Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Efficient carbazole-based small-molecule organic solar cells with an improved fill factor

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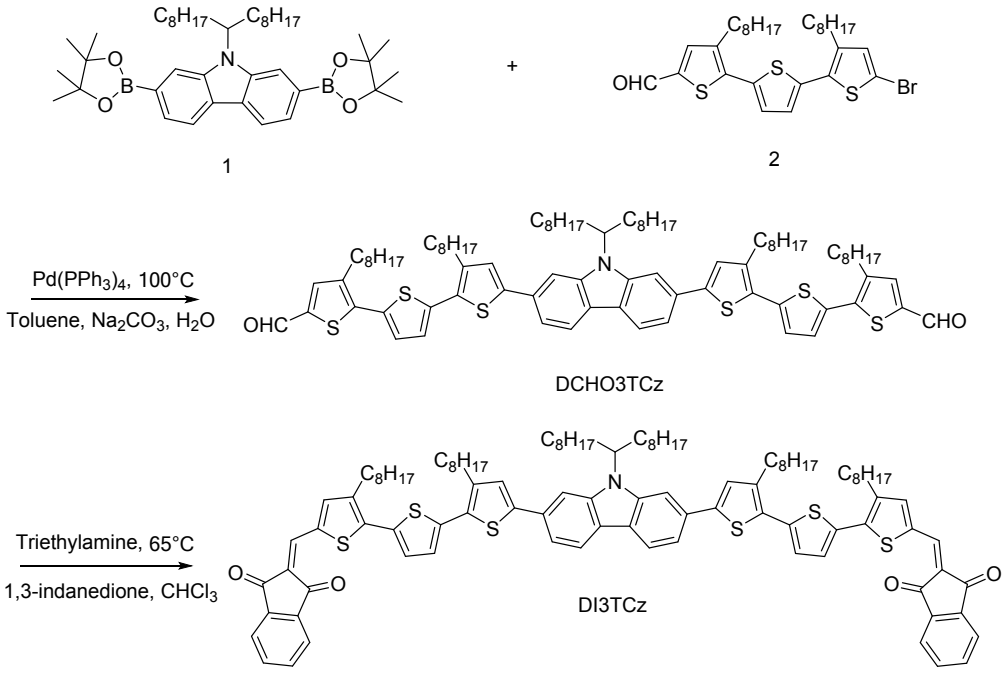

Scheme S1. Synthetic routes for DI3TCz.

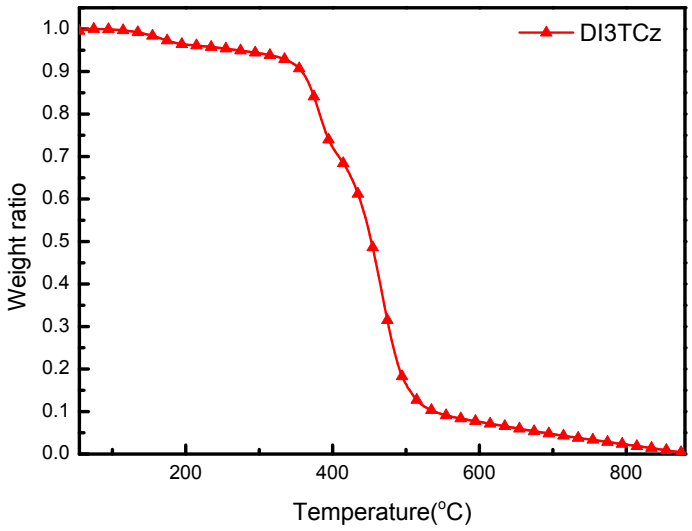

Figure S1. TGA curve of DI3TCz with a heating rate of 10°C min^{-1} under N_2 atmosphere.

