

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Highly piezoelectric Biocompatible and Soft Composite Fibers

ANTAL JAKLI, JASON MORVAN, Kent State University Kent, OH 44242, EBRU BUYUKTANIR, Stark State College, North Canton, OH, 44720, JOHN WEST, Kent State University Kent, OH 44242 — We report the fabrication of highly piezoelectric biocompatible soft fibers containing Barium Titanate (BT) ferroelectric ceramic particles dispersed in electrospun poly lactic acid (PLA). These fibers form mats that have two orders of magnitude larger piezoelectric constant per weight than single crystal barium titanate films. We demonstrate that the observed superpiezoelectricity results from the electrospinning induced polar alignment of the ferroelectric particles and the increased surface area compared to single crystal films. Due to the biocompatibility of PLA that encases the ferroelectric particles, these mats can be applied even in biological applications such as bio-sensors, artificial muscles and energy harvesting devices.

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Date submitted: 18 Nov 2011

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