

Influence of Functionalized C₆₀ Structure on Polymer Photovoltaic Degradation

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Polymer-based photovoltaics hold the promise for inexpensive flexible solar cells. However there are currently two major obstacles to polymer solar cell technology: relatively poor power conversion efficiency and chemical instability. Our work is focused on the latter issue. We are studying the time dependence of device performance for photocells using blends containing a conjugated polymer (MEH-PPV) with two different functionalized C₆₀ electron acceptor molecules: a commercially available version and one produced in our laboratory. These devices are fabricated in a chemically inert environment, but then tested under ambient conditions. Variations in the characteristic lifetime of the devices are observed to depend on the molar fraction of the electron acceptor molecules (calculated with respect to the MEH-PPV monomer fraction). We also see dramatic differences in the decay behavior between the two blends.