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Molecular and Crystalline Microstructure of Ferroelectric Poly(vinylidene fluoride-*co*-trifluoroethylene) Ultrathin Films on Bare and Self-Assembled Monolayer-Modified Au Substrates YOUN JUNG PARK, SEOK JU KANG, Yonsei University, BERNARD LOTZ, ANNETTE THIERRY, Institut Charles Sadron, CHEOLMIN PARK, Yonsei University —
There has been much interest in polymorphic crystal structures and ferroelectric properties in polymer materials, as one way of an application for organic memory device. We investigate the molecular and microdomain structure of Poly vinylidene fluroride-*co*-trifluoroethylene (P(VDF-TrFE)) thin films spin-coated on bare and self-assembled monolayers (SAMs)-modified Au substrates. The two types of films display similar crystal morphologies with edge-on needlelike crystalline microdomains. They have, however, a different structure depending on the substrate. When the films are deposited on a bare Au surface, the films preferentially have a (110) contact plane with the substrate but a (100) contact plane when deposited on the Au surface modified by SAMs. The polar $b-$axis, along which the ferroelectric polarization is oriented, is therefore tilted to the film (and substrate) surface normal at 30 and 90 $^\circ$, respectively. In particular, the orientation of the polar b-axis tilted at some 90 $^\circ$ to the normal of the polymer films on a CH_3 terminated SAM modified Au surface explains the smaller remanent polarization at low initial electrical bias.

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