



**Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION VI
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 2017.**

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Dear Colleagues,

We have great pleasure to welcome you to the Advanced Ceramic and Application Conference VI 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 and Institute for Technology of Nuclear and Other Raw Mineral 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 emphasize 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.

For the first time Advanced Ceramic and Application Conference hosting delegations from Republics of Ghana, Nigeria, Niger and Cameroon with the idea to connect, share and provide positive influence to the scientific and industrial communities all around world.



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
Academy of Engineering Sciences of Serbia Member

Conference Topics

- Basic Science & Sintering of Ceramics
- Nano, Bio- & Opto Ceramic
- Electro & Multifunctional Ceramics
- Magnetic, Catalytic & Composite Materials
- Renewable Energy, Heritage & Archeology
- Industrial Talks

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Influence of synthesis parameters and thermal treatment on functional properties of Fe₃O₄-BaTiO₃ multiferroics obtained by mechanical activation

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Mechanical activation of a mixture of polycrystalline powders Fe₃O₄ (50% wt.) and BaTiO₃ (50% wt.) was performed in a planetary ball-mill, with different milling times (3 h, 6 h and 12 h). Average crystallite size determined by XRD analysis ranges from 12 to 30 nm, depending on the milling time.

The activated powders were pressed into disc-shaped samples, 8 mm in diameter and 1.5 mm thick, applying the pressure of 500 MPa. Thermoelectric measurements conducted in the temperature range from room temperature to 350 °C revealed that the electrical resistivity of the sample depends on temperature and activation time. At room temperature, the maximum value of specific electrical resistivity ($\rho_0 = 1 \text{ M}\Omega\text{m}$) was observed for the sample obtained by pressing the powder activated for 6 h.

Magnetic properties of pressed powder samples were studied using a modified Faraday method. At room temperature, the pressed powder activated for 3 h exhibited the maximum value of magnetization, $M_0 = 0.86 \text{ Am}^2/\text{kg}$. Multiple heating of the pressed samples, for 10 min, was performed in a magnetic field of 20 kA/m. After cooling, the highest magnetization values were observed for the samples previously heated at 380 °C, while the maximum one ($M = 1.04 \text{ Am}^2/\text{kg}$) corresponds to the sample activated for 3 h.

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PHYSICAL AND MECHANICAL PROPERTIES OF CEMENT COMPOSITES MADE WITH EXPANDED CLAY AND EXPANDED GLASS

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The results of experimental tests, conducted on Self-compacting concrete (SCC) made with lightweight aggregate and fly ash, will be presented in this paper. Two types of lightweight aggregate were used, namely expanded clay and expanded glass (also known as "poraver"). These series were made with the quantity of cement ranging from 421 kg/m³ up to 550 kg/m³. Three series of samples with expanded clay were made, with the constant quantity