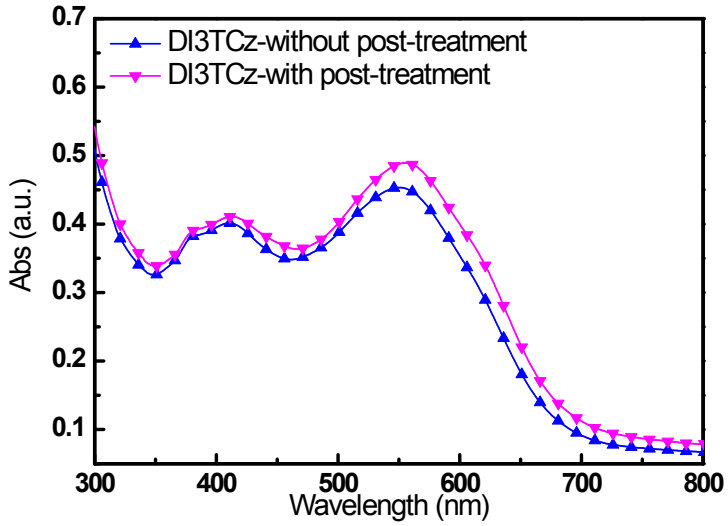

Figure S2. Uv-vis absorption spectral of DI3TCz:$PC_{71}BM$ blend films.

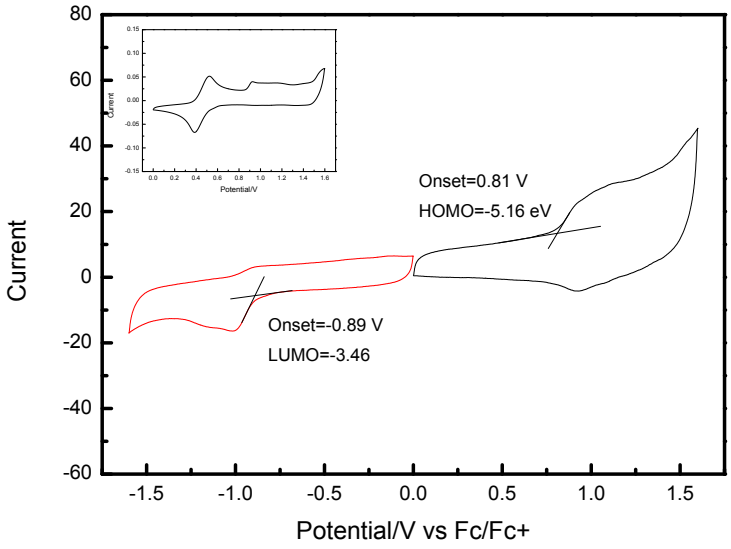

Figure S3. Cyclic voltammograms of DI3TCz in CH_2Cl_2 with 0.1M Bu_4NPF_6 with a scan rate of 100 mV s^{-1}.

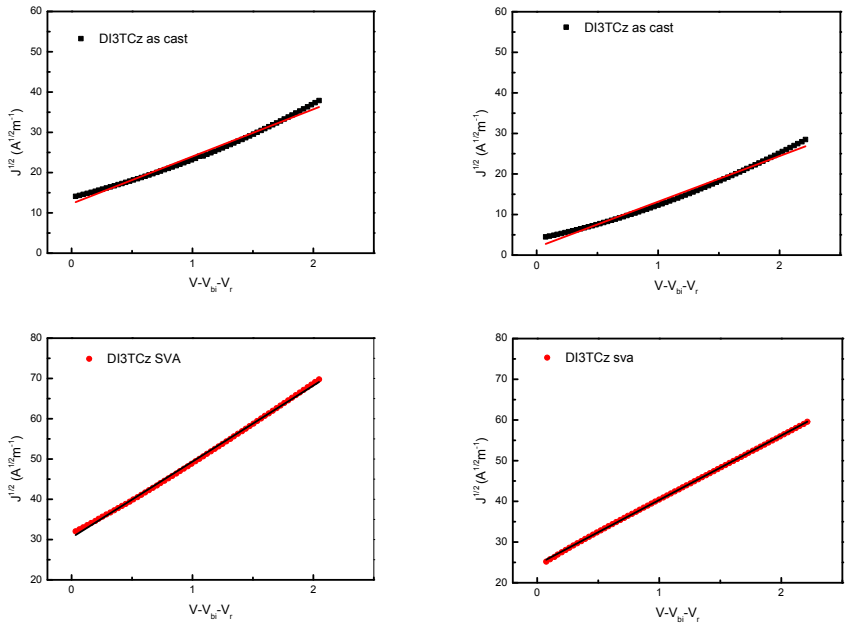

Figure S4. J-V characteristics for electron-only (a) and hole-only (b) devices fabricated from DI3TCz:$PC_{71}BM$ (1:0.8). The solid lines represent the fit using a model of single carrier SCLC with field-independent mobility. The JD-V characteristics are corrected for the built-in voltage Vbi that arises from the work function difference between the contacts.

