

The Serbian Society for Ceramic Materials  
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

A microscopic image of ceramic particles, showing a transition from white to red. The particles are spherical and densely packed. The top half is white, and the bottom half is red, with a horizontal band of red particles in the middle.

# PROGRAMME and the BOOK of ABSTRACTS

## 4CSCS-2017

4<sup>th</sup> Conference of  
the Serbian Society for Ceramic Materials  
June 14-16.2017. Belgrade Serbia

Edited by:  
**Branko Matović**  
**Zorica Branković**  
**Dušan Bućevac**  
**Vladimir V. Srdić**

Programme and Book of Abstracts of The Fourth Conference of The Serbian Society for Ceramic Materials **publishes abstracts from the field of ceramics, which are presented at international Conference.**

***Editors-in-Chief***

Dr Branko Matović  
Dr. Zorica Branković  
Dr. Dušan Bučevac  
Prof. Vladimir V. Srdić

***Publisher***

Institute for Multidisciplinary Research, University of Belgrade  
Kneza Višeslava 1, 11000 Belgrade, Serbia

***For Publisher***

Prof. Dr Sonja Veljović Jovanović

***Printing layout***

Vladimir V. Srdić

***Press***

Zonex, Beograd, Serbia  
Circulation: 140 copies

CIP- Каталогизacija y publikaciji  
Narodna biblioteka Srbije

666.3/.7(048)  
66.17 /.018(048)

**DRUŠTVO za keramičke materijale Srbije. Konferencija (4 ; 2017 ; Beograd)**

Programme ; and the Book of Abstracts / 4th Conference of The Serbian Society for Ceramic Materials, 4CSCS-2017, June 14-16, 2017, Belgrade, Serbia ; [organizers] The Serbian Society for Ceramic Materials ... [et al.] ; edited by Branko Matović ... [et al.]. - Belgrade : Institute for Multidisciplinary Research, University, 2017 (Beograd : Zonex). - 116 str. : ilustr. ; 24 cm

Tiraž 140. - Str. 6: Welcome message / Branko Matovic. - Registar.

ISBN 978-86-80109-20-6

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

COBISS.SR-ID 236529164

**The Serbian Society for Ceramic Materials  
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**

# **PROGRAMME AND THE BOOK OF ABSTRACTS**

**4<sup>th</sup> Conference of The Serbian Society for  
Ceramic Materials**

**June 14-16, 2017**

**Belgrade, Serbia**

**4CSCS-2017**

Edited by:

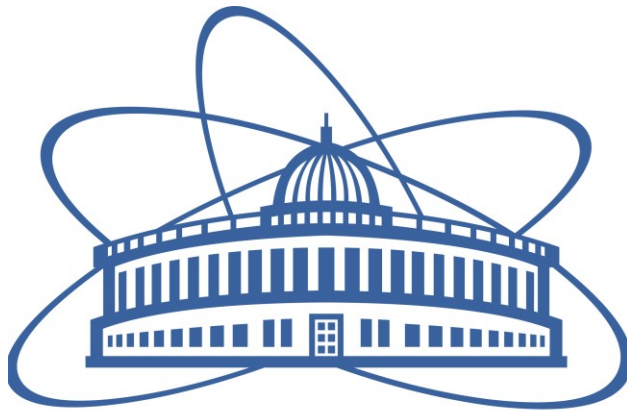
**Branko Matović**

**Zorica Branković**

**Dušan Bučevac**

**Vladimir V. Srdić**

**SPECIAL THANKS TO**



JOINT INSTITUTE  
FOR NUCLEAR RESEARCH

## Committees

### Organizer

- 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
- Faculty of Mechanical Engineering, University of Belgrade

### Scientific Committee

1. Dr. Snežana Bošković, Institute of Nuclear Sciences “Vinča”, University of Belgrade, *Serbia*
2. Prof. Biljana Stojanović, Institute for Multidisciplinary Research, University of Belgrade, *Serbia*
3. Dr. Branko Matović, Institute of Nuclear Sciences “Vinča”, University of Belgrade, *Serbia*
4. Prof. Vladimir V. Srdić, Faculty of Technology, University of Novi Sad, *Serbia*
5. Dr. Zorica Branković, Institute for Multidisciplinary Research, University of Belgrade, *Serbia*
6. Dr. Goran Branković, Institute for Multidisciplinary Research, University of Belgrade, *Serbia*
7. Dr. Zorana Dohčević-Mitrović, Institute of Physics, University of Belgrade, *Serbia*
8. Prof. Tatjana Volkov-Husović, Faculty of Technology and Metallurgy, University of Belgrade, *Serbia*
9. Dr. Miroslav Komljenović, Institute for Multidisciplinary Research, University of Belgrade, *Serbia*
10. Dr. Maja Šćepanović, Institute of Physics, University of Belgrade, *Serbia*
11. Dr. Dejan Zagorac, INN Vinca, University of Belgrade, *Serbia*
12. Dr. Marija Prekajski Đordjević, Institute of Nuclear Sciences “Vinča”, Belgrade, *Serbia*
13. Dr. Tatjana Srećković, Institute for Multidisciplinary Research, University of Belgrade, *Serbia*
14. Prof. Gordana Bakić, Faculty of Mechanical Engineering, University of Belgrade, *Serbia*
15. Prof. Aleksandra Zarubica, Faculty of Science and Mathematics, University of Nis, *Serbia*

