



**Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION V
New Frontiers in Multifunctional Material Science and Processing**

**Serbian Ceramic Society
Institute of Technical Sciences of SASA
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials
School of Electrical Engineering and Computer Science of Applied Studies**

PROGRAM AND THE BOOK OF ABSTRACTS

**Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 21st-23rd September 2016.**

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Serbia, Belgrade, 21-23. September 2016.

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

Publisher:

Serbian Ceramic Society

Editors:

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Printing:

Serbian Academy of Sciences and Arts,
Knez Mihailova 35, Belgrade

Edition:

140 copies

CIP

Dear Colleagues,

We have great pleasure to welcome you to the Advanced Ceramic and Application Conference V organized by the Serbian Ceramic Society in cooperation with the Institute for Testing of Materials, Institute of Technical Sciences of SASA, Institute of Chemistry Technology and Metallurgy, Institute for Technology of Nuclear and Other Raw Mineral Materials and School of Electrical Engineering and Computer Science of Applied Studies.

Advanced Ceramics today include many old-known ceramic materials produced through newly available processing techniques as well as broad range of the innovative compounds and composites, particularly with plastics and metals. Such developed new materials with improved performances already bring a new quality in the everyday life. The chosen Conference topics cover contributions from a fundamental theoretical research in advanced ceramics, computer-aided design and modeling of a new ceramics products, manufacturing of nanoceramic devices, developing of multifunctional ceramic processing routes, etc. Traditionally, ACA Conferences gather leading researchers, engineers, specialist, professors and PhD students trying to emphasizes the key achievements which will enable the wide speared use of the advanced ceramics products in High-Tech industry, renewable energy utilization, environmental efficiency, security, space technology, cultural heritage, prosthesis, etc.

Serbian Ceramic Society has been initiated in 1995/1996 and fully registered in 1997 as Yugoslav Ceramic Society, being strongly supported by American Ceramic Society. Since 2009, it has continued as Serbian Ceramic Society in accordance to the Serbian law procedure. Serbian Ceramic Society is almost the only one Ceramic Society in the South-East Europe, with members from more than 20 Institutes and Universities, active in 16 sessions, by program and the frames which are defined by the American Ceramic Society activities.

Advanced Ceramic & Application Conference V is dedicated to Academician Momčilo Ristić.



Prof. Dr Vojislav Mitić
President of the Serbian Ceramic Society
World Academy Ceramics Member
European Academy of Sciences&Arts Member



Prof. Dr Olivera Milošević,
President of the General Assembly of the
Serbian Ceramic Society
Academy of Engineering Sciences of Serbia Member

General Conference Topics

- Basic Ceramics Science
- Nanostructural, Bio- and Opto-Ceramic Materials and Technologies
- Multifunctional Materials
- Magnetic and Amorphous Materials
- Construction Materials and Eco-ceramics
- Composite Materials, Catalysis and Electrocatalysis
- Artistic Ceramics and Design, Archaeology and Heritage
- Young Researchers
- Sintering processes
 - kinetics
 - microstructure
 - thermodinamics
 - modeling

Conference Co-chairmens:

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Prof. Dr. Olivera Milošević SRB
Prof. Dr. Marcel Van de Voorde EU
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Acknowledgements:

The Conference Organizers are grateful to the Ministry of Education and Science of the Republic of Serbia for financial support, as well as to the Serbian Academy of Sciences and Arts, European Academy of Sciences and Arts, American Ceramics Society, Institute of Technical Sciences of SASA, Archeological Institute of SASA, Institute of Physics UB, Vinča Institute of Nuclear Sciences - Laboratory of Physics (010), Electrical Engineering Institute Nikola Tesla, Technical High School Niš, High School-Academy for Arts and Conservation, Serbian Orthodox Church. We are also grateful to the FORMAT doo, and others who support the conference.

