



**Serbian Ceramic Society Conference**  
**ADVANCED CERAMICS AND APPLICATION VI**  
**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, 18-20. September 2017.**

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Dear Colleagues,

We have great pleasure to welcome you to the Advanced Ceramic and Application Conference VI 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 and Institute for Technology of Nuclear and Other Raw Mineral 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, 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.

For the first time Advanced Ceramic and Application Conference hosting delegations from Republics of Ghana, Nigeria, Niger and Cameroon with the idea to connect, share and provide positive influence to the scientific and industrial communities all around world.



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 Science & Sintering of Ceramics
- Nano, Bio- & Opto Ceramic
- Electro & Multifunctional Ceramics
- Magnetic, Catalytic & Composite Materials
- Renewable Energy, Heritage & Archeology
- Industrial Talks

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town existed for a very short time. By the beginning of VII century, it perished in a large conflagration, after which it was not rebuilt.

This archeological site has an outstanding cultural and historical value. Caričin Grad, after a decision of the Assembly of the no. 29 of 29<sup>th</sup> March 1979 was categorized as an immovable cultural property of outstanding importance for the Republic of Serbia. In 2010, it was preliminary listed among the cultural properties which will be nominated for the UNESCO cultural heritage list (Tentative List). The site has been under intensive restoration, in order to restore it to a certain condition, after which a nomination portfolio for inclusion in the UNESCO cultural heritage list will be prepared. During the month of August of 2017 the first action camp World Heritage Volunteers Initiative, WHV-Heritage in our Hands Decorated Stone Elements Rescue and Conservation under the auspices of the UNESCO was held.

The works in Caričin Grad have been going on, at different intensity, since 1912 until the present day. The site, over the course of a century attracted a number of eminent researchers of different professions. Archeologists, conservation architects, art historians, mosaic restorers all contributed to the research. The paper presents the historical review of the research on this very important archeological site, in order to once again emphasize the significance of this site, which will, we believe, soon attain a global reputation it deserves.

### **P35**

#### **Generalized Lorentz model description of electrical, dielectric, conductive and magnetic processes two-time relaxations in BaTiO<sub>3</sub> ceramics with constitutive relations**

Zoran B. Vosika<sup>1</sup>, Vojislav V.Mitić<sup>1,2</sup>, Goran Lazović<sup>3</sup>, Vesna Paunović<sup>1</sup>, Ljubiša Kocić<sup>1</sup>

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In this study, generalized Lorentz model is considered in the framework of dielectric, conductive and/or magnetic responses of materials. Beside positive temperature coefficient of resistivity (PTCR) materials (current stabilizers, time delay circuits and current limiters for overvoltage or overcurrent protection, temperature sensors, self-heating, ...), magnetic properties indicate to multifunctional or specific applications (for example, nanocubic technologies).

AC conductivity studies of various BaTiO<sub>3</sub> ceramics or similar ceramics produced equivalent circuits with impedance spectra, usually within the framework of RCPE elements serial connection (CPE - constant phase element) or Cole element. One of the first models that explains PTC effect is the Heywang model, in terms of grain boundaries potential barriers of the Shottky type. Dielectric frequency spectra can be described in similar relationships. However, magnetic features of BaTiO<sub>3</sub> ceramics are not well described.

In this presentation all three behaviors (dielectric, conductive and magnetic) of materials and their relationships are considered in the case of electric or magnetic alternate fields, which are the basis for experimental measurements.