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Distinct Monolayer Structure of DH6T Films Grown on Untreated SiO₂¹ JOSEF SPALENKA, EHREN MANNEBACH, PHILLIP JOHNSON, University of Wisconsin-Madison, ZHONGHOU CAI, Advance Photon Source-Argonne National Laboratory, FRANZ HIMPSEL, PAUL EVANS, University of Wisconsin-Madison — Due to the relatively weak interactions between neighboring molecules, thin films of vacuum evaporated organic semiconductors can have different properties in monolayer films as compared to several monolayer and bulk-like films. We have structurally characterized monolayer and several monolayer films of dihexyl-sexithiophene (DH6T) using grazing incidence diffraction and near-edge x-ray absorption fine structure spectroscopy (NEXAFS), and electrically characterized low-coverage FET structures during deposition. The structural data indicate a distinct phase of DH6T in the monolayer which has a distorted unit cell and a distinct NEXAFS signature compared to thicker films. The hole mobility of ~ 0.8 cm²/V-s is approximately an order of magnitude higher than previously reported for vacuum deposited thick films of DH6T on unmodified SiO₂ surfaces.

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Josef Spalenka
University of Wisconsin-Madison

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