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Properties of Ferroelectric Polyvinylidene fluoride-co-trifluoroethylene Nanorods JODIE LUTKENHAUS, Yale University, THOMAS RUSSELL, University of Massachusetts Amherst — Ferroelectric and piezoelectric nanorods of polyvinylidene fluoride (PVdF) are potential candidates for sensing mechanical stimuli on the nano-scale. Left untreated PVdF tends to crystallize in a non-ferroelectric (α) phase. PVdF-co-trifluoroethylene (PVdF-TrFE), on the other hand, readily crystallizes into the ferroelectric (β) phase; however, the structure and properties can be significantly influenced by confinement. Here, the creation of PVdF-TrFE nanorods (dia. = 15 to 200 nm) using anodized aluminum oxide membranes was investigated. The crystallization behavior and the Curie transition (ferro- to paraelectric phase) were studied. Changes in structure and phase were investigated by X-ray diffraction (XRD) and differential scanning calorimetry (DSC). The effects of electrical poling, which increases dipole-orientation within the ferroelectric phase, are discussed.

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