

**The Serbian Ceramic Society
Vinča Institute of Nuclear Sciences, University of Belgrade
Institute for Multidisciplinary Research, University of Belgrade
Institute of Physics, University of Belgrade**

PROGRAM AND THE BOOK OF ABSTRACTS

**1st Conference of the Serbian Ceramic Society
March 17-18. 2011.
Belgrade, Serbia
1CSCS-2011**

**Edited by:
Snežana Bošković
Zorica Branković
Jasmina Grbović Novaković**

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**Društvo za Keramičke Materijale Srbije
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Institut za multidisciplinarna istraživanja, Univerzitet u
Beogradu
Institut za fiziku, Univerzitet u Beogradu**

**PROGRAM I KNJIGA APSTRAKATA
Prva konferencija Društva za Keramičke
Materijale Srbije
17-18. Mart 2011, Beograd, Srbija
1CSCS2011**

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Snežana Bošković
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Jasmina Grbović Novaković**

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PROGRAM:

THURSDAY, 17.03.2011. NEW BELGRADE MUNICIPAL HALL

8⁰⁰-9⁰⁰ **REGISTRATION**

9⁰⁰ -9³⁰ **OPENING CEREMONY**

9³⁰ - 10⁰⁰ **COCKTAIL**

Chairman: S. Bosković, Z. Dohčević-Mitrović

10⁰⁰ - 10⁴⁵ *Plenary lecture*

Marija Kosec

POLAR CERAMICS: NEW APPLICATIONS, NEW COMPOSITIONS, NEW STRUCTURES

Electronic Ceramic Department, Jozef Stefan Institute, Ljubljana, Slovenia

1. Synthesis and Processing

Chairman: S. Bosković, Z. Dohčević-Mitrović

10⁴⁵ - 11¹⁵ *Invited lecture*

Aleksandar Rečnik¹, Nina Danu¹, Thomas Walther², Takashi Yamazaki³, Masahiro Kawasaki⁴ and Werner Mader²

STRUCTURE AND CHEMISTRY OF BASAL-PLANE INVERSION BOUNDARIES IN Sb₂O₃-DOPED ZnO

¹Jozef Stefan Institute, Ljubljana, Slovenia,

²Anorg. Chemie, Univ. Bonn, Bonn, Germany,

³Depr. of Physics, Tokyo University of Science, Tokyo, Japan,
⁴USA Incorporation, Peabody, Massachusetts, USA

Oral presentations

- 11¹⁵ - 11³⁰ **Branko Matovic, Biljana Babic, Milena Rosic, Jelena Dukic, Ana Radosavljevic-Mihajlovic, Snezana Boskovic**
SYNTHESIS AND CHARACTERIZATION OF (Ba, Yb) DOPED CERIA ELECTROLYTES
Vinca Institute of Nuclear Sciences, Materials Science Laboratory, Belgrade Serbia
- 11³⁰ - 11⁴⁵ **B.M. Jović, U. Lačnjevac, V.D. Jović**
THE NON-NOBLE METAL COMPOSITES AS CATODES FOR HYDROGEN EVOLUTION: Ni-MoO_x COATINGS
Institute for Multidisciplinary Reserach, Belgrade, Serbia
- 11⁴⁵ - 12⁰⁰ **Coffee break**
- Chairman:** **V. Srdić, V. Urbanovich**
- 12⁰⁰ - 12¹⁵ **U. Lačnjevac, B.M. Jović, V.D. Jović**
THE NON-NOBLE METAL COMPOSITES AS CATODES FOR HYDROGEN EVOLUTION: Ni-MoO₂ COATINGS
Institute for Multidisciplinary Reserach, Belgrade, Serbia
- 12¹⁵ - 12³⁰ **P. Gautham, M. Winterer**
SPARK PLASMA SINTERING
Technische Institut Universitaet Darmstadt, Germany
- 12³⁰ - 12⁴⁵ **Anja Došen¹, Rossmann Giese²**
THE ADVANTAGES OF THE THERMAL X-RAY DIFFRACTION: BRUSHITE EXAMPLE
¹Department of material science, INS Vinca, Serbia,
²Geology Department, State University of New York at Buffalo, USA
- 12⁴⁵ - 13³⁰ **Lunch break**
- 13³⁰ - 14³⁰ **Poster session (C1-C3)**

