

Supplementary Material (ESI) for RSC Advances

# Triisopropylsilylacetylene-Functionalised Anthracene-*alt*-Benzothiadiazole Copolymers for Application in Bulk Heterojunction Solar Cells

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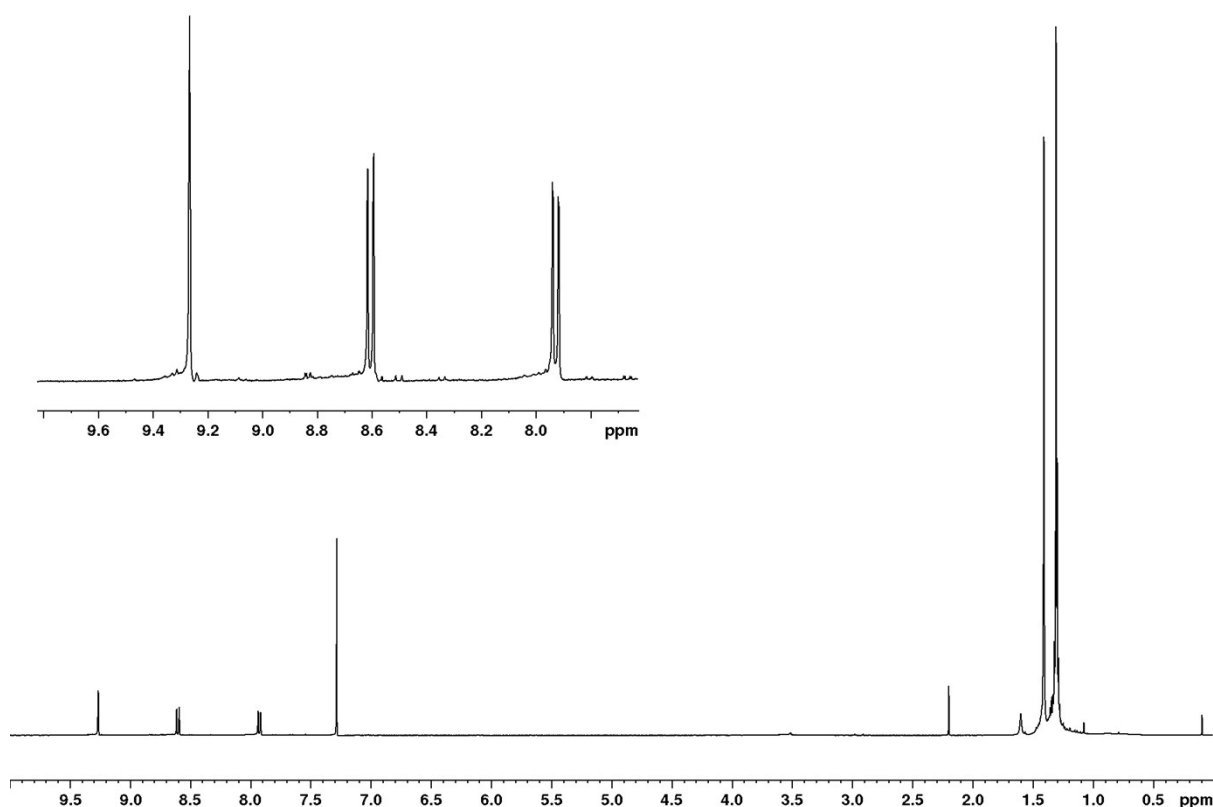
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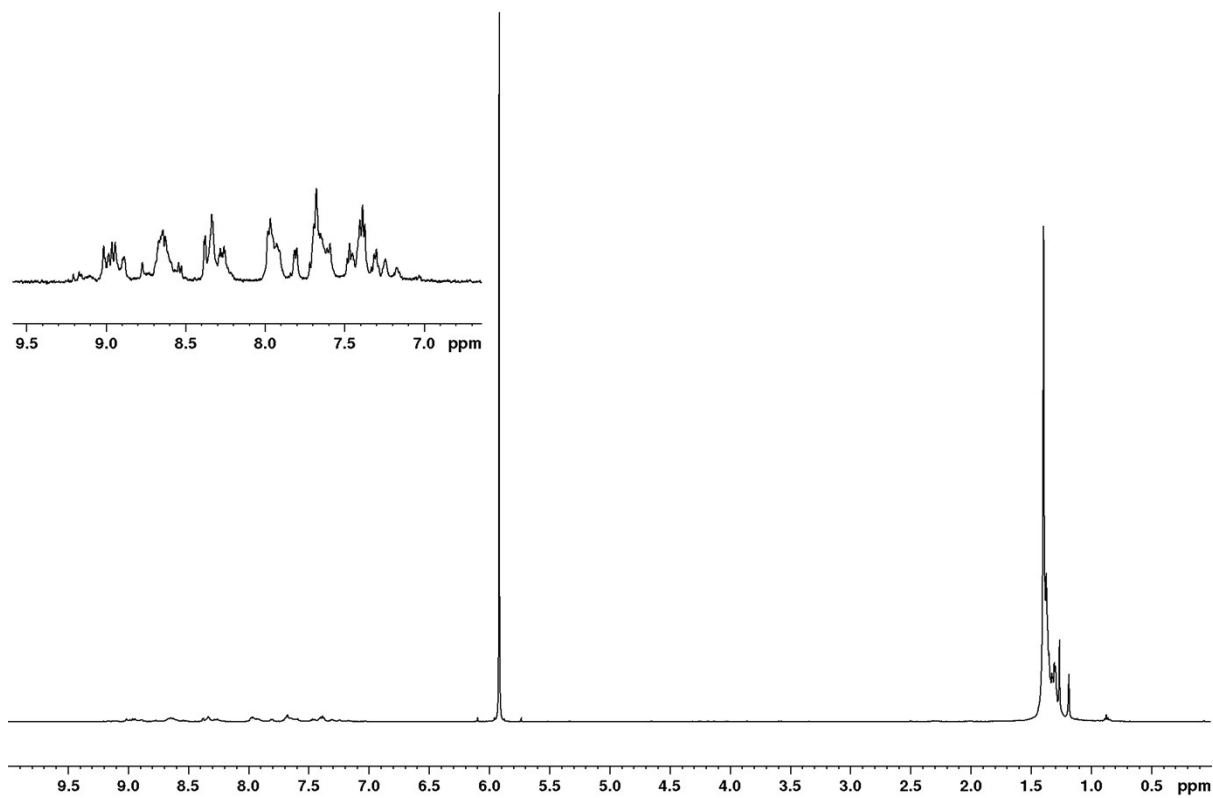