## International Advisory Board

### GERMANY:

Dr. Klaus Doll, *Institute of Theoretical Chemistry, University of Stuttgart*  
Dr. Günter Motz, *Ceramic Materials Engineering, University of Bayreuth*,  
Dr. Zaklina Burghard, *Institute for Mater. Science, University of Stuttgart*

### JAPAN:

Prof. Katsumi Yoshida, *Tokyo Institute of Technology*  
Prof. Masatoshi Kondo, *Tokyo Institute of Technology*

### RUSSIA:

Prof. Marina Frontasyeva, *Joint Institute for Nuclear Research, Dubna*

### INDIA:

Prof. K.C. Hari Kumar, *Indian Institute of Technology Madras*  
Prof. Ravi Kumar, N. V., *Indian Institute of Technology Madras*

### USA:

Dr. Krenar Shqau, *Battelle Memorial Institute, Columbus, Ohio*  
Prof. Tahir Cagin, *Texas A & M University, Texas*

### ROMANIA:

Prof. Adrian Volceanov, *University Politehnica Bucharest*  
Dr. Victor Fruth, *Institute of Physical Chemistry, Romanian Academy*  
Dr. Eniko Volceanov, *University Politehnica Bucharest*

### MONTENEGRO:

Prof. Mira Vukcevic, *Faculty Metallurgy Technol., University of Montenegro*

### CYPRUS:

Prof. Claus Rebholz, *University of Cyprus, Nicosia*

### FRANCE:

Dr. Samuel Bernard, *Inst. Européen des Membranes, Université Montpellier*

### ITALY:

Dr. Claudio Ferone, *Department of Engineering, University of Napoli*

### CROATIA:

Prof. Damir Pajić, *Department of Physics, University of Zagreb*

### SLOVENIA:

Dr. Slavko Bernik, *Jozef Stefan Institute, Ljubljana*

### CHINA:

Prof. Guorong Li, *Shanghai Inst. Ceramics, Chinese Academy of Sciences*

## **Organizing Committee**

1. Dr. Nadežda Stanković, Institute of Nuclear Sciences “Vinča”, Belgrade, *Serbia*
2. Dr. Vesna Maksimović, Institute of Nuclear Sciences “Vinča”, Belgrade, *Serbia*
3. Dr. Milena Rosić, Institute of Nuclear Sciences “Vinča”, Belgrade, *Serbia*
4. Maria Čebela, Institute of Nuclear Sciences “Vinča”, Belgrade, *Serbia*
5. Miljana Mirković, Institute of Nuclear Sciences “Vinča”, Belgrade, *Serbia*
6. Svetlana Dmitrović, Institute of Nuclear Sciences “Vinča”, Belgrade, *Serbia*
7. Jelena Luković, Institute of Nuclear Sciences “Vinča”, Belgrade, *Serbia*
8. Svetlana Ilić, Institute of Nuclear Sciences “Vinča”, Belgrade, *Serbia*
9. Dr. Sanja Martinović, IHTM Belgrade, *Serbia*
10. Dr. Milica Vlahović, IHTM Belgrade, *Serbia*
11. Dr. Milica Počuča Nešić, Institute for Multidisciplinary Research, Belgrade, *Serbia*
12. Dr. Marina Vuković, Institute for Multidisciplinary Research, Belgrade, *Serbia*
13. Nikola Tasić, Institute for Multidisciplinary Research, Belgrade, *Serbia*
14. Dr. Jovana Ćirković, Institute for Multidisciplinary Research, Belgrade, *Serbia*
15. Dr. Aleksandar Savić, Institute for Multidisciplinary Research, Belgrade, *Serbia*

## WELCOME MESSAGE

On behalf of the organizers and organizing committee of the 4<sup>th</sup> Conference of the Serbian Society for Ceramic Materials (4CSCS-2017), I would like to extend my warmest welcome to all of you for attending the 4CSCS-2017. The conference is hosted and organized by the Serbian Society for Ceramic Materials, and co-organized by Institute for Multidisciplinary Research - University of Beograd, Institute of Physics - University of Beograd, Center of excellence for the synthesis, processing and characterization of materials for use in extreme conditions “CEXTREME LAB” - Institute of Nuclear Sciences Vinca, University of Belgrade and Faculty of Mechanical Engineering, 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. 4CSCS-2017 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 more than 100 abstracts submitted from 15 countries.

The Conference will feature two plenary lectures, 25 invited talks and more than 70, oral and poster presentations as well as exhibitions of some new ceramic materials and devices. 4CSCS-2017 includes Ceramic Powders, Characterization and Processing, High temperature Phenomena, Sintering, Microstructure Design and Mechanical Properties, Electro and Magnetic Ceramics, Ceramic Composites, Membranes and Multimaterials, Traditional Ceramics and Computing in Materials Science. Exhibitions from company sponsors will be held at the Conference as well.

We are grateful for the support from the Ministry of Education, Science and Technological Development 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.