2. Ceramics Nanostructures

Chairman: G. Branković, S. Bernik

14³⁰ - 15⁰⁰ *Invited lecture*

Vladimir Urbanovich

**THE INVESTIGATIONS IN THE FIELD OF
NANOSTRUCTURED BULK MATERIALS BASED ON
HIGH-MELTING POINT COMPOUNDS OBTAINED BY
HIGH PRESSURE SINTERING**

Scientific-Practical Materials Research Centre NAS of Belarus,
Minsk, Belarus

Oral presentations

15⁰⁰ - 15¹⁵

**Sanja Milošević, Željka Rašković, Sandra Kurko, Ljiljana
Matović, Nikola Cvjetičanin, Jasmina Grbović Novaković**
**THE INFLUENCE OF VO₂ ON HYDROGEN
DESORPTION PROPERTIES OF MgH₂**

¹Material science Laboratory, Vinča Institute of Nuclear
Sciences, Serbia,

²Faculty of Physical Chemistry, University of Belgrade, Serbia

15¹⁵ - 15³⁰

**Marko Radović, Zorana Dohčević-Mitrović, Aleksandar
Golubović, Zoran V. Popović**
**SPECTROSCOPIC ELLIPSOMETRY INVESTIGATION
AND MODELING OF BAND GAP IN Fe DOPED CERIA
NANOPARTICLES**

Center for Solid State Physics and New Materials, Institute of
Physics, Belgrade, Serbia

15³⁰ - 15⁴⁵

**Lidija Mancic, Katarina Marinkovic, Ivan Dugandzic,
Vesna Lojpur, Olivera Milosevic**
**SOFT CHEMISTRY ROUTES FOR SYNTHESIS OF 3D
AND 1D NANOSTRUCTURES**

Institute of Technical Science of Serbian Academy of Sciences
and Arts, Serbia

15⁴⁵ - 16⁰⁰

Coffee break

3. Structural Ceramics and Bioceramics

Chairman: T. Volkov-Husović, B. Babić

16⁰⁰ - 16³⁰ *Invited lecture*

Krzysztof Haberko, Radoslaw Lach
CERAMIC MATRIX COMPOSITES IN ALUMINA AND YAG SYSTEM- PREPARATION AND PROPERTIES
Department of Special Ceramics, AGH University of Science and Technology, Krakow, Poland

Oral presentations

16³⁰ - 16⁴⁵ **Marijana Majić, Lidija Ćurković**
FRACTURE TOUGHNESS OF ALUMINA CERAMICS DETERMINED BY INDENTATION TECHNIQUE
Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, Croatia

16⁴⁵ - 17⁰⁰ **Dusan Bucevac, Biljana Babic, Snezana Boskovic**
EFFECT OF HEAT TREATMENT ON MECHANICAL PROPERTIES OF SiC-TiB₂ COMPOSITES
Department of material science, INS Vinca, Serbia

17⁰⁰ - 17¹⁵ **Ivan Djordjevic¹, Namita Roy Choudhury², Naba Dutta², Sunil Kumar², Endre Szili³, David Steele³**
BIODEGRADABLE CITRIC-ACID BASED POLYESTER ELASTOMERS FOR TISSUE ENGINEERING APPLICATIONS

¹Institute for Multidisciplinary Research, University of Belgrade,

²Ian Wark Research Institute, University of South Australia,

³Mawson Institute, University of South Australia

FRIDAY, 18.03.2011, NEW BELGRADE MUNICIPAL HALL

8⁰⁰ - 9⁰⁰ REGISTRATION

Chairman: Z. Popović, K. Haberko

9⁰⁰ - 9⁴⁵ *Plenary lecture*

J.C. Schoen, A. Hanneman, M. Jansen

MODELING STRUCTURE AND PROPERTIES OF AMORPHOUS SILICON BORON NITRIDE CERAMICS

Max-Planck Institute for Solid State Research, Stuttgart, Germany

4. Theoretical Modelling

Chairman: Z. Popović, K. Haberko

Oral presentations

**9⁴⁵ – 10⁰⁰ D.Zagorac, J.C. Schön, I. Pentin, M. Jansen
STRUCTURE PREDICTION AND ENERGY LANDSCAPE EXPLORATION IN THE ZINC OXIDE SYSTEM**

Max Planck Institute for Solid State Research, Stuttgart, Germany

**10⁰⁰ - 10¹⁵ Radojka Vujasin¹, Milan Senćanski², Miljenko Perić³
THEORETICAL INVESTIGATION OF THE STRUCTURE OF BC₂**

¹Department of Material Sciences, VINČA Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia,

²Innovation center of the Faculty of Chemistry, University of Belgrade, Belgrade, Serbia,

³Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia

10¹⁵ – 10³⁰ **Igor Stankovic¹, Aleksandar Belic¹, Milan Zezelj¹,
Aleksandar Golubovic², Maja Scepanovic²**

**MODELING OF AGGLOMERATION DYNAMICS OF
NANO-PARTICLE SUSPENSIONS**

¹Scientific Computing Laboratory, Institute of Physics,
University of Belgrade, Belgrade, Serbia

²Center for Solid State Physics and New Materials, Institute of
Physics, University of Belgrade, Belgrade, Serbia

10³⁰ – 10⁴⁵ **Coffee break**

5. Electroceramics and Solid Oxide Fuel Cells

Chairman: B. Stojanović, M. Kosec

10⁴⁵ – 11¹⁵ ***Invited lecture***

**Bernik Slavko^{1,2}, Matejka Podlogar,^{1,2} Nina Daneu^{1,2},
Aleksandar Recnik^{1,2}**

**LOW-DOPED ZnO-BASED VARISTOR CERAMICS
WITH BROAD RANGE OF BREAK-DOWN VOLTAGES**

¹Jozef Stefan Institute, Ljubljana, Slovenia,

²Center of Excellence NAMASTE, Ljubljana, Slovenia

11¹⁵ – 11⁴⁵ ***Invited lecture***

**Victor Fruth¹, Eniko Volceanov², Cristian Andronesu¹,
Rares Scurtu¹, Silviu Preda¹, Zorana Dohcevic-Mitrovic³,
Zoran Popovic³**

**PREPARATION AND CHARACTERIZATION OF
DOPED LANTHANUM GALLATE (LSGM)
ELECTROLYTE IN ACTIVATED MICROWAVE FIELD**

¹Institute of Physical Chemistry Ilie Murgulescu, Bucharest
Romania,

²Metallurgical research Institute, ICEM SA Bucharest, Romania,

³Institute of Physics, Center for Solid State Physics and New
Materials, Belgrade, Serbia

Oral presentations

- 11⁴⁵ – 12⁰⁰ **Milan Zunic¹, Aleksandar Radojkovic¹, Zorica Brankovic¹, Goran Brankovic¹**
SYNTHESIS AND CHARACTERIZATION OF ANODIC SUBSTRATES FOR IT-SOFCs BASED ON PROTON CONDUCTORS
¹Institute for Multidisciplinary Research, Belgrade, Serbia
- 12⁰⁰ – 12¹⁵ **G. Branković¹, Z. Marinković Stanojević¹, Z. Jagličić², M. Jagodič², L. Mančić³, A. Rečnik⁴, Z. Branković¹**
MECHANOCHEMICAL SYNTHESIS OF PURE AND DOPED BISMUTH MANGANITE MULTIFERROICS
¹Institute for Multidisciplinary Research, Belgrade, Serbia
²Institute of Mathematics, Physics and Mechanics, Ljubljana, Slovenia
³Institute of Technical Sciences SASA, Belgrade, Serbia
⁴Jozef Stefan Institute, Ljubljana, Slovenia
- 12¹⁵ – 12³⁰ **Matejka Podlogar^{1,2}, Jacob J. Richardson³, Nina Daneu^{1,2}, Aleksander Rečnik^{1,2}, Damjan Vengust¹, Slavko Bernik^{1,2}**
LOW-TEMPERATURE AQUEOUS SYNTHESIS AND CHARACTERISTICS OF TRANSPARENT ZINC OXIDE FILMS ON GLASS SUBSTRATE
¹Jožef Stefan Institute, Ljubljana, Slovenia,
²Center of Excellence NAMASTE, Ljubljana, Slovenia,
³Materials Department, University of California, Santa Barbara, USA
- 12³⁰ – 12⁴⁵ **Coffee break**

6. Silicates, Refractories, Cements and Traditional Ceramics

Chairman: M. Komljenović, B. Matović

Oral presentations

12⁴⁵ – 13⁰⁰ **Z. Bašcarević, Lj. Petrašinović-Stojkanović, M. Komljenović, N. Jovanović, V. Bradić**
APPLICATIONS OF FLY ASH AS A SECONDARY RAW MATERIAL FOR BUILDING MATERIALS PRODUCTION
Institut for Multidisciplinary Research, Belgrade, Serbia

