

Abstract Submitted
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Comparison of Reverse Leakage Current Density in Bilayer and Bulk Heterojunction Organic Photodetectors¹ XIN XU, ANANTH DODABALAPUR, University of Texas Austin — Soft materials such as organic semiconducting polymers and small molecules will allow the development of next generation photodetectors. Their ease of manufacturing and ability to be placed on flexible substrates allow new innovations such flexible camera elements. While organic photodetectors are structurally similar to their solar cell counterparts, their operation under reverse bias is an important difference which leads to differences in optimization. Reverse leakage current within photodetectors are a key metric in their performance. Minimizing these leakage currents is an important research goal for the advancement of organic photodetectors. We have examined a variety of photodetector structures and material systems to study this topic. We will compare two different active layer structures, bilayer and heterojunctions, and their respective optimizations. We have examined how the HOMO-LUMO level alignments in our device structure will impact device performance. We have also examined different material systems such as ZnO/CuPc, ZnO/P3HT, and P3HT/PCBM. Using all of this data, we will present a broad picture on how to improve organic photodetector performance.

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