Conference Program and Abstracts

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Conference Information:

Venue: Serbian Academy of Sciences and Arts, Great Hall (second floor) and Halls 1, 2 (first floor), Knez Mihailova 35, Belgrade, Serbia

Conference fee: Standard fee for foreign participants: 100 EUR; Standard fee for domestic participants: 50 EUR, Members of SCS and PhD Students: 30 EUR, last year winners for oral and poster presentations: free of charge.

Abstracts and papers publication: The official language of the conference is English. Conference abstracts are published in this Book of Abstracts. Contributions presented at the conference can be submitted for publishing in peer-reviewed Journals Science of Sintering and Journal of Multifunctional Materials and Ceramics as well as for Conference Proceedings published by Atlantic Press.

Type of presentation: Visuals for oral presentations should be in Microsoft PowerPoint, versions up to 2007 (.ppt or .pptx, or Adobe Acrobat Reader 9 (.pdf)). Any animation or video files must be compatible with Windows 7 and Windows Media Player. Please bring your presentation to the reception desk at the beginning of the Conference on flash memory. Posters should be prepared in dimension: 70x100 cm. The official language of the conference is English.

Restaurant Peking Vuka Karadžića 2 (50m from the Conference Venue).

Additional Conference information

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<http://www.serbianceramicsociety.rs/about.htm>



Program Overview

Date	Time	PROGRAMME	Floor, Room
September, 21, Wednesday	08.00-09.00	Registration	2 nd Floor, Hall
	09.00-09.20	Opening Ceremony	2 nd Floor, Great Hall
	09.20-09.30	Short Break	2 nd Floor, Hall
	09.30-12.00	Plenary Session 1	2 nd Floor, Great Hall
	12.00-12.30	Coffee Break & Photo Session	2 nd Floor, Hall
	12.30-14.00	Plenary Session 2	2 nd Floor, Great Hall
	14.00-15.00	Buffet Lunch	Club SASA, Mezzanine
	15.00-17.00	Plenary Session 3	2 nd Floor, Great Hall
	17.00-17.30	Coffee Break	2 nd Floor, Hall
	17.30-19.00	Plenary Session 4	2 nd Floor, Great Hall
	20.00	Conference Dinner (with invitation only)	Restaurant Peking
September, 22, Thursday	08.30-09.00	Registration Poster and Exhibition Installation	1 st Floor, Hall
	09.00-10.40	Keynote Session 1	1 st Floor, Blue Hall
	10.40 – 11.00	Coffee Break	1 st Floor, Hall
	11.00-13.00	1 st Session: Basic Ceramic and Sintering	1 st Floor, Blue Hall
	13.00-14.00	Buffet Lunch	Club SASA Mezzanine
	14.00-15.40	Keynote Session 2	1 st Floor, Blue Hall
	15.40-16.10	Coffee Break	1 st Floor, Hall
	16.10-17.55	2 nd Session: Nano, Opto, Bio and Multifunctional Ceramic	1 st Floor, Blue Hall
	17.55-18.15	Round table 1 Atlantis Press Publishing	
	18.15-19.15	Poster Session	1 st Floor, Hall
September, 23, Friday	09.00-11.05	Keynote Session 3	1 st Floor, Blue Hall
	11.05-11.30	Coffee Break	1 st Floor, Hall
	11.30-13.15	3 rd Session: Magnetic, Amorphous, Composites and Catalysts	1 st Floor, Blue Hall 2
	13.15-14.15	Buffet Lunch	Restaurant Peking
	14.15-16.35	4 th Session: Construction materials, Eco-ceramic and Heritage	1 st Floor, Blue Hall 2
	16.35-17.30	Round Table 2 Intelligent materials for the future: Serbia-EU cooperation perspectives	1 st Floor, Blue Hall 2
	17.30	Closing Ceremony	1 st Floor, Blue Hall 2

