

11TH CONFERENCE FOR YOUNG SCIENTISTS IN CERAMICS



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Satellite event:
ESR COST IC1208 Workshop

BOOK OF ABSTRACTS

October 21-24, 2105
Faculty of Technology
Novi Sad, Serbia

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Satellite event:
ESR Workshop, COST IC1208



PROGRAMME and BOOK OF ABSTRACTS

**October 21-24, 2015
Novi Sad, Serbia**

Programme and Book of Abstracts of The 11th Conference for Young Scientists in Ceramics (SM-2015, and ESR Workshop, COST MP1208) publishes abstracts from the field of ceramics, which are presented at traditional international Conference for Young Scientists in Ceramics.

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Preface

The 11th Conference for Young Scientists in Ceramics is organized by the Department of Materials Engineering, Faculty of Technology Novi Sad, University of Novi Sad, Serbia (October 21-24, 2015) and it is followed with one Satellite Event: Early Stage Researchers Workshop of the COST Action IC1208 "Integrating devices and materials: a challenge for new instrumentation in ICT".

This Conference first started as the Students' Meeting back in 1998 when it was just a national meeting for Serbian PhD students. After three national, this year is going to be the eighth consecutive international conference held every second year. For several years now, the Conference has a well-earned reputation as an excellent opportunity for the promotion of the work in the field of ceramics done by early stage researchers, being MSc and PhD students or young doctors. Additionally, the young scientists will be in the position to attend sessions covering major general topics of broad interest which will be presented by experienced scientists through the invited lectures. In that way, young researchers will have a chance to participate in the active discussions with their senior colleagues who are all well-known scientists in their area of expertise. We strongly hope that the overall activities during this event will create for the young researchers a fruitful platform for finding new topics, ideas and approaches for their scientific research and an excellent opportunity for establishing connections and finding proposals for collaborations

General idea behind the Conference was and will continue to be the building of the closely intertwined European scientific network by offering the platform for young scientists to meet, discuss and exchange ideas in the ever growing field of ceramics. It is our deepest belief that this approach will be beneficial for both young researchers and the European science as a whole. Therefore, we strongly appreciate that the European Ceramic Society identified the efforts and the enthusiasm we have put into this idea of creating the bridge between young researchers and we truly hope that the European Ceramic Society will support this initiative in the future. Special thanks to the JECS Trust Fund and COST IC1208 for strong financial support of the Meeting. The Conference was also recognized by the Serbian Ministry of education, science and technological development as well as by the Provincial Secretary of science and technological development and we would like to thank them for their endorsement too. A total number of 110 presentations given by young researchers and 13 invited talks coming from 25 countries with multidisciplinary profiles will be presented during the conference. It should be emphasised that presented topics cover research subjects of the highest scientific interest: experimental, theoretical and applicative aspects of synthesis, processing, advanced nano/microscale and functional characterisation of various types of structures and ceramic materials. We wish to express our thanks to the members of the local organizing committee in Novi Sad for their effort and time during preparation of the Conference, and especially to thank our endorsers and sponsors for making this event possible.

Editors

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WEDNESDAY, OCTOBER 21, 2015.

09.00 – 11.00 h – Registration (Conference desk)

11.00 – 11.30 h – Oppening (Rectorate-Amphitheater)

11.30 – 12.15 h – IT1 Invited lecture (Rectorate-Amphitheater)
Francis Cambier, Belgium, The use of lasers to obtain complex shape ceramics

12.15 – 13.15 h – Welcome Party (Rectorate-Ceremonial Hall)

13.15 – 14.00 h – IT2 Invited lecture (Rectorate-Amphitheater)
Paula Vilarinho, Portugal, Is potassium-sodium niobate a lead free alternative to PZT?