4CSCS-2017 President

Branko Matovic



## Content

### PROGRAMME

<b>Wednesday, June 14, 2017</b> .....	<b>16</b>
<b>Thursday, June 15, 2017</b> .....	<b>18</b>
<b>Friday, June 16, 2017</b> .....	<b>20</b>

### PLENARY LECTURES

<b>D. Ferber-Lopez, D. Fonblanc, A. Lale, M. Schmidt, A. Viard, S. Bernard</b> DESIGN, PROCESSING AND APPLICATION OF POLYMER-DERIVED SINGLE- AND MULTI-PHASE CERAMICS IN THE Si-X-C-N (X = Al, B AND/OR TRANSITION METALS) SYSTEM.....	<b>23</b>
<b>K.C. Hari Kumar</b> CALPHAD MODELLING APPLIED TO CERAMIC SYSTEMS.....	<b>24</b>

### INVITED LECTURES

<b>M. Vukčević, I. Bošković, S. Nenadović, M. Mirković, M. Stojmenović,</b> <b>V. Pavlović, Lj. Kljajević</b> CHARACTERISTICS OF RED MUD AND/OR METAKAOLIN-BASED GEOPOLYMERS AS A FUNCTION OF MICROSTRUCTURE MODIFICATION BY Ca(OH) <sub>2</sub> .....	<b>25</b>
<b>B. Matovic</b> SYNTHESIS OF GADOLINIA NANOMETRIC POWDERS .....	<b>26</b>
<b>V. Fruth, I. Atkinson, L. Predoana, J. Pandele-Cusu, S. Petrescu, I. Raut,</b> <b>M. Doni, L. Jecu, D. Nastac, I. Barcan, A. Badanoiu</b> BACTERIA AS SELF-HEALING AGENT, AN ALTERNATIVE TO RECOVER CEMENT MATERIALS .....	<b>27</b>
<b>K. Doll</b> ELECTRONIC STRUCTURE CALCULATIONS IN SOLID STATE CHEMISTRY ..	<b>28</b>

<b>I. Pašti, A. Dobrota, A. Jovanović, N. Gavrilov, S. Mentus, N. Skorodumova</b> CARBON-BASED MATERIALS FOR ENERGY CONVERSION APPLICATION - FIRST PRINCIPLES INSIGHTS .....	29
<b>K. Yoshida, M. Takahashi, T. Yano</b> EFFECTS OF BORON AND ALUMINUM ADDITIVES ON MICROSTRUCTURE OF POROUS SIC CERAMICS WITH IN-SITU GRAIN GROWTH .....	30
<b>N. Kostoglou, B. Babic, B. Matovic, G. Constantinides, A. Kontos, T. Steriotis, V. Ryzhkov, E. Gunduz, C. Mitterer, C. Rebholz</b> NOVEL PRODUCTION ROUTES FOR POROUS BORON NITRIDE NANOSTRU- CTURES AND CARBON FOAM-ALUMINIUM FLUORIDE NANOCOMPOSITES..	31
<b>S. Ramya, A. Eranezhuth, R. Kumar</b> SYNTHESIS, CHARACTERIZATION AND EVALUATION OF PHOTOCATALYTIC PROPERTIES OF NANO-ZIRCONIA .....	32
<b>D. Bucevac, V. Krstic</b> LOW-TEMPERATURE SINTERING OF YAG:Ce FOR LASER PHOSPHOR PROJECTION .....	33
<b>G. Motz, M. Seifert</b> FORMATION OF MULTIPHASE CERAMIC COMPOSITES BY REACTION OF NIOBIUM OR MOLYBDENUM WITH POLYSILAZANES .....	34
<b>K. Shqau</b> SUPPORTED CERAMIC MEMBRANES FOR ENERGY-RELATED GAS SEPARATION .....	35
<b>C. Ferone, G. Roviello, L. Ricciotti, F. Messina, R. Cioffi, O. Tarallo, C. Menna, D. Asprone</b> HYBRID ORGANIC-INORGANIC GEOPOLYMER FOAMS .....	36
<b>V. Jordan, M. Podlogar, A. Rečnik</b> HIERARCHIC SELF-ASSEMBLY OF INORGANIC MESOCRYSTALS .....	37
<b>E. Volceanov, S. Badea, A. Volceanov, V. Fruth</b> LAYERED AND PARTICULATE SILICATE-POLYMER NANOCOMPOSITES FOR LIGHTWEIGHT HIGH STRENGTH APPLICATIONS .....	38
<b>G. Bakic, M. Djukic, V. Maksimovic, B. Rajcic, A. Maslarevic</b> APLICATION OF METAL MATRIX COMPOSITE COATINGS IN THERMAL POWER PLANTS .....	39
<b>Z. Burghard</b> STRUCTURAL DESIGN OF OXIDE BASED FUNCTIONAL MATERIALS INSPIRED BY NATURE .....	40
<b>M. Frontasyeva</b> STATE OF THE ART OF NEUTRON ACTIVATION ANALYSIS AT THE REACTOR IBR-2 OF FLNP JINR .....	41

