

Characterization of the Electro-mechanical Behavior of Microstructure Textured Electroceramics

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Recent advances in the area of microstructure engineering for polycrystalline ceramics have indicated that significant performance gains can be realized for textured electro-ceramics. This has opened the door for the possibility of using lead free ferroelectrics to replace lead based systems for piezoelectric applications. To better characterize how the degree of texturing affects the macroscopic properties of the bulk ceramics the dielectric and electromechanical properties of textured and un-textured lead free ceramics have been measured. The particular family of compositions explored lies in the recently studied bismuth titanate - sodium bismuth titanate – barium titanate ternary. These results are compared to the electromechanical properties of an un-textured lead zirconate titanate (PZT) system. The results for PZT and the lead free ceramics will be presented as a function of pressure, temperature and electric field, and compared based on the textured orientation.

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