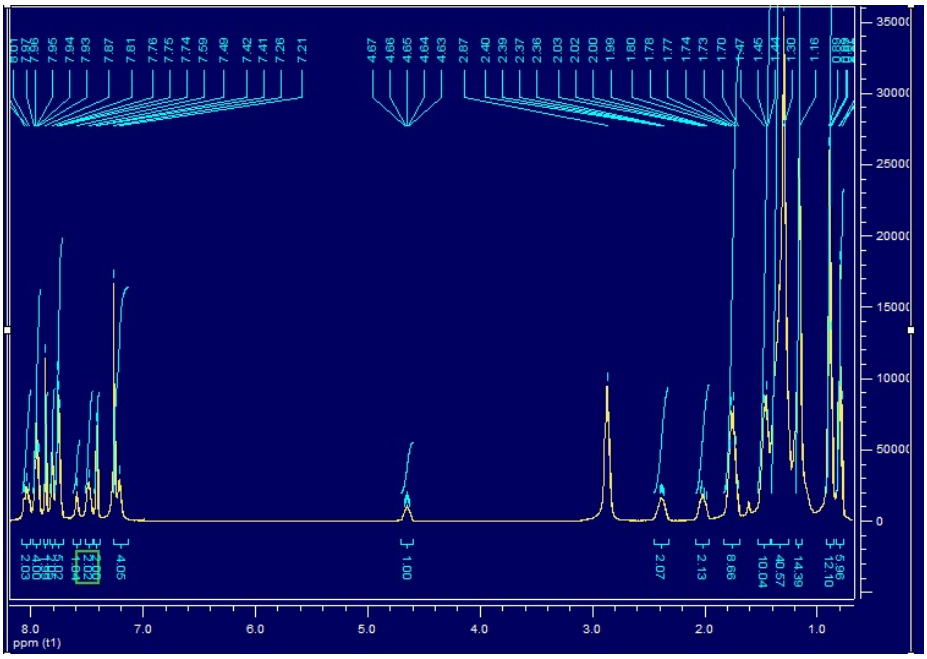

Figure S5. ^{1}H NMR spectral of compound DI3TCz at 300K in $CDCl_3$.

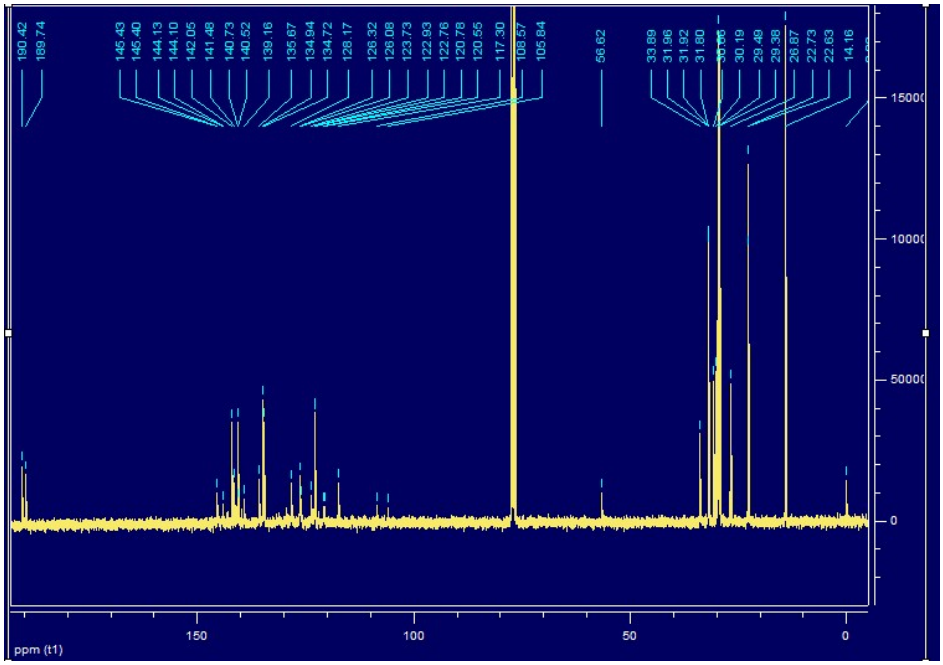

Figure S6. ^{13}C NMR spectral of compound DI3TCz at 300K in $CDCl_3$.

