

12TH CONFERENCE FOR YOUNG SCIENTISTS IN CERAMICS

CYSC

2017



12TH CONFERENCE
FOR YOUNG SCIENTISTS IN CERAMICS

BOOK OF ABSTRACTS

October 18-21, 2017
Faculty of Technology Novi Sad
Novi Sad, Serbia

**12th CONFERENCE for
YOUNG SCIENTISTS in CERAMICS**

**PROGRAMME
and
BOOK OF ABSTRACTS**

**October 18-21, 2017
Novi Sad, Serbia**

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Preface

The 12th Conference for Young Scientists in Ceramics is organized by the Department of Materials Engineering, Faculty of Technology Novi Sad, University of Novi Sad, in cooperation with Young Ceramists Network (an initiative of the European Ceramic Society).

This Conference first started as the Students' Meeting back in 1998 when it was just a national meeting for Serbian PhD students. After three national, this year is going to be the ninth consecutive international conference held every second year. For several years now, the Conference has a well-earned reputation as an excellent opportunity for the promotion of the work in the field of ceramics done by early stage researchers, being MSc and PhD students or young doctors. Additionally, the young scientists will be in the position to attend sessions covering major general topics of broad interest which will be presented by experienced scientists through the invited lectures. In that way, young researchers will have a chance to participate in the active discussions with their senior colleagues who are all well-known scientists in their area of expertise. We strongly hope that the overall activities during this event will create for the young researchers a fruitful platform for finding new topics, ideas and approaches for their scientific research and an excellent opportunity for establishing connections and finding proposals for collaborations.

General idea behind the Conference was and will continue to be the building of the closely intertwined European scientific network by offering the platform for young scientists to meet, discuss and exchange ideas in the ever growing field of ceramics. It is our deepest belief that this approach will be beneficial for both young researchers and the European science as a whole. Therefore, we strongly appreciate that the European Ceramic Society identified the efforts and the enthusiasm we have put into this idea of creating the bridge between young researchers and we truly hope that the European Ceramic Society will support this initiative in the future. Special thanks to the JECS Trust Fund for strong financial support of the Meeting. The Conference was also recognized by the Serbian Ministry of education, science and technological development as well as by the Provincial Secretariat for Higher Education and Scientific Research and we would like to thank them for their endorsements, too. A total number of 115 presentations given by young researchers, 1 plenary talk, and 13 invited talks coming from 25 countries with multidisciplinary profiles will be presented during the conference. It should be emphasized that presented topics cover research subjects of the highest scientific interest: experimental, theoretical and applicative aspects of synthesis, processing, advanced nano/microscale and functional characterization of various types of structures and ceramic materials.

We wish to express our thanks to the members of the local organizing committee in Novi Sad for their effort and time during preparation of the Conference, and especially to thank our endorsers and sponsors for making this event possible.

Editor

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**STRUCTURAL AND PHOTOLUMINESCENCE PROPERTIES OF THE
(Ni,Zn) Fe₂O₄-BaTiO₃ MULTIFERROIC COMPOSITE NANOPOWDERS**

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Ferriocs and multiferroics are among the most attractive multifunctional materials. In recent years, multiferroic composite consisted of two or more ferroic orders, such as ferroelectric, ferromagnetic, or ferroelastic, in which coupling between these phases can produce magnetoelectric effect, has been drawing significant attention. Besides others, (Ni, Zn)Fe₂O₄-BaTiO₃ composites have attracted considerable attention not only due to fundamental research of magneto-electric effect, but also for the potential applications in many electronic devices such as drug delivery, heterogeneous catalysis, levitated railway system, magnetic-refrigeration, microwave devices, antennas, memory devices, etc. In this composite, (Ni,Zn)Fe₂O₄(NZF) possesses magnetic behavior, and the ferroelectricity is due to the presence of BaTiO₃(BT). In the present work, it was investigated the structural and photoluminescence properties of NZF-BT composite nanopowders prepared by auto-combustion method and the different ratio of NZF/BT was explored. XRD indicated well cristallized powders but with small presence of secondary phases respecting to BT. By FE-SEM analyses was noticed the agglomerates with wide particles size distribution, as well as the difference of the particles morphology between (Ni,Zn)Fe₂O₄ and BaTiO₃. FT-IR spectra display interactions between metal-oxygen around 500-600 cm⁻¹. The different ratio of NZF/BT effects on the optical band gap values indicating the formation of intermediary levels modifying the Fermi level. Photoluminescence (PL) analysis provides important information about the materials structures, however the PL behavior of these composites is not very well known. The presence of PL emission suggests that the structures of the materials are medium range disordered. All samples showed a broad band emission centered around 450 nm, being a region characteristic of resultant emission from the presence of shallow defects in materials structures. This behavior is reinforced by deconvolution of PL bands, which shows the contribution of tree sub bands to emission (blue, green and yellow emission), being that the largest area of spectra is occupied by a band correspondent to blue emission.