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Non-volatile Ferroelectric Poly(vinylidene fluoride-co-trifluoroethylene) Memory based on Single Crystalline Triisopropylsilylethynyl Pentacene Field Effect Transistor[1] SEOK JU KANG, INSUNG BAE, YOUN JUNG PARK, TAE HO PARK, JINWOO SUNG, CHEOLMIN PARK, Yonsei university — We develop a new type of non-volatile ferroelectric poly(vinylidene fluoride-co-trifluoroethylene) (P(VDF-TrFE)) memory based on Organic Thin Film Transistor (OTFT) with single crystal Triisopropylsilylethynyl pentacene (TIPS-PEN) active layer. A bottom gate OTFT was fabricated with thin P(VDF-TrFE) film gate insulator on which 1D ribbon type single crystal TIPS-PEN grown via solvent exchange method was positioned between Au source and drain electrode. As consequences a memory device exhibits substantially stable source-drain current modulation with the hysteresis ON/OFF ratio larger than 10^3, superior to a ferroelectric P(VDF-TrFE) OTFT with vacuum evaporated pentacene layer. Data retention longer than $5x10^4$ seconds was achieved in ambient condition by incorporating an interlayer between gate electrode and P(VDF-TrFE) thin film. The device is environmentally stable for more than 40 days without additional passivation.

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