

Abstract Submitted
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Interfacial Width Measurements of Dielectric/P(NDI2OD-T2) Using Resonant Soft X-ray Reflectivity¹ HONGPING YAN, ZIRAN GU, ELIOT GANN, BRIAN COLLINS, NC State Univ., SUFAL SWARAJ, SOLEIL, CHENG WANG, Advanced Light Source, TORBEN SCHUETTFORT, CHRIS MCNEILL, Univ. of Cambridge, HARALD ADE, NC State Univ. — Interfaces between a conjugated polymer and a dielectric play a critical role in organic thin-film transistors, yet it's difficult to measure. Resonant Soft X-ray Reflectivity (R-SoXR) is a unique and relatively simple method to investigate such interfaces. By tuning the soft X-ray energies, we are able to selectively and quantitatively characterize the interfacial width and thicknesses of the films. In an effort to relate performance to interface structure, we have used R-SoXR to investigate polystyrene (PS) or poly(methyl methacrylate) (PMMA) as the top layer and poly{[N,N9-bis(2-octyldodecyl)-naphthalene-1,4,5,8-bis(dicarboximide)-2,6-diyl]-alt-5, 59-(2,29-bithiophene)} (P(NDI2OD-T2)) as bottom layer supported on a Si substrate. We found that the device with PS as dielectric has a higher threshold voltage, which correlates to the increased interfacial trapping due to increased interfacial roughness. The extension of R-SoXR to the energy of fluorine K absorption edge is also demonstrated.

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