Wednesday, September 21st, 2016

Hall, 2nd Floor

- 08.00-09.00** **Registration**
Great Hall, 2nd Floor
- 09.00-09.20** **Opening Ceremony of the Fifth Serbian Ceramic Society Conference: Advanced Ceramics and Application**
Prof. Dr. Vojislav Mitić, Prof. Dr. Olivera Milošević, Prof. Dr. Vladimir Pavlović, Prof. Dr. Danilo Suvorov, Dr. Zeger Karssen, Prof. Dr. Muamer Zukorlić, High-representative of Government
- 09.20-09.30** **Short break**
Great Hall, 2nd Floor
- 09.30-12.00** **Plenary Session 1**
Chairpersons: Branislav Vlahović, Vladimir Pavlović
- 09.30-10.00** **PL1 Novel Graphene and Graphene like 2D materials synthesis**
Chuanbao Cao
Research Center of Materials Science, Beijing Institute of Technology, China
- 10.00-10.30** **PL2 Fundamental mechanisms that determine the loss tangent and temperature coefficient of resonant frequency (τ_F) in modern microwave ceramic dielectrics**
Nathan Newman¹, Shengke Zhang¹, Hasan Sahin^{2,4}, Engin Torun², Francois Peeters², Dinesh Martien³, Tyler DaPron³, and Neil Dilley³
¹Arizona State University, Tempe, AZ
²Dept. Of Physics, University of Antwerp, Belgium
³Quantum Design, San Diego, CA
⁴Department of Photonics, Izmir Institute of Technology, Turkey
- 10.30-11.00** **PL3 Rare earth oxide stabilized zirconia ceramics and composites with enhanced mechanical and functional properties**
Frank Kern
Universität Stuttgart, IFKB Stuttgart, Deutschland
- 11.00-11.30** **PL4 New Superionic Conductor Narpsio Glass-Ceramics**
Toshinori Okura
Department of Applied Chemistry, School of Advanced Engineering, Kogakuin University, Tokyo, Japan

- 11.30-12.00** **PL5 Oxides Powders Produced by Plasma-Spray Pyrolysis Technique and Sintered Ceramics for Structural and Biomedical Applications**
Sergey N. Kulkov
Ceramic Composites Lab., Inst. of Strength Phys. and Material Sciences, RAS, Tomsk, Russia and Tomsk State University
- Hall, 2nd Floor**
- 12.00-12.30** **Coffee Break and Photo Session**
- Great Hall, 2nd Floor**
- 12.30-14.00** **Plenary Session 2**
Chairpersons: Chuanbao Cao, Lidija Mančić
- 12.30-13.00** **PL6 Morpho-Genetic Materials: Functional Materials Replicated from Superstructures of Natural Species**
Di Zhang
State Key Laboratory of Metal Matrix Composites, Shanghai Jiao Tong University, China
- 13.00-13.30** **PL7 Air-Stable High Efficiency Hybrid Solar Cells Based on Metal Oxide and Graphene**
Yoon-Bong Hahn
School of Semiconductor and Chemical Engineering, Chonbuk National University, Republic of Korea
- 13.30-14.00** **PL8 Modelling of Weakly Coupled Nanoparticles**
Branislav Vlahovic, Igor Filikhin
North Carolina Central University, Durham, New York, USA
- 14.00-15.00** **Buffet Lunch**
- Club SASA,
Mezzanine Hall, 1st floor**
- Great Hall, 2nd Floor**
- 15.00-17.00** **Plenary Session 3**
Chairpersons: Frank Kern, Dušan Jovanović
- 15.00-15.30** **PL9 Zr_{n+1}AlC_n MAX phases for future fission environments**
Eugenio Zapata Solvas
Centre for Nuclear Engineering, Department of Materials, Imperial College London, UK

