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EVOLUTION OF DIELECTRIC CERAMIC $Ba_{6-3x}Nd_{8+2x}Ti_{18}O_{54}$ (x=0.15) WITH MICROSTRUCTURE AT DIFFERENT SINTERING TEMPERATURES

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ABSTRACT

The doping mechanism of neodymium ion on barium titanate could be promising a new material for applications in miniature microwave technology and mobile communication systems. Microstructural of $Ba_{6-3x}Nd_{8+2x}Ti_{18}O_{54}$, with x=0.15 ceramics at different sintering temperatures were investigated. The samples were prepared by the magnetic stirring method and sintered at a temperature range from 600°C to 1300°C. Sintering effects on the crystallite structure and surface morphology were studied and characterized by XRD and FESEM. The transformation of majority of the phase in the system from barium titanate to barium neodymium titanate was confirmed by XRD pattern due to change in sintering temperature. The change in sample densities was determined using Archimede's method. Two activation energies of grain growth were observed by using estimated diffusion process. The activation energies were 0.0698 and 0.3348 eV for low sintering and high sintering temperatures respectively.

KEYWORDS: Evolutions, Microstructure, Surface Morphology, Activation Energy