14.00 – 14.45 h – IT3 Invited lecture (Rectorate-Amphitheater)
Ákos Kukovecz, Hungary, Nanotechnology and sensors nanocomposites

14.45 – 15.15 h – Coffe Break (Blue Hall & Class Room, R10)

15.15 – 16.45 h – Section 1

Synthesis of ceramic powders - I (Blue Hall)

- 15.15 – 15.30 h **A1 – A. Kompch, et al., Germany**
Synthesis and structural analysis of Mn-doped ZnO nanoparticles
- 15.30 – 15.45 h **A2 – A. Marzec, et al., Poland**
Hydrothermal synthesis of composite heterostructures in the TiO₂-SnO₂ system
- 15.45 – 16.00 h **A3 – V. Nikolic, et al., Serbia**
Solvothermal synthesis of magnetite nanoparticles suitable for application in magnetic hyperthermia
- 16.00 – 16.15 h **A4 – M. Piciorus, et al., Romania**
Spherical silica nanoparticles obtained by Stober process.

- Tetra-ethyl-orthosilicate concentration influence upon silica nanoparticles morphology
 16.15 – 16.30 h **A5 – J. Pantić, et al., Serbia**
 Phase evolution of sphene based ceramics during annealing
 16.30 – 16.45 h **A6 – D. Nicheva, et al., Bulgaria**
 Study of nickel-cobalt spinels prepared by Pechini method

Ceramic processing - I (Class Room, R10)

- 15.15 – 15.30 h **A7 – A. Chmielarz, et al., Poland**
 Ti₂AlC gel-cast foams-properties and characterization
 15.30 – 15.45 h **A8 – K. Wojciechowski, et al., Poland**
 Translucent zirconia polycrystals prepared from nanometric powders
 15.45 – 16.00 h **C1 – J. Roleček, et al., Czech Republic**
 Ice-templating of ceramics in industrial scale
 16.00 – 16.15 h **C2 – J. Zygmuntowicz, et al., Poland**
 Alumina matrix ceramic-nickel composites formed by centrifugal slip casting
 16.15 – 16.30 h **A9 – A. Presenda, et al., Spain**
 Low temperature degradation of zirconia materials sintered via microwave heating technology
 16.30 – 16.45 h **A10 – P. Ctibor, et al., Czech Republic**
 Extremely thick coating prepared from TiO₂ by plasma spraying

16.45 – 17.00 h – Coffe Break (Blue Hall & Class Room, R10)

17.00 – 18.15 h – Section 2

Ceramics for Energy - I (Blue Hall)

- 17.00 – 17.15 h **C3 – F. Ulu, et al., Belgium**
 Development of core-shell structured metal oxide powders to be used as lithium ion battery cathode materials
 17.15 – 17.30 h **A11 – M. Botros, et al., Germany**
 Aluminum-doped Li₇La₃Zr₂O₁₂ as a solid electrolyte for lithium-ion batteries
 17.30 – 17.45 h **A12 – D. Ciria, et al., France**
 Mechanical properties of fully dense ceramic electrolytes for Solid Oxide Fuel Cells
 17.45 – 18.00 h **C4 – M. Plodinec, et al., Croatia**
 Ceramic composites based on TiO₂ nanotubes for application in solar cells
 18.00 – 18.15 h **A13 – Z. Slavkova, et al., Bulgaria**
 Characterization of LiNaSO₄ for batteries application

Engineering ceramics - I (Class Room, R10)

- 17.00 – 17.15 h **A14 – U. Akkasoglu, et al., Turkey**
Pressureless sintering of SiAlON ceramics for cutting tool application
- 17.15 – 17.30 h **C5 – A. Dubiel, et al., Poland**
Mechanical and thermal properties of silicon nitride-titanium nitride particulate composites
- 17.30 – 17.45 h **C6 – A. Wilk, et al., Poland**
Aluminium oxynitride - hexagonal boron nitride composites with anisotropic properties
- 17.45 – 18.00 h **C7 – O. Poliarus, et al., Ukraine**
High-temperature oxidation character of NiAl-ZrB₂ composite materials
- 18.00 – 18.15 h **C8 – V. Tsukrenko, et al., Ukraine**
Ageing of ceramics in the ZrO₂-Y₂O₃-CeO₂-CoO-Al₂O₃ system

THURSDAY, OCTOBER 22, 2015.

