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Broadband Dielectric Spectroscopy of A-site Substituted Relaxor Ceramics

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The technique of dielectric spectroscopy which overlaps frequency range from 1 mHz to 5 THz is a powerful tool to investigate disordered materials. Such experiments can be combined with FTIR measurements in order to describe the dynamics of polar nanoregions and optical phonons in materials like relaxor ferroelectrics.
In this contribution the broadband dielectric spectroscopy was employed to investigate several solid solution systems based on sodium bismuth titanate (i.e. 0.4Na0.5Bi0.5TiO3-(0.6-x)SrTiO3-xPbTiO3, (0.4-y)Na0.5Bi0.5TiO3-0.6SrTiO3-yPbTiO3 and zNa0.5Bi0.5TiO3-(1-z)Sr0.7Bi0.2TiO3). All three systems show rich behavior ranging from glassy state which crossovers to relaxor and even normal ferroelectric phase. The influence of polar nanoregions and phase diagrams of investigated materials will be discussed. In addition, ferroelectric hysteresis, pyroelectric and piezo measurements will be presented.

Primary author: Prof. BANYS, Juras (Vilnius University)

Co-authors: Prof. STERNBERG, Andris (Institute of Solid State Physics, University of Latvia); Dr BIRKS, Eriks (Institute of Solid State Physics, University of Latvia); Dr DUNCE, Marija (Institute of Solid State Physics, University of Latvia); Mr SVIRSKAS, Sarunas (Vilnius University); Prof. KAMBA, Stanislav (Institute of Physics, Academy of Science of Czech Republic)

Presenter: Prof. BANYS, Juras (Vilnius University)

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