Electrical and Structural Characterization of Ba(Y, Ta)$_x$ Ti$_{1-2x}$O$_3$

With $x = 0.025$ and $0.05$\(^1\) JERRY CONTRERAS, STEVEN C. TIDROW, The University of Texas-Pan American, DANIEL POTREPKA, FRANK CROWNE, U.S. Army Research Laboratory, ARTHUR TAUBER\(^2\), Retired — Ba(Y, Ta)$_x$ Ti$_{1-2x}$O$_3$, with $x = 0.025$ and $0.05$, is investigated through temperature dependent electrical and structural characterization. The material is electrically characterized from 10Hz to 2 MHz for dielectric constant, tunability, dissipation factor and figure of merit over the temperature range $-50 \degree C$ to $125 \degree C$. In addition, lattice parameters and structural changes of the material are reported as a function of temperature as obtained using x-ray diffraction and Rietveld refinement. Properties of these electric-field tunable materials are discussed in terms of ferroelectrics, non-relaxor versus relaxor behavior, and a ferroelectric dipole-like glass state.

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