

## Significantly Improving the Efficiency of Polymer Solar Cells through Incorporating Noncovalent Conformational Locks

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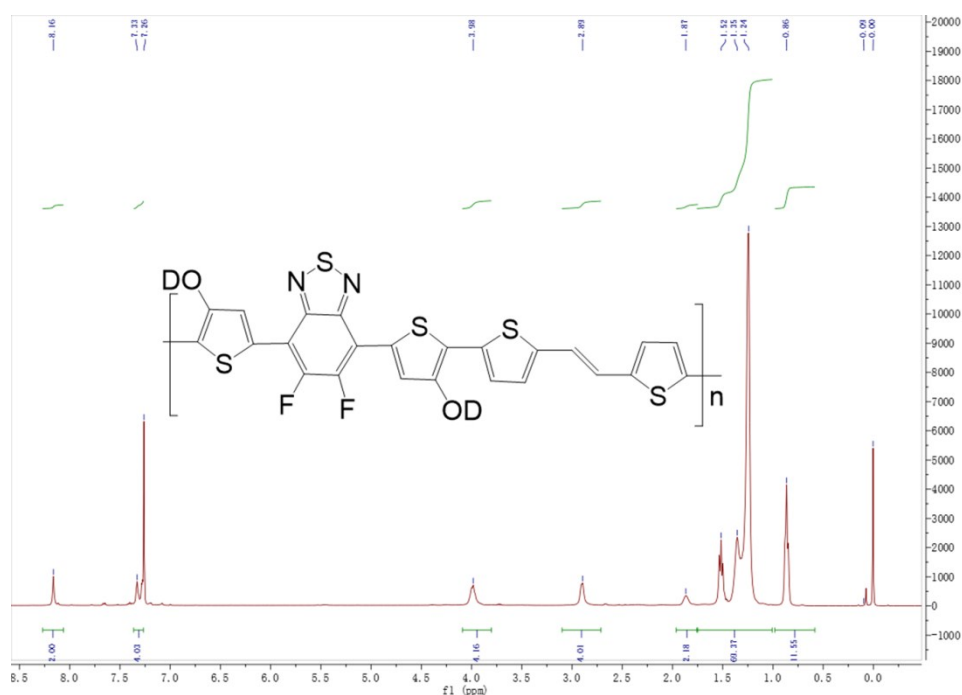


Fig. S1. <sup>1</sup>H NMR spectrum of PDTffBT-TVT at 298K.

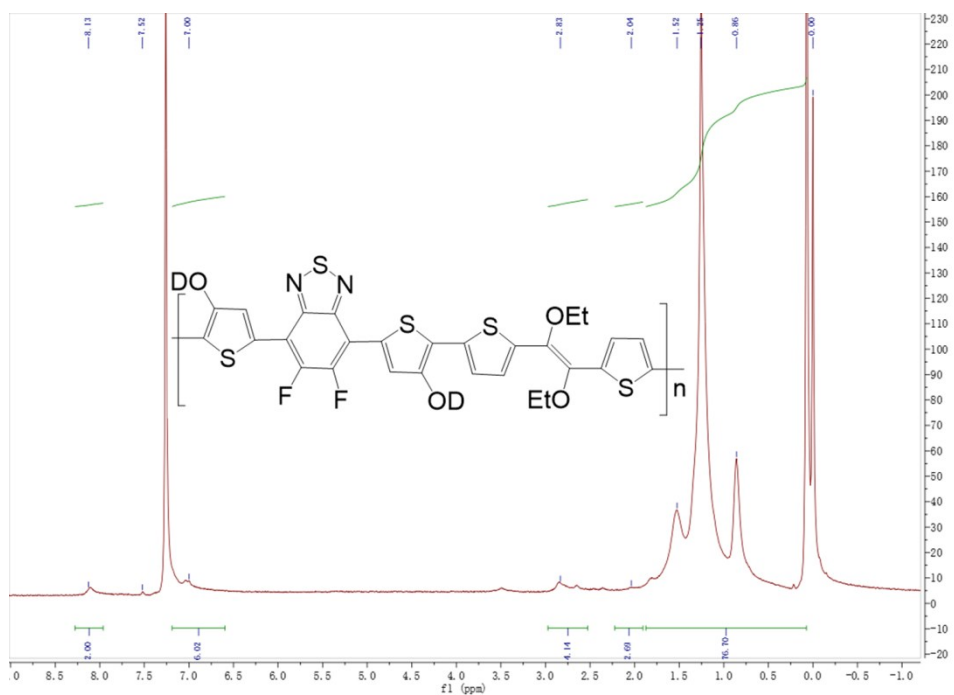


Fig. S2.  $^1\text{H}$  NMR spectrum of PDTffBT-TVTOEt at 298K.

