, Technological Development and Inovation of the Republic of Serbia. We would also like to express our sincere thanks to the symposia organizers, session chairs, presenters, exhibitors and all the Conference attendees for their efforts and enthusiastic support in this exciting time in Belgrade. I look forward to meeting you and interacting with you at Conference.

7SCSC-2023 President

Branko Matović

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lead based and lead free flexible films as well as potential use of those films as energy storage and energy harvesting systems were considered.

1. S. Guo et al., *Micromachines*, **11** (2020) 1076.

I-7

ENHANCING THE REACTIVITY OF THE INDUSTRIAL FLY ASH IN THE PROCESS OF ALKALI ACTIVATION

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Over the past few decades a new group of binding materials, geopolymers, have emerged as an alternative to traditional binding materials such as Portland cement. Geopolymers are obtained by the process of alkali activation of various alumino-silicate materials, both natural and synthetic. Of particular importance is the possibility of alkali activation of the industrial waste material such as fly ash. Fly ash (FA) is generated in the process of coal combustion in thermal power plants. In Serbia a small part of fly ash is recycled while the rest is landfilled, causing a serious environmental pollution. Alkali activation represents a process by which fly ash can safely be converted into a useful biding material, suitable for the construction purposes. Geopolymers (or alkali-activated materials) based on fly ash are known for their good compressive strength and good durability in aggressive environments, when propeerly designed. However, the limiting factor for wider use of fly ash in the process of alkali activation and geopolymers synthesis is its low reactivity and consequent low compressive strength of binding elements. Our research has shown that the reactivity of fly ash in the process of alkali activation can be enhanced by the appropriate choice of the reaction conditions – by mechanical activation of fly ash and by blending with more reactive material such as blast furnace slag (BFS). Both options were explored in this paper and comparison was performed. Mechanical activation of fly ash was conducted in a planetary ball mill, while blends of fly ash and blast furnace slag were prepared with different ratios (FA/(FA+BFS) = 1; 0,75; 0,50; 0,25; 0). Alkali activation was carried out at 95ºC by use of sodium silicate solution as an activator. In both cases significant increase of geopolymer compressive strength was observed in respect to the geopolymer based on the initial fly ash. Optimal geopolymer strength was correlated with the chemical composition of the binding gel. Empirical values of optimal gel composition could serve as a basis for tailoring properties of alkali-activated binders based on different precursors. Both alkali-activated systems represent promissing routes for geopolymer technology development.