

INFLUENCE OF ZINC OXIDE ADDITION ON LITHIUM-NIOBIUM-TITANIUM OXIDE CERAMICS

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Abstract

Lithium-niobium-titanium oxide ceramics (LNTOs) are prepared by solid-state reaction method and sintering at lower than standard temperatures for potential microwave electronics applications [1]. ZnO is added as a functional additive in two different weight percentages (2 and 5 wt. %) and changes in microstructure and electrical properties are observed. Scanning Electron Microscopy (SEM) has confirmed the existence of plate and rod-like shaped particles, which is a characteristic property of the *M*-phases group of LNTOs [2]. The density increase and porosity reduction appeared also as an effect of ZnO addition. X-Ray Diffraction (XRD) patterns and Raman spectra have been used to identify phases present in the synthesized LNTOs and to investigate their structure. To understand the conduction mechanism, electrical properties associated with microstructures in synthesized LNTOs were studied as a function of frequency and temperature using the complex impedance spectroscopy (IS) technique. The analysis of impedance data using an equivalent circuit indicates the differences in the electrical properties of the two LNTOs that are mainly attributed to the processes related to the grain boundaries.

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References

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