- 15.30-16.00** **PL10 Geopolimers: Versatil Ceramic Composites Made at Ambient Temperatures, or Precursors to HT Structural Ceramic Powders**
Waltraud Kriven
Department of Material Science&Engineering, University of Illinois USA
- 16.00-16.30** **PL11 Spectroscopic studies of heavy metal glasses**
Saleem Farooq Shaukat, Robina Farooq
COMSATS Institute of Information Technology, Lahore, Pakistan
- 16.30-17.00** **PL12 The Role of Microstructural Features in High Frequency and Energy Ceramics**
Danilo Suvorov
Advanced Materials Department, Jozef Stefan Institute, Ljubljana, Slovenia
- 17.00-17.30** **Coffee Break** **Hall, 2nd Floor**
Great Hall, 2nd Floor
- 17.30-19.00** **Plenary Session 4**
Chairpersons: Di Zhang, Dragoljub Mirjanić
- 17.30-18.00** **PL13 Design and development of car body from composite materials using single step resin infusion process**
Zaffar M. Khan
Department of Aeronautics and Astronautics,
Institute of Space Technology
Islamabad, Pakistan
- 18.00-18.30** **PL14 Porous Mano Structured Ceramics – From Bulk to Nanofibers**
G. S. Grader
Chemical Engineering Department, Technion, Haifa, 32000, ISRAEL
- 18.30-19.00** **PL15 Multi Layer Ceramics: Design and Process Methods**
Krishnamurty Balasubramanian
Nonferrous Materials Technology Development Centre,
Kanchanbagh, Hyderabad, India
- 20.00** **Conference Dinner** **Restaurant Peking**
(with invitations)

Thursday, September 22nd, 2016
Hall, 1st floor

08.30-09.00 **Registration**
Posters Installation

Blue Hall 2, 1st floor

09.00-10.40 **Keynote Session 1**
Chairpersons: Smilja Marković, Suzana Filipović

09.00-09.25 **KN1 Bioelectrochemical harvesting of greenhouse gases**
Robina Farooq, Saleem Farooq Shaukat
COMSATS Institute of Information Technology, Lahore, Pakistan

09.25-09.50 **KN2 Metallic Butterfly Scales: Fabrication and Their Plasmonic Applications**
Jiajun Gu
State Key Laboratory of Metal Matrix Composites, Shanghai Jiao Tong University, China

10.50-10.15 **KN3 Modeling Liquid Bridge Rupture Induced by Grain Rearrangement**
Zoran S. Nikolic
University of Niš, Faculty of Electronic Engineering, Department of Microelectronics, Niš, Serbia

10.15-10.40 **KN4 Electric Discharge Coating of Metals with Ceramic Compounds**
Sükrü Talas
Department of Metallurgical and Materials Engineering, Faculty of Technology Afyon Kocatepe University, A.N.S. Campus, Turkey

Hall, 1st floor

10.40-11.00 **Coffee Break**

Blue Hall 2, 1st floor

11.00-13.00 **1st Session: Basic Ceramic and Sintering**
Chairpersons: Vaclav Pouchly, Nina Obradović

11.00-11.20 **INV1 Curie-Weiss Law Fractal Corrections and Clausius-Mossotti Equation**
Vojislav V. Mitić^{1,2}, Ljubiša M. Kocić¹, Vesna V. Paunović¹
¹University of Niš, Faculty of Electronic Engineering, Niš, Serbia
² Institute of Technical Sciences of SASA, Belgrade, Serbia

