

# Dielectric properties of $(\text{BiNbO}_4)_x\text{-(CaTiO}_3)_{1-x}$ by complex impedance spectroscopy

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Many materials have been developed to meet a variety of applications and, more recently, ceramics with low sintering temperature, high dielectric constant ( $\epsilon' r$ ) and low dielectric loss ( $\tan\delta$ ), have been highlighted [1, 2]. To develop a low-cost material with these characteristics, we present in this work the development of a series of composite ceramics based on bismuth niobate ( $\text{BiNbO}_4$ ) and calcium titanate ( $\text{CaTiO}_3$ ) matrices. The series follows the equation  $(\text{BiNbO}_4)_x\text{-(CaTiO}_3)_{1-x}$  and was produced from the solid state reaction. The compositions have the x variation of the formula with 0; 0.2; 0.4; 0.6; 0.8 and 1. Structural characterization was performed using X-ray Diffraction with Rietveld Refinement and morphology was studied using Scanning Electron Microscopy. Experiments were carried out to evaluate the dielectric behavior of the samples in the Radiofrequency range. The investigated samples showed that the material has great potential for application in radiofrequency and microwaves and can be used in the manufacture of miniaturized electronic devices and antennas.

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