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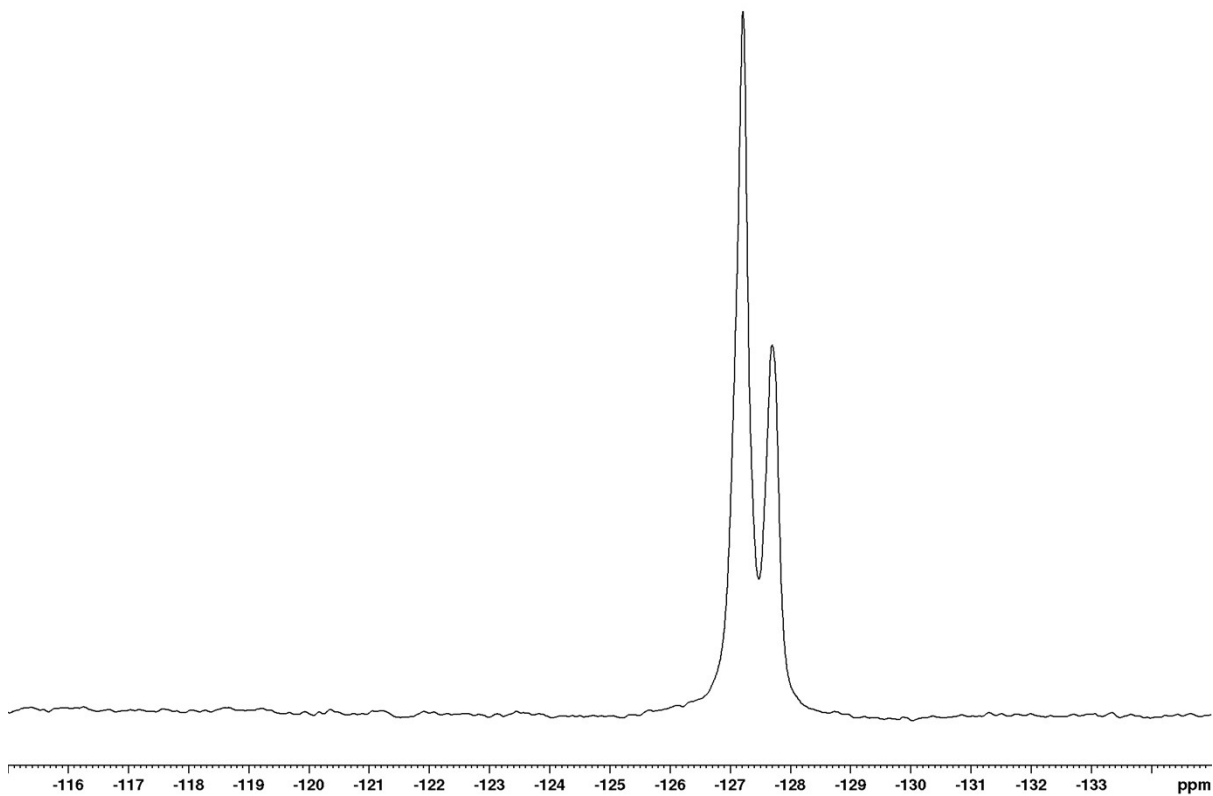
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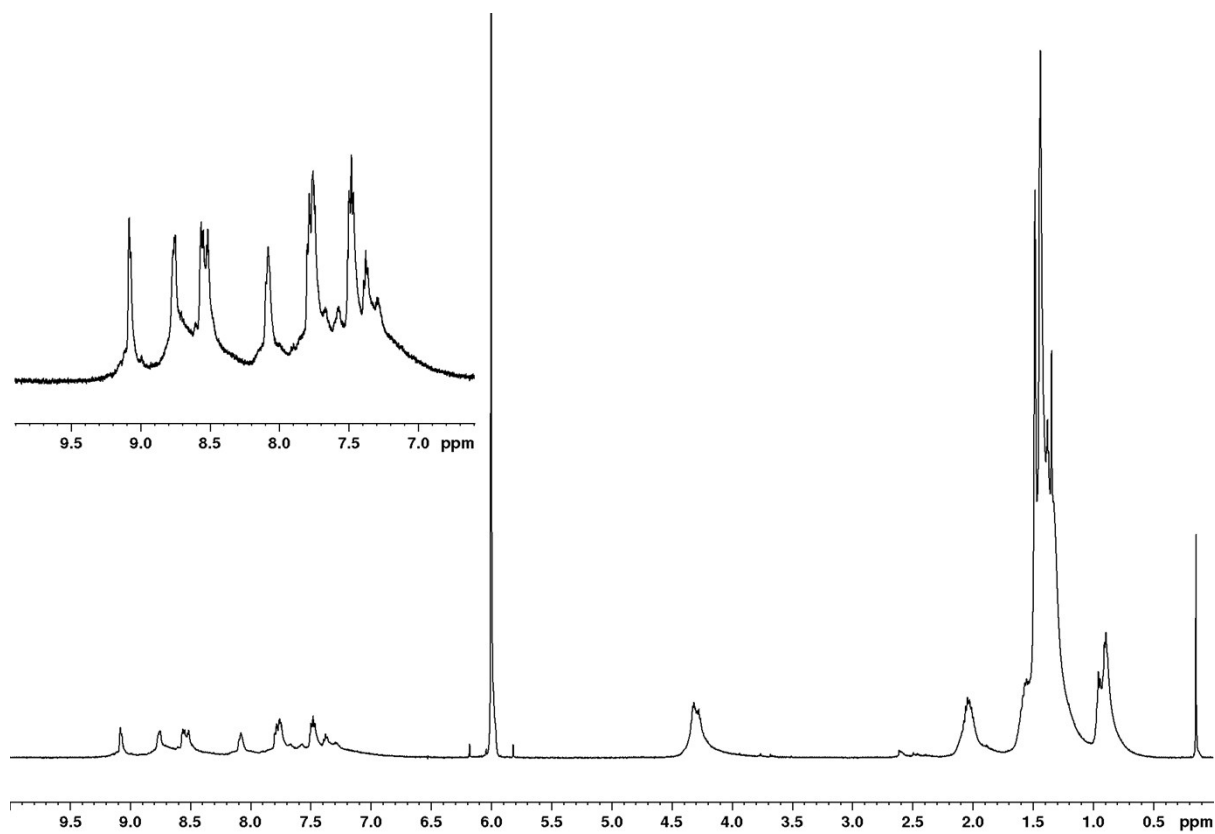
**Figure S1.** <sup>1</sup>H NMR spectrum of 2,6-bis-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-9,10-bis(triisopropylsilylacetylene) anthracene (**M1**).



