

Abstract Submitted
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In-situ X-ray characterization of thermal and solvent based annealing of thin P3HT and P3HT/PCBM films¹ TOMMY HOFMANN, Brookhaven National Laboratory, HTAY HLAING, Stony Brook University, CHANG-YONG NAM, CHARLES BLACK, BENJAMIN OCKO, Brookhaven National Laboratory, BROOKHAVEN NATIONAL LAB TEAM — We have studied the annealing of thin films of P3HT (polyhexylthiophene) and mixed P3HT and PCBM thin films using in-situ Grazing Incidence Angle x-ray scattering techniques at the National Synchrotron Light Source. The films, 50-200 nm thick, were prepared using spin coating from a volatile solution. Both thermal and solvent annealing techniques are well known to improve electrical properties yet the precise mechanism is not well understood. In our measurements, we have monitored the dependence of the diffraction peak positions and widths under a variety of different in-situ thermal and solvent conditions. A detailed comparisons between these methods provides new insight into how to improve the crystallinity beyond what can be obtained by thermal methods alone. This may eventually lead to better electrical properties in thin film organic photovoltaic devices.

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Ben Ocko
Brookhaven National Laboratory

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