



**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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## OR-NOP2

### **In-vitro visualization of primary tumor cells using up-conversion nanophosphors**

Lidija Mancic<sup>1</sup>, Aleksandra Djukic-Vukovic<sup>2</sup>, Ljiljana Mojovic<sup>2</sup>, Mihailo Rabasovic<sup>3</sup>, Aleksandar J. Krmpot<sup>3</sup>, Ivana Dinic<sup>4</sup>, Antonio MLM. Costa<sup>5</sup>, Olivera Milosevic<sup>1</sup>

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Due to their unique luminescent features, lanthanide doped up-converting nanoparticles (Ln-UCNPs) have an important role in biomedical use, particularly in the area of NIR-excited fluorescent cell imaging. For such purpose, Ln-UCNPs should have specific morphological characteristics and efficient luminescence response. In this work, a biocompatible and water dispersible NaYF<sub>4</sub>:Yb,Er@PLGA nanoparticles synthesized using a one-step hydrothermal synthesis were tested as fluorescent bio-labels of primary cell cultures obtained after passage of head and neck squamous carcinoma cells (HNSCC). Structural, morphological and optical properties of particles were obtained using X-ray powder diffraction (XRPD), field emission scanning and transmission electron microscopy (FESEM/TEM), energy dispersive X-ray (EDX), Fourier transform infrared (FTIR) and photoluminescence (PL) spectroscopy. The results revealed coexistence of the cubic (*Fm-3m*) and hexagonal (*P6<sub>3</sub>/m*) phase in spherical and irregularly shaped nanoparticles, respectively. Moreover, preservation of the PLGA ligands at the particles surface facilitates their interactions with the cell membrane and provides permeation into cells. To assess a biological safety of their use, viability of human gingival fibroblasts (HFG) was additionally evaluated by a colorimetric MTT assay.

## OR-EM1

### **Effect of annealing temperature on structural and surface morphology of ceramic electrolyte for IT-SOFC applications**

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In the present work the powder of Gd<sub>0.1</sub>Ce<sub>0.9</sub>O<sub>1.95</sub> Gadolinium-doped ceria (10GDC) is procured from Sigma Aldrich with 99.9% purity. Using powder 10GDC the electrolyte material in pellets form were sintered at different temperature of 800, 900, 1100 and 1200 °C for 4 hr in microwave high temperature furnace to investigate the effect of sintering temperature on density, structural and morphological properties of 10GDC. Density was measured using the Archimedes's method.