

Novel spirobifluorene-based electron-donor for solution-processed organic solar cells

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Organic solar cells (OSCs) are considered as the most promising next-generation energy resources to execute the increasing renewable energy demand. Spiro-based molecules have rigid fused ring structure which efficiently suppress intermolecular interactions and diminish the aggregation of molecules owing to high steric hindrance. In this work, a novel spirobifluorene-based small molecule, CF<sub>3</sub>-Spiro-R was synthesized and applied as donor for the solution-processed small molecule organic solar cells. The obtained small molecule displays excellent solubility and good electrochemical properties in common organic solvents owing to presence of side chain. The small molecule-based solar cell devices have shown a promising performance in solution-processed fabrication. The improved solubility results in the smooth film morphology which facilitated the intramolecular charge transfer and enhances the efficiency.