<b>M. Kondo</b> DEVELOPMENT OF SOLID ELECTROLYTE CERAMIC SENSORS FOR OXYGEN AND HYDROGEN MONITORING IN FAST REACTORS AND FUSION REACTORS .....	42
<b>S. Bernik, M. Presečnik</b> SYNTHESIS AND PROCESSING OF p-TYPE $\text{Ca}_3\text{Co}_4\text{O}_9$ CERAMICS FOR MICROSTRUCTURAL ENHANCEMENT OF THE THERMOELECTRIC CHARACTERISTICS .....	44
<b>M. Vijatovic Petrovic, A. Dzunuzovic, J. Bobic, R. Grigalaitis, B. Stojanović</b> THE OVERVIEW OF BARIUM TITANATE PROPERTIES AND APPLICATION OPPORTUNITIES .....	45
<b>E. Traversa</b> TAILORING THE CATHODE NANOSTRUCTURE TO ACHIEVE HIGH POWER OUTPUT FOR SOLID OXIDE FUEL CELLS OPERATING AT 600°C .....	46
<b>T. Rojac, D. Damjanovic</b> CHARGED DEFECTS AND DOMAIN WALLS IN $\text{Pb}(\text{Zr,Ti})\text{O}_3$ AND $\text{BiFeO}_3$ CERAMICS .....	47
<b>E. Babić, I. Kušević, N. Novosel, D. Pajić</b> VORTEX PINNING AND CONNECTIVITY IN NOVEL SUPERCONDUCTORS ...	48
<b>T. Tian, L.H. Cheng, L.Y. Zheng, J.J Xing, H. Gu, S. Bernik, H.R. Zeng, W. Ruan, K.Y. Zhao, G. Li</b> HIGH CONDUCTIVITY OF $\text{ZnO}$ CERAMICS AND THEIR ENHANCED THERMOELECTRIC PROPERTIES .....	49
<b>A. Radojković, M. Žunić, S.Savić, Z. Branković, G. Branković</b> IMPROVED PROPERTIES OF DOPED $\text{BaCe}_{0.9}\text{Y}_{0.1}\text{O}_{3-\delta}$ AS A PROTON CONDUCTING ELECTROLYTE FOR IT-SOFC .....	50

## ORAL PRESENTATIONS

<b>S. Jovanović, J. Rmuš, M. Vukomanović, D. Bajuk-Bogdanović, D. Peddis, D. Suvorov</b> SYNTHESIS AND CHARACTERIZATION OF ZINC DOPED COBALT FERRITE NANOPARTICLES .....	51
<b>N. Stanković, M. Nikolić, B. Jelenković, B. Matović</b> DEPENDENCE OF LUMINESCENCE PROPERTIES OF $\text{Y}_2\text{MoO}_6\cdot\text{Eu}^{3+}$ ON TEMPERATURE .....	52
<b>M. Kokunešoski, A. Šaponjić, Z. Baščarević, Z. Rakočević, Đ. Šaponjić, B. Matović, B. Babić</b> INFLUENCE OF SYNTHESIS CONDITIONS ON MORPHOLOGICAL FEATURES OF SBA-15 .....	53

<b>S. Bromley</b> NANOSCALE-TO-BULK: SIZE-DEPENDENT CRYSTALLINITY OF CERAMIC OXIDES .....	53
<b>J. Zagorac, D. Zagorac, M. Rosić, B. Matović</b> STRUCTURE PREDICTION OF ALUMINIUM NITRIDE MODIFICATIONS USING DATA MINING .....	55
<b>A. Cuko, M. Calatayud, S. Bromley</b> THEORETICAL STUDY ON TITANOSILICATES MIXING: FROM NANOSCALE TO BULK .....	56
<b>D. Zagorac, J. C. Schön, M. Rosic, J. Zagorac, B. Matovic</b> ENERGY LANDSCAPE INVESTIGATIONS OF COBALT MOLYBDATE AND CONNECTION TO THE EXPERIMENT .....	58
<b>A. Knöller, Z. Burghard, J. Bill</b> V <sub>2</sub> O <sub>5</sub> NANOFIBER SCAFFOLDS - A CONCEPT TO GENERATE DAMPING CERAMICS .....	59
<b>S. Kilper, T. Jahnke, Z. Burghard, D. Rothenstein, J. Bill</b> M13 BACTERIOPHAGES AS VERSATILE BIO-TEMPLATES FOR FUNCTIONAL CERAMIC COMPOSITE MATERIALS .....	60
<b>N. Tasić, Z. Branković, T. Novaković, G. Branković</b> NANOSIZED TITANIA PHOTOCATALYSTS OBTAINED BY SIMPLE CHEMICAL METHOD .....	60
<b>D. Kisić, M. Nenadović, Đ. Veljović, M. Popović, Z. Rakočević</b> ZnO NANORODS GROWN BY VAPOUR - LIQUID - SOLID METHOD ...	61
<b>S. Dmitrović, M. Prekajski, A. Zarubica, B. Matović</b> SPIDER SILK-CERAMICS COMPOSITES CANDIDATE FOR SYNTHESIS OF NOVEL BIOPOLYMERS .....	62
<b>D. Chudoba</b> RESEARCH POSSIBILITIES IN FRANK LABORATORY OF NEUTRON PHYSICS AT JOINT INSTITUTE FOR NUCLEAR RESEARCH .....	63
<b>K. Vojisavljević, T. Pečnik, H. Uršič, B. Malič</b> ENHANCED LOCAL PIEZOELECTRIC RESPONSE IN Mn-DOPED (K <sub>0,5</sub> Na <sub>0,5</sub> ) <sub>0,99</sub> Sr <sub>0,01</sub> NbO <sub>3</sub> FILMS .....	64
<b>A. Nesterovic, J. Vukmirovic, B. Bajac, G. Dubourg, J. Stanojev, E. Djurdjic, Z. Cvejic, V.V. Srdic</b> DESIGN OF DOPED BARIUM TITANATE THIN FILMS BASED VARACTOR AND GOLD ELECTRODES FOR MEASUREMENT OF TUNABLE PROPERTIES .	65
<b>M. Malinović, I. Stijepović, V.V. Srdić, M. Milanović</b> SYNTHESIS AND CHARACTERISAZATION OF DOUBLE FERRITE NANOCOMPOSITES .....	66

