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Morphology and Crystal Orientation of Ferroelectric P(VDF-ran-TrFE) in Cylindrical Nanopores NITIN SHINGNE, Institute of Physics, Martin Luther University, Halle, Germany, MARKUS GEUSS, Adolphe Merkle Institute, University of Fribourg, Switzerland, MARTIN STEINHART, Institute for Chemistry, University of Osnabruck, Osnabruck, Germany, THOMAS THURN-ALBRECHT, Institute of Physics, Martin Luther University, Halle, Germany — We prepared ferroelectric Poly(vinylidene fluoride -ran- trifluoroethylene) nanorods and nanotubes using ordered nanoporous alumina template. The nanostructures were characterized by using DSC, XRD, SEM and TEM. The DSC results show that the melting temperature decreases with increasing confinement while the ferroelectric to paraelectric phase transition temperature does not change. This shows that the size of the ferroelectric domain is independent of the crystal thickness. The x-ray results show that the P(VDF-ran-TrFE) crystallites are preferentially oriented with (110) planes parallel to the template surface with polar b-axis oriented 30° to the long axis of the pores. While the alignment of the chain perpendicular to the long axis of the pores is a result of crystallization kinetics in the hexagonal phase, the preferred orientation of the b-axis takes place during the paraelectric to ferroelectric phase transition.

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