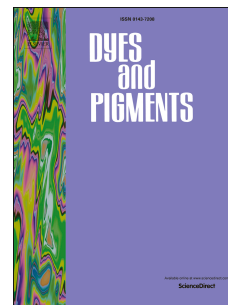


Accepted Manuscript

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PII: S0143-7208(17)30473-4

DOI: [10.1016/j.dyepig.2017.04.052](https://doi.org/10.1016/j.dyepig.2017.04.052)

Reference: DYPI 5949

To appear in: *Dyes and Pigments*

Received Date: 7 March 2017

Revised Date: 26 March 2017

Accepted Date: 24 April 2017

Please cite this article as: Weng C, Guo H, Zhang Z, Zhang J, Zhao B, Tan S, Regular terpolymers with benzothiadiazole side groups for improving the performances of polymer solar cells, *Dyes and Pigments* (2017), doi: 10.1016/j.dyepig.2017.04.052.

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Regular terpolymers with benzothiadiazole side groups for improving the performances of polymer solar cells

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ABSTRACT: Three new random or regular terpolymers (ra-P1, re-P2, and re-P3) based on diketopyrrolopyrrole (DPP) and 5,6-difluorobenzo-[c][1,2,5]thiadiazole (ffBT) as electron-deficient unit (A), alkylthienyl-substituted benzodithiophene (BDTT) as electron-rich units (D) have been designed and synthesized for donor materials in polymer solar cells. The differences on photophysical, electrochemical, and photovoltaic properties of these terpolymers have been investigated. Compared with random terpolymer ra-P1, regular terpolymer re-P2 has stronger absorption band range from 300 to 800 nm, higher hole mobility and more appropriate surface morphology. With increasing the quantity of DTffBT, regular terpolymer re-P3 showed more stronger absorption band in 300-600 nm compared to re-P2. The polymer solar cells have been fabricated by using these terpolymers as donor materials and [6,6]-phenyl-C₇₁-butyric acid methyl ester (PC₇₁BM) as the acceptor

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