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Crystal Orientation and Temperature Effects on the Double Hysteresis Loop Behavior of a PVDF-*g*-PS Graft Copolymer[1] LEI ZHU, LIANYUN YANG, FANGXIAO GUAN, Department of Macromolecular Science and Engineering, Case Western Reserve University, Cleveland, OH 44106 —
In a recent report, double hysteresis loop behavior is observed in a nanoconfined poly(vinylidene fluoride-*co*-trifluoroethylene-*co*-chlorotrifluoroethylene)-*graft*-polystyrene [P(VDF-TrFE-CTFE)-*g*-PS] copolymer. It is considered that the PS grafts are capable of reducing the compensation polarization and thus the polarization electric field during the reverse poling process, resulting in the double hysteresis loop behavior. In this study, we further investigated crystal orientation and temperature effects on this novel ferroelectric behavior. It is observed that with increasing the orientation factor, the electric displacement-electric field (D-E) loop changes from linear for non-oriented film to double loop for the well-oriented film. With increasing the temperature, the double hysteresis loop is gradually replaced by the single and open loop, which is attributed to the impurity ion migrational loss in the sample.

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