Applying direct heteroarylation synthesis to evaluate organic dyes as the core component in PDI-based molecular materials for fullerene-free organic solar cells

Titre	Applying direct heteroarylation synthesis to evaluate organic dyes as the core component in PDI-based molecular materials for fullerene-free organic solar cells
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Résumé en anglais	Direct heteroarylation has emerged as a versatile and powerful tool to access π-conjugated materials through atom-economical Pd-catalyzed carbon–carbon bond forming reactions. Employing this synthetic protocol has enabled the facile evaluation of a series of organic dyes in a PDI-dye-PDI framework. Material properties are largely dictated by the PDI components, but the incorporation of either thienoisoindigo, diketopyrrolopyrrole or isoindigo has been shown to influence the ionization potential and absorption profiles of the final materials. Solution-processable organic solar cell devices were fabricated to investigate the influence of the different dye cores on photovoltaic performance when paired with the donor polymer PTB7-Th. It was found that the diketopyrrolopyrrole-based material out-performed the other organic dyes, demonstrating energy losses of less than 0.6 eV, promising efficiencies when cast from non-halogenated solvents and the ability to dictate self-assembly induced by small volume fractions of the high-boiling solvent additive 1,8-diiodooctane to reach best device efficiencies of 4.1%.
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Liens

[1] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=26388
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