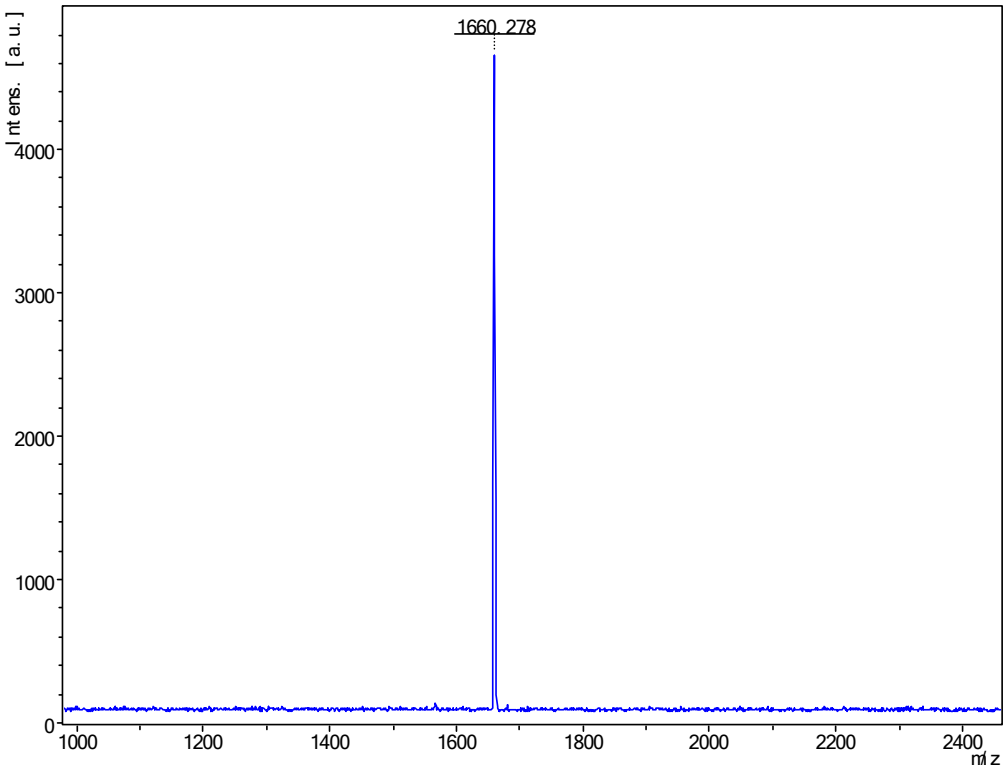

Figure S7. The MALDI-TOF plot of compound DI3TCz.

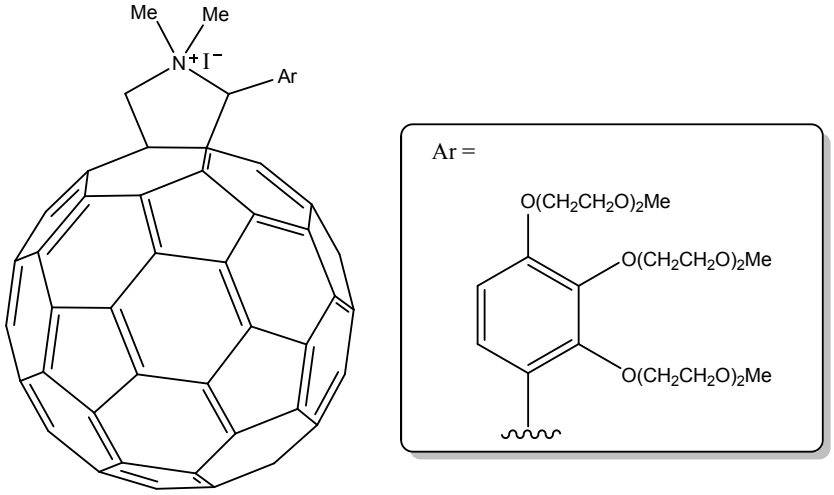

Figure S8. The chemical structure of PrC60MA. (Li, C. Z.; Chueh, C. C.; Yip, H. L.; O'Malley, K. M.; Chen, W. C.; Jen, A. K. Y. *J. Mater. Chem.* **2012**, *22*, 8574)