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Confinement Effects of Polyvinylidene Fluoride-Co-Trifluoroethylene Nanorods KATHLEEN MCENNIS, University of Massachusetts Amherst, JODIE LUTKENHAUS, Yale University, THOMAS RUSSELL, University of Massachusetts Amherst — Polyvinylidene fluoride-co-trifluoroethylene (PVdF-TrFE) readily crystallizes into the ferroelectric β crystal phase and the crystallization and properties of PVdF-TrFE are affected by confinement. PVdF-TrFE nanorods were made by wetting and filling anodized aluminum oxide (AAO) templates that ranged in pore diameter from 15nm to 200nm. Modulated differential scanning calorimetry (MDSC) and X-ray diffraction (XRD) were used to analyze the effect of confinement on the transitions and structure. The ferroelectric and piezoelectric behavior of confined PVdF-TrFE nanorods was investigated using a high voltage displacement measuring fixture and results were compared to the bulk film. Crystallization within confined PVdF-TrFE nanorods was increasingly suppressed in smaller diameter pores, while the ferroelectric-paraelectric Curie transition remained invariant.

Kathleen McEnnis
University of Massachusetts Amherst

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