

Abstract Submitted
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Trap healing and ultra low-noise Hall effect at the surface of organic semiconductors VITALY PODZOROV, Rutgers Univ — Fundamental studies of intrinsic charge transport properties of organic semiconductors are often hindered by charge traps associated with static disorder present even in optimized single-crystal devices. Here, we report a novel method of surface functionalization using an inert non-conjugated polymer, perfluoropolyether (PFPE), deposited at the surface of organic molecular crystals, that results in accumulation of mobile holes and “trap healing” effect at the crystal/PFPE interface [1]. As a consequence, a remarkable ultra low-noise, trap-free conduction regime characterized by intrinsic mobility and transport anisotropy emerges in organic single crystals, and Hall effect measurements with unprecedented signal-to-noise ratio are demonstrated. This general method to convert trap-dominated organic semiconductors to intrinsic systems may enable the determination of intrinsic transport parameters with high accuracy and make Hall effect measurements in molecular crystals ubiquitous.

[1] B. Lee, Y. Chen, D. Fu, H. T. Yi, K. Czelen, H. Najafov, V. Podzorov, “Trap healing and ultra low-noise Hall effect at the surface of organic semiconductors,” *Nature Mater.* DOI 10.1038/NMAT3781 (2013).

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