

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Relaxor Ferroelectric Behavior from Strong Physical Pinning in a Poly(vinylidene fluoride-*co*-trifluoroethylene-*co*-chlorotrifluoroethylene) Random Terpolymer**<sup>1</sup> LEI ZHU, LIANYUN YANG, Dept. of Macromolecular Sci. & Eng., Case Western Reserve University, Cleveland, OH 44106, BRADY TYBURSKI, Dept. of Chemistry, Central Michigan University, Mount Pleasant, Michigan 48859, FABRICE DOMINGUES DOS SANTOS, Piezotech S.A.S, Arkema-CRRA, Rue Henri Moissan 69493 Pierre-Benite Cedex, France — Although narrow single hysteresis loop (SHL) is observed for electron beam (e-beam) irradiated poly(vinylidene fluoride-*co*-trifluoroethylene) [P(VDF-TrFE)] random copolymers owing to strong chemical pinning in isomorphic (or defect-modified) crystals, it has not been achieved for P(VDF-TrFE)-based random terpolymers, such as P(VDF-TrFE-CFE) (CFE is 1,1-chlorofluoroethylene), which only exhibits double hysteresis loops (DHLs). This is attributed to the weak physical pinning of CFE units in isomorphic crystals. In this work, the comonomer CFE in the terpolymer was replaced by the larger chlorotrifluoroethylene (CTFE). Intriguingly, narrow SHLs were exclusively observed for the P(VDF-TrFE-CTFE) terpolymer above room temperature. This was attributed to the stronger physical pinning force of the larger CTFE, which has a smaller dipole moment (only 0.64 Debye). This result provides us further insight into the structure and behavior of relaxor ferroelectric polymers, which can help to design and develop new ferroelectric polymers with more desirable properties and enhanced performance.

<sup>1</sup>This work is supported by National Science Foundation (DMR-0907580 and DMR-1402733).

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Date submitted: 14 Nov 2014

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