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Title:Morphology effects on charge generation and recombination dynamics at ZnPc:C60 bulk hetero-junctions using time-resolved terahertz spectroscopy

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Abstract:The influence of growth temperature induced phase segregation and crystallinity in ZnPc:C60 blend films on the charge generation and recombination dynamics is investigated with optical-pump terahertz-probe spectroscopy. While an ultrafast photo-induced charge generation process is observed for all morphologies, a subsequent sub-nanosecond photoconductivity rise depends on crystallinity and phase segregation. For higher intensities, the signal is dominated by a morphology-dependent bimolecular recombination process. High local mobilities of minimal $\mu \sim 0.3 \text{ cm}^2/\text{Vs}$ are found. The increase of photoconductivity with film growth temperature correlates with formerly observed device photocurrent improvements.

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