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Ferroelectric Properties of Large Area Evaporated Vinylidene Fluoride Thin Films[1] KEITH FOREMAN, Univ of Nebraska-Lincoln, SHASHI PODDAR, Universite de Louvain, ADAM WORKMAN, SARA CALLORI, California State University, San Bernardino, STEPHEN DUCHARME, SHIREEN ADENWALLA, Univ of Nebraska-Lincoln — Organic electronics provide advantages in price, processing, and functionality. Poly(vinylidene fluoride) (PVDF) is a popular organic ferroelectric used a in wide variety of applications. The VDF oligomer features a higher surface charge density than PVDF and its copolymers and oligomer thin films can be deposited in vacuum, allowing for deposition on a metallic thin film without breaking vacuum. Despite these advantages, there has been little work towards employing the VDF oligomer in devices. Here, we report on stable and tunable ferroelectric behavior of large area VDF oligomer thin films and the interface with Co thin films. Pyroelectric measurements are used to identify the operating temperature of VDF oligomer-based devices and probe the stability of the ferroelectric polarization states over long periods of time. Using capacitance-voltage, current-voltage, and x-ray diffraction measurements, the remanent polarization and crystalline phase are reported, and the effects of annealing are clarified. X-ray photoelectron spectroscopy is used to characterize the VDF/Co interface. Finally, piezoresponse force microscopy is used to demonstrate large area ferroelectric domain writing VDF oligomer thin films. This work sets the stage for VDF oligomer based organic electronics.

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