BROADBAND DIELECTRIC SPECTROSCOPY OF $Ag_{1-x}Li_xNbO_3$ (x = 0.05) CERAMICS

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Nowadays ferroelectric materials are a widely investigated topic due to their wide array of uses. Currently, lead based ceramics are dominant in regard to their excellent piezoelectric properties. However, due to their pollutive nature, alternative materials are necessary [1]. One of the possibilities is Ag1-xLixNbO3. Its excellent piezoelectric properties, high polarization and phase transition temperatures spark an interest in further research of this material. The present work is aimed towards investigating Ag1-xLixNbO3 via dielectric spectroscopy on a wide frequency scale. Ceramics were prepared by solid-state reaction method [2]. The investigation was carried out for a sample of x = 0.05 in wide temperature (120 K – 500 K) and frequency (100 kHz – 750 GHz) ranges. The obtained results show a weak dielectric anomaly close to ferroelectric phase transition temperature T = 300 K and a much stronger dielectric anomaly close to antiferroelectric phase transition temperature T = 400 K (Fig. 1). The value of the dielectric permittivity is quite high, while losses are quite low in wide frequency and temperature ranges, indicating that the ceramics are suitable for microwave applications.

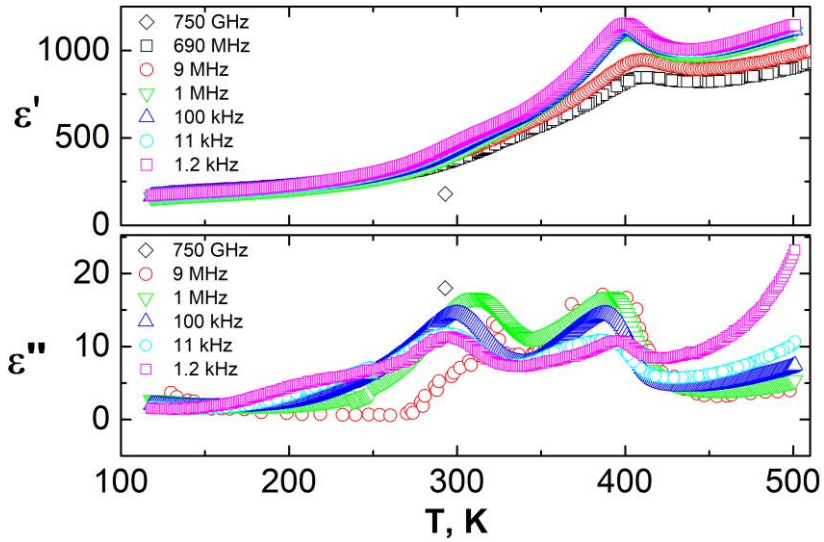

Fig. 1. Temperature dependence of real (*ε'*) and imaginary (*ε''*) parts of complex dielectric permittivity of $Ag_{0.95}Li_{0.05}NbO_3$ ceramics at varying frequencies.

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1. A. Saito, S. Uraki, H. Kakemoto, T. Tsurumi, S. Wada, Growth of lithium doped silver niobate single crystals and their piezoelectric properties, Materials Science and Engineering B 120 (2005).
2. A. Niewiadomski, D. Kajewski, A. Kania, K. Balin, S. Miga, M. Pawlik, J. Koperski, *Microstructure and characterization of $Ag_{1-x}Li_xNbO_3$ ceramics*, Ceramics International 42, 4445-4451 (2016).