09.15 – 11.15 h – Section 3

Synthesis of ceramic powders – 2 (Blue Hall)

- 09.15 – 09.30 h **A15 – A. Ghafarinazari, et al., Italy**
Thermal oxidation mechanism of mesoporous silicon
- 09.30 – 09.45 h **A16 – A. Levish, et al., Germany**
Chemical vapor synthesis of aluminum nitride nanoparticles from metallic aluminum
- 09.45 – 10.00 h **A17 – R. Crisan, et al., Romanian**
Nano-meter sized maghemite with high surface area and superparamagnetic behavior synthesis by oxidation of magnetite
- 10.00 – 10.15 h **A18 – S. Lukic, et al., Germany**
Chemical vapor synthesis (CVS) of Ga₂O₃ and GaN nanoparticles for water splitting

Electroceramics - I (Blue Hall)

- 10.15 – 10.30 h **C9 – V. Tsygoda, et al., Ukraine**
Thermo-electromotive force of multicomponent composites based on the refractory oxygen-free compounds
- 10.30 – 10.45 h **A19 – N. Kanas, et al., Norway**
Ceramic processing of all-oxide ceramic thermoelectric module
- 10.45 – 11.00 h **A20 – J. Lelièvre, et al., France**
New lead-free materials with A_{1/2}Bi_{1/2}BO₃ formula (A=Rb; B=Ti)
- 11.00 – 11.15 h **A21 – J. Ćirković, et al., Serbia**
Structural and electrical properties of BST ceramics prepared by hydrothermally assisted complex polymerization method

Bioceramics - I (Class Room, R10)

- 09.15 – 09.30 h **A22 – D. Larionov, et al., Russia**
Osteoconductive ceramics with a specified system of interconnected pores based on monophasic calcium phosphates
- 09.30 – 09.45 h **A23 – M. Putz, et al., Romania**
Mixed cationic templates controlling ordered silica morphology
- 09.45 – 10.00 h **C10 – N. Aničić, et al., Slovenia**
The influence of polymer characteristics and particle morphology on the elution control of vanadate ions from V₂O₅/polymer composites
- 10.00 – 10.15 h **A24 – A. Wajda, et al., Poland**
The structure and textural characterization of zinc doped

- 10.15 – 10.30 h bioactive glasses from NaCaPO₄-SiO₂ system
A25 – T. Đorđević, et al., Serbia
 Evaluation of mesoporous silica and titanium dioxide as
 antibiotic carriers in drug delivery systems
- 10.30 – 10.45 h **A26 – A. Vladescu, et al., Romania**
 Improvement of the mechanical and antibacterial properties of
 hydroxyapatite
- 10.45 – 11.00 h **A27 – M. Radović, et al., Serbia**
 Synthesis of alumina powders and their insecticidal effect
 against *Acanthoscelides obtectus* say
- 11.00 – 11.15 h **A28 – P. Jeleń, Poland**
 Spectroscopic studies of bioactive coatings based on silicon
 oxycarbide glasses

11.15 - 11.45 h – Coffe Break (Rectorate-Amphitheater)

11.45 – 12.30 h – IT4 Invited lecture (Rectorate-Amphitheater)
Anne Leriche, France, Comparison of two different methods to
 process macroporous scaffolds for bone substitution applications

12.30 – 13.15 h – IT5 Invited lecture (Rectorate-Amphitheater)
Markus Winterer, Germany, Routes to nanoparticles optimized
 for energy technology

13.15 – 14.45 h – Lunch (TF-Ceremonial Hall)

14.45 – 17.00 h – Section 4

COST Workshop - 1 (Blue Hall)

- 14.45 – 15.30 h **IT6 Invited lecture – Offer Schwartzglass, Israel**
 Advanced ceramic material for efficient ultrasonic cleaning
 and micro blowers realization
- 15.30 – 15.45 h **E1 – R.M. Oliveira Pinho, et al., Portugal**
 Effect of poling on dielectric, piezoelectric and ferroelectric
 properties of doped potassium sodium niobate
- 15.45 – 16.00 h **E2 – J. Zaffran, et al., Israel**
 Improving NiOOH catalytic activity in electrochemical water
 splitting using transition metal dopants: A first-principles
 calculation based study
- 16.00 – 16.15 h **E3 – O.A. Condurache, et al., Romania**
 Study of ferroelectric-relaxor BaCe_xTi_{1-x}O₃ ceramics
- 16.15 – 16.30 h **E4 – N.I. Ilić, et al., Serbia**
 BiFeO₃ ceramics densification study
- 16.30 – 16.45 h **E5 – L. Fulanović, et al., Slovenia**
 Characterization of 0.9Pb(Mg_{1/3}Nb_{2/3})O₃-0.1PbTiO₃

