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Cross-sectional Imaging of Organic Optoelectronic Devices and Molecularly Assembled Nanostructures[1] D.W. STEUERMAN, A. GARCIA, R. YANG, D.S. SEFEROS, H. WU, D. KORYSTOV, A. MIKHAILOVSKY, J.P. LOFVANDER, G.C. BAZAN, D.D. AWSCHALOM — As the science of organic optoelectronic devices continuously matures, performance often improves at the expense of molecular and architectural complexity. One widespread approach toward optimization is the use of several polymers and hybrid materials, either as blends or in multiple layers. Tools to provide a thorough understanding of interfacial structure are lacking. Therefore, we employed a dual beam scanning electron microscope/focused-ion beam (SEM/FIB) to create device cross-sections that we subsequently investigated by transmission electron microscopy (TEM). High resolution images of an assortment of devices will be presented, including: interfaces of polymer-electrode, polymer-polymer, polymer-nanoparticles, and oligomer-nanoparticles in fully fabricated devices and optical cavities. We directly observed a variety of polymer-polymer interfaces depending upon solvent casting conditions, annealing treatments, and molecular functionality.

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