

**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**

**Serbian Academy of Sciences and Arts, Knez Mihailova 35**  
**Sep 30<sup>th</sup> - Oct 1<sup>st</sup>, 2013, Belgrade, Serbia**

**Book title:** Serbian Ceramic Society Conference - ADVANCED CERAMICS AND APPLICATION II: Program and the Book of Abstracts

**Publisher:**

Serbian Ceramic Society

**Editors:**

Prof.dr Voja Mitić  
Dr Nina Obradovic  
Dr Lidija Mančić

**Technical Editor:**

Dr Lidija Mačić

**Printing:**

Serbian Academy of Sciences and Arts,  
*Knez Mihailova 35, Belgrade*  
Format  
*Pop Lukina 15, Belgrade*

**Edition:**

100 copies

**Mosaics:** Original Format 30x40 cm

Mirjana Milić, Vladimir Skerlić, Maja Opačić, Maša Nicić, Nina Nicić, Milica Konstantinović,  
Marjan Vesić - Academy od SOC for Fine Arts and Conservation

CIP - Каталогизација у публикацији  
Народна библиотека Србије, Београд

666.3/.7(048)  
66.017/.018(048)

SERBIAN Ceramic Society. Conference (2 ; 2013 ; Beograd)

Advanced Ceramics and Application : new frontiers in multifunctional material science and processing : program and the book of abstracts / II Serbian Ceramic Society Conference, Sep 30th-Oct 1st, 2013, Belgrade, Serbia ; organized by Serbian Ceramic Society... [et al.] ; [editors Vojislav Mitić, Nina Obradović, Lidija Mančić]. - Belgrade : Serbian Ceramic Society, 2013 (Belgrade : Serbian Academy of Sciences and Arts). - XVI, 61 str. ; 30 cm

Tiraž 100.

ISBN 978-86-915627-1-7

1. Serbian Ceramic Society (Beograd)

a) Керамика - Апстракти b) Наука о материјалима - Апстракти

c) Наноматеријали - Апстракти

COBISS.SR-ID 201203212

P12

### **The influence of mechanical activation on the electrical properties of $\text{Ba}_{0.77}\text{Sr}_{0.23}\text{TiO}_3$ ceramics**

D. Kosanović<sup>1\*</sup>, J. Živojinović<sup>1</sup>, N. Obradović<sup>1</sup>, V. P. Pavlović<sup>2</sup>, V. B. Pavlović<sup>1</sup>,  
M. M. Ristić<sup>3</sup>

<sup>1</sup>Institute of Technical Sciences of the Serbian Academy of Sciences and Arts,  
Knez Mihailova 35/IV, 11000 Belgrade, Serbia

<sup>2</sup>Faculty of Mechanical Engineering, University of Belgrade, Belgrade, Serbia

<sup>3</sup>Serbian Academy of Sciences and Arts, Knez Mihailova 35, 11000 Belgrade, Serbia

Ferroelectric ceramic barium strontium titanate ( $\text{Ba}_{0.77}\text{Sr}_{0.23}\text{TiO}_3$ ), BST, was prepared by solid-state reactions using starting powders of barium carbonate ( $\text{BaCO}_3$ ), strontium carbonate ( $\text{SrCO}_3$ ) and titanium dioxide ( $\text{TiO}_2$ -anatase). Non-activated and mechanically activated mixtures with high-energy planetary ball mill (0, 5, 10, 20, 80 and 120 minutes) were sintered at 1100, 1200, 1300 and 1400 °C for two hours in air. The maximum value of ceramic density is about 86.20% TG. X-ray diffraction analysis was used to obtain information on the phase composition, as well as determining the influence of mechanical activation on the half height width of the diffraction lines (111) BST isothermally sintered samples at 1400 °C during two hours. Defects and the beginning process of sintering on the microstructure were investigated by scanning electron microscopy (SEM). Electrical measurements (loss tangent of the angle, Nyquist diagrams and influence the activation time dependence of  $X_C = f(\log \nu)$ ) are made of ceramics sintered at 1400 °C for two hours.

P13

### **Density and electrical properties of cordierite based ceramics as function of compaction pressure**

N. Obradović<sup>1</sup>, N. Đorđević<sup>2</sup>, N. Labus<sup>1</sup>, A. Peleš<sup>1</sup>, M. Mitrić<sup>3</sup>, V. B. Pavlović<sup>1</sup>

<sup>1</sup>Institute of Technical Sciences of SASA, Knez Mihajlova 35/IV, 11000 Belgrade, Serbia

<sup>2</sup>Institute for Technology of Nuclear and Other Mineral Raw Materials, Belgrade, Serbia

<sup>3</sup>Vinča Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia

Mechanical activation is widely used and relatively inexpensive procedure for sintering process sample preparation. However, the influence of pressure, which is used for compaction, has not been completely investigated. Cordierite,  $2\text{MgO}\cdot 2\text{Al}_2\text{O}_3\cdot 5\text{SiO}_2$ , is a very actual high-temperature ceramic material, due to its characteristics. Based on our previous investigation, the mechanical activation of the starting mixtures with 5.00 mass%  $\text{TiO}_2$  was performed in a high energy ball mill during 10 minutes. Compaction pressure varied from 0.5 to 6t/cm<sup>2</sup> (49 MPa - 588 MPa). Sintering process was performed at 1350°C for 4h in air atmosphere. The phase composition of activated and sintered samples was analyzed by the X-ray diffraction method. Scanning electron microscopy was performed to analyze the microstructure of both compacted and sintered sample. Non-isothermal sintering up to 1400°C, with a constant heating rate, was investigated by thermal shrinkage change with dilatometer. In this paper we research green bodies and sintered samples compaction pressure influence electrical properties.