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**Novel Dyad-Fullerene Derivative Used as Acceptor with P3HT in Bulk Heterojunction Solar Cells**

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Novel Dyad-Fullerene Derivative Used as Acceptor with P3HT in Bulk Heterojunction Solar Cells

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Within the world of solar cells, research is rapidly uncovering potential solutions to the alternative energy issues by utilizing bulk-heterojunction cell techniques (Figure 1a) for low-cost and quick effective manufacturing. In this scope of research, a unique concept of donor-acceptor (D-A) system pairing as an acceptor within the bulk-heterojunction cell has been brought to light; a new concept of utilizing HOMO/LUMO pairings to create effective transport systems between a combination D-A acceptor and polymer donor is being optimized for maximum Photo-Conversion Efficiency (PCE). Due to a similar band gap relationship between the commonly reported PCBM and the novel dyad fullerene derivative (Figure 1b C60-TPA) used in this bulk-heterojunction system, a reference polymer donor referred to as P3HT is the designed to accomplish the goal of achieving higher PCEs. After synthesis and characterization of the dyad and preparation of devices using this distinctive concept of a potential donor-acceptor dyad system testing of the PCE was done using a PCBM/P3HT as a reference. Research in this innovative arena of photovoltaic cells is crucial because of the alternative possibilities it offers within development of organic photovoltaic cells, vital for establishing a competitive advantage in efficiency over the inorganic counterparts in the solar cell field.