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Synthesis and properties of $PbTi_{1-x}Ni_xO_3$. LARRY BUROKER, SOMADITYA SEN, MARIJA GAJDARDZISKA-JOSIFOVSKA, YING ZOU, SHISHIR RAY, MARK WILIAMSEN, PRASENJIT GUPTASARMA[1], University of Wisconsin - Milwaukee, USA — Magnetoelectrics are a class of multiferroic materials with magnetic and ferroelectric properties in the same phase. These have been a subject of intense investigation due to their fascinating physical properties, and the potential for new devices. We examine here the question of whether the successful substitution of a magnetic ion into a traditional ferroelectric lattice can result in a new magnetoelectric phase. Using a sol gel technique employing metal-ion chelate complexes, we have synthesized phase pure nanoparticulate samples of $PbTi_{1-x}Ni_xO_3$ for $0<x<0.3$. We report our studies of crystal structure refinement, magnetic and dielectric properties $0.3<T<300$ Kelvin, microstructure studies using High Resolution TEM, optical properties and vibrational spectroscopy in this new system.

[1]Corresponding Author

Larry Buroker
University of Wisconsin - Milwaukee, USA

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