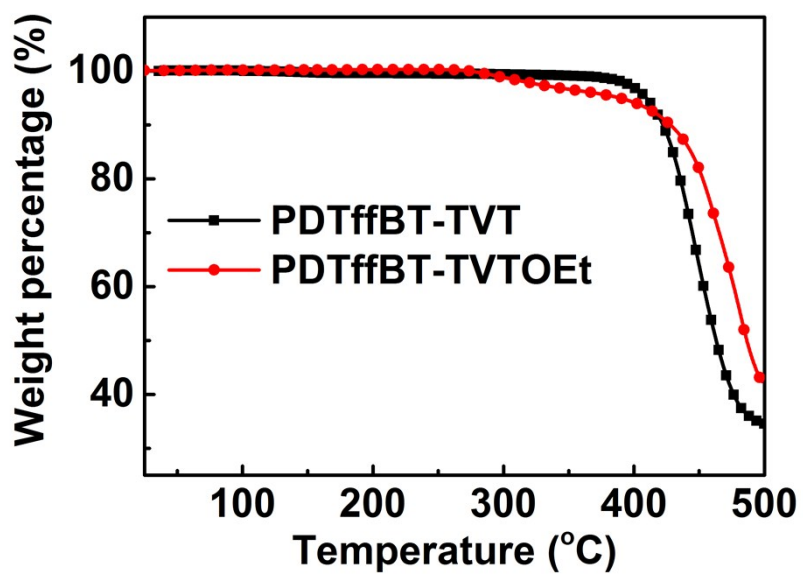


Fig. S3. TGA thermograms of polymers under nitrogen.

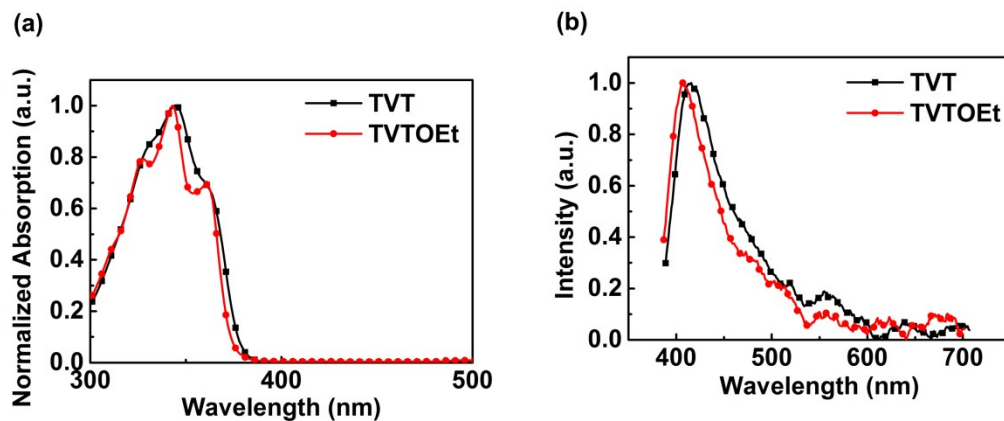


Fig. S4. UV-vis (a) and photoluminescence (b) spectra of the solution of TVT and TVTOEt.