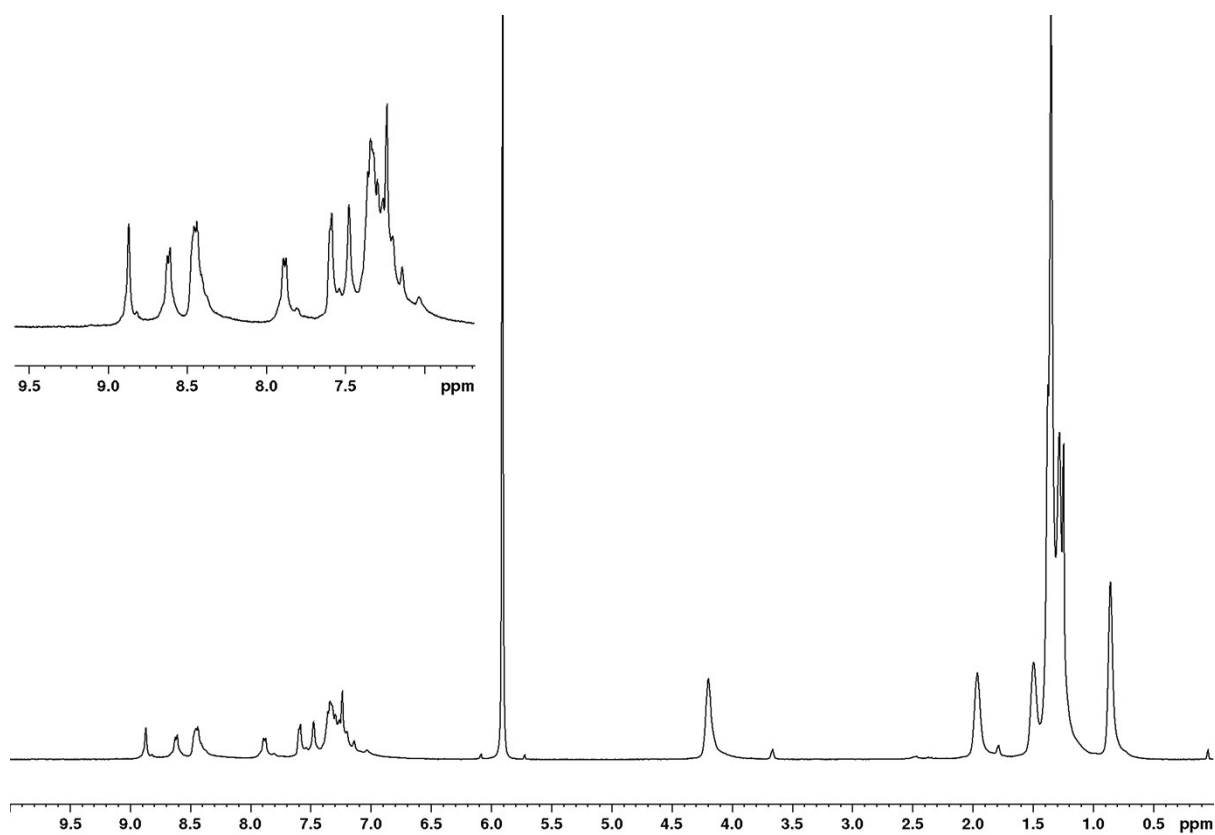
**Figure S2.**  $^1\text{H}$  NMR spectrum of the toluene fraction of **PTATffBT** in  $\text{C}_2\text{D}_2\text{Cl}_4$  at  $100^\circ\text{C}$ .



