



**Serbian Ceramic Society Conference  
ADVANCED CERAMICS AND APPLICATION VIII  
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**

**PROGRAM AND THE BOOK OF ABSTRACTS**

**Serbian Academy of Sciences and Arts, Knez Mihailova 35  
Serbia, Belgrade, 23-25. September 2019.**

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**EUROPEAN ACADEMY**  
of Sciences and Arts

Dear Colleagues,

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

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 emphasize the key achievements which will enable the wide spread use of the advanced ceramics products in High-Tech industry, renewable energy utilization, environmental efficiency, security, space technology, cultural heritage, 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.

This year the conference is supported by the Serbian Chapter of American Ceramic Society and European Academy of Sciences and Arts.

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*

## Conference Topics

- Basic Ceramic Science & Sintering
- Nano-, Opto- & Bio-ceramics
- Modeling & Simulation
- Glass & Electro Ceramics
- Electrochemistry & Catalysis
- Magnetic & Refractory Ceramic
- Renewable Energy, Composites & Amorphous Ceramics
- Heritage, Art & Design

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Dr. Nina Obradović SRB

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Archeological Institute of SASA, Institute of Physics UB, Vinča Institute of Nuclear Sciences UB -  
Laboratory of Physics (010), Electrical Engineering Institute Nikola Tesla and  
High School-Academy for Arts and Conservation.

# **Conference Program and Abstracts**





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## The Eight Serbian Ceramic Society Conference »Advanced Ceramics and Application«



September 23-25, 2019

## Conference Information:

**Conference 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: 200 EUR; Standard fee for domestic participants: 10000 RSD, Members of SCS, Keynote lecturers and PhD Students: 50% Discount; Invited lecturers have 40% Discount; Plenary lecturers & the last year winners for oral and poster presentations: Free of charge. Invoice and bank details for Conference fee payment: Banka Intesa ad Beograd, Account No. 160-380150-55, notification: Conference fee – participant name.

Paying of the conference fee at site will be available only in cash.

**Currency:** The official currency in Serbia is dinar, abbreviated RSD. Money may be exchanged in all banks and authorized exchange offices. Exchange rate for 1 EUR is around 118 RSD. Cash may be taken from ATMs 24 hours a day. Credit cards are accepted in shops, hotels and restaurants.

**Abstracts and papers publication:** The official language of the conference is English. Conference abstracts will be published in the Book of Abstracts Conference. Papers presented at the conference can be submitted for publishing either in book or selected journals. More precisely, Serbian Ceramic Society and Springer Nature will publish each year one of Chapter book draw on the research and innovation presented at ACA Conferences in the frame of chosen topic. Beside, limited number of papers will be consider for publishing in following journals: Materials Chemistry and Physics, Journal of Ceramic Science and Technology and Science of Sintering.

Deadlines for submitting of full manuscripts will be delivered after the Conference.

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

### Additional Conference information

president@serbianceramicsociety.rs

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

Recommended places near the Conference venue:

Hotel: Hotel Palas, Topličin venac 23; <http://www.palacehotel.co.rs/>

Restaurant: Pivnica „Maxim 2“, Đure Jakšića 1, Belgrade (street beside conference venue)

Exchange office: „Hulk“, Vuka Karadžića 4

Tourist Information Centre: Knez Mihailova 5

Water: Tap water in Belgrade is safe to drink.

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## **Thermal and Thermomechanical Properties of Organic-Inorganic Nanocomposites Prepared from Polyurethane Network and Mesoporous Silica Nanoparticles**

Marija V. Pergal<sup>1</sup>, Igor D. Kodranov<sup>2</sup>, Milena Špírková<sup>3</sup>, Dragan D. Manojlović<sup>2</sup>, Sanja Ostojčić<sup>4</sup>, Nikola Knežević<sup>5</sup>

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Polyurethane (PU) networks based on poly(dimethylsiloxane) (PDMS) and hyperbranched polyester (HBP) possess unique properties such as chemical stability, good thermal behavior, good surface and mechanical properties, making these materials good candidates for coating applications. The silica addition in polymer typically leads to a significant improvement of mechanical and thermal properties due to good filler dispersion, good compatibility with the matrix, and the presence of a strong interaction between reinforcements and the polymer matrix.

In this paper, polyurethane-mesoporous silica nanocomposites (PU-MSNs) were prepared in the form of films, from hydroxyl-terminated PDMS, 4,4'-methylenediphenyl diisocyanate and HBP of the second pseudogeneration as the precursors. PU-MSNs, having 50 wt. % of the soft PDMS segment, were prepared containing 1 wt% of different type of MSNs (MSN with non-modified surface and surface-modified MSNs, with 3-(trihydroxysilyl)propyl methylphosphonate (FOMSN) and 2-[methoxy(polyethyleneoxy)6-9propyl]trimethoxysilane (PEGMSN)). Thermal properties of PU-MSN films were investigated by DSC and TGA, while thermomechanical properties were determined by DMTA. The glass transition of hard segment of PUS-MSNs was higher than that of pure PUS network, implying that PUS-MSNs exhibit higher degree of microphase separation. Thermal stability of the prepared PUS-MSNs was improved with addition of the mesoporous nanosilica nanoparticles as compared to pure PUS network. The PU-MSN films prepared with surface-modified MSNs feature better thermal and thermomechanical properties in comparison to materials obtained using non-modified MSN.

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## **Analytical modeling of ICP-OES and XRF procedures for detection of the main elements in traditional brick clays**

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Comparison of two instrumental analytical techniques, i.e. X-ray fluorescence (XRF) and inductively coupled plasma-optical emission spectrometry (ICP-OES), for measuring of the concentrations of major elements (Si, Al, and Fe) found in the traditional brick clay was conducted. Sixty-nine samples of clays from various Serbian deposits were analyzed and characterized in order to evaluate the possibility of