16.45 – 17.00 h electrocaloric multilayered structures prepared by tape casting
E6 – I. Turcan, et al., Romania
Investigation of BaSrTiO₃ porous ceramics

Catalists - 1 (Class Room, R10)

14.45 – 15.30 h **IT7 Invited lecture – Andras Sapi, Hungary**
3D Mesoporous oxide supported platinum nanoparticles for heterogenous catalytic applications - Gas vs. liquid phase reactions

Bioceramics - 2 (Class Room, R10)

15.30 – 15.45 h **A29 – A. Tikhonov, et al., Russia**
Intercalation of layered calcium phosphate and synthesis of ceramics based on it

Optics - 1 (Class Room, R10)

15.45 – 16.00 h **A30 – A. Sidorowicz, et al., Poland**
Influence of thulium and holmium oxide powders morphology on properties of transparent Tm,Ho:YAG

16.00 – 16.15 h **A31 – A. Bjelajac, et al., Serbia**
Microwave assisted synthesis of CdS quantum dots in DMSO

16.15 – 16.30 h **A32 – M. Nakielska, et al., Poland**
Spectroscopic investigations of Tm,Ho:YAG ceramics for solid state laser applications

16.30 – 16.45 h **A33 – I. Dinić, et al., Serbia**
Hydrothermal synthesis of optically active rare earth fluorides

16.45 – 17.00 h **A34 – M. Chaika, et al., Ukraine**
Influence of Yb²⁺ on optical properties of YAG:Yb garnet

17.00 – 17.15 h – Coffe Break (Blue Hall & Class Room, R10)

17.15 – 18.30 h – Section 5

COST Workshop - 2 (Blue Hall)

17.15 – 17.30 h **E7 – B. Bajac, et al., Serbia**
Structure and properties of multiferroic BaTiO₃/NiFe₂O₄ thin films obtained by solution deposition technique

17.30 – 17.45 h **E8 – V.A. Lukacs, Romania**
Biomorphic growth and functional properties of nickel oxide 1-D microstructures

17.45 – 18.00 h **E9 – B. Belec, et al., Slovenia**
Magnetic properties of plate-like composite nanoparticles combining soft-magnetic iron oxide with hard-magnetic barium hexaferrite

18.00 – 18.15 h **E10 – I.V. Ciuchi, et al., Italy**
Enhancement of the energy storage properties in PLZT

18.15 – 18.30 h ceramics with compositions across FE-AFE phase boundary
E11 – E. Đurđić, et al., Serbia
The cation distribution in NiFe_2O_4 and $\text{NiFe}_{1.85}\text{Y}_{0.15}\text{O}_4$: Raman and X-ray diffraction studies

Engineering ceramics - 2 (Class Room, R10)

17.15 – 17.30 h **A35 – S. Ilic, et al., Serbia**
Phase development and thermal behaviour of hybrid sol-gel derived mullite precursor

17.30 – 17.45 h **A36 – A. Dudek, et al., Poland**
Subcritical crack growth in oxide and non-oxide ceramics using the Constant Stress Rate Test

17.45 – 18.00 h **A37 – T. Csanádi, et al., Slovakia**
Micro-scale plasticity and elastic behaviour of ceramic crystals under micropillar compression

18.00 – 18.15 h **A38 – K. Kornaus, et al., Poland**
The influence of sintering temperature and additive on the microstructure of pressure-less sintered tungsten carbide

18.15 – 18.30 h **C11 – E. Okur, et al., Turkey**
Improving the thermal shock properties of Y-alpha-SiAlON/glass composite

20.00 h – Social Event

Restaurant “Fontana” *Meeting of Young Ceramist Network of the European Ceramic Society*, Invited speakers: Paula Vilarinho and Francis Cambier

FRIDAY, OCTOBER 23, 2015.

