

Abstract Submitted
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Illumination induced metastable polaron-supporting phase in poly p-phenylene- vinylene films E. EHRENFREUND, E. GERSHMAN, Y. EICHEN, Technion-Israel Institute of Technology, T. DRORI, C.X. SHENG, Z.V. VARDENY, University of Utah — We found a new illumination induced metastable polaron-supporting phase in pristine films of a soluble derivative of poly-p-phenylene vinylene (MEH-PPV). In the pristine, un-illuminated MEH-PPV phase *A*, the polymer films do not show any long-lived photogenerated polarons. Prolonged UV illumination, however, was found to induce a reversible, metastable phase *B*, characterized by its ability to support the existence of abundant long-lived photogenerated polarons. In the dark, films of phase *B* revert back to the original phase *A* within about thirty minutes at room temperature. Relying on the well-established ubiquitous reversible photoinduced cyclization of diarylethenes into dihydropyrene derivatives, we propose a reversible mechanism in which UV illumination creates metastable deep defects that substantially increase the photogenerated polaron lifetime.

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