The Serbian Ceramic Society
The Academy of Engineering Sciences of Serbia
Institute for Multidisciplinary Research - University of Belgrade
Institute of Physics - University of Belgrade
Vinča Institute of Nuclear Sciences - University of Belgrade

PROGRAMME and the BOOK of ABSTRACTS

2CSCS-2013

2nd Conference of the Serbian Ceramic Society
June 5-7.2013. Belgrade Serbia

Edited by:
Snežana Bošković
Vladimir V. Srdić
Zorica Branković

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Dear ceramists,

On behalf of all committees of the 2nd Conference of The Serbian Ceramic Society (2CSCS-2013), and also on behalf of the co-organizers of this Conference i.e. Academy of Engineering Sciences of Serbia, Institute for Multidisciplinary Research - University of Belgrade, Institute of Physics - University of Belgrade, Vinča Institute of Nuclear Sciences - University of Belgrade, it is our great pleasure to welcome you to Belgrade and Serbia on June 5-7th 2013.

The Serbian Ceramic Society is national society which brings together the scientists and engineers working in the fields of research and application of ceramic materials. There is rather large ceramic community in Serbia since it has long tradition which involves both traditional and advanced ceramic materials. The members of The Serbian Ceramic Society, are professionally dealing with very attractive topics like nanostructured ceramics, ceramics in energy conversion, eco- and bio-ceramics, as well as, ultra high temperature ceramic composites. The activities of The Serbian Ceramic Society include organizing highly interesting lectures for the members, but also Students Meetings, which has taken place in Novi Sad under the sponsorship of the European Ceramic Society each year since 1998. In addition, the Serbian Ceramic Society publishes, since 2007, the Journal "Processing and Application of Ceramics" which is becoming ever more attractive to authors from abroad.

The aim of the 2CSCS-2013 is to bring together the scientists working in the field of ceramic materials for the exchange of attractive results in the areas of the development, characterization and application of ceramic materials as well as, to improve contacts for future scientific cooperation.

The abstracts of the papers that are going to be presented at the 2ndConference of The Serbian Ceramic Society are summarized in this book. They are divided according to topic to which the papers belong, i.e. into:

1. **Ceramic Powders, Characterization and Processing** (chemical routes, hydrothermal synthesis, non-conventional routes, dispersion and processing aids, wet processing, spray-drying, plastic forming, net shape forming and porous products)
2. **High Temperature Phenomena, Sintering and Microstructure Design** (high temperature reactions, phase diagrams, densification and grain growth, tailoring microstructure to properties, hard coatings and wear)
3. **Electro and Magnetic Ceramics** (ferroelectric and relaxors, piezoelectric, films, multilayer devices, interfaces, capacitor, microwave ceramics, varistors, conducting ceramics and electrodes, ionic conductors, resistors)
4. **Ceramic Composites, Membranes and Multimaterials** (ceramic matrix composites, fibres, nanocomposites and polymer transformation, laminates, biocomposites)
5. **Refractories, Cements, Glass and Corrosion** (raw materials and engineering, emission control, environment, recycling)
6. **Ceramic Heritage**

Four plenary lectures, fourteen invited lectures, twenty-two oral and fifty-seven poster presentations will be presented at the Conference. This book contains, as mentioned, all the received abstracts, and some of the papers, after regular peer review will be published in the international journal The Processing and Application of Ceramics.

June 5-7th, 2013.
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MAGNETIC PROPERTIES OF MECHANOCHEMICALLY SYNTHESIZED YTTRIUM MANGANITE

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Yttrium manganite ($YMnO_3$) is a multiferroic material, which means that it exhibits both ferromagnetic and ferroelectric properties, making it interesting in spintronics. In this work, single-phase $YMnO_3$ powders were prepared for the first time by mechanochemical synthesis in a planetary ball mill. The $YMnO_3$ was formed directly from the highly activated constituent oxides, Y_2O_3 and Mn_2O_3, after 60 min of milling time. However, the X-ray diffraction analysis and the Rietveld refinement indicated that already after 240 min of milling time a pure orthorhombic perovskite structure could be obtained. Particle size analysis along with SEM revealed the agglomeration of powders with prolonged milling time. The magnetic properties of the obtained $YMnO_3$ powders were found to change as a function of the milling time in a manner consistent with the variation in the nanocomposite microstructure. In addition, small magnetic hysteresis at low temperature and a discrepancy between the ZFC and FC curves with negative paramagnetic Curie-Weiss temperature indicate that the obtained samples are basically anti-ferromagnetic with weak ferromagnetism.

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MECHANOCHEMICALLY ASSISTED SOLID-STATE SYNTHESIS OF Cu SUBSTITUTED THERMOELECTRIC SODIUM COBALTITE

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Polycrystalline samples of Cu substituted $NaCo_{2-x}Cu_xO_4$ (x=0, 0.01, 0.03, 0.05, 0.1) were prepared using mechanochemically assisted solid-state reaction method

starting from the Na_2CO_3, Co_3O_4 and CuO powders. Each powder mixture was mechanically activated by grinding for 3 h in a planetary ball mill with ball to powder mixture ratio 20:1, at the basic disc rotation speed of 360 rpm. The as-prepared powders were pressed into disc-shaped pellets and subsequently subjected to a heat treatment at 880 °C for 24 h in inert argon atmosphere. Changes in structural characteristics of the samples and particle morphology, caused by Co substitution by Cu, were characterized using X-ray diffraction and scanning electron microscopy, respectively. It should be emphasized that milling process reduced the time necessary for obtaining pure sodium cobaltite. From the results obtained in this study, observed changes in microstructure were correlated with changes in the lattice parameters, indicating the influence of Cu ion incorporation in $NaCo_2O_4$ crystal lattice.

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NANOINDENTATION OF NICKEL MANGANITE CERAMICS OBTAINED BY COMPLEX POLIMERIZATION METHOD

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Nickel manganite is very interesting NTC material due to its outstanding properties and wide field of applications mainly in microelectronics and optoelectronics and lately in the mobile phone industry. In this work, chemical synthesis of this material was performed by complex polymerization method (CPM). The presence of pure nickel manganite phase was confirmed by X-ray analysis. The obtained fine nanoscaled powders were uniaxially pressed and sintered at different temperatures: 1000 °C -1200°C for 2h. Microstructure development during sintering was observed by scanning electron microscope (SEM). Indentation experiments were carried out using a three sided pyramidal (Berkovich) diamond tip. Young's modulus of elasticity at various indentation depths and hardness of NTC ceramics were calculated. It was found that the highest hardness and elastic modulus exhibit the ceramics sintered at highest temperature.