Blue Hall 2, 1st floor

- 14.00-15.40** **Keynote Session 2**
Chairpersons: Vladimir Blagojević, Dragana Jugović
- 14.00-14.25** **KN5 Environmental forensics – concepts and contemporary challenges**
Goran Kniewald
Rudjer Bošković Institute, Zagreb, Croatia
- 14.25-14.50** **KN6 Fractals, Materials and Energy Technologies L**
Ljubiša M. Kocić¹, Vojislav V. Mitić^{1,2}, Vesna V. Paunović¹
¹University of Niš, Faculty of Electronic Engineering, Niš, Serbia
²Institute of Technical Sciences of SASA, Belgrade, Serbia
- 14.50-15.15** **KN7 Yttrium doped barium cerate: ceramic matrix in the solid oxide fuel cells**
Margarita Gabrovska¹, Dimitrinka Nikolova¹, Slavcho Rakovsky¹,
Daria Vladikova², Emiliya Mladenova², Zdravko Stoynov²
¹Institute of Catalysis, Bulgarian Academy of Sciences, Sofia, Bulgaria
²Acad. Evgeni Budevski Institute of Electrochemistry and Energy Systems, Bulgarian Academy of Sciences, Sofia, Bulgaria
- 15.15-15.40** **KN8 Intelligent nanomaterials for medicine diagnostic and therapy application**
Dragoljub Lj. Mirjanić¹, Snežana Pelemiš²
¹Academy of Sciences and Arts of Republic of Srpska, B&H
²Faculty of Technology, University of East Sarajevo, B&H
- 15.40-16.10** **Coffee Break** **Hall, 1st floor**
- Blue Hall 2, 1st floor**
- 16.10-17.55** **2nd Session – Nano, Opto, Bio and Multifunctional Ceramic**
Chairpersons: Zorica Lazarević, Vesna Paunović
- 16.10-16.30** **INV4 Electrical characterization of YFeO₃ nanoferrite and its potential application for humidity sensing**
Dalibor L. Sekulić¹, Zorica Ž. Lazarević², Čedomir D. Jovalekić³,
Nebojša Ž. Romčević²
¹University of Novi Sad, Faculty of Technical Sciences, Novi, Serbia
²University of Belgrade, Institute of Physics, Belgrade, Serbia
³University of Belgrade, The Institute for Multidisciplinary Research, Belgrade, Serbia

- 16.30-16.50** **INV5 Development and Evaluation of glass-like coatings for cardiovascular implant applications such as stents**
M. Amlung¹, K. Kiefer^{1,2}, P. W. de Oliveira¹, H. Abdul-Khaliq²
¹INM – Leibniz-Institute for New Materials, 66123 Saarbrücken, Germany
²Clinic for Pediatric Cardiology, Saarland University, 66124 Homburg, Germany
- 16.50-17.10** **INV6 A review on the selection of anode materials for solid-oxide fuel cells**
Shabana P. S. Shaikh, and K.P.Adhi
Advanced Materials Processing Lab, Department Of Physics, SBP, Pune University, Pune, India
- 17.10-17.25** **OR5 Synthesis and structural characterization of some cathode materials for lithium-ion batteries**
Dragana Jugović¹, Miodrag Mitrić²
¹Institute of Technical Sciences of SASA, Belgrade, Serbia
²Vinča Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia
- 17.25-17.40** **OR6 Application of Ceramic Components in Knee Arthroplasties**
Aleksandar Radunović¹, Zoran Popović², Aleksandar Jevtić¹
¹MD,MMA, Belgrade, Serbia
²Vožd clinic, Belgrade, Serbia
- 17.40-17.55** **OR7 *In vivo* degradation of Bio-Oss® in implants loaded with macrophages treated with lipopolysaccharide**
Jelena Živković¹, Sanja Stojanović¹, Marija Vukelić-Nikolić¹, Jelena Najdanović¹, Vladimir Cvetković², Maja Čakić-Milošević³, Stevo Najman¹
¹University of Niš, Faculty of Medicine, Institute of Biology and Human Genetics, Department for Cell and Tissue Engineering, Niš, Serbia
²University of Niš, Faculty of Science and Mathematics, Department of Biology and Ecology, Niš, Serbia
³University of Belgrade, Faculty of Biology, Belgrade, Serbia
- 17.55-18.15** **Round table 1 Atlantis Press Publishing**
Moderator: Zeger Karssen
- 18.15-19.15** **Poster Session** **Hall, 1st floor**

