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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INV-GE 2

The $BaTiO_3$ ferroelectric properties within the microscale fractal nature

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The electronic ceramics applications based on ferroelectric and dielectric properties have enormous grow in function of very high microelectronics integrations. We used nano $BaTiO_3$ with different versions of Y_2O_3 additives. We consolidated samples by sintering process in temperature interval from 1200 C to 1350 C. Here we also present some results as a "pre-coating" process for $BaTiO_3$nano structure. This was quite original experimental process effected on different ferroelectrics characteristics between the grains. By our approach these relations between the grains corresponding to our ideas for fractal microelectronics properties integrations. The fractal nature analysis has been applied, too. We applied the complex fractal corrections between the grains and pores surfaces, including the particles Brownian's Motion between the boundaries. This is completely new approach to the phenomenas of the ferroelectrics, dielectric and in general electronic properties integrations. we are on the way to create the correlation between the processing, structural and advance electronic properties for modern applications.

INV-GE 3

Synthesis, characterization and application of activated carbon materials obtained from biowaste

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The main objective of this research is to obtain carbonaceous material and active carbon material by the carbonization process in an inert atmosphere, activation with CO_2, then the hydrothermal synthesis method with the emphasis on phosphoric acid activation as well as a combination of carbonization and hydrothermal synthesis. It is also given an insight into the optimization of the parameter of the process of obtaining active carbon material, that is, how the process parameters affect the final product. Different precursors of biowaste for obtaining carbon materials were used.

The initial composition of the precursor as well as the final product (active carbon materials) were analyzed using a proximative and ultimate method. The active area surface, volume and pore size was determined using the BET method. Verification of surface-active reaction groups in the identified structures was carried out through Fourier-transform infrared (FTIR) spectroscopy.. Morphology of resulting activated carbon materials has been investigated by scanning electron microscopy (SEM) and X-ray diffraction (XRD). Energy efficiency or thermal power was measured using a calorimetric bomb.

The application of the obtained materials is reflected in the fact that we removed the waste, we prevented the pollution of nature, and on the other hand we have obtained material that can be used for various purposes, for example, air filters, water, superconductors, etc.