**Figure S3.**  $^{19}\text{F}$  NMR spectrum of the toluene fraction of **PTATffBT** in  $\text{C}_2\text{D}_2\text{Cl}_4$  at  $100^\circ\text{C}$ .



**Figure S4.** <sup>1</sup>H NMR spectrum of the toluene fraction of **PTATBT-8** in C<sub>2</sub>D<sub>2</sub>Cl<sub>4</sub> at 100°C.



**Figure S5.** <sup>1</sup>H NMR spectrum of the toluene fraction of **PTAT2BT-8** in C<sub>2</sub>D<sub>2</sub>Cl<sub>4</sub> at 100°C.

**Table S1.** Performance of glass/ITO/PEDOT:PSS/polymer : PC<sub>70</sub>BM/Ca/Al devices using blends of polymers : PC<sub>70</sub>BM in weight ratios 1:1 to 1:4. Results were obtained under a simulated photovoltaic light with 1000 Wm<sup>-2</sup> illumination (AM 1.5). PCE values given represent the highest and average values obtained.

Polymer	Polymer : PC <sub>70</sub> BM <sup>a</sup> (w/w)	Solvent	$J_{sc}$ (mA cm <sup>-2</sup> )	$V_{oc}$ (V)	FF	PCE (%)
<b>PTATBT-8</b>	1 : 1	CB	-3.72	0.92	28.2	0.96 (0.89 ± 0.05)
	1 : 2	CB	-6.76	0.89	34.5	1.77 (1.74 ± 0.04)
	1 : 3	CB	-6.88	0.90	37.8	2.36 (2.28 ± 0.07)
	1 : 4	CB	-6.83	0.87	37.9	2.26 (2.19 ± 0.05)
<b>PTAT2BT-8</b>	1 : 1	CB	-7.05	0.82	39.0	2.24 (2.20 ± 0.05)
	1 : 2	CB	-7.11	0.78	42.5	2.36 (2.25 ± 0.10)
	1 : 3	CB	-8.30	0.78	41.8	2.72 (2.08 ± 0.08)
	1 : 4	CB	-7.59	0.78	40.7	2.44 (2.22 ± 0.17)