Friday, September, 23rd, 2015

Blue Hall 2, 1st floor

- 09.00-11.05** **Keynote Session 3**
Chairpersons: Goran Kniewald, Ljubiša Kocić
- 09.00-09.25** **KN9 Energy storage systems for stationary applications**
Palani Balaya
Department of Mechanical Engineering, National University of
Singapore, Singapore
- 09.25-09.50** **KN10 Smart composite materials for waste water
remediation**
Ajay Kumar Mishra
Nanotechnology and Water Sustainability Research Unit, College of
Science, Engineering and Rechnology, University of South Africa,
South Africa
- 09.50-10.15** **KN11 Magnetic properties of melt-spun alnico-v alloy
ribbon**
Feroz A. Khan
Department of Physics, Bangladesh University of Engineering and
Technology (BUET), Dhaka-1000, Bangladesh
- 10.15-10.40** **KN12 The rainbow ion-solid interaction potential**
Srđan Petrović
Laboratory of Physics, Vinča Institute of Nuclear Sciences, University
of Belgrade, P. O. Box 522, 11001 Belgrade, Serbia
- 10.40-11.05** **KN13 An overview of ceramics in dentistry: Basic properties
and clinical applications**
Csaba Hegedűs
University of Debrecen, Department of Biomaterials and Prosthetic
Dentistry, University of Debrecen, Hungary
- Hall, 1st floor**
- 11.05-11.30** **Coffee Break**

Blue Hall 2, 1st floor

- 14.15-16.50** **3rd Session: Magnetic, Amorphous, Composites and Catalysts**
Chairpersons: Dalibor Sekulić, Christina Graf
- 11.30-11.50** **INV7 Silica-based Catalytic Systems Prepared by Sol-Gel Methods**
Raed Abu-Reziq
Institute of Chemistry, Casali Center for Applied Chemistry, Center for Nanoscience and Nanotechnology, The Hebrew University, Jerusalem, Israel
- 12.50-12.10** **INV8 Ceramic powder compaction: numerical simulation and calibration through inverse analysis**
Vladimir Buljak, Shwetank Pandey, Milorad Milovancevic
University of Belgrade, Mechanical Engineering Faculty, Department of Strength of Materials
- 14.15-16.50** **INV9 Comparative fractal analysis of *Valeriana officinalis* roots shrinkage during drying**
Ivan J. Zlatanović¹, Dragana V. Rančić¹, Vojislav V. Mitić^{2,3}, Ljubiša Kocić³
¹University of Belgrade – Faculty of Agriculture
²Institute of Technical Sciences of SASA
³University of Niš – Faculty of Electronic Engineering
- 14.15-16.50** **OR8 Mo-doped TiO₂ nanocomposite coatings: visible light photocatalytic activity and antifungal efficiency**
Bojan Miljević¹, J. M. Van der Bergh¹, S. Vučetić¹, A. Vidaković¹, S. Markov¹, D. Lazar², J. Ranogajec¹
¹University of Novi Sad, Faculty of Technology, Novi Sad, Serbia
²University of Novi Sad, Faculty of Sciences, Department of Physics, Novi Sad, Serbia
- 14.15-16.50** **OR9 Characterisation of Mn_{0.63}Zn_{0.37}Fe₂O₄ powders after intensive milling and subsequent thermal treatment**
Nebojša Labus¹, Zorka Vasiljević¹, Obrad Aleksić¹, Miloljub Luković¹, Smilja Marković¹, Vladimir Pavlović¹, Slavko Mentus^{2,3}, Maria Vesna Nikolić⁴
¹Institute of Technical Sciences of SASA, Beograd, Serbia
²Faculty of Physical Chemistry, University of Belgrade, Serbia
³Serbian Academy of Sciences and Arts, Belgrade, Serbia
⁴Institute for Multidisciplinary Research, University of Belgrade, Beograd, Serbia

14.15-16.50 OR10 Optical and structural characterization of Se–CuSe₂ thin films

Martina Gilić¹, Milica Ćurčić¹, Jovana Ćirković², Uroš Ralević¹, Miodrag Mitrić³, Tanja Barudžija³, Svetlana Savić-Šević¹, Nebojša Romčević¹, Ibrahim Yahia⁴

¹Institute of Physics Belgrade, University of Belgrade, Belgrade, Serbia

²The Institute for Multidisciplinary Research, University of Belgrade, Belgrade, Serbia