POSTER PRESENTATIONS

<b>S. Nenadović, I. Bošković, L. Kljajević, I. Vukanac, N. Stanković, B. Todorović, M. Vukčević</b> RADIOLOGICAL AND PHYSICO-CHEMICAL PROPERTIES OF RED MUD BASED GEOPOLYMERS .....	66
<b>M. Mirković, A. Dosen, S. Erić, M. Stojmenović, B. Matović, A. Rosić</b> SYNTHESIS, CHARACTERIZATION AND APPLICATION OF PURE AND DOPED CALCIUM PHOSPHATE MATERIALS .....	67
<b>M. Omerašević, J. Ružić, J. Orlić, Z. Baščarević, M. Savić-Biserčić, L. Matović</b> TRANSFORMATION OF Cs-LTA TYPE OF ZEOLITE TO POLLUCITE PHASE USING HOT PRESSING METHOD .....	68
<b>M. Maletić, A. Kalijadis, M. Vukčević, J. Ćirković, J. Jovanović, B. Babić, M. Laušević</b> SYNTHESIS AND PHOTOCATALYTIC ACTIVITY OF N-DOPED TiO <sub>2</sub> /CARBON COMPOSITES .....	69
<b>M. Ivanović, L. Kljajević, S. Marković, M. Prekajski, B. Todorović, J. Gulicovski, S. Nenadović</b> THE INFLUENCE OF ALKALI ACTIVATION ON THE PROCESS OF POLYMERIZATION OF GEOPOLYMERS .....	70
<b>A. Diem, Z. Burghard, J. Bill</b> FLEXIBLE V <sub>2</sub> O <sub>5</sub> -BASED SCROLLS – MIMICKING THE STRUCTURE OF THE SPONGE SPICULE .....	71
<b>T. Jahnke, Z. Burghard, J. Bill</b> HIGH-PERFORMANCE rGO-SnO <sub>2</sub> FLEXIBLE ELECTRODES .....	72
<b>N. Kostoglou, B. Babic, B. Matovic, G. Constantinides, G. Charalambopoulou, T. Steriotis, M. Baker, K. Polychronopoulou, C. Mitterer, C. Rebholz</b> HYDROGEN STORAGE AND SELECTIVE GAS SEPARATION PERFORMANCE OF A NANOPOROUS CARBON CLOTH-LIKE MATERIAL .....	73
<b>M. Čebela, D. Zagorac, J. Zagorac, R. Hercigonja, B. Matović</b> BiFeO <sub>3</sub> PEROVSKITES: THEORETICAL AND EXPERIMENTAL INVESTIGATIONS .....	74
<b>L. Kljajević, Z. Melichova, D. Kisić, M. Nenadović, K. Trivunac, B. Todorović, S. Nenadović</b> HYDROPHOBICITY CONTROL OF ALKALI ACTIVATED ALUMINO-SILICATE MATERIALS-GEOPOLYMERS .....	75
<b>M. Rosić, D. Zagorac, J. Zagorac, Z. Dohčević-Mitrović, B. Stojadinović, K. Đuriš, B. Matović</b> ELECTRONIC PROPERTIES INVESTIGATION OF CaMnO <sub>3</sub> DOPED WITH Gd USING THEORETICAL AND EXPERIMENTAL METHODS .....	76