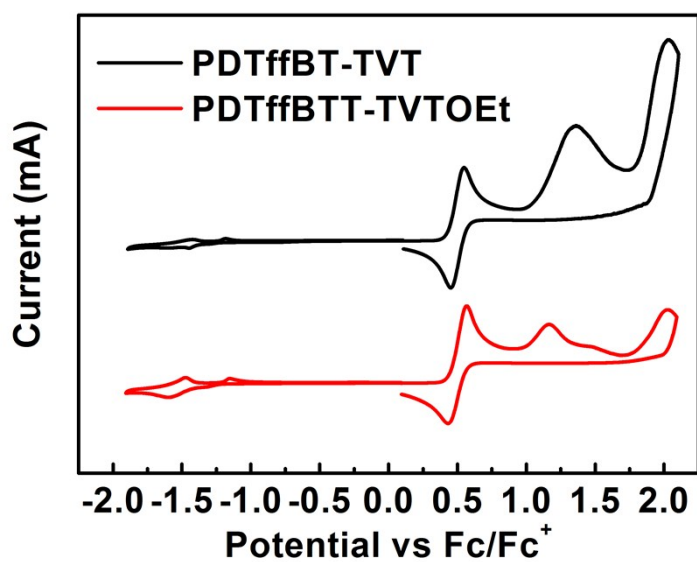


Fig. S5. Cyclic voltammograms of polymers' films on Glassy Carbon electrode in 0.1 M  $\text{Bu}_4\text{NPF}_6$  solution in acetonitrile with a scan rate of 50 mV/s.

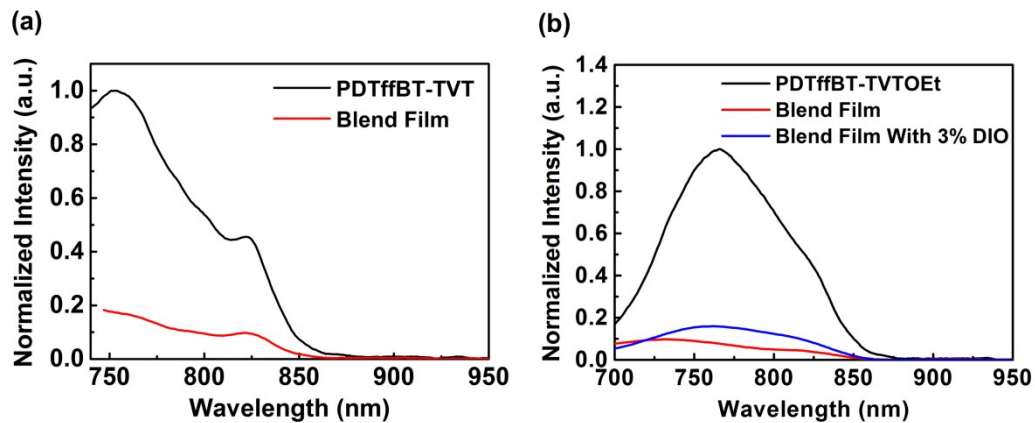


Fig. S6. Photoluminescence of polymers: PC<sub>71</sub>BM blend films

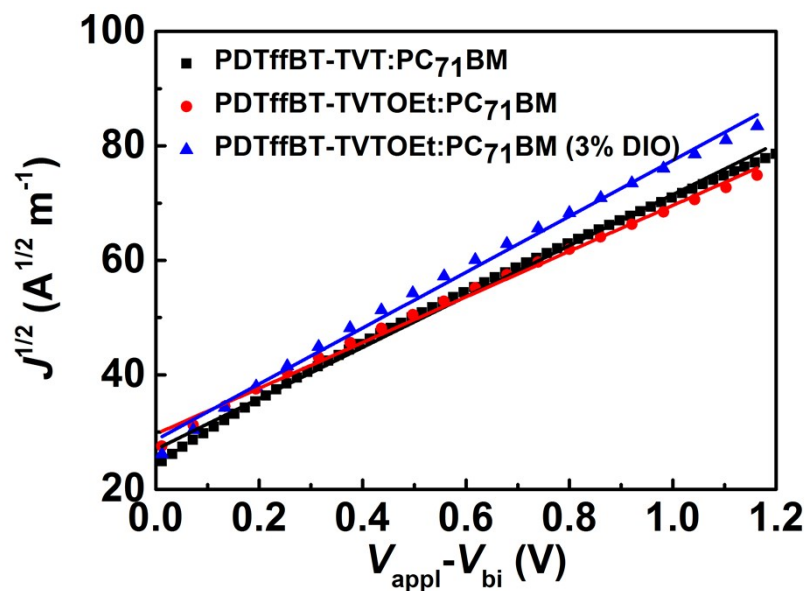


Fig. S7.  $J^{1/2}$ - $V$  plots for hole-only devices based on polymer:PC<sub>71</sub>BM.

Table S1 Summary of absorption and emission characteristics of the solution of TVT and TVTOEt

	$\lambda_{em}$ [nm]	$\lambda_{abs}$ [nm]	$\Delta\lambda$ [nm]
TVT	416	345	71
TVTOEt	402	343	59