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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This paper reveals a new perspective on the enriched and more accurate integration of electronic parameters between grain and pore, especially in the domain of Brownian particle motion.

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The Rare earth Neodymium Zinc Titanite properties in microwave telecommunications and fractal nature structure analysis

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In this paper we present the research results on dielectric properties based on Rare earth Neodymium Zinc Titanites (NZT). These results show that we have a stable perovskite structure and the other structure search suggest that the monoclinic crystal structure could be proposed for NZT. Modelling and simulation were used in this research to define the atomic position and crystal structure of NZT. The compositions have very specific dielectric properties which could useful in microwave telecommunications. It is very important to reduce the size, weight and microelectronic devices coast for future applications. So, the new miniaturization, better packaging and higher level of integrations, by using multi-layer processes and advanced interconnection methods are very important for modern telecommunications. In that sense, some new results and knowledges about fractal nature in materials, electronic ceramics and perovskites are very important for new fractal microelectronics applications for modern communications and IT technologies. Instead of classic semiconductor technologies, which are not anymore so much perspective and promising in this area. Finally, all of these aspects are very important for microanthena systems in telecommunications.

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Structural and Dielectric Properties of Rare earth Neodymium Zinc Titanite

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Using the high -resolution x-ray diffraction (XRD) analysis, scanning electron microscopy (SEM), and temperature-dependent microwave resonator characterization the dielectric properties and phase assemblage of Rare earth Neodymium Zinc Titanite (NZT) was investigated in this research work. NZT ceramics samples were prepared via mixed oxide. The result shows that it is distrustful to be a stable perovskite structure, in fact something comparable to Ilmenite structure, nevertheless further research shows that the monoclinic structure can be purposed for NZT. The Modelling and simulation were used in this study to define the atomic position and structure of NZT.

In conclusions, single-phase ceramics of NZT; have been synthesised at every sintering temperature 1250-1675°C. NZT has the temperature coefficient of resonant frequency 47 MK^{-1}, Quality factor was 42000 at frequency of 4.33 GHz and relative permittivity 36. The crystal structure of NZT is monoclinic with Bravais Lattice P and space group of $P2_1/n$. Kikuchi line shows that this material has a single phase. These compositions have promising dielectric properties and can be used in microwave telecommunications.