<b>B.Ž. Todorović, P.I. Premović</b> CHARACTERIZATION OF IRON IN THE HYDROTHERMAL DICKITE FROM JEDLINA ZDROJ (NOWA RUDA, LOWER SILESIA, POLAND) .....	76
<b>M. Prekajski Đorđević, A. Zarubica, A. Kalijadis, B. Babić, S. Dmitrović, J. Maletaškić, B. Matović</b> NOVEL SYNTHESIS ROUTE FOR OBTAINING HIGHLY EFFICIENT Ag <sub>3</sub> PO <sub>4</sub> PHOTOCATALYST NANOSPHERES .....	77
<b>S. Ilić, V. Ivanovski, J. Zagorac, S. Zec, B. Matović</b> MOSSBAUER SPECTRA OF SOL-GEL IRON SUBSTITUTED MULLITE .....	78
<b>J. Zdravković, L. Radovanović, B. Simović, D. Poleti, J. Rogan, Ž. Radovanović, K. Mihajlovski</b> ZnO NANOPOWDERS OBTAINED BY THERMOLYSIS OF ZINC BENZENEDICARBOXYLATE COMPLEXES WITH 2,2'-DIPYRIDYLAMINE .....	79
<b>D. Zagorac, K. Doll, J. Zagorac, D. Jordanov, B. Matovic</b> QUANTUM MECHANICAL INVESTIGATIONS OF ELECTRONIC PROPERTIES OF BARIUM SULFIDE UNDER EXTREME CONDITIONS .....	80
<b>A. Džunuzović, M. Vijatović Petrović, N. Ilić, J. Bobić, M. Ivanov, D. Makovec, B. Stojanović</b> STRUCTURE AND CHARACTERIZATION OF (x)Ni <sub>0.7</sub> Zn <sub>0.3</sub> Fe <sub>2</sub> O <sub>4</sub> – (1-x)BaTiO <sub>3</sub> COMPOSITES .....	81
<b>D.C. Nastac, L. Predoana, V. Fruth</b> THE INFLUENCE OF DREDGE WASTE AND EFFLUENT TREATMENT PLANTS SLUDGE ON THE PORTLAND CEMENT CLINKER MANUFACTURE .....	82
<b>A. Dapčević, D. Poleti, A. Radojković, G. Branković</b> HIGHLY CONDUCTIVE V-DOPED δ-Bi <sub>2</sub> O <sub>3</sub> WITH 3×3×3 SUPERSTRUCTURE ...	82
<b>J. Luković, D. Zagorac, J. Zagorac, B. Matović</b> TUNGSTEN BASED SILICIDES: FROM QUANTUM MECHANICS TO ACTUAL SYNTHESIS .....	84
<b>M. Vijatović Petrović, R. Grigalaitis, A. Džunuzović, J. Bobić, N. Ilić, B. Stojanović</b> CORRELATION BETWEEN STRUCTURE AND ELECTRICAL CHARACTERISTICS IN SAMARIUM DOPED BARIUM TITANATE SYSTEMS ..	85
<b>B. Stojadinović, Z. Dohčević-Mitrović, D. Stepanenko, M. Rosić, I. Petronijević, N. Tasić, N. Ilić, B. Matović, B. Stojanović</b> INCREASE OF THE BREAKDOWN FIELD IN BiFeO <sub>3</sub> NANOPOWDERS WITH Ho DOPING .....	86
<b>J.D. Bobić, M. Ivanov, N.I. Ilić, A.S. Džunuzović, M.M. Vijatović Petrović, R.M. Katiliute, B.D. Stojanović</b> PZT-NICKEL FERRITE AND PZT-COBALT FERRITE COMPARATIVE STUDY: STRUCTURE, DIELECTRIC, FERROELECTRIC AND MAGNETIC PROPERTIES OF COMPOSITE CERAMICS .....	87

<b>M. Vuković, Z. Branković, D. Poleti, G. Branković</b> MECHANICAL AND COUPLED MECHANICAL-ULTRASONIC ACTIVATION OF HIGH BREAKDOWN FIELD ZnO VARISTORS .....	88
<b>M. Vuksanović, B. Medo, M. Rakin, T. Volkov Husovic, Z. Stević, R. Jančić Heinemann</b> COMPARISON OF ANALYTICAL AND NUMERICAL RESULTS OF ALUMINA CERAMIC MATERIALS BEHAVIOR UNDER THE BRAZILIAN DISK TEST .....	89
<b>M. Pavlović, M. Dojčinović, J. Majstorović, S. Martinović, M. Vlahović, Z. Stevic, T. Volkov Husović</b> IMPLEMENTATION OF IMAGE ANALYSIS ON COMPARISON OF CAVITATION EROSION DEGRADATION OF MULITE AND CIRCON SAMPLES BASED .....	90
<b>J. Ćirković, D. Luković Golić, A. Radojković, A. Dapčević, M. Čizmić, Z. Branković, G. Branković</b> PHOTODEGRADATION OF ORGANIC DYE USING BiFeO <sub>3</sub> PARTICLES SYNTHESIZED BY ULTRASOUND ROUTE .....	91
<b>D. Luković Golić, A. Radojković, A. Dapčević, J. Ćirković, N. Tasić, D. Pajić, Z. Marinković Stanojević, Z. Branković, G. Branković</b> THE EFFECT OF GADOLINIUM SUBSTITUTION ON THE STRUCTURAL, FERROELECTRIC AND MAGNETIC PROPERTIES OF BISMUTH FERRITE CERAMICS .....	92
<b>N. Ilić, J. Bobić, V. Spasojević, B. Stojanović</b> INFLUENCE OF DOPING ION VALENCE AND SIZE ON PROPERTIES OF BiFeO <sub>3</sub> MATERIALS .....	93
<b>A. Volceanov, Z. Ghizdaveț, D. Nastac, M. Eftimie, B. Stefan, I. Stanciu</b> MICROSTRUCTURE OF SOME CLINKERS THROUGH THEIR FRACTAL DIMENSION .....	93
<b>M. Momčilović, J. Đorđević, A. Zarubica, M. Randelović</b> ELECTROCHEMICAL BEHAVIOUR OF SERPENTINITE AND FORSTERITE IN FERRI/FERRO CYANIDE BENCHMARK REDOX SYSTEM .....	94
<b>A. Radojković, D. Luković Golić, J. Ćirković, A. Dapčević, D. Pajić, F. Torić</b> B-SITE DOPING AS A STRATEGY FOR TAILORING BiFeO <sub>3</sub> PROPERTIES .....	95
<b>V. Ribić, A. Rečnik, Z. Branković, G. Branković</b> DFT SCREENING OF DOPANTS TRIGGERING THE FORMATION OF BASAL- PLANE INVERSION BOUNDARIES IN ZnO .....	96
<b>R. Pacheco-Contreras, J.O. Juárez-Sánchez, Á. Posada-Amarillas, M. Dessens-Félix, A. Fortunelli</b> STRUCTURES OF TRIMETALLIC Ag <sub>l</sub> Au <sub>m</sub> Pt <sub>n</sub> ( $l+m+n=13, 19, 33$ and $38$ ) CLUSTERS .....	97
<b>S. Perać, S.M. Savić, Z. Branković, S. Bernik, G. Branković</b> ENHANCEMENT OF THERMOELECTRIC PROPERTIES INDUCED BY Cu SUBSTITUTION IN NaCo <sub>2</sub> O <sub>4</sub> .....	98

<b>J. Maletaškić, B. Matović, V. Maksimović, M. Prekajski Djordjević, K. Yoshida, T. Yano</b> SINTERING BEHAVIOR AND MECHANICAL PROPERTIES OF SINTERED CATISIO <sub>5</sub> (SPHENE) .....	99
<b>Z.Z. Vasiljevic, M. Vesna Nikolic, M.D. Lukovic, M. Vujkovic, J. Vujancevic, V.B. Pavlovic, O.S. Aleksic</b> PHOTOELECTROCHEMICAL WATER SPLITTING POTENTIAL OF ZnFe <sub>2</sub> O <sub>4</sub> THICK FILMS .....	99
<b>Z.Z. Vasiljevic, M.D. Lukovic, M.V. Nikolic, M. Vujkovic, J. Vujancevic, V.B. Pavlovic, O.S. Aleksic</b> PHOTOELECTROCHEMICAL WATER SPLITTING BEHAVIOR OF NANOSTRUCTURED Fe <sub>2</sub> TiO <sub>5</sub> THICK FILMS PREPARED BY A SOLID STATE REACTION .....	100
<b>M. Jović, R. Damjanović, M. Vuksanović, I. Živković, V. Radojević, R. Jančić Heinemann</b> INFLUENCE OF ALUMINA NANOPARTICLES AS REINFORCEMENT ON MECHANICAL PROPERTIES OF ACRYLOID COPOLYMERS .....	101
<b>M.D. Lukovic, M.V. Nikolic, N. Blaz, M. Milutinov, Z.Z. Vasiljevic, N. Labus, O. S. Aleksic</b> STRUCTURAL, ELECTRICAL AND MAGNETIC PROPERTIES OF MECHANICALLY ACTIVATED MANGANESE AND ZINC FERRITE .....	102
<b>F. Torić, D. Pajić, E. Babić, M. Vuković, Z. Branković, G. Branković</b> INFLUENCE OF Cu-Zn SUBSTITUTION ON MAGNETIC BEHAVIOUR OF MULTIFERROIC CuO .....	103
<b>V.D. Pavkov, G.M. Bakic, V. Maksimovic, B. Matovic</b> MATERIALS AND CONCEPT OF PLASMA SPRAYING .....	104
<b>B. Janković</b> DISTRIBUTION OF ACTIVATION ENERGY COUNTERPARTS DURING ISOTHERMAL THERMO-ANALYTICAL MEASUREMENTS OF MECHANICALLY ACTIVATED INDIUM TIN OXIDE (ITO) POWDERS .....	104
<b>M.M. Janković, N.B. Sarap</b> AN ASSESSMENT OF GROSS ALPHA AND BETA ACTIVITY IN KAOLIN .....	105
<b>P. Šenjuga, F. Torić, J. Dragović, D. Pajić, D. Luković Golić, A. Radojković, J. Čirković, G. Branković</b> INFLUENCE OF La, Yb AND Gd SUBSTITUTION ON MAGNETIC BEHAVIOUR OF BULK BiFeO <sub>3</sub> .....	106
<b>V. Lojpur, J. Krstić, Z. Kačarević-Popović, M. Mitrić, Z. Rakočević, I. Validžić</b> Sb <sub>2</sub> S <sub>3</sub> BASED HYBRID SOLAR CELLS AT LOW LIGHTS WITH CHITOSAN AND PEG AS A SOLID HOLDER OF ELECTROLYTE .....	107



