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ADVANCED CERAMICS AND APPLICATION III
New Frontiers in Multifunctional Material Science and Processing

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Institute of Chemistry Technology and Metallurgy
Institute of Physics
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BaTiO₃ – ceramics and Fractal Microstructure Analyses

M. Cvetanović¹, F. Bastić¹, D. Sirmić¹, V. Mitić^{1,2}, Lj. Kocić¹, V. Paunović¹, M. Miljković³

¹*University of Niš, Faculty of Electronic Engineering, Niš, Serbia*

²*Institute of Technical Sciences of SASA, Belgrade, Serbia*

³*University of Nis, Center for Electron Microscopy, Nis, Serbia*

milos_cvetanovic@yahoo.com

Ceramics grain structure is difficult to describe by using traditional analytical methods based on Euclidean geometry. Using the fractal geometric/analytic methods instead, the new approach is offered in this paper.

There are a many materials that can be doped to BaTiO₃, in order to gain different characteristics and in this study we are using Ho₂O₃. Different concentrations has been used, as well as different sintering temperatures. For selected contacted grains, the SEM (Scanning Electron Microscope) pictures are taken providing suitable configuration for an electrical model study. It is shown that ferroelectric, optoelectric and piezoelectric properties, are influenced by fractal structure of grains and intergrains contacts, distribution of pores and inner dynamics during sintering process.

Nowadays the material science is aware of importance of taking fractal properties of different ceramics and a new analytic and numerical models are suggested. The similar behavior is discovered in thin films and nano technologies as well.