09.15 – 11.15 h – Section 6

COST Workshop – 3 (Blue Hall)

- 09.15 – 09.30 h **E12 – A. Chandran, et al., Serbia**
Synthesis and structural characterizations of SnO₂ thick films
- 09.30 – 09.45 h **E13 – V. Preutu, et al., Romania**
Preparation and properties of PCL-functional oxide composites
- 09.45 – 10.00 h **E14 – A. Dzunuzovic, et al., Serbia**
Properties of BaTiO₃ - NiZnFe₂O₄ multiferroic composites obtained by auto-combustion synthesis
- 10.00 – 10.15 h **E15 – J. Vukmirovic, et al., Serbia**
Fabrication of BaTiO₃ thin films by inkjet printing

Ceramics processing - 2 (Blue Hall)

- 10.15 – 10.30 h **A39 – J. Hruby, et al., Czech Republic**
Calculation of activation energy and its changes during sintering using MSC and Wang & Raj models
- 10.30 – 10.45 h **C12 – A. Miazga et al., Poland**
Graded ceramic/metal composites obtained by the centrifugal slip casting
- 10.45 – 11.00 h **A40 – V. Mackert et al., Germany**
UV laser sintering of SnO₂ and ZnO thin films produced by electrophoretic deposition
- 11.00 – 11.15 h **A41 – R. Cabezas-Rodríguez, et al., Spain**
Synthesis of yttrium silicate by solid-liquid state reaction for environmental barrier coatings

Bioceramics - 2 (Class Room, R10)

- 09.15 – 09.30 h **A42 – S. Kurbatova, et al., Russia**
Synthesis and characterization of resorbable calcium phosphate bioceramics with a ratio of $0,5 \leq \text{Ca/P} \leq 1$
- 09.30 – 09.45 h **A43 – M.J. Lukić, et al., Serbia**
Simultaneous thermal analysis and dilatometric study of HAp-LiFePO₄ system
- 09.45 – 10.00 h **A44 – M. Slama, et al., Czech Republic**
Effect of colloidal milling on the physical, mechanical and biological properties of hydroxyapatite monoliths prepared by electrophoretic deposition
- 10.00 – 10.15 h **A45 – L. Stipniece, et al., Latvia**
Synthesis and characterization of divalent cation substituted calcium phosphates
- 10.15 – 10.30 h **A46 – M. Kuzina, et al., Russia**

- Mixed-anionic calcium phosphate powders for bioresorbable ceramic
- 10.30 – 10.45 h **A47 – T. Maravić, et al., Serbia**
Influence of dental composite core material on biomedical properties of premolars restored with a zirconia full crown: A finite element analysis
- 10.45 – 11.00 h **A48 – T. Uhlířová, et al., Czech Republic**
Elastic properties of cellular alumina ceramics prepared by biological foaming
- 11.00 – 11.15 h **A49 – M. Mirković, et al., Serbia**
Synthesis of monetite (CaHPO_4) by mechanochemical treatment of brushite ($\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$)

11.15 - 11.45 h – Coffe Break (Rectorate-Amphitheater)

11.45 – 12.30 h – IT8 Invited lecture (Rectorate-Amphitheater)

Lucian Pintilie, Romania, Polarization driven effects and the role of interfaces in ferroelectric thin films and heterostructures

12.30 – 13.15 h – IT9 Invited lecture (Rectorate-Amphitheater)

Endre Horváth, Hungary, From synthesis to application of photovoltaic perovskite nanowires

13.15 – 14.45 h – Lunch (TF-Ceremonial Hall)

14.45 – 17.00 h – Section 7

Popular science (Blue Hall)

- 14.45 – 15.15 h **IT10 Invited lecture – Roger Anderton, Great Britain**
Boscovich's Unification that came after Newton's Unification
- 15.15 – 15.45 h **IT11 Invited lecture – Dragoslav Stoiljkovic, Serbia**
From Boscovich's theory to modern quantum theory

Bioceramics - 3 (Blue Hall)

