Serbian Ceramic Society Conference

ADVANCED CERAMICS AND APPLICATION II

New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials
Institute for Testing of Materials
Archeological Institute of SASA

PROGRAM AND THE BOOK OF ABSTRACTS

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Dear Colleagues, dear friends, we have great pleasure to welcome you to the Advanced Ceramic and Application Conference II organized by the Serbian Ceramic Society in cooperation with the Institute of Chemistry Technology and Metallurgy, Institute for Technology of Nuclear and Other Raw Mineral Materials, Institute for Testing of Materials and Archeological Institute of SASA. This conference brings together researchers from academia and industry to present the latest advances in synthesis and characterization in the field on new ceramic structures. The chosen Conference topics opening the new frontiers in designing of advanced ceramic materials since they cover fundamental theoretical research, modeling and simulation, controlled nanostructured materials synthesis and optimization of the consolidation process, which all together should provide practical realization of the new ideas towards device miniaturization, energy-materials-information integration and preservation of cultural heritage.

Prof. Dr Vojislav Mitić
President of the Serbian Ceramic Society
World Academy Ceramics Member

General Conference topics included:

- Basic Ceramics Science
- Nano-, Bio- and Opto-ceramic Nanotechnologies
- Multifunctional Materials
- Magnetic and Amorphous Materials
- Construction and Eco-ceramic
- Composites, Catalysis, Electro-catalysis
- Artistic Ceramic and Design, Archeological Heritage
- Young Researchers
- **Sintering processes**
  - kinetics
  - thermodinamics
  - microstructure
  - modeling

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Synthesis of the glass-ceramics based on basalt

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In this paper, results and investigation of possibility of sythesis of the glass-ceramics based on basalt are presented. Glass-ceramic due to its specific properties (high hardness, abrasion resistance, good chemical consistency, etc.) has wide area of application in mining, civil engineering and building industry, metallurgy, for manufacturing of parts of equipment or devices, constructing materials, etc. For obtaining of the glass-ceramic basalt from *Vrelo, Kopaonik* deposit was used. A series of melting on various temperatures from 1150 to 1300°C were performed. Synthesis parameters, temperature, melting interval, and cooling rate were defined. Selection of composition of glassy mixture was performed in order to obtain satisfactory quality. On thus obtained products various conditions of thermal treatment were performed and optimal regime was determined: gradual heating up to 850°C in time intervals of 1.5 h and progressive cooling gave good physico-mechanical properties. Structure of glass-ceramic samples obtained by melting of basalt after thermal processing is crypto–crystal accompanied by appearance of small low-crystallized aggregates. The structure also contains bubbles filled with either air of glass. These are initial results of investigation of application of basalt from Serbian deposits for obtaining glass-ceramics. These products are not carcinogenic and they can successfully substitute materials such as: asbest or various metallic materials. Technology applied in manufacturing of basalt is ecologically clean, which is of high importance from economical, ecological and energetically point of view.

P8

The influence of Ni on the performance of Al, Fe, Ni pillared bentonite based electrodes in electrooxidation of phenol

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Composite Nafion-clay modified glassy carbon electrodes (GCEs) were tested in the electrooxidation of phenol in acidic media. The clay originated from Mečji Do, a seldom investigated bentonite deposit in Serbia. Raw clay was Na-enriched and pillared with different species. The following pillared clays (PILCs) were obtained: Al90Fe10-PILC, Al85Fe10Ni5-PILC and Al90Fe5Ni5-PILC, where numbers represent the molar percentage of each species in the pillaring solution. The aim of this investigation was to test the influence of Ni on the electrochemical performance of PILC bearing electrodes. The obtained materials were characterized by X-ray diffraction, FTIR spectroscopy and X-ray photoelectron spectroscopy. The cyclic