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Shear-induced orientation of poly(vinylidene fluoride-co-trifluoroethylene) thin films HEEJOON JUNG, JIYOUN CHANG, CHEOLMIN PARK, yonsei university, NANOPOLYMERS LABORATORY, YONSEI UNIVERSITY TEAM — Control of molecular and micro structures of crystalline polymers, in particular in organic electronics, has been widely studied because of the significant influence of the electrical performance of polymers by the controlled structures. Shear technique has been known as one of the most effective methods for manipulating micro structure of many different polymers. The application of the shear method to polymer films is, however, very difficult of the thickness of less than 200nm. In order to utilize the shear method for thin polymer film, we designed a new shear apparatus. We have demonstrated global ordering of semi-crystalline P(VDF-TrFE), well known crystalline polymer for in non-volatile ferroelectric polymer memory, using simple static shear in large area of a few centimeter squares. The orientation, systematically examined as a function of shearing temperature, rate and film thickness, was elucidated by Atomic force Microscope and Field-Emission Scanning Electron Microscope and related to the ferroelectric polarization of a metal/ferroelectric/metal capacitor. In addition, the globally ordered thin film P(VDF-TrFE) crystal was characterized by Grazing Incident Wide Angle X-rays.

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