- 15.45 – 16.00 h **C13 – G. Kazakova, et al., Russia**
Resorbable bioceramics in $\text{Ca}_3(\text{PO}_4)_2 - \text{Mg}_2\text{P}_2\text{O}_7$ system
- 16.00 – 16.15 h **A50 – I. Narkevica, et al., Latvia**
Development of innovative 3D porous TiO_2 ceramic scaffolds for orthopaedic applications
- 16.15 – 16.30 h **A51 – J. Sekaninova, et al., Czech Republic**
Calcium partially stabilized ZrO_2 bioceramics nanocrystals
- 16.30 – 16.45 h **A52 – M. Prekajski, et al., Serbia**
Ouzo effect – as the new simple nanoemulsion method for synthesis of strontium hydroxyapatite nanospheres
- 16.45 – 17.00 h **A53 – M.D. Vranceanu, et al., Romania**
Calcium phosphate coatings deposited on Ti substrate using

electrochemically assisted deposition

Equipment (Class Room, R10)

14.45 – 15.45 h **Demonstration of JEOL microscopes**
Slavko Žižek, Slovenia

Catalysts & ceramics for energy (Class Room, R10)

15.45 – 16.00 h **A54 – T. Varga, et al., Hungary**
Synthesis, characterisation, and electrochemical properties of graphite oxide/vanadate nanowire composites

16.00 – 16.15 h **A55 – N. Lysunenکو, et al., Ukraine**
Electrical efficiency of SOFCs with 8YSZ and 10Sc1CeSZ electrolytes

16.15 – 16.30 h **A56 – S. Dimitrović, et al., Serbia**
Synthesis and characterization of Ag doped ceria nanopowders

16.30 – 16.45 h **A57 – K.L. Juhasz, et al., Hungary**
Synthesis and characterization of platinum nanoparticles with controlled size for heterogen catalytic processes

16.45 – 17.00 h **C14 – J. Sroka, et al., Poland**
Improved properties of the epoxy – fly ash composites by silane treatment of the filler

17.00 – 17.15 h – Coffe Break (Blue Hall & Class Room, R10)

17.15 – 18.30 h – Section 8

Electroceramics - 2 (Blue Hall)

17.15 – 17.30 h **A58 – M. Čebela, et al., Serbia**
Synthesis, optical and magnetic properties studies of multiferroic BiFeO₃

17.30 – 17.45 h **A59 – C. Vlăduț, Romania**
ZnO based films with sensing properties

17.45 – 18.00 h **C15 – M. Drozdova, et al., Estonia**
Electrical behavior of zirconia-alumina nanofibers-graphene composites

18.00 – 18.15 h **C16 – C. Ianasi, et al., Romania**
Fe₂O₃-SiO₂-PVA hybrid xerogels, precursors for superparamagnetic nanocomposites, potential candidates as MRI T2 contrast agents

18.15 – 18.30 h **C17 – E. Pawlikowska, et al., Poland**
Ferroelectric barium-strontium titanate and ceramic-polymer composites based on BST in terahertz radiocommunication applications

Electroceramics - 3 (Class Room, R10)

- 17.15 – 17.30 h **C18 – A. Kukharchik, *et al.*, Russia**
Nano- and bio-structured materials: Surfaces and mesophase features
- 17.30 – 17.45 h **C19 – M. Pareiko, *et al.*, Ukraine**
Self-fluxing Fe-based alloy with TiB₂ additives for the spraying wear-resistant coatings
- 17.45 – 18.00 h **C20 – D. Németh, *et al.*, Slovakia**
FEM analysis of cracking around the indent in W-C coating
- 18.00 – 18.15 h **C21 – K. Jach, Poland**
Modification of quartz and ceramic substrates by deposition of tungsten layers
- 18.15 – 18.30 h **C22 – I. Sytnyk, *et al.*, Ukraine**
The structure and properties of chromium carbide steels with titanium nitride coating

19.30 h – Social Event – Excursion

SATURDAY, OCTOBER 24, 2015.

