Plastic Solar Cells based on Interpenetrating Network of Donor/Acceptor Bulk Heterojunctions

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Using conjugated polymers as electron donors as well as fullerene derivatives as electron acceptors in bulk solid state mixtures photovoltaic cells AM1.5 energy conversion efficiencies up to 3% have been realized.

These plastic solar cells are based on an ultrafast electron transfer between these donor/acceptor phases upon light illumination. The control of this photoinduced electron transfer by controlling of the chemical as well as the morphological structure of the two phases is important for charge generation. After the charges are generated they have to be transported to the electrodes which puts a challenge on the mobility of the charge carriers in this complex morphology. By optimizing both parameters the efficiencies can be significantly increased.