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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properties toward the removal of MB dye during dark and visible light conditions. This finding is attributed to the presence of titanium particles coated the surface of CX-CNTs which act as active sites.

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Characterisation and optical properties of unmodified and modified CdSe/ZnS quantum dots in pol(methyl-methacrylate) and 3-mercaptopropyltrimethoxysilane

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The aim of this work is characterization of polymer nanocomposites based on poly (methyl methacrylate) (PMMA) matrix with embedded core-shell CdSe/ZnS quantum dots (QD`s). The modification of CdSe/ZnS quantum dots in PMMA interface was achieved with 3-mercaptopropyltrimethoxysilane (MPTMS). The optical properties and fluorescence of nanocomposite were investigated as consequence of interface modification. The optical properties were analyzed through FTIR and Raman. In polymer nanocomposite was established dipole-dipole bonding between S-H group of silane coupling agent and carbonyl groups of the polymer matrixes. Raman spectrum confirms a presence of alloyed layer at the core-shell interface. Time-resolved laser induced fluorescence measurements confirmed slight blue shift in CdSe/ZnS quantum dots in PMMA composite without interface modification, while there was a slight red shift with modified particles. Oxidation effects in quantum dots were removed with the use of PMMA as a host, and the core remained active, which was confirmed with FTIR analysis and time-resolved laser induced fluorescence measurements.

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Generalized Lorentz model description-Caputo-Fabrizio fractional derivative approach, of electrical, dielectric, conductive and magnetic processes in materials

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In this study, generalized Lorentz model is basic one-particle model in the framework of dielectric, conductive and/or magnetic responses of materials.

AC conductivity studies of various $BaTiO_3$ 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. This element, in the generalized Lorentz model, corresponds to Čaputo fractional derivative, who, as operator, contains a singular integral kernel in itself. However, in the literature,

fractional derivatives with a non singular integral kernels have recently emerged. One of them is a Caputo-Fabrizio fractional derivative.

In this work, physical basics and 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 tools for experimental measurements.

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Comparative Studies of BCY15 /Ni-Cu and BCY15 /Ni Cermet by Impedance Spectroscopy

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Yttrium-doped barium cerate (BCY15) with perovskite-type structure was used for the preparation of Ni-based BCY15 anode for proton conducting solid oxide fuel cell (pSOFC).

A low-temperature wet chemical approach for integration of Ni or Ni/Cu metallic particles in BCY15 was introduced aiming to avoid the traditional ceramic high-temperature processes. The bimetallic (BCY15/Ni-Cu) and monometallic (BCY15/Ni) powders were characterized by different physical-chemical methods. The electrochemical characterization of the produced cermet was performed by impedance spectroscopy.

The purpose of this work is a deeper insight into the electrochemical performance of the anode materials obtained by the new preparation approach and evaluation of its effectiveness. The kernel is the metallic phase oxidation level during the sintering step performed at high temperature (1250°C) in air. For this purpose comparative study of the reduction process which follows the high temperature sintering was carried out. The analysis of the results shows that in the bimetallic anode electronic conductivity is registered before the reduction while in the Ni-based BCY15 cermet no electronic conductivity is observed. This result shows that the presence of highly conductive Cu brings to lower oxidation which opens possibility for introduction of the wet chemical approach in the preparation of pSOFC.

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