09.15 – 10.15 h – Section 9

Synthesis of ceramic powders - 3 (Blue Hall)

- 09.15 – 09.30 h **A60 – M. Nikolić, *et al.*, Serbia**
Synthesis and characterization of mesoporous and superparamagnetic bilayered-shell aroundsilica core particles
- 09.30 – 09.45 h **A61 – S. Ognjanovic, *et al.*, Germany**
Characterization of aluminum nitride nanoparticles synthesized by chemical vapor synthesis
- 09.45 – 10.00 h **C23 – S. Ilies, *et al.*, Romania**
Silver modified zeolite-multi-walled carbon nanotubes-epoxy composite electrode for electrochemical detection and degradation of ibuprofen in water
- 10.00 – 10.15 h **C24 – T. Minović Arsić, *et al.*, Serbia**
Synthesis and characterization of ceria/carbon cryogel composite

Electroceramics - 3 (Class Room, R10)

- 09.15 – 09.30 h **A62 – J. Stanojev, *et al.*, Serbia**
Dielectric properties of barium titanate based thin films

Traditional ceramics - 1 (Class Room, R10)

- 09.30 – 09.45 h **T1 – M. Kavanová, *et al.*, Czech Republic**
Characterization of the interaction between glazes and ceramic bodies
- 09.45 – 10.00 h **T2 – V. Topalović, *et al.*, Serbia**
Properties of sintered cordierite ceramics obtained by sol-gel methods of powder synthesis
- 10.00 – 10.15 h **T3 – A. Abdelghany, *et al.*, Egypt**
Effect of transition metal addition in the bioactivity of borate bioglass: A descriptive correlational study

10.15 – 11.00 h – IT12 Invited lecture (Blue Hall)

Andreja Gajovic, Croatia, Raman spectroscopy technique and specific applications for study of ceramics

11.00 – 11.15 h – Coffe Break (Blue Hall)

11.15 – 12.00 h – IT13 Invited lecture (Blue Hall)

Kostantinos Giannakopoulos, Greece, Structural characterisation of layers for advanced non-volatile memories

12.00 – 13.00 h – Section 10

Traditional ceramics - 2 (Blue Hall)

- 12.00 – 12.15 h **T4 – K. Pasiut, *et al.*, Poland**
The influence of molar ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ on the structure of ceramic glazes
- 12.15 – 12.30 h **T5 – A. Gerle, *et al.*, Poland**
Corrosion of MgCr_2O_4 , MgAl_2O_4 , MgFe_2O_4 spinels in SO_2 - O_2 - SO_3 atmosphere – thermodynamic evaluation
- 12.30 – 12.45 h **T6 – O. Chudinovich, *et al.*, Ukraine**
Phase equilibria and properties of solid solutions in the La_2O_3 - Yb_2O_3 and La_2O_3 - Y_2O_3 - Yb_2O_3 systems at 1500 °C
- 12.45 – 13.00 h **T7 – M. Gluszek, *et al.*, Poland**
Preparation, properties and applications of shear thickening fluids based on silica, glycols and dopants

Ceramics processing - 2 (Class Room, R10)

- 12.00 – 12.15 h **C25 – O. Kornienko, *et al.*, Ukraine**
Interaction cerium oxide with dysprosia at 1500 °C
- 12.15 – 12.30 h **A26 – M. Marych, *et al.*, Ukraine**
Features of the structure and properties of ceramic composite system B_4C – eutectic alloy (B_4C - TiB_2)
- 12.30 – 12.45 h **A27 – J. Shishkina, Ukraine**
Fabrication of $\text{Ti}_x\text{Al}_y/\text{TiC}$ based ceramic composite powder from the TiH_2 -Al-C system

13.00 – 13.15 h – Closing (Blue Hall)



Book of Abstracts



11th Conference for Young Scientists in Ceramics
SM-2015 & COST Workshop

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University of Novi Sad, Novi Sad, Serbia

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11th Conference for Young Scientists in Ceramics, SM-2015

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ESR Workshop of COST IC1208 "Integrated devices and materials: A challenge for application of ceramics in ITC"

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For preparation we used a solvent casting method which implied the use of relatively low temperatures, simple apparatus and which leads to composite films with a good distribution of filler in the polymeric matrix.

After the preparation, the composite formation and their characteristic structure and microstructure were investigated by XRD and SEM. The XRD analyses confirmed the formation of biphasic composites (spinel-polymer/perovskite-polymer) with no other secondary phases. The SEM images showed a very good distribution of the ferroelectric/magnetic nanoparticles in the polymeric matrix.

