

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Stretching-Induced Novel Relaxor Ferroelectric Behavior In a Poly(vinylidene fluoride-*co*-trifluoroethylene-*co*-hexafluoropropylene) Random Terpolymer**<sup>1</sup> LEI ZHU, Dept. Macromolecular Science and Engineering, Case Western Reserve University, Cleveland, OH 44106, YUE LI, College of Polymer Science and Engineering, Sichuan University, China, THIBAUT SOULESTIN, BRUNO AMEDURI, Institut Charles Gerhardt de Montpellier, 34296 Montpellier, Cedex 5, France, FABRICE DOMINGUES DOS SANTOS, Piezotech S.A.S., Arkema-CRRA, rue Henri-Moissan, 69493 Pierre-Benite, Cedex, France — Poly(vinylidene fluoride-*co*-trifluoroethylene) [P(VDF-TrFE)]-based random terpolymers can exhibit unique relaxor ferroelectric behavior due to the formation of ferroelectric nanodomains by inclusion of relative bulky third monomers in the isomorphic crystalline structure. When the third monomer is too large such as hexafluoropropylene (HFP), they tend to be excluded from the crystalline lattice under normal crystallization conditions. Nonetheless, uniaxial stretching is found to induce the relaxor ferroelectric behavior for the P(VDF-TrFE-HFP) terpolymer. On the basis of structural characterization using X-ray diffraction and infrared spectroscopy, the relaxor ferroelectric behavior is found to be induced by inclusion of the large HFP units in P(VDF-TrFE) crystals upon stretching. The included HFP units not only expand the lateral interchain spacing to facilitate easier dipole/domain switching, but also divide the original large ferroelectric domains into nanodomains. As a result, the relaxor ferroelectric behavior is successfully achieved for the stretched films.

<sup>1</sup>This work is supported by NSF Polymers Program (DMR-1402733).

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Date submitted: 09 Nov 2016

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