³Institute of Nuclear Sciences Vinča, University of Belgrade, Belgrade, Serbia

⁴Nano-Science and Semiconductors Labs., Physics department, Faculty of Education, Ain Shams University, Roxy, Cairo, Egypt

13.15-14.15 Buffet Lunch Restaurant Peking

14.15-16.35 4th Session: Constructional, Eco-ceramic and Catalysts
Chairpersons: Vladimir Pavlović, Darko Kosanović

14.15-14.35 INV10 Silica particles with controlled roughness – synthesis, characterization, and use as building blocks for non-close packed arrays

Christina Graf, Christian Goroncy, Madlen Schumde, Christian Grunewald, Thomas Risse

Institut für Chemie und Biochemie, Freie Universität Berlin, Germany

14.35-14.55 INV11 Influence of different pore-forming agents on wollastonite microstructures

Nina Obradović¹, Suzana Filipović¹, Smilja Marković¹, Miodrag Mitrić², Vesna Antić³, Vladimir B. Pavlović¹

¹Institute of Technical Sciences of SASA, Belgrade, Serbia

²Vinča Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia

³Faculty of Agriculture, University of Belgrade, Belgrade, Serbia

14.55-15.15 INV12 Education and materials science in cultural heritage preservation

Jonjaua Ranogajec¹, Slavica Vujović², Snežana Vučetić¹, Bojan Miljević¹, Helena Hiršenberger³, John Milan van der Bergh¹

¹University of Novi Sad, Faculty of Technology, Novi Sad, Serbia

²Provincial Institut for Protection of Cultural Heritage Monuments, Petrovaradin, Serbia

³University of Novi Sad, Faculty of Technical Sciences, Novi Sad, Serbia

- 15.15-15.35** **INV13 Characteristics of mortar from the archeological site Romuliana – Gamzigrad**
Gordana A. Topličić-Ćurčić¹, Ana J. Momčilović-Petronijević¹,
Vojislav V. Mitić^{2,3}, Vesna V. Paunović², Dušan Z. Grdić¹, Nenad S.
Ristić¹, Zoran J. Grdić¹
¹University of Nis, Faculty of Civil Engineering and Architecture, Nis,
Serbia
²University of Nis, Faculty of Electronic Engineering, Nis, Serbia
³Serbian Academy of Science and Art, Institute of Technical Sciences,
Belgrade, Serbia
- 15.35-15.50** **OR11 Conservation and restauration of seven paintings by Veljko Zecevic on canvas**
Filip Jankovic
Graduated painter-restorer, a freelancer
Belgrade, Serbia
- 15.50-16.05** **OR12 Detoxication of methanol from water solution using zeolite**
Milena S. Stojilković¹, Staniša T. Stojilković²
Faculty of Technology Leskovac, University of Niš
- 16.05-16.20** **OR13 Importance of the synergical application of the EU regulation on construction products (EU CPR 305/2011) from the fire safety aspect**
Edin Garaplija, Sanin Džidić
Institute for Fire and Explosion Safety and Protection, Sarajevo
- 16.20-16.35** **OR14 The in-situ challenge of better understanding structure-properties relationship in nanomaterials**
Dušan Popović
Analysis
- 16.35-17.30** **Round table 2 Intelligent materials for the future: Serbia-EU perspectives for cooperation**
Moderators: Vladimir Pavlović, Nina Obradović
- 17.30** **Closing Ceremony**

P5

CHARACTERIZATION OF ZEOLITIC TUFF FROM DEPOSIT TOPONICA NEAR KOSOVSKA KAMENICA

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In this paper are presented the results of mineralogical and crystallographic analysis of zeolitic tuff from deposits Toponica. Deposit of zeolitic tuff "Toponica", is located in the eastern part of Kosovo. The geological structure of the zeolite tuff deposits make up the footwall stratum of Miocene (M) clay sandstone, white zeolite tuff horizon and roof seam Miocene shales, clay and gravel. For mineralogical analysis was used the optical microscope and SEM/EDS method. The basic minerals composition are presented with clinoptilolite-Ca, clay minerals, mica and feldspar. The XRPD method was used for crystallographic analysis, based the semi-quantitative phase analysis, in the zeolitic tuff is present ~ 89% clinoptilolite. The cation exchange capacity of zeolitic tuff is 140 meq / 100g, which this mineral raw material classified as extremely high quality and suitable for use in various industries.

