

Time-of-flight photocurrent measurements to resolve long-range ordering of transport molecule in a photoreceptor charge transport layer

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Abstract

Structure and order within the charge generating, charge transporting, and overcoat layers of an organic photoreceptor can influence the device performance characteristics. Accordingly, the ability to measure the distribution of the active and non-active components within these layers is of fundamental importance. Charge transport dynamics across a semiconducting film of N,N'-diphenyl-N,N'-bis(3-methylphenyl)-[1,1'-biphenyl]-4,4'-diamine (TPD) doped polycarbonate is investigated via the time-of-flight method. The resulting photocurrent transients indicate a gradient in TPD concentration through the thickness of the film. This conclusion is verified by mapping TPD concentration through the cross-section of the film via Raman microspectroscopy.

Author Biography

Klenkler received a B.Eng. degree within the discipline of Materials Engineering from McMaster University in 2001. He continued on to pursue graduate studies in the Materials department at McMaster under the supervision of Dr. Gu Xu and former Xerox research fellow Dr. Zoran Popovic. After completing his Ph.D. in 2007, he joined the Xerox Research Centre of Canada as a post-doctoral fellow where he is currently exploring charge transport phenomena in organic photoreceptors.