The frequency dependence of dielectric properties at room temperature have been investigated for all the samples, and discussed in correlation with the microstructural data and a theoretical model based on the microstructural formation.

Acknowledgements: The COST Action IC1208 is highly acknowledged.

References

- [1] M.A. Woodruff, D.W. Huttmacher, *Prog. Polymer Sci.*, **35** (2010) 1217.

E14

PROPERTIES OF BaTiO₃-NiZnFe₂O₄ MULTIFERROIC COMPOSITES OBTAINED BY AUTO-COMBUSTION SYNTHESIS

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Nickel zinc ferrite (NZF(70-30)) and barium titanate (BT) nanosized powders were synthesised by auto-combustion method. Multiferroic composites with the general formula $x\text{Ni}_{0.7}\text{Zn}_{0.3}\text{Fe}_2\text{O}_4-(1-x)\text{BaTiO}_3$ ($x = 0.1, 0.3, 0.5, 0.7, 0.9$) were prepared from nickel zinc ferrite and barium titanate powders by mixing in planetary ball mill for 24 h. Pellets were sintered at different temperatures in order to get dense, two phased composites. XRD characterization showed the formation of nickel zinc ferrite spinel structure and perovskite barium titanate structure, without presence of secondary phases. SEM images at the free surface indicated the formation of two types of grain morphology: polygonal grains typical for NZF phase and rounded grains typical for BT phase, both nanosized.

Magnetic measurements of all sintered composites were carried out and presented in Fig. 1. Saturation magnetization moment decreases in comparison with pure NZF, because of non-magnetic barium titanate phase. Coercive field was higher for composites with regard to pure NZF, which can be explained with fact that the composite possesses a higher anisotropy field than the NZF at the same applied field. The fields at which saturation occur was almost the same for all materials

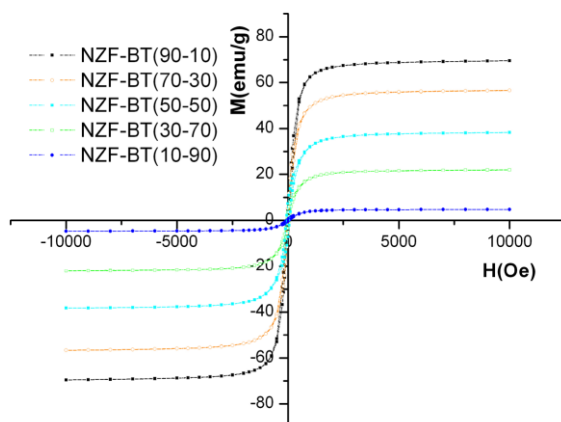


Figure 1. Magnetic measurements of $x\text{Ni}_{0.7}\text{Zn}_{0.3}\text{Fe}_2\text{O}_4-(1-x)\text{BaTiO}_3$ ceramics

E15

FABRICATION OF BaTiO_3 THIN FILMS BY INKJET PRINTING

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Barium titanate in thin film form is one of the most investigated ferroelectric materials for microelectronics application. The properties of barium titanate thin films are dependent of many factors such as synthesis method, deposition technique, substrate selection, thermal treatment, etc. It has been a challenge to adjust these factors and obtain thin films with required microstructure and functional properties.

In this research, BaTiO_3 films were prepared with inkjet printing technique (Dimatix DMP 3000 and Epson XP-202 printer). Inkjet printing is one of the most popular method in thin film production. Although inkjet printing is simple and cheap technique, it is necessary to achieve required rheological properties of inks for successful printing process (viscosity, surface tension, particle size). Barium titanate inks were prepared with sol gel technique, where manipulation with rheological parameters is relatively easy. After examination of rheological parameters, inks were deposited on silicon substrates and calcinated at 750 °C. Microstructure of obtained films was investigated by scanning electron microscopy (SEM), atomic force microscopy (AFM), X-ray diffraction and Raman spectroscopy. In addition, BaTiO_3 thin films were prepared with spin coating method. Thus, advantages and disadvantages of the deposition techniques in production of sol gel prepared barium titanate thin films were investigated.