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

Serbian Ceramic Society
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, 21-23. September 2015

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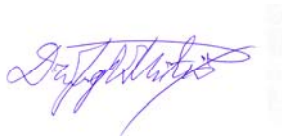
Dear Colleagues, Dear Friends,

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

Advanced Ceramics play an important role in the European Union's prioritized materials to enable the transition towards to a knowledge-based efficient societies. The chosen Conference topics cover fundamental theoretical research in advanced ceramics, modeling and simulation of technological processes, controlled synthesis of nanomaterials, developing of new composite and hybrid structures which should provide practical realization of the new ideas and brings new quality in everyday life. ACA IV Conference gathers the researchers, engineers, academy staff, artist, specialist and PhD students trying to emphasizes the key innovation activities toward developing the next generation of advanced ceramics products for industry of high-technology, renewable energy sources, 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.



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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
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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

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Conference Program and Abstracts

Program and Abstract's Contents

with burial depth, whereas organic matter-hosted pores generally are more abundant and increase in size within samples of higher maturity (1.8 – 2.1 %Rr). However, lack of nanopores in bitumen within mainly gas-prone samples at 1.4 - 1.8 %Rr as well as its abundance in an oil-prone sample at ~0.8 %Rr points out that varying kerogen composition might be an equally important influencing factor as thermal maturation of OM. To which extent composition of mineral matrix and burial history affect the generation or preservation of nanopores within bitumen, remains an unresolved issue.

INV4

Interaction of UV irradiation with thin films of organic molecules

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There is an ongoing interest in organic materials due to their application in various organic electronic devices. However stability of organic materials limits their potential use. They are prone to degradation both during the working life and storage. One of the main causes is extrinsic degradation, under the influence of oxygen and moisture. This problem can be solved by encapsulation of devices. However no encapsulation is perfect.
In the first part of this work a study of degradation of thin films of N,N′-bis(3-methylphenyl)-N,N′-bis(phenyl)benzidine (TPD) and 4,4′-bis(2,2-diphenylvinyl)-1,1′-biphenyl (DPVBi) under UV irradiation in air is given. Films of both materials are stable in vacuum, but readily degrade in the presence of oxygen. Thus, the necessary condition for degradation is the simultaneous presence of UV light and oxygen. Chemical analysis of irradiated films by NMR, mass and infrared spectroscopy revealed presence of oxidized species (impurities). These impurities are responsible for increased morphological stability of irradiated films and quenching of photoluminescence. Only small amount of impurities, 0.4 % (0.2 %) for TPD (DPVBi), causes 50 % decrease of photoluminescence. This implies a non-trivial mechanism of quenching. For both molecules it was found that distance between impurities is smaller or equal to exciton diffusion length, which is the
necessary condition for quenching. Following mechanism of quenching is proposed: exciton diffuses by hopping form one DPVBi (TPD) to another through FRET in a random walk manner. If, during its lifetime, it comes to proximity of an impurity, a Dexter-type energy transfer occurs and PL is quenched.
Findings of DPVBi study are important because they show that even a small amount of oxygen that penetrates a DPVBi layer would impair luminescence efficiency of a device. Moreover, the absorption of own radiation (for DPVBi and TPD both) would additionally contribute to the rate of degradation of a device. It is reasonable to expect that transport properties would also be affected when materials are used as a hole-transporting layer in OLEDs.