

Abstract Submitted  
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**Photoinduced charge transfer in bifunctional molecules with both electron donor and acceptor groups** J. H. PARK, Y. WU, J. PARQUETTE, A. J. EPSTEIN, The Ohio State University, Columbus OH 43210-1106, P. PADMAWAR, L. Y. CHIANG, University of Massachusetts, Lowell MA 01854-5047 — Charge transfer within photo-active molecules is one of the important mechanisms for achieving photo-sensitive devices. We have employed two kinds of material, C<sub>60</sub>-diphenylaminofluorene-C<sub>18</sub> [1] and an intramolecularly hydrogen-bonded, porphyrin-terminated dendron with a focal naphthylene diimide [2]. Both have electron donor and acceptor groups in a molecule. For the former, we made the structure by sandwiching a film of the photo-active material between ITO electrodes to measure photoconductivity spectrum in near-UV/Vis/near-IR range. Photoconductivity is on order of 10<sup>-12</sup>S/cm and it is dependent on light intensity and wavelength. As light intensity increases, photoconductivity increases for  $\lambda \sim 350\text{nm}$ , but it decreases for  $\lambda \sim 650\text{nm}$ . For the latter, we made photovoltaic cells with aluminum and ITO electrodes. IV characteristics were measured at each spectrum peak of donor (414, 516, 552, 590, 646nm) and acceptor (360, 382nm) absorption. At 516, 552 nm, the devices shows highest power conversion efficiency with  $V_{oc} \sim 0.8\text{ V}$  and  $J_{sc} \sim 5 \times 10^{-8}\text{ A/cm}^2$ . The mechanisms and measurements of temperature dependence will be discussed. [1] H. Luo *et. al.*, J. Phys. Chem. B 107, 9312 (2003). [2] Y. Wu *et. al.* to be published

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