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Charge-extraction analysis of organic and inorganic dielectrics for organic field-effect transistors JOSUE MARTINEZ HARDIGREE, THOMAS DAWIDCZYK, Johns Hopkins Univ, MATHIAS NYMAN, RONALD OSTERBACKA, Abo Akademi University, HOWARD KATZ, Johns Hopkins Univ — Organic field-effect transistors (OFETs) offer the promise of low-power, inexpensively-processed electronic devices. However, high threshold voltages (Vt) required for operation and poor Vt stability due to gate bias stress in OFETs has limited their adoption in high duty-cycle applications such as display technology. Herein we employ the charge extraction in a linearly-increasing voltage (CELIV) method to investigate the Vt stability of polarized gate dielectrics consisting of pristine and polarized polystyrene (PS) and perfluorinated polystyrene (F-PS). CELIV measurements were carried out on representative gate stacks analogous to previously-investigated p-type OFETs (J. Appl. Phys. doi: 10.1063/1.1427136). We compare CELIV transients of pristine and polarized polystyrene (PS) and perfluorinated polystyrene (F-PS) dielectrics in representative pentacene OFET gate stacks, correlating transient differences and Vt stability to the observed surface potential measurements of lateral OFETs fabricated using a recently-developed method (Appl. Phys. Lett., doi: 10.1063/1.3684977).

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