

Triplet States in Organic and Organometallic Photovoltaic Cells

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Light absorption by conjugated organic polymers produces the singlet exciton state. This is the state that is active in charge generation in bulk heterojunction organic photovoltaic materials. By incorporating heavy metals such as platinum, gold and mercury into a conjugated polymer it is possible to induce rapid and efficient formation of the triplet exciton state. We have been investigating the fundamental properties and solar cell application of triplet excitons in organometallic conjugated polymers that contain platinum(II) centers. The studies show that triplet exciton state has a comparably long diffusion length and it is active in charge generation in polymer/PCBM bulk heterojunction and bilayer film device formats.