P6

Characterization of microstructural and thermal properties of the steatite powders applied as fillers in the ceramic coatings

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Steatite is a magnesium silicate multi-componential composite that can be synthesized from natural raw materials, and eventually produced via standard ceramic processing methods and readily machined or sintered into a variety of forms. Due to its excellent electrical properties, high mechanical resistance, low dielectric loss and high temperature resistance, steatite is widely utilized as a material for thermal insulation and heath protection. The raw materials used in steatite powder synthesis are: talc mixture for calcination, clay minerals as bonding agent, and feldspar or BaCO₃ as melting agents. The synthesis is usually conducted at approximately 1400°C, and its product is a crystalline phase of magnesium metasilicate (MgSiO₃) obtained from talc, while melting agent forms a vitreous phase which melts and surrounds the crystalline phase. Steatite ceramics' fillers were fabricated via combined method of high-energy ball milling, cold pressing and sintering. The powder blends containing same amounts of components in all 4 mixtures were dry-pulverized for 30 min a laboratory mill, with ceramic vial and ceramic balls. After milling, the powders were compacted to cylindrical tablets with a diameter of 25 mm by uniaxial compression at 4

tons/cm². The green compacts were sintered at 1000-1400°C (10°C/min) for 2 h in an air atmosphere. The effect of dry grinding on phase, microstructural and thermal properties of the sintered tablets were carried out by using X-ray diffraction technique (XRD), thermogravimetry/differential thermal analyzer (TG/DTA) and scanning electron microscope (SEM). The effects of grinding on the change of the particle diameter, crystallinity and the phase transformations, and reactivity of the powders were studied. The powders that were pulverized for 30 min showed properties which positively influenced on the decrease of sintering temperature and the increase of the sintering rate of steatite fillers.

P7

Utilization of bentonite as partial replacement of cement in unshaped construction composites

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The development in construction sector requires constant increase in production of the concretes. To prevent depleting of natural resources it is necessary to use industrial byproducts and/or economical primary materials as a replacement of concrete's main components such as cement or fillers. The fly ash is one of the most commonly utilized additions to concrete design. However, the presence of toxic elements in the coal combustion products cannot be ignored even though their abundance is minor. Pollution induced by heavy metals is a huge problem since they are non-degradable and accumulative. Owing to their sorption properties, certain clays can develop the ability to immobilize heavy metals and other toxic or hazardous substances within the concrete microstructure. Bentonites, as natural clay mineral mixtures mainly composed of smectite, i.e. montmorillonite clay (≥ 70 wt. %), have expanding type sheet silicates composed of one octahedral layer situated between two tetrahedral layers. They are characterized by a high cationic exchange capacity (Na, K, Ca, Mg), high specific surface area and ability to absorb interlayer water molecules by increasing the basal length. Therefore, besides being a natural pozzolana, bentonite is applied in concrete as adsorbent of toxic heavy metals and/or radionuclides due to high cation exchange capacity and high specific surface area. In this paper, the compatibility of fly ash and bentonite in construction composites (concretes) was investigated. The main variable is the proportion of bentonite (10%, 15%, 20%, 25%, and 30% by weight of cement) in replacement mode while the amount of cementitious material, water to cementitious material ratio, fine and coarse aggregate content were kept constant. The mineralogical phase composition of concretes was analyzed by X-ray diffraction method and scanning electron microscopy was applied in the analysis of the microstructure. The thermal behavior was observed via DTA method. Test results substantiate the feasibility to develop low cost concrete using bentonite. It will reduce energy consumption and greenhouse gases related to cement production as well as prevent leaching of the toxic elements into the environment.