13⁰⁰ – 13¹⁵ **Vesna Svoboda¹, Radmila Jančić-Heinemann², Suzana Polić-Radovanović¹**
THE ROLE OF EXPERIMENTAL RESEARCH ON CERAMICS IN THE IDENTIFICATION OF INTANGIBLE CULTURAL HERITAGE
¹Central Institute for conservation in Belgrade, Serbia,
²Faculty of Technology and Metallurgy, University of Belgrade, Serbia

13¹⁵ – 13³⁰ **Sanja Martinović², Milica Vlahović², Marija Dimitrijević¹, Marina Dojčinović¹, Aleksandar Devečerski³, Branko Matović³, Tatjana Volkov-Husović¹**
PROPERTIES OF LOW CEMENT HIGH ALUMINA CASTABLE SINTERED AT 1300 °C
¹University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia,
²Institute for Technology of Nuclear and Other Raw Mineral Materials, Belgrade, Serbia,
³Institute of Nuclear Science “Vinca”, Material Science Laboratory, Belgrade, Serbia

- 13³⁰ – 13⁴⁵** **Sanja Martinovic², Marija Dimitrijevic¹, Jelena Majstorovic³, Branko Matovic⁴, Tatjana Volkov-Husovic¹**
MODELING OF STRENGTH DEGRADATION DURING THERMAL STABILITY TESTING OF LOW CEMENT HIGH ALUMINA CASTABLE
¹University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia,
²Institute of Nuclear and Other Raw Materials, Belgrade, Serbia,
³University of Belgrade, Faculty of Mining and Geology, Belgrade, Serbia,
⁴Institute of Nuclear Sciences Vinca, Materials Science Laboratory, Belgrade, Serbia
- 13⁴⁵ – 14¹⁵** **Lunch break**
- 14¹⁵ – 15¹⁵** **Poster session (C4-C7)**
- 15⁰⁰ - 18⁰⁰** **Students Speaking Contest**
- 20³⁰** **Conference dinner at “Zlatni bokal”, Skadarlija**

Dear colleagues,

On behalf of all chairs and members of all committees of 1st Conference of the Serbian Ceramic Society (1CSCS-2011) and The Serbian Ceramic Society, it is our great pleasure to welcome you to Belgrade and Serbia on March 17-18th this year. The Serbian Ceramic Society brings together the scientists and engineers working in the fields of research and application of ceramic materials. In Serbia, ceramics have rather long tradition involving both traditional and advanced ceramics for modern technologies. Scientists, the members of the Society, are dealing also with very attractive topics like nanostructured ceramics and the newest types of ceramic composites. Regular activities of The Serbian Ceramic Society include organizing highly interesting lectures for the members, but also Students Meetings, which have 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 1CSCS-2011 is to allow the scientists to exchange the most recent results and technical advances in the development, characterization and application of ceramic materials in order to foster basic knowledge on those materials and to improve contacts for future scientific cooperation and networks. The Scientific and Organizing Board and The Serbian Ceramic Society cordially invite all our colleagues from around the world to take part in the Conference, and to enjoy the company of colleagues in scientific discussions and during the social events of the Conference. The Student Speaking Contest for young researcher from Serbia in the field of ceramic materials will be organized during this Conference.

President of Program Committee

Dr. Snežana Bošković

THE CALCIFICATION OF COLLAGEN BY HAP FUNCTIONALIZED CARBON MATERIALS

O. Neskovic, Z. Rakocevic, N. Bibic, J. Cveticanin, Dj. Trpkov, Z. Rogic and D. Vlatkovic

Vinca Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia.

Bone is composed of two phases. The organic phase is made of collagen fibrils assembled in broad fibers acting as a template for mineralization. The mineral phase comprises hydroxyapatite (HAP) crystals grown between and inside the collagen fibers. We have developed a material using functionalized carbon nanotubes, carbon fibers and glasy carbon as scaffold to initiate in vitro mineralization. Mentioned carbon materials are functionalized with carboxylic groups prior to decorating. All samples were dispersed in ultra-pure water and incubated for 2 weeks in a synthetic body fluid with dispersed HAP, in order to induce the calcification of the functionalized carbon materials. Atomic force microscopy (AFM) and transmission electron microscopy (TEM) showed that Ca^{2+} and PO_4^{3-} ions were deposited as round-shaped nodules. Raman spectroscopic studies confirmed the HAP formation, and image analysis made on TEM pictures showed that HAP were packed around and inside the carbon materials together. All three types of investigated carbon materials leading to successful calcification of collagen. This suggests that it takes the presence of carbon materials to prevent it from calcification of collagen, independent of the structures of the material.

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