<b>J. Ruzic, S. Emura, I. Watanabe, T. Ohmura</b> INVESTIGATION OF THE $M_0$ DISTRIBUTION THROUGH THE LARGE B-PHASE GRAINS AND ITS INFLUENCE ON ELASTIC MODULUS OF Ti-12Mo ALLOY BY NANOINDENTATION TEST .....	107
<b>B. Jokić, I. Cvijović-Alagić, B. Babić, D. Jugović, M. Mitrić</b> INVESTIGATION OF DIFFERENT SINTERING CONDITIONS ON MECHNAICAL PROPERTIES OF NANOSTRUCTURED BIOCERAMICS .....	108
<b>M. Vuksanović, M. Gajić Kvašček, M. Dojčinović, T. Volkov Husović, R. Jančić Heinemann</b> APPLICATION OF PRINCIPAL COMPONENT ANALYSIS TO INVESTIGATE THE MORPHOLOGY DAMAGE CAUSED BY CAVITATION .....	109
<b>J. Maletaškić, B. Matović, M. Cebela, M. Prekajski Djordjević, A. Matković, D. Kozlenko, S. Kichanov</b> COMBINED MAGNETIC AND STRUCTURAL CHARACTERIZATION OF HIDROTHERMAL BISMUTH FERRITE ( $BiFeO_3$ ) NANOPARTICLES .....	110
<b>G. Ferreira Teixeira, A. Džunuzović, G.M.M.M. Lustosa, M. Vijatovic Petrovic, B.D. Stojanović, M.Ap. Zaghete</b> NZF-BT COMPOSITES: A PHOTOLUMINESCENCE APPROACH .....	111
<b>T. Bräuniger</b> CHARACTERISATION OF CALCIUM ALUMINATE PHASES IN CEMENTS BY $^{27}Al$ -MAS-NMR SPECTROSCOPY .....	112
<b>M. Počuča-Nešić, Z. Marinković Stanojević, A. Dapčević, N. Tasić, Z. Jagličić, Z. Branković, G. Branković</b> PREPARATION OF $YMnO_3$ CERAMIC MATERIAL FROM CHEMICALLY PREPARED POWDERS .....	113
<b>A. Miletić, B. Škorić, P. Panjan, L. Kovačević, P. Terek, G. Dražič</b> NANOLAYERED $CrAlN/TiSiN$ COATING DESIGNED FOR TRIBOLOGICAL APPLICATION .....	114
<b>J. Vukašinović, M. Počuča-Nešić, D. Luković Golić, S.M. Savić, Z. Branković, G. Branković</b> ELECTRICAL PROPERTIES OF $BaSn_{(1-x)}Sb_xO_3$ CERAMICS MATERIALS .....	115
<b>M. Podlogar, A. Kaya, D. Vengust, D. Svetin, A. Rečnik, S. Bernik</b> MORPHOLOGY EVOLUTION OF $ZnO$ FILMS INFLUENCED BY DOPANTS UNDER HYDROTHERMAL CONDITIONS .....	116
<b>Author Index</b>	117

P-29

## INFLUENCE OF DOPING ION VALENCE AND SIZE ON PROPERTIES OF BiFeO<sub>3</sub> MATERIALS

Nikola Ilić<sup>1</sup>, Jelena Bobić<sup>1</sup>, Vojislav Spasojević<sup>2</sup>, Biljana Stojanović<sup>1</sup>

<sup>1</sup>*Institute for Multidisciplinary Research, Belgrade, Serbia*

<sup>2</sup>*Institute of Nuclear Sciences "Vinča", Belgrade, Serbia*

Bismuth ferrite (BiFeO<sub>3</sub>) is one of the most promising single multiferroic materials, and for sure the most studied one. It expresses specific magnetic and electric properties well above the room temperature. However, the nature of its properties is still arguable. In this study, an attempt to reveal some of the peculiarities of BiFeO<sub>3</sub> by introducing metal ions of various valences and sizes in the places of Bi<sup>3+</sup> and Fe<sup>3+</sup> ions. Powders with 5 mol% of doping metals were synthesized by auto-combustion method using glycine as a fuel. The powders and ceramic samples prepared from them were characterized. At this level, doping ions make significant change in structure, phase composition, rate of the solid state reaction, microstructure, conductivity, electrical polarization and magnetization. Potential mechanisms of their influence on different properties are discussed.

P-30

## MICROSTRUCTURE OF SOME CLINKERS THROUGH THEIR FRACTAL DIMENSION

Adrian Volceanov<sup>1</sup>, Zeno Ghizdavet<sup>1</sup>, Daniela Nastac<sup>2</sup>, Mihai Eftimie<sup>1</sup>, Bianca Stefan<sup>1</sup>, Iuliana Stanciu<sup>1</sup>

<sup>1</sup>*University Politehnica of Bucharest, 313 Spl. Independentei, Bucharest, Romania*

<sup>2</sup>*CEPROCIM S.A., 6 Preciziei Blvd, Bucharest, Romania, e-mail: avolceanov@yahoo.co.uk*

*Multivariate Analysis* on a complex database has been performed, aiming to reveal correlations *composition-processing conditions-microstructure*. Database was made of cement clinker chemical analysis, information extracted from image analysis of clinker micrographs and process parameters recorded on the clinkering plant where the clinkers were obtained. Clinkers were burned in different conditions in industrial environments (19 clinkers) and in laboratory (7 clinkers). Image analysis of each